



SYDNEY INTERNATIONAL CONVENTION, EXHIBITION AND ENTERTAINMENT  
PRECINCT

# TRANSPORT & TRAFFIC IMPACT ASSESSMENT REPORT

S96 (MOD2) for SSDA2- Darling Square Concept Proposal



## LEND LEASE PTY LTD

# SICEEP - DARLING SQUARE CONCEPT PROPOSAL

## Transport and Traffic Impact Assessment Addendum Report for SSDA2 S96 (MOD2) Submission

### Stage 1 State Significant Development Application (SSDA 2)

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**Report No** SSDA 2 S96 (MOD1)

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# 1 INTRODUCTION

This report supports an application made under section 96 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify Development Consent, SSD 13-5878 relating to the concept proposal for Darling Square, the new urban neighbourhood at the southern end of the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP).

Development Consent SSD 13-5878 was granted on 5 December 2013 and approved the following key components and development parameters

- Indicative staging of demolition and development of future development plots;
- Land uses across the site including residential and non-residential uses;
- Street and laneway layouts and pedestrian routes;
- Open spaces and through-site links;
- Six separate development plots, development plot sizes and separation, building envelopes, building separation, building depths, building alignments, and benchmarks for natural ventilation and solar access provisions;
- A maximum total gross floor area (non-residential and residential GFA);
- Above ground car parking including public car parking;
- Residential car parking rates;
- Design Guidelines to guide future development and the public domain; and
- A remediation strategy.

This section 96 application (the Modification Application) constitutes the first modification to the consent. This Modification Application follows the approval and current assessment of a number of SSDAs and s96s within the SICEEP site, including:

- SSDA1 which secured approval for the core convention, exhibition and entertainment facilities of the SICEEP Project;
- SSDA2, a staged application that established a Concept Proposal for a new mixed use neighbourhood at Darling Harbour known as Darling Square;
- SSDA3, SSDA4, and SSDA5 which related to three detailed proposals for use of the development plots within Darling Square;
- SSDA 6 which secured approval for the construction of the ICC Sydney Hotel; and
- SSDA7 which secured approval for the construction and use of a mixed use development on the North-East Plot of Darling Square.
- SSDA8 which secured approval for the ICC Hotel fitout, external lighting and subdivision;
- SSDA12 which secured approval for the construction and use of a residential building (student accommodation) within the Western Plot (Darling Drive) of Darling Square;
- SSDA9 which seeks approval for the construction and use of a mixed use development on the South-East Plot of Darling Square;
- SSDA10 which seeks approval for the construction and use of a mixed use development on the North Plot and public domain works to the new Square within Darling Square; and
- SDA11 which seeks approval for an interactive display system.

## 2 OVERVIEW OF PROPOSED DEVELOPMENT

### 2.1 BACKGROUND

The existing convention, exhibition and entertainment centre facilities at Darling Harbour were constructed in the 1980s and have provided an excellent service for Sydney and NSW.

The facilities however have limitations in their ability to service the contemporary exhibition and convention industry which has led to a loss in events being held in Sydney.

The NSW Government considers that a precinct-wide renewal and expansion is necessary and is accordingly committed to Sydney reclaiming its position on centre stage for hosting world-class events with the creation of the Sydney International Convention, Exhibition and Entertainment precinct.

Following an extensive and rigorous Expressions of Interest and Request for Proposals process, Lend Lease and Darling Harbour Live (formerly known as 'Destination Sydney'- a consortium comprising AEG Ogden, Lend Lease, Capella Capital and Spotless) was announced by the NSW Government in December 2012 as the preferred proponent to transform Darling Harbour and create the new Sydney International Convention, Exhibition and Entertainment Precinct.

Key features of the Darling Harbour Live Preferred Master Plan include:

- Delivering world-class convention, exhibition and entertainment facilities, including:
  - Up to 40,000m<sup>2</sup> exhibition space;
  - Over 8,000m<sup>2</sup> of meeting rooms space, across 40 rooms;
  - Overall convention space capacity for more than 12,000 people;
  - A ballroom capable of accommodating 2,000 people; and
  - A premium, red-carpet entertainment facility with a capacity of 8,000 persons.
- Providing a hotel complex at the northern end of the precinct.
- A vibrant and authentic new neighbourhood at the southern end of the precinct, called 'Darling Square', home to apartments, student accommodation, shops, cafes and restaurants.
- Renewed and upgraded public domain, including an outdoor event space for up to 25,000 people at an expanded Tumbalong Park.
- Improved pedestrian connections linking to the proposed Ultimo Pedestrian Network drawing people between Central, Chinatown and Cockle Bay Wharf as well as east-west between Ultimo/Pymont and the City.

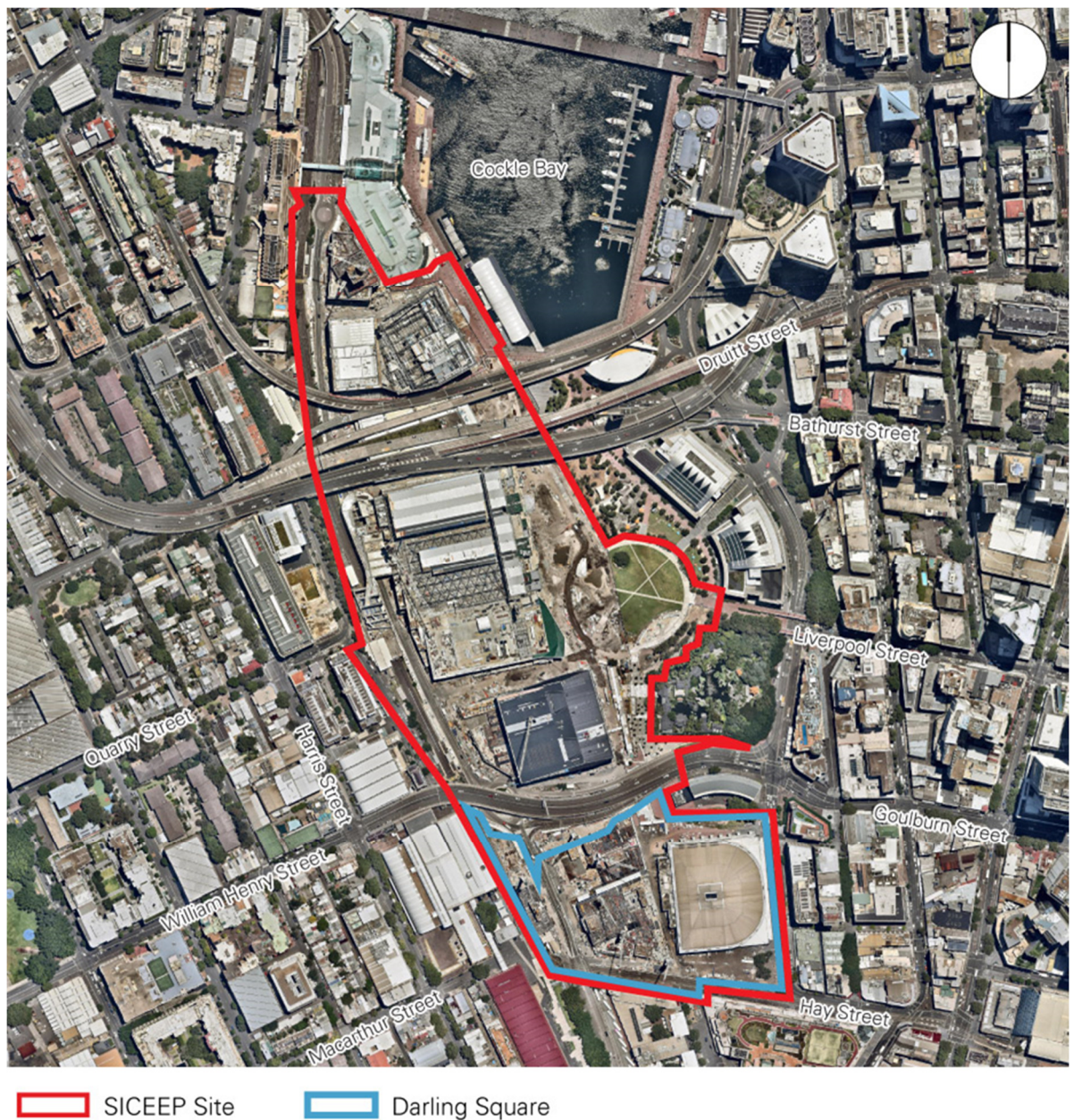
### 2.2 SITE DESCRIPTION

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

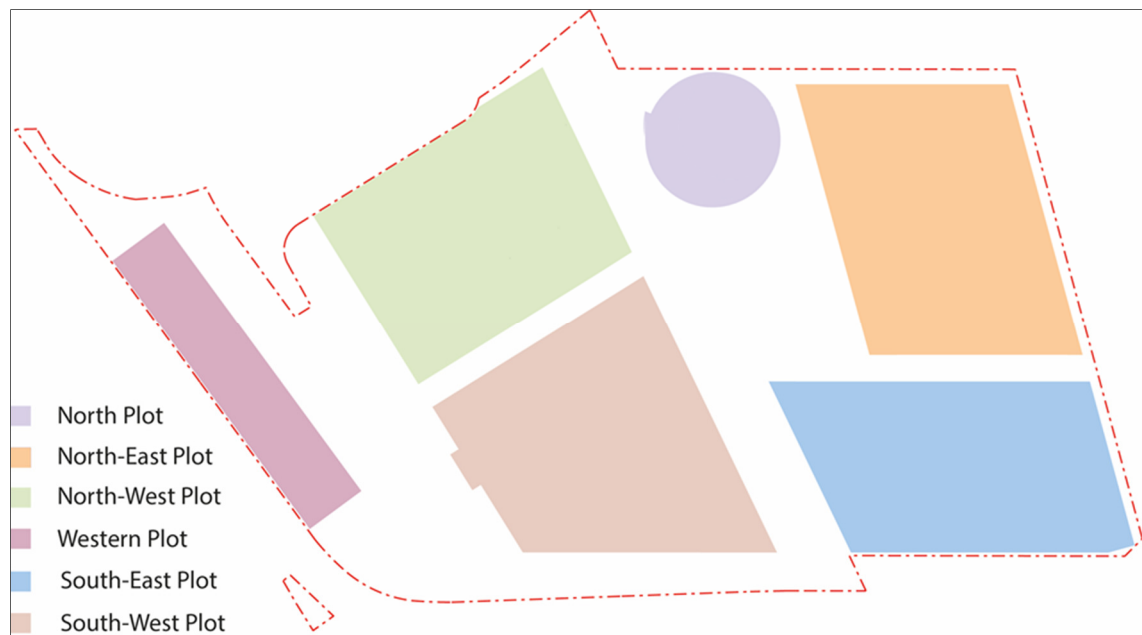
With an area of approximately 20 hectares, the SICEEP Site is generally bound by the Light Rail Line to the west, Harbourside shopping centre and Cockle Bay to the north, Darling Quarter, the Chinese Garden and Harbour Street to the east, and Hay Street to the south (refer to Figure 1).

The Darling Square Site (refer to Figure 1 and Figure 2) the subject of this modification application is:

- located in the south of the SICEEP Site, within the northern portion of the suburb of Haymarket;
- bounded by the Powerhouse Museum to the west, the Pier Street overpass and Little Pier Street to the north, Harbour Street to the east, and Hay Street to the south; and
- irregular in shape and occupies an area of approximately 37,700m<sup>2</sup>.



**Figure 1 Aerial Photograph of the SICEEP Site**



**Figure 2 Concept Proposal Development Plots**

## 2.3 PURPOSE OF THIS ADDENDUM

An overall Transport and Traffic Impact Assessment (including TMAP and Road Safety Assessment) Study was undertaken for the SSDA1 and SSDA2 in order to assess the cumulative impacts of the proposal as a whole. A Transport and Traffic Assessment Report (Main Report) was prepared to support the development approval of the project. This report is being submitted to support the Modification Application to SSDA2 Concept Proposal for Darling Square and has been prepared in conjunction with the SSDA1 and SSDA2 Traffic and Transport Main Report.

This report also has regard to the detailed SSDAs that have been approved at SICEEP including SSDA 3, 4, 5, 7 and 12. These approvals allow for the construction and use of the relevant development plots (including W1, W2, NW, SW and NE plots) within Darling Square.

The purpose of this report is to investigate the implications on the traffic assessment previously undertaken for the SSDA2 submission and to provide commentary of the likely impacts of the proposed amendments on the current findings of the traffic assessment.

This report incorporates the new peak hour traffic generation rates suggested in RMS Technical Direction document (TDT 2013/04a) released (August 2013) by the Roads and Maritime Services as an update to the Guide to Traffic Generating Development (2002) for selected land uses (i.e. residential/office/commercial). TDT 2013/04a supplements the RMS Guide which was first released in 1991 and revised in 2002.

This report should be read in conjunction with the *Traffic and Transport Assessment for SSDA2 prepared by Hyder Consulting Pty Ltd and dated 18 March 2013*.

## 3 STRATEGIC CONTEXT

In line with the NSW Long Term Master Plan, a significant amount of work is now underway to improve transport and reduce the amount of congestion in the CBD. A number of related policy documents have also been released after the submission of SSDA1 and SSDA2. These documents outline initiatives to improve each modal transport to help reduce congestion on the CBD roads. These initiatives will consequently result in improved access and connectivity for Darling Square and are discussed further below.

### 3.1 SYDNEY'S LIGHT RAIL FUTURE

Sydney's Light Rail Future was released in December 2012. It outlines an extension of light rail from Circular Quay to Kingsford and Randwick, through the Sydney City Centre via George Street. Construction of Sydney CBD and South East Light Rail has commenced with the 12 kilometre extension linking Circular Quay and Central via George Street with the Moore Park precinct, Randwick Racecourse, the University of NSW and Prince of Wales Hospital. As part of the Light Rail project, increased pedestrian use of George Street between Bathurst Street and Hunter Street is proposed. This arrangement will have a significant impact on the operation of the road network within the city centre. The introduction of the Light Rail on George Street means that buses will no longer be able to operate along George Street as they currently do.

### 3.2 SYDNEY CITY CENTRE ACCESS STRATEGY

The Sydney City Centre Access Strategy, released in December 2013, is an integral part of the NSW Long Term Master Plan. It provides a blueprint for developing an integrated, multi-modal response to Sydney's CBD major transport challenges. It details initiatives to make travel easier to, from and within the Sydney city centre as well as supporting greater public transport use to meet future growth in residents, workers and visitors to the Sydney city centre. It provides a direction for how different transport modes can work as a fully integrated transport network around the Sydney city centre over the next 20 years.

The Sydney City Centre Access Strategy has earmarked streets as preferred/priority routes for public transport, and encourages other traffic, particularly private cars, to use alternative identified routes. As part of the Access Strategy bus routes are to be redesigned to improve flexibility of transfer with other transport modes, including the Sydney Central Business District (CBD) and South East Light Rail services (CSELR) project. It will move bus operations out of George Street and include bus routes to service Barangaroo and a comprehensive cycleway network.

It should be noted that priority allocations will differ for peak and non-peak times to reflect the changing activity in the city in a typical day. This Access Strategy seeks to also encourage people walking, cycling, and driving or riding in taxis to select the route that best meets their needs, knowing the prevailing traffic conditions.

### 3.3 SYDNEY'S BUS FUTURE

Sydney's Bus Future (released in December 2013) redesigns the city centre bus services to accommodate growth in passenger demand and modification to the street network associated with the Sydney Light Rail project. The redesigned bus service together with the extensions to the light rail network will mean 220 fewer buses travelling into the city centre in the morning. The principles adopted include:

- Primary north-south bus movements along Elizabeth Street and Castlereagh Street, allowing buses arriving from the south to travel to Circular Quay or northwards onto the Cahill Expressway, or buses arriving from the north to Central Station and beyond.
- Primary east-west bus movements will be along Park Street/Druitt Street to connect buses entering the City Centre from the east on William Street to buses travelling to and from the western suburbs via Victoria Road.
- The re-routing of bus services to travel along Elizabeth Street/Castlereagh Street and Druitt Street/Park Street, consolidating more buses onto fewer streets and improving network legibility where users can understand the bus network system.

New bus infrastructure will be implemented to integrate with the CBD Light Rail project and walking and cycling initiative.

## 3.4 SYDNEY'S CYCLING FUTURE

Sydney's Cycling Future (released in December 2013) proposes a connected cycleways network to make cycling in and around the CBD safer and easier for cyclists.

## 3.5 SYDNEY'S WALKING FUTURE

Sydney's Walking Future (released in December 2013) will make walking the transport choice for quick trips under two kilometres and will help people access public transport. Increasing the number of people walking will help to reduce the burden of congestion on our roads and free up capacity on key public transport corridors.

## 3.6 SYDNEY'S FERRY FUTURE

A ferry hub at Barangaroo is included in both the NSW Long Term Master Plan and Sydney's Ferry Future (released in December 2013) which will ultimately replace the Darling Harbour King Street Wharf. The ferry hub will connect ferry customers to the western and central parts of the CBD. Wynyard Walk, a high quality pedestrian link is currently under construction and will connect Barangaroo and Wynyard. It is expected to be completed and opened in 2016.

## 3.7 SYDNEY'S RAIL FUTURE

Sydney's Rail Future (released in December 2013) outlines several initiatives that benefit rail customers travelling to the city centre.

## 4 EXISTING TRANSPORT CONDITIONS

### 4.1 ROAD NETWORK PERFORMANCE

As part of the traffic investigations for SSDA1 and SSDA2, an assessment of existing network capacity was undertaken to identify key issues with regard to network deficiencies at key roads and intersections.

The traffic assessment for SSDA1/SSDA2 was based on traffic data collected in October 2012. Although no new traffic surveys have been undertaken since then, growth in traffic in the immediate vicinity of Darling Square is not anticipated to have increased significantly. It is also expected that the demolition of the Sydney Exhibition and Convention Centre will have had a consequent reduction in vehicle traffic to and from the study area.

A review of the future network performance is carried out on the basis of traffic data used in the SSDA1/SSDA2 submission with consideration of any additional traffic attributed to the subject Modification Application to the Concept Plan. Regard has also been given to the traffic attributed to the approved detailed SSDAs including SSDA 3, 4, 5, 7 and 12 (approved subsequent to SSDA1/2).

### 4.2 PUBLIC TRANSPORT SERVICES

Recent developments in the provision of public transport services in the Sydney CBD as part of the Sydney City Centre Access Strategy will improve access and connectivity to and from the Darling Square Precinct. The improvements are outlined below.

#### 4.2.1 LIGHT RAIL

A key element to deliver Sydney's Light Rail Future is the Sydney CBD and South East Light Rail project (CSELR). This new Light Rail line will extend from Circular Quay along George Street to Central Station, through Surry Hills to Moore Park, then to Kensington and Kingsford via Anzac Parade and Randwick via Alison Road and High Street. The CSELR will be delivered, operated and maintained by a private operating company appointed for the Sydney Light Rail network as part of a Public Private Partnership (PPP).

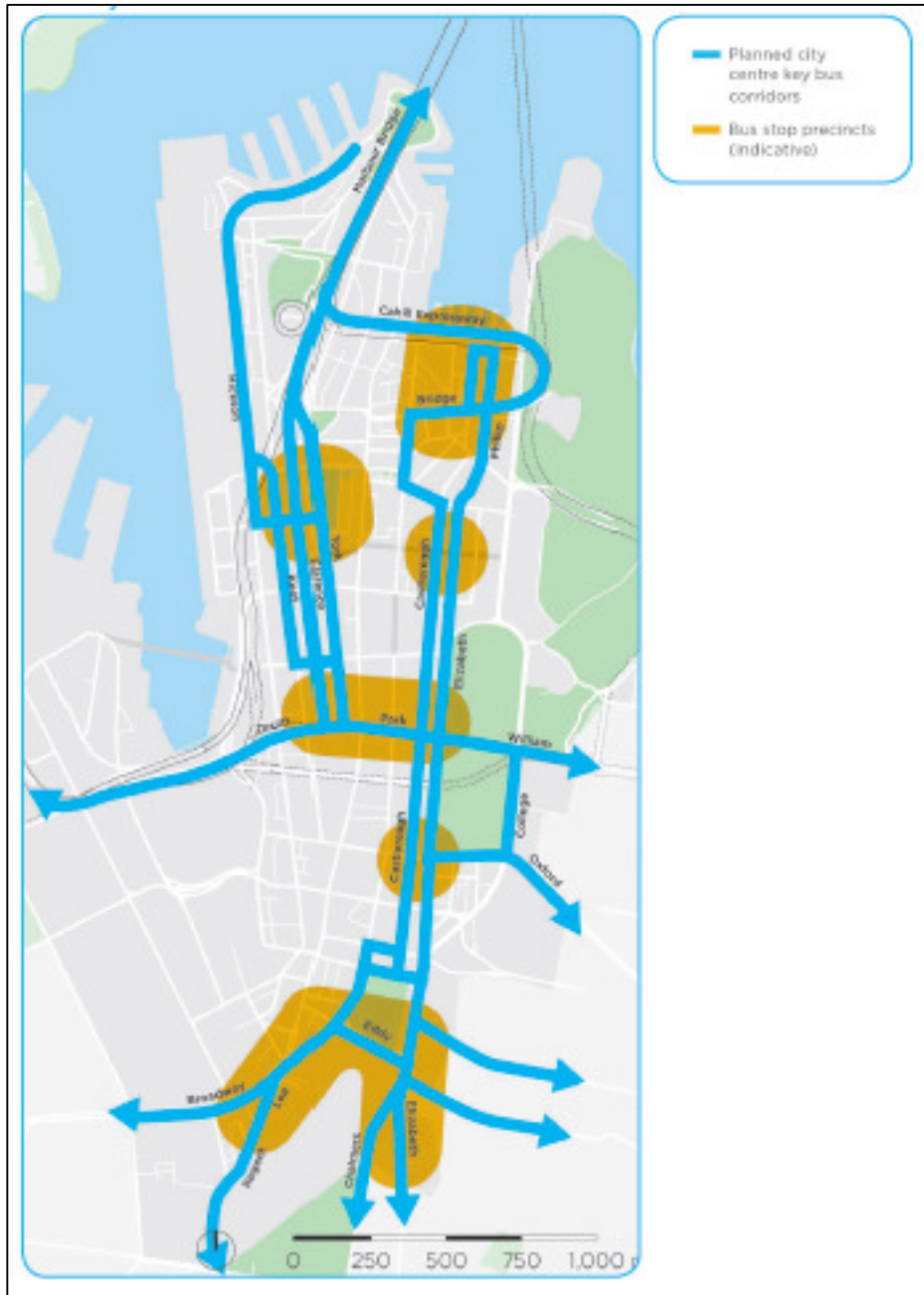
The project received planning approval on 4 June 2014 and early works began in August 2014. In December 2014 the NSW Government awarded the PPP contract to design, construct, operate and maintain the CBD and South East Light Rail line. Major construction of the project is now expected to finish in 2018, and services are scheduled to commence in early 2019.

#### 4.2.2 BUS SERVICES

As part of the Sydney City Centre Access Strategy bus routes would be redesigned to improve flexibility of transfer with other transport modes, including the CSELR services.

The redesigned, improved bus network that, together with the commencement of the CSELR, would reduce the number of buses travelling into the Sydney City Centre during peak travel periods. New bus infrastructure is being provided to support implementation of the future Sydney City Centre bus network proposed in the Sydney City Centre Access Strategy.

The key change to the bus network is the removal of buses on George Street to make way for light rail. The new bus network in the CBD is shown in Figure 3.



Source: City Centre Access Strategy

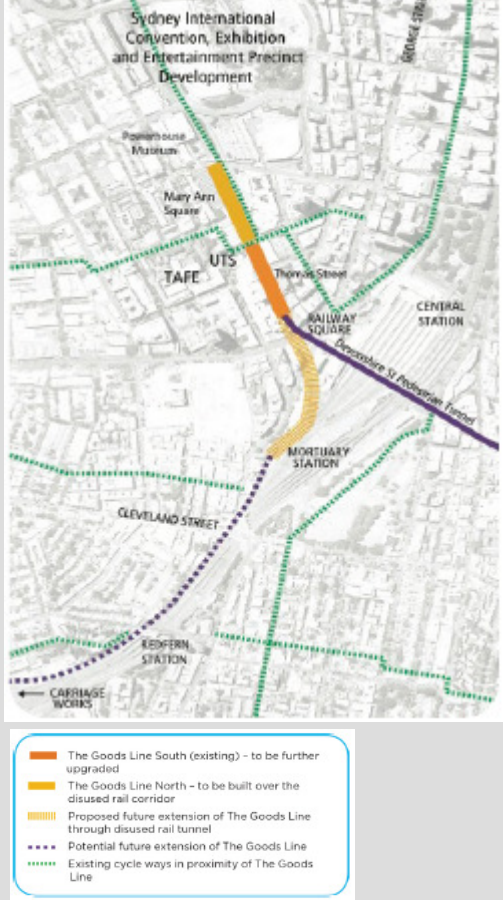
**Figure 3 Future Sydney CBD Bus Network**

## 4.3 PEDESTRIAN AND CYCLE FACILITIES

### 4.3.1 PEDESTRIANS

The introduction of the CBD and South East Light Rail will create a one-kilometre pedestrian zone, shared with the new light rail, on George Street between Bathurst and Hunter streets.

Sydney's Walking Future outlines initiatives aimed at improving access, signage, shelter and prioritising pedestrian phases at intersections. The current pedestrian network improvement projects directly relevant to the development at Darling Square include:

| Project Description                                                                                                                                                                                                                                                              | Illustration                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>Pedestrianisation of George Street from Bathurst Street to George Street.</p>                                                                                                                                                                                                 |    |
| <p>The Goods Line will be transformed into an active transport link, connecting cultural and educational institutions, and improving pedestrian access from Central Station and Railway Square through to Pyrmont and Darling Harbour. The Goods line opened in August 2015.</p> |  |

## 4.3.2 CYCLE FACILITIES

Cycleways are identified in the Sydney City Centre Access Strategy as part of an integrated solution to unlock congestion and help residents and visitors to get around the city. The CBD Cycleways Project identifies new connected cycleways for the city on Castlereagh, Liverpool and Park streets. New cycleways as well as connecting the cycleways in the city centre will encourage growth in cycling and reduce the potential conflict between bicycles and motor vehicles and pedestrians. The proposals include:

- The Castlereagh Street cycleway will be split into two sections. The Castlereagh Street south cycleway will form part of a primary north-south cycle route through the CBD, connecting Liverpool Street in the north and Hay Street in the south
- The Liverpool Street cycleway will be a primary east-west cycle route through the CBD, connecting to Sussex Street in the west and Castlereagh Street in the east.
- The Park Street cycleway from Castlereagh Street to Elizabeth Street is under assessment.

## 4.4 PARKING

The key change to the number of public car parks located adjacent to and within walking distance to the SICEEP is the demolition of the Sydney Exhibition and Convention Centre and the Sydney Entertainment Centre car parking that accommodated a total of approximately 2,800 bays. Other car parks identified in SSDA1/SSDA2 that are in close proximity to Darling Square continue to operate.

Figure 4 identifies the locations of the car parks with Table 1 indicating their respective capacities.

**Table 1 Car Parking Capacity**

| Map ID | Car Park <sup>1</sup>        | Bays | Availability <sup>1</sup> |         |
|--------|------------------------------|------|---------------------------|---------|
|        |                              |      | Day                       | Evening |
| 4      | 1 Dixon Street               | 100  | 14                        | 53      |
| 5      | Darling Quarter              | 600  | 66                        | 246     |
| 8      | Market City                  | 614  | 68                        | 250     |
| 9      | World Square                 | 557  | 62                        | 227     |
| 11     | Citigate Central (Thomas St) | 600  | 67                        | 245     |

<sup>1</sup> Selected car parks in close proximity to Darling Square only. No available information on carpark capacity for carparks A, B, C and G.

Figure 4 Locations of Car Parking near The Haymarket Precinct



## 5 PREVIOUS ASSESSMENT OF THE SSDA2 PROPOSAL

In order to assess the traffic implications of the s96 Modification Application it is important to revisit the previous assessment which supported the SSDA2 Concept Proposal.

The assessment of the SSDA2 Concept Proposal references the traffic and transport analysis undertaken for SSDA1. The traffic and transport component of SSDA1 provides the overarching assessment of the Whole of Precinct development of the SICEEP site. A micro-simulation model was developed for the core study area (SICEEP) bounded by Darling Drive to the West, Harbour Street to the East, Hay Street to the South and Pyrmont Bridge to the North. The traffic modelling encompasses the Whole of Precinct (WOP) and investigates cumulative impacts from the development of the PPP, Darling Square and the ICC Hotel. The future modelling scenario for the Friday PM peak and Saturday PM peak represent 'worst case scenario' analysis and accounts for design proposals developed at the time of the SSDA1 and 2 submissions. Details of the modelling are reported in the SSDA1/2 reports (Main Report and subsequent Addendum Reports).

The assessment of the WOP included the whole Darling Square development component with each of the individual plots including the W1, W2, NW, SW, N, NE and SE plots.

An indication of the peak hour traffic generation potential of the SSDA2 development of Darling Square (as set out in the SSDA2 Concept Proposal) was based on the Roads and Maritime Services Guide to Traffic Generating Developments (2002). The RMS's Guide provides a series of traffic generation rates for a variety of land uses based on generic surveys undertaken by the RMS. These rates are generally applied to the Gross Floor Area (GFA), Gross Leasable Floor Area (GLFA), or unit numbers.

The typical peak hour traffic generation rates applicable for the proposed land uses of Darling Square are as follows:

- Residential evening peak vehicle trips: 0.24 vehicle trips per hour for each unit
- Retail evening peak hour vehicle trips: 0.56 vehicle trips per hour per 10sqm GLFA
- Commercial evening peak vehicle trips: 2 vehicle trips per hour per 100sqm GFA

The calculating traffic generation, following assumptions were applied:

- Arrival/departure split of 80/20 for residential, 50/50 for retail and 20/80 for commercial during the evening peak period.
- Retail trips will mainly consist of non-car trips; and
- Office/Commercial trips will be capped reflecting the available parking space allocation. The NW Plot has a maximum total of 50 parking spaces (plus 1 car share space) allocated for the total office/commercial development.
- Trip generation associated with the student accommodation will be minimal and mainly attributed to service vehicle deliveries and drop off/pick up.

Application of the above traffic generation rates to the proposed development yields for a weekday peak period total traffic generation potential of 372 vehicle trips per hour comprising 270 In / 102 Out during evening peak periods.

For the purpose of the SSDA2 assessment, the following traffic distribution was assumed:

- 30% trips anticipated to arrive from western suburbs via M4 Western Distributor;

- 10% trips anticipated to arrive from western suburbs via Great Western Highway/Parramatta Road;
- 30% trips anticipated to arrive from northern suburbs via M4 Western Distributor and then through Darling Drive and Ultimo Road;
- 20% trips anticipated to arrive from southern suburbs by using Eastern Distributor and then through north Darling Drive and Ultimo Road; and
- 10% trips anticipated to arrive from southern suburbs by using Great Western Highway and then through Harris Street and Ultimo Road.

## 6 OVERVIEW OF PROPOSED MODIFICATION

This Modification Application seeks approval for the following amendments:

- increase in the total maximum non-residential and residential Gross Floor Area;
- adjustments and increase to the maximum height of the North Plot parameter plan/building envelope;
- minor administrative correction to the alignment of Little Hay Street; and
- consequential amendments to the Design Guidelines.

These modifications are driven principally by responding to the realities of moving from concept to the design and delivery of individual stages (which is a fluid process that involves a number of facets and considerations).

The proposed additional GFA is to be allocated to the South-West Plot, North Plot and Square and South-East Plot.

The following table sets out the proposed increase in GFA and where it is to be utilised within the specific plot within Darling Square.

| Land Use                             | Additional GFA                                                                                    |
|--------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Non-Residential</b>               |                                                                                                   |
| - SW Plot                            | 305m <sup>2</sup> retail                                                                          |
| - North Plot and Square              | 4,138m <sup>2</sup> community (child care and library ) and retail (market and food and beverage) |
| <b>Residential</b>                   |                                                                                                   |
| - SE Plot                            | 6,681m <sup>2</sup>                                                                               |
| <b>Overall Total Increase in GFA</b> | 11,124m <sup>2</sup>                                                                              |

# 7 IMPLICATIONS OF THE PROPOSED MODIFICATION ON THE TRAFFIC ASSESSMENT FOR THE SSDA2

## 7.1 TRAFFIC GENERATION

The RMS Guide to Traffic Generating Developments (2002) referred to in Section 4 and 6 of this report was supplemented with Technical Direction TDT 2013/04a in August 2013 and based on new surveys undertaken to update trip generation and parking information for residential, office, and retail land uses, among others. The new information supplied in TDT 2013/14 is intended to supplement and replace sections of the current RMS Guide (2002), particularly the revised and updated traffic generation rates for the land uses covered in the new data.

The updated rates take into consideration the accessibility of a proposed development site to public transport and suggest lower vehicle trip generation trends and a significant reduction by up to 40% from the previous traffic generation rates. This generally implies that the rates used in the previous traffic modelling are therefore considered to be conservative.

The new rates provided are:

- Residential evening peak vehicle trips: 0.15 vehicle trips per hour for each unit
- Retail evening peak hour vehicle trips: 0.56 vehicle trips per hour per 10sqm GLFA
- Commercial evening peak vehicle trips 1.2 vehicle trips per hour per 100sqm GFA

In the calculation of total traffic generation, the following clarifications are provided:

### **Commercial**

Office/Commercial trips would be capped reflective of the parking space allocation. In the North West Plot a total of 50 (plus 1 car share) car park spaces are allocated for the office/commercial component. Vehicle trips in excess of 50 will be accounted for in the consideration of vehicle trips associated with the public car park.

### **Retail**

It is anticipated that retail trips for the precinct will generally consist of non-car trips. However, for the purpose of the assessment the traffic generation rate above has been applied.

### **Student Accommodation**

There are no guidelines for trip generation rates for student accommodation in the RMS Guide. However, it is anticipated that majority of the trips for the student accommodation will comprise of walking trips and public transport trips during the peak hour. Vehicle trips for this land use are expected to be minimal and are anticipated to mostly occur outside the normal commuter peak. In the absence of any guidelines, it is assumed that vehicle trip generation for student accommodation is not likely to exceed the vehicle trip generation for high density residential (0.15 vehicle trips per unit) and a high estimate could potentially be in the order of 0.12 vehicle trips per unit. Hence, for a total of 422 units, vehicle trip generation could be in the order of 50 vehicle trips.

Table 2 provides a comparison of the traffic generation estimates for each plot and summarises the net impact of the Modification Application to the Concept Plan on traffic generation and its implication on the traffic assessment of SSDA2.

**Table 2 Traffic Generation Comparison: SSDA1/2 Traffic Generation compared to Updated Traffic Generation (which includes the additional Commercial Office GFA proposed as part of this Modification Application)**

| Darling Square Divisions                        | SSDA1 /2 GFA/GLFA/ Unit Nos Assessed    | Approved GFA/GLFA/ Unit Nos as part of plot specific SSDAs      | Proposed GFA to be utilised as part of the Future specific SSDAs | SSDA 2 Traffic Generation Assumed in the modelling | Updated Traffic Generation (includes the additional GFA proposed as part of this Modification Application) <sup>4</sup> | Net PM Peak Hour Traffic Generation (Veh trips per hour) |
|-------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Commercial<br>- North West                      | 17,442 GFA                              | 28,055 GFA                                                      |                                                                  | 349 (capped at 50)                                 | 337 (capped at 50)                                                                                                      | 0                                                        |
| Retail <sup>2</sup><br>- South West             | 1,700 GLFA                              | 1,522 GLFA                                                      | +232 GLFA                                                        | 95                                                 | 98                                                                                                                      | +3                                                       |
| - North East                                    | 3,600 GLFA                              | 1,558 GLFA                                                      |                                                                  | 202                                                | 87                                                                                                                      | -115                                                     |
| - South East                                    | 1,900 GLFA                              |                                                                 | 1148 GLFA                                                        | 106                                                | 64                                                                                                                      | -42                                                      |
| - North West                                    | 0                                       | 1,296 GLFA                                                      |                                                                  | 0                                                  | 73                                                                                                                      | +73                                                      |
| - North                                         | 400 <sup>1</sup> GLFA                   |                                                                 | 4324 <sup>1</sup> GLFA                                           | 0                                                  | 0                                                                                                                       | 0                                                        |
| Total Net Generation for Retail and Community = |                                         |                                                                 |                                                                  |                                                    |                                                                                                                         | -81                                                      |
| Residential<br>- South West                     | 446                                     | 539                                                             |                                                                  | 107                                                | 81                                                                                                                      | -26                                                      |
| - North East                                    | 479                                     | 581                                                             |                                                                  | 115                                                | 87                                                                                                                      | -28                                                      |
| - South East                                    | 391                                     |                                                                 | 391                                                              | 94                                                 | 59                                                                                                                      | -35                                                      |
| - North Plot                                    | 44                                      |                                                                 | 0                                                                | 11                                                 | 0                                                                                                                       | -11                                                      |
| - West Plot                                     | W1 - 170 (431 EPs)<br>W2 -252 (635 EPs) | W1 - 265 <sup>2</sup> (668 EPs/beds)<br>W2 - 252 (635 EPs/beds) |                                                                  | 50 <sup>3</sup>                                    | 50 <sup>3</sup>                                                                                                         | 0 <sup>3</sup>                                           |
| Total Net Generation for Residential =          |                                         |                                                                 |                                                                  |                                                    |                                                                                                                         | -100                                                     |

Notes:

<sup>1</sup> The community floor area is not anticipated to generate regular traffic during the peak and it is expected to cater mainly to the local residents and the local business community. The GLFA excludes terrace and balcony areas for the proposed The Darling Exchange (to be lodged as part of SSDA10).

<sup>2</sup> 668 beds approved which converts to 265 units using the same bed to unit ratio as W2.

<sup>3</sup> In the absence of any guidelines, it is assumed that vehicle trip generation for student accommodation is not likely to exceed the vehicle trip generation for high density residential (0.15 vehicle trips per unit) and a high estimate could potentially be in the order of 0.08-0.12 vehicle trips per unit. Hence, for an estimated total of 517 units, vehicle trip generation could be in the order of 34-50 vehicle trips. In addition, there will also be seasonal logistical requirements of students moving in and out of the buildings. These trips are anticipated to occur outside the peak hour and dispersed throughout the day.

<sup>4</sup> Recalibrated traffic generation based on RMS Technical Direction TDT 2013/04a (August 2013)

Table 2 shows that the net traffic generation brought about by the changes to the development mix results in decrease in the PM peak hour vehicle trip generation for the retail development in

the order of approximately 81 vehicle trips and a reduction in the PM peak hour generation for the residential development in the order of approximately 100 vehicle trips. This concludes that the assessment undertaken previously is conservative and that the conclusions drawn in the previous submission remain valid.

No new traffic modelling is undertaken to support this s96 application. A comparison of the outcomes of the previous assessment of SSDA1/SSDA2 is made on the basis of the changes in traffic generation with the modified Concept Plan. The previous modelling has accounted for trip generation associated with the proposed land use mix and the vehicle arrival/departure profile of the proposed public carpark in the NW Plot.

## 7.2 PARKING

### SSDA2 Stage 1 Concept Proposal (SSD 5878) Approval and s96 Implications for Parking

The overall parking provision for Darling Square has changed as a result of modification to the number of units as presented in the plot specific SSD DAs but remains consistent with the parking ratios proposed in SSDA2 Stage 1 Concept Proposal approval (SSD 5878).

A breakdown of the car park spaces is shown in Table 3.

**Table 3 Overall Parking Provision for the Darling Square Precinct**

| Parking Location                               | SSDA1 / 2 Proposed Parking Bays |       | Approved and Proposed as per Modification |       |
|------------------------------------------------|---------------------------------|-------|-------------------------------------------|-------|
| Residential <sup>1</sup>                       |                                 |       |                                           |       |
| North East residential                         | 350                             |       | 445                                       |       |
| North Lot                                      | 30                              |       | 0                                         |       |
| South East residential                         | 285                             |       | 265                                       |       |
| South West residential                         | 325                             |       | 399                                       |       |
| Provision for residential                      |                                 | 990   |                                           | 1,109 |
| Office/Commercial <sup>1</sup>                 |                                 |       |                                           |       |
| North West                                     | 50                              |       | 50                                        |       |
| Provision for office/commercial                |                                 | 50    |                                           | 50    |
| Retail <sup>1</sup>                            | 0                               |       | 0                                         |       |
| Student Accommodation (W1, W2) <sup>2</sup>    | 0                               |       | 0                                         |       |
| Total provision within Darling Square Precinct |                                 | 1,040 |                                           | 1,159 |
| North West Public Carpark                      | 400 <sup>3</sup>                |       | 400 <sup>3</sup>                          |       |

<sup>1</sup> Approved + Proposed Design for Darling Square

<sup>2</sup> No parking will be provided for this land use but loading facilities will be incorporated in the design layout to allow for students moving in and moving out.

<sup>3</sup>This public car park will consist of 400 car park spaces to be delivered under Darling Square and will be available for visitors for the SICEEP precinct.

The overall parking provision of 1,159 spaces has been assessed in terms of maximum allowable parking provisions approved for Stage 1 (SSD 5878) - Condition B19. The relative increase of 119 spaces is considered within the approved range and is also not expected to alter the results of the modelling undertaken as part of SSDA1 and SSDA2.

## 7.3 INTERSECTION OPERATION

The results of the traffic modelling reporting in SSDA1/SSDA2 submission have accounted for traffic generation for the proposed development mix. The results of modelling indicated that the impact of Darling Square development does not impose conditions on the intersections worse than what would have otherwise occurred through existing traffic. The modifications and the final development mix of the Darling Square have been assessed in terms of the implications on traffic generation and the findings indicate that there is a reduced traffic generation of approximately 175 vehicle trips in the PM peak hour.

The comparison has taken into account the proposal to increase residential and non-residential floor areas and has applied the more recent and updated trends in terms of traffic generation rates for the specific land uses. The assessment concludes that the modification application is not likely to generate adverse traffic implications in excess of what has already been considered and included in the modelling for the SSDA 1 and subsequently for the SSDA 2. Even with the increase in floor area, the reduced traffic generation rates result in lower peak hour traffic generation for the proposed modifications and hence indicates that the modified SSDA2 is not likely to change the outcomes reported in the traffic assessment for the SSDA 1 and SSDA 2.

## 8 ROAD SAFETY

Road safety issues have been addressed in the submission for SSDA1 and SSDA2. The proposed modifications are not expected to result in new issues relating to road safety that have not already been considered in SSDA1 and SSDA2.

## 9 CONSTRUCTION TRAFFIC MANAGEMENT

Construction Traffic Management Plans have been prepared for each of the plots with Darling Drive and mitigating arrangements have been considered to minimise construction impacts on vehicular and pedestrian movements within and around the study area.

## 10 SUMMARY AND CONCLUSIONS

The overall assessment of the SICEEP (detailed in the Main Report) was undertaken to assess existing and future transport conditions surrounding the precinct (site wide with consideration of the SICEEP Whole of Precinct development that will be delivered in stages. The outcomes of the assessment highlight key features of the SICEEP development that would support the overall efficiency of the transport network servicing the whole site.

### ***Generally:***

The transport assessment of Darling Square (SSDA2 report) focussed on access and the connectivity of the precinct with the external network for all modes of transport and cites the key features of the whole precinct that will contribute to this, including design elements of the proposal.

The proposed modifications to the SSDA2 Concept Plan have been assessed in this report in terms of the implications on traffic and transport as compared to the previous assessment undertaken to support SSDA1 and SSDA2 submissions.

The comparison has taken into account the proposal to increase residential and non-residential floor areas and has applied the more recent and updated trends in terms of traffic generation rates for the specific land uses. The assessment concludes that the amendments are not likely to generate adverse traffic implications in excess of what has already been considered and included in the modelling for the SSDA 1 and subsequently for the SSDA 2. The reduced traffic generation rates result in lower peak hour traffic generation for the proposed amendments and hence indicated that the modified SSDA2 is not likely to change the outcomes reported in the traffic assessment for the SSDA 1 and SSDA 2.

No new traffic modelling was undertaken to support this s96 application. The comparison of the outcomes of the previous assessment of SSDA1/SSDA2 is made on the basis of the changes in traffic generation with the modified Concept Plan.

The previous modelling has accounted for trip generation associated with the proposed land use mix and the vehicle arrival/departure profile of the proposed public carpark in the NW Plot.

### ***Darling Square Public Transport***

- Darling Square is well served by public transport. The improvements associated with Sydney's Access Strategy will provide improve access connections to public transport and enhanced connectivity.
- The new CBD and South East Light Rail on George Street will replace buses on George Street but bus services will still be available on corridors parallel to George Street.
- The Darling Square development design generally provides enhanced access to the public transport services through the creation of more direct travel paths through pedestrian boulevards and walkways.

### ***Darling Square Parking***

- The overall parking provision for Darling Square has changed as a result of modification to the number of units as presented in the plot specific SSD DAs but remains consistent with the parking ratios proposed in SSDA2 Stage 1 Concept Proposal approval (SSD 5878).
- The overall parking provision of 1,159 spaces has been assessed in terms of maximum allowable parking provisions approved for Stage 1 (SSD 5878) - Condition B19. The

relative increase of 119 spaces is considered within the approved range and is also not expected to alter the results of the modelling undertaken as part of SSDA1 and SSDA2.

- The outcomes reported in the traffic assessment for the SSDA 1 and SSDA 2 does not change as a result of the modification.

#### ***Darling Square Pedestrian and Cycle***

- The development design layout for Darling Square provides new east-west and north-south pedestrian linkages to connect with the existing pedestrian pathways to the Sydney CBD to the east and Ultimo to the west. These linkages provide enhanced access to George St for improved access to bus services, rail stations and to the future CSELR. The proposed cycle connections have been reviewed and are consistent with the current regional bike route plan and broadly align with the City Centre Access Strategy of Dec 2013. The enhanced north south connections along Darling Drive and via a through route along the Boulevard, improves connectivity in the precinct as do the east-west cycle routes aligning with the western regional route via Liverpool Street.
- The improvements to be implemented through Sydney's Cycling Future and Sydney's Walking Future will further enhance connectivity and access to Darling Square.