Aurecon Australasia Pty Ltd ABN 54 005 139 873 Level 5, 116 Military Road Neutral Bay NSW 2089 PO Box 538 Neutral Bay NSW 2089 Australia 
 T
 +61 2 9465 5599

 F
 +61 2 9465 5598

 E
 sydney@aurecongroup.com

 W
 aurecongroup.com



### Document Reference Number: SMCSWSPS-AUR-OSN-TF-PLN-000002 Sydney Metro Document Reference Number: SMCSWSPS-AUR-OSN-TF-PLN-000002

### 2020-10-05

### Sydney Metro State Significant Development, Development Application (SSD DA) Pitt Street North Over Station Development

Appendix E - SSD DA Response to Submission Transport and Traffic Accessibility Impact Letter

### **Revision A**

### Prepared for Pitt Street North Developer Pty Ltd

### Re: SSD DA Response to Submission – Transport and Traffic Accessibility Impact Letter

#### 1 Introduction

The Department of Planning, Industry and Environment (**DPIE**) issued a letter to the applicant on the 26 August 2020, requesting a response to the comments raised during the public exhibition period for both the Concept SSD DA Modification application (**SSD-8875-Mod-1**) and the Detailed SSD DA (**SSD-10375**).

This 'Response to Submissions' **(RtS)** letter has been prepared by Aurecon on behalf of Pitt Street Developer North Pty Ltd to address the Transport and Traffic Accessibility matters raised by the City of Sydney during public exhibition of the proposed Sydney Metro Pitt Street North Over Station Development **(OSD)** State Significant Development **(SSD)**.

On 25 September 2020, the applicant consulted with the City of Sydney to address the Transport and Traffic Accessibility comments received. This letter outlines the responses provided to the public authority. A copy of the presentation is attached for information.

2 Response to City of Sydney Comments

#### 2.1 City of Sydney Comment 1 - Vehicle access and queuing arrangements

The application proposes an automated car stacker with 40 car parking spaces for commercial use (including 3 courier/servicing) and 7 loading spaces at ground floor with access via a driveway off Castlereagh Street (right-in and right-out).

#### 2.1.1 Response to Comment 1

The proposed development includes an automatic car stacker (with two lifts) and 7 loading spaces. A total of 40 bays are provided via the automatic car stacker, of which 3 of the 40 bays may be used for longer dwell time service vehicle parking. The 7 loading spaces on ground level include 1 Sydney Metro Station maintenance bay (B99), 3 Courier Service Bays (B99), 2 Small Rigid Vehicles (SRV) loading bays, 1 Medium Rigid Vehicle (MRV) loading bay, also suitable for a waste vehicle. The location of each service loading bay is shown in Figure 2-1.

# aurecon



Figure 2-1 – Pitt Street North OSD – Loading Dock (Image Reference: Foster + Partners)

### 2.2 City of Sydney Comment 2 - Vehicle access and queuing arrangements

The vehicle access and queuing arrangements are unclear. Limited space is provided for vehicle waiting, queuing and manoeuvring.

Vehicular access arrangements must be redesigned to reduce the need for vehicles to queue on the street to enter the site or by moving loading and servicing vehicles on street, which would impact on the busy footpath, street, and bus lane. In addition, a cycleway along Castlereagh Street is planned adjacent to the site.

The design assumes all vehicles will travel in the same direction, at the same time, which will be difficult to manage. The proposed usage of the lifts, in AM for inbound flow and PM for outbound flow, would not be guaranteed, and is dependent on tenancy types. If vehicles are exiting the lift, the proposed waiting arrangement will not work (see Figure 1 below).

The design proposes that vehicles wait:

- 1. In front of the vehicle lifts (1 and 2 in Figure 1 below);
- 2. In front of vehicle parking/loading areas (1, 2 and 3) which impacts on loading; or
- 3. Immediately inside the driveway (3 and 4) which impacts on vehicles entering and exiting the site.





Figure 2-4: North OSD automatic car stacker available queuing space for vehicles (B99)

### 2.2.1 Response to Comment 2

Vehicle access to the Pitt Street North OSD loading dock is via Castlereagh Street with right-in and right-out movements.

As shown in Figure 2-2, access to the commercial parking is via the automatic car lift. There are two dedicated automatic car lifts available for a total of 40 car parking bays stacked over three levels. The 40 bays will be utilised by commercial tenant and longer dwell time service delivery vehicles only, and no public parking has been allowed for at North OSD.

Prior to access to use the automatic car lift, the specific commercial tenant will need to undertake an induction on '*How to use the Automatic Car Lift*' which will provide them access to the car lift. The induction will cover critical components around where the driver should stop the car and how access to the car lift will be undertaken, including any after hour restrictions that may be imposed by the building operations.



Figure 2-2: North OSD Automatic Car Stacker Commercial Vehicle Access

To assess the potential vehicle queue that may occur at the automatic car lift, each individual stage of the vehicle journey has been considered to estimate the service rate of the automatic car park lift and its operations. As a worst-case scenario, assessment for the car lift has assumed the commercial tenant is required to vacate their car.

As part of the car lift assessment the following assumptions have been considered:

• The average time taken for drivers to exit / enter the lift from the waiting area is 30 seconds



- Once the vehicle is within the lift, the average time taken for the driver to exit / enter the vehicle in the lift is 30 seconds
- The average time taken for the driver to send the lift using the digital screen is 30 seconds
- The single lift service rate is 21 vehicles per lift per hour (as provided by the lift manufacturer).

With two lifts in operation, the service rate is assumed to double with the use of both lifts, equating to a total of 42 vehicles per hour. When both lifts are operational, this results in a vehicle accessing the lift every 86 seconds.

Based on the trip rates for North OSD, the estimated demand for the automatic car stacker is assumed as 26 vehicles per hour for the inbound AM peak. This is equivalent to 2 vehicles arriving every 4 to 5 minutes.

In addition, the development has considered the closest signalised intersection to the North OSD loading dock, being Market Street and Castlereagh Street. It is assumed that during the AM peak, this signalised intersection has a typical total cycle time of 110 seconds, and similarly for the PM peak. Both Market Street and Castlereagh Street are one-way streets, as such the likelihood of vehicles arriving can either be equally distributed which equates to a vehicle arriving approximately every minute, or dominant for one approach only which equates to a vehicle arriving approximately every two minutes. Based on the arrival profile for commercial vehicles noted earlier, two commercial vehicles are likely to arrive every 4 to 5 minutes during the peak hour, which is accommodated within 2 signal cycle times at the Market Street / Castlereagh Street intersection and also accommodated by the two automatic car lifts.

To further supplement the commercial tenant queuing, based on the queueing theory outlined in *Austroads Guide to Traffic Management Part 2: Traffic Theory Section 4.4.1 (Queue Lengths)*, Table 2-1 summarises queueing probabilities as estimated for the two lifts for the peak inbound AM Peak demand of up to 26 vehicles/ hour. Based on this, the 95<sup>th</sup> percentile queue for the two automatic car lifts is estimated as 2 vehicles in queue i.e. outside of the automatic car stacker. The percentile queue has not included the vehicles within the car stacker, which can accommodate one vehicle per automatic car lift within the overall design.

Table 2-1: Queuing Probabilities based on queuing theory outlined in Austroads Guide to Traffic Management

Scenario	Probability of a lift being available on arrival	Probability of no vehicles queued but both lifts in use	Probability of one vehicle queued, and both lifts in use	Probability of two or more vehicles queued, and both lifts in use
Probability	69%	21%	7%	3%

As shown in Figure 2-3, the area within the OSD North loading dock on approach to the automatic car lift is estimated to hold up to four B99 vehicles without impacting the Castlereagh Street public domain. It should be noted that this does not include the two vehicles already using the automatic car lift. As such, the automatic car lift is not estimated to have an impact on the adjacent corridor or access to the loading dock via Castlereagh Street including the pedestrian footpath.





Figure 2-3: North OSD automatic car stacker available queuing space for vehicles (B99)

Furthermore, with the 4 to 5 minute arrival internal to the loading dock during the AM peak for the estimated maximum 26 vehicles, and the operation of each car lift allowing access approximately every 3 minutes, (or with the two lifts this improves access for vehicles to every 1.5 minutes), there is a high probability that the commercial vehicle will be able to arrive and access the automatic car lift with minimal queuing required. The probability of more than two vehicles arriving at the same time is 3% which, over the hour equates to 2 minutes which is likely to clear up before the arrival of the successive vehicle to use the loading dock.

While the estimated queue that may result from the automatic car stacker will be kept within the development. Further information on the automatic car stacker operations is provided in Section 4.3 of the SMCSWSPS-AUR-OSN-TF-PLN-000001 Transport and Accessibility Impact Assessment submitted with the Detailed SSD DA (**SSD-10375**).

### 2.3 City of Sydney Comment 3 - Vehicle access and queuing arrangements

The queuing analysis for the site should follow the Australian Standards, which requires 98% of the vehicles to queue within the site. It does not appear that the 98% onsite queue requirement has been achieved in the current proposal.

The vehicle queue calculations must take into account all of the mechanical installations – vehicle lift/s, turn table/s, and stacker system.

If these mechanical parking installations are considered in the system, the specification data sheet (vehicle lift operation speed, vehicle retrieval time from the stacker, turntable operation time etc.) from the manufacturer / written confirmation must be supplied.

A detailed and appropriate vehicle queue analysis must be submitted and the required number of waiting areas shown clearly on the plan. The required waiting areas should not impact on access to and from the site.

### 2.3.1 Response to Comment 3

The response provided in Comment 2 provides clarification on the queuing assessment. As explained, the operation of each car lift allows access every 3 minutes in consideration of the vehicle lift operation speed, retrieval time from the car stacker and turntable operational time.



Furthermore the assessment is in line with the *Austroads Guide to Traffic Management Part 2: Traffic Theory (2020 edition)* Section 4.5 (page 32) which states "the queue storage length required prior to the payment point, assuming that the length provided must be adequate for at least 95% of the time".

### 2.4 City of Sydney Comment 4 - Vehicle access and queuing arrangements

The waiting area for vehicles using the car lift and automatic stacker limits use of both loading areas. The transport report proposes that no loading and servicing access be available during peak time/s, however, it is not clear how access arrangements will be managed during other times or if a loading vehicle enters the site during this time.

The Traffic Report states: "Access to the loading dock and the automatic car lift usage are intertwined with two customer types. The first are the commercial tenants who will use the automatic car stacker at an ad hoc basis. The second are the loading dock users who can arrive to the loading dock based on a time allocated to them." (emphasis added). It then states that unscheduled loading and servicing vehicles can be accommodated.

### 2.4.1 Response to Comment 4

A booking system will be used for managing the arrival and departures of the loading dock requirements. A typical loading dock booking activity profile is shown in Figure 2-4 (also provided in Landscape as Attachment 1) combining the use of the loading dock and the commercial tenant access to the automatic car stacker. A delivery exclusion period during the peak commercial tenant arrival (i.e. 7 – 9am) is proposed and there is contingency within the loading dock to accommodate the arrival and departure of loading vehicles. In the event that a vehicle arrives unexpectedly outside the scheduled booking timeframe to the loading dock, the vehicle can still be accommodated for within the loading dock. Further details are provided in Section 4.3 of the SMCSWSPS-AUR-OSN-TF-PLN-000001 Transport and Accessibility Impact Assessment submitted with the Detailed SSD DA (**SSD-10375**).



Figure 2-4: Typical Loading Dock Bookings and arrival of automatic car lift arrival profile for Pitt Street North

#### 2.5 City of Sydney Comment 5 - Vehicle access and queuing arrangements

The application proposes the use of a warning system and convex mirrors mounted onto street poles. Measures that reduce the amenity for pedestrians and the public space on Castlereagh Street, such as audible signalling and flashing lights, are not supported. The site should be designed so that it is safe. Any safety devices should be onsite.

#### 2.5.1 Response to Comment 5

The comment has been considered and safety devices are now proposed to be included within the site boundary.



### 2.6 City of Sydney Comment 6 - Loading and Servicing

The proposal does not comply with Schedule 7, 7.8.1 Service Vehicles of the Sydney DCP 2012. Notionally, 21 servicing and loading bays would be required (excluding the space for the Metro). It is unclear if all 6 loading bays can be used at the same time.

As discussed above, the design of the access to the loading area, driveway, and waiting area for the lifts could potentially lead to conflicts between the vehicles accessing the car lifts, using the driveway, people leaving their vehicle (although this arrangement requires clarification) and the loading dock.

A delivery exclusion period between 7am and 9am is proposed to mitigate this conflict, however, this is the time that deliveries are often at peak which would potentially force delivery and service vehicles into on-street.

Justification for the shortfall as shown in Figure 2 below requires further explanation – for example, how have the deductions in spaces been determined? The SDCP 2012 rates include a mix of courier and other bays therefore it is not clear how converting 3 bays into 3 courier bays equates to a reduction of 5 loading and servicing bays.



Figure 4-6: Loading bays required with management measures (source: Pitt Street North Dock Activity Assessment – Draft Version 2, 9 April 2018)

We also note that the 3 courier bays are accessed via vehicle lift and automatic stackers, which limits their use as they should not be used by visitors. And, the traffic report mentions different maximum use rates for the loading and servicing areas. These should be consistent.

Additionally, the City further requests clarification on the comment in the Traffic Report 'the use of a vehicle in the southern segment of the loading dock does hinder the use of the northern segment of the loading dock'.

#### 2.6.1 Response to Comment 6

In line with the RMS guidelines the forecast profiles for the current North OSD design show an indicative total maximum of 13 bays are required for commercial and retail land uses without any management and re-arrangement of loading bays. As management measures, including an on-site dock manager, converting 3 bays into courier spaces, and implementing a delivery service plan, are included as part of the loading dock operations strategy, this reduces the loading spaces required if such measures were not in place, as it keeps the loading dock operating with a high utilisation. With the operational management measures in place, a lower provision of 6 bays was considered acceptable and in line with the previous measures recommended for a similar land use. The reduction from 13 to 6 bays assessment is shown in Figure 2-5.

Figure 2: Snapshot from Appendix v1 Transport Report (Figure4-6)





Figure 2-5: Loading bays required with management measures (source: Pitt Street North Dock Activity Assessment – Draft Version 2, 9 April 2018)

The North OSD provides a total of 7 on-site service vehicles bays including a Sydney Metro operational bay as shown in Figure 2-6. Within the loading zone there is a 'general share use area', highlighted blue, which will be used by all vehicles using the loading dock. This includes the commercial tenants who will access the automatic car stacker (highlighted in red), the B99 bays at the southern section of the loading dock for service deliveries (highlighted in orange), and larger vehicles and the Sydney Metro Bay in the northern section of the loading dock (highlighted in green).



Figure 2-6: North OSD Loading bay locations (*Note: the image reference used for this image is an older drawing but the location of the proposed parking bays within the loading dock remains unchanged*)

The North OSD loading dock will be managed by the dock master on site via a dedicated booking system. The operation of the loading dock booking allocation is proposed to be staggered such that for example a bay in the northern compartment of the loading dock is accessed following a bay in the southern compartment of the loading dock (or vice versa). This allows for seamless access to the loading dock and the use of all 6 bays. The intention of the loading dock operations is to provide a constant arrival and departure for service vehicles and OSD North loading requirements.



Although there is no online booking facility proposed between the assumed 7 - 9am, there is allowance for contingency within the loading dock to accommodate arrival and departure of loading vehicles such that in the event that a vehicle arrives at the loading dock mistakenly during the two hours where the highest movement of vehicles is assumed for the automatic car lift, the loading dock vehicle can still use the loading dock, with no greater than 6 - 8 service vehicles accessing the loading dock during the peak 7 - 9am time period.

While retail deliveries may typically arrive between 7 - 9am, food storage facilities, including cold storage facilities are provided for each retail tenant within the development. This is in part to allow the development to accommodate deliveries outside the typical 7 - 9am retail delivery period and not impact typical retail operations. The North OSD booking system enables the development to be managed and ensure deliveries occur outside of these the typical timeframes.

With the booking system in place for managing the arrival and departures of the loading dock requirements, a typical loading dock booking activity profile is shown in Figure 2-4 combining the use of the loading dock and the commercial tenant access to the automatic car stacker. As noted earlier, a delivery exclusion period during the peak commercial tenant arrival (i.e. 7 - 9am) is proposed and there is contingency within the loading dock to accommodate the arrival and departure of loading vehicles such that in the event that a vehicle arrives to the loading dock it can still use the loading dock, however the online booking facility is not proposed during this time (except for Sydney Metro Bay access).

### 2.7 Comment 7

Confirmation should be sought if the driver vacates the vehicle at the car lift or at the car parking area/stacker.

Also, confirmation as to whether the automatic parking stacker includes the ability for the vehicle to enter and exit the site in a forward motion (i.e. does it include a turntable?). If so, this must be included in the queue analysis.

### 2.7.1 Response to Comment 7

A comprehensive automatic car stacker response is provided via Comment 2.

For the assessment a worst-case has been assumed where the driver vacates the car within the car stacker lift on ground level, the driver then vacates the car stacker lift before the vehicle is sent via the car stacker to the nominated parking bay. An example of automatic car operation is shown via the below link for information: <u>https://www.youtube.com/watch?v=ROqleDrVmfE</u>. Similarly, when the driver needs to retrieve the parked vehicle, the vehicle will be brought down into the lift, the driver will access the vehicle within the car stacker lift on ground level and when safe, directly vacate (forward out) the development onto Castlereagh Street. This process will be communicated to the automatic car lift users as part of the initial welcome pack.

As part of the automatic car stacker operations, vehicles will enter and exit the development in a forward motion. The mechanics associated with the vehicle turning operations are considered as part of the overall automatic car stacker hourly capacity of 21 vehicles per hour per lift, and as there are two lifts provided at Pitt Street North this equates to 42 vehicles per hour.

### 2.8 Comment 8

The total required bike parking should be provided at the initial stage of the development. Figure 4-17 of the Transport Report shows that the automatic car parking stackers will need to be converted to accommodate bike parking to achieve compliance with the SDCP 2012. The provision of the required bike parking spaces should be included in the initial stage of the development to establish and



promote the use of cycling, towards the City of Sydney's 10 per cent mode share target. Further, it is queried how this would not trigger a Section 4.55 modification to be lodged, to convert car spaces to bike parking bays.

### 2.8.1 Response to Comment 8

A total of 200 bicycle spaces are provided as part of Pitt Street North OSD which is considered appropriate for the development.

The North OSD is a Transport Orientated Development (TOD) where a Sydney Metro Station is being developed below the North OSD. Typically, at TOD locations, the walking and cycling (active transport) mode share is higher than average, with walking and cycling as first/last mile options for people using public transport. Given the location of North OSD adjacent to multiple public transport options, for people living near and working at the site, it is likely that these traditionally active transport mode trips could be replaced by public transport (including short trips). This trend can be seen from the 1.4% of those who work in the Sydney SA2 area travel by bicycle to work, whereas a total of 77% use public transport.

It should be noted that the Sydney DCP 2012 also refers to the mode share target for trips by bike in the *Cycle Strategy and Action Plan 2007-2017*, which has been superseded by the more recent plan, the *City of Sydney Cycle Strategy and Action Plan 2018-2030* (City of Sydney, 2018). Figure 2-7 below is extracted from the *City of Sydney Cycling Strategy and Action Plan 2018 – 2030*, which shows a bike mode share target of 10% for the City of Sydney (LGA) by 2030 with interim targets in 2021.

Proportion of trips made by bike						
Indicator	Baseline	Interim targets	2030	Data source	Data frequency	
proportion of journeys to work by bike by City residents	1.9% (2006) 3.4% (2016)	5% (2021)	10%	Census	Every 5 years	
proportion of journeys to work by bike by people working in the City	1.01% (2006) 1.8% (2016)	3% (2021)	10%	Census	Every 5 years	

Note: Census data is used as a proxy for cycling for all trip purposes, since NSW has no reliable data on non-work cycling trips.

#### Figure 2-7: Proportion of trips made by bike

The earliest the OSD North development will be operational is in 2024, with the opening of the Pitt Street Metro. Linear interpolation of the *City of Sydney Cycle Strategy and Action Plan 2018-2031* using a baseline 2016 value of 1.4% (which is based on the 2016 Census mode share statistics for the Sydney, Haymarket and The Rocks) equates to a target bike mode share of 4.0% in 2024. The provision for 200 bicycle spaces upon opening corresponds to a mode share of 4.1% for cycling based on the estimated number of staff with the development fully occupied which represents an approximate 300% increase from the travel mode share as measured in 2016. In line with the above, the development is targeting a significant shift in mode share for cycling, with the provision of sufficient bicycle parking to effect this change.

Yours sincerely

Iris Brkic Senior Transport Engineer



**Enc:** Attachment 1 – Figure 2-4 loading profile in landscape view

Attachment 2 – City of Sydney presentation from 25 September 2020



#### Attachment 1 - Figure 2-4 loading profile in landscape view

The following diagrams shows the typical loading dock arrival profile combining the commercial tenants using the automatic car lift and the typical use of the loading dock movements based on the booking profile.



Attachment 2 - City of Sydney presentation from 25 September 2020

# Pitt Street Integrated Station Development (PSISD) Over Station Development (OSD) North

Presentation to City of Sydney





# Contents

- 1. City of Sydney feedback to date
- 2. Overview of the North Loading Dock
- 3. Automatic car lift operations
- 4. Demand analysis
- 5. Loading dock manager role
- 6. Operator movement in the North loading dock
- 7. Summary overview of North loading dock capacity
- 8. Bike Parking Provision

1. City of Sydney feedback to date

## COS comment addressed in Presentation Section;

The application proposes an automated car stacker with 40 car parking spaces for commercial use (including 3 courier/servicing) and 7 loading spaces at ground floor with access via a driveway off Castlereagh Street (right-in and right-out).

The vehicle access and queuing arrangements are unclear. Limited space is provided for vehicle waiting, queuing and manoeuvring. Vehicular access arrangements must be redesigned to reduce the need for vehicles to queue on the street to enter the site or by moving loading and servicing vehicles on street, which would impact on the busy footpath, street, and bus lane. In addition, a cycleway along Castlereagh Street is planned adjacent to the site.

The design assumes all vehicles will travel in the same direction, at the same time, which will be difficult to manage. The proposed usage of the lifts, in AM for inbound flow and PM for outbound flow, would not be guaranteed, and is dependent on tenancy types. If vehicles are exiting the lift, the proposed waiting arrangement will not work (see Figure 1 below).

The design proposes that vehicles wait:

2

- 1. In front of the vehicle lifts (1 and 2 in Figure 1 below);
- 2. In front of vehicle parking/loading areas (1, 2 and 3) which impacts on loading; or
- 3. Immediately inside the driveway (3 and 4) which impacts on vehicles entering and exiting the site.

# e is provided for vehicle waiting, queuing and manoeuvring. 3. Automa

 Automatic car lift operations and
 Demand Analysis
 Loading Dock pedestrian movement







# 1. City of Sydney feedback to date

The queuing analysis for the site should follow the Australian Standards, which requires 98% of the vehicles to queue within the site. It does not appear that the 98% onsite queue requirement has been achieved in the current proposal.

The vehicle queue calculations must take into account all of the mechanical installations – vehicle lift/s, turn table/s, and stacker system.

If these mechanical parking installations are considered in the system, the specification data sheet (vehicle lift operation speed, vehicle retrieval time from the stacker, turntable operation time etc.) from the manufacturer / written confirmation must be supplied.

A detailed and appropriate vehicle queue analysis must be submitted and the required number of waiting areas shown clearly on the plan. The required waiting areas should not impact on access to and from the site.

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The waiting area for vehicles using the car lift and automatic stacker limits use of both loading areas. The transport report proposes that no loading and servicing access be available during peak time/s, however, it is not clear how access arrangements will be managed during other times or if a loading vehicle enters the site during this time.

The Traffic Report states: "Access to the loading dock and the automatic car lift usage are intertwined with two customer types. The first are the commercial tenants who will use the automatic car stacker at an ad hoc basis. The second are the loading dock users who can arrive to the loading dock based on a time allocated to them." (emphasis added). It then states that unscheduled loading and servicing vehicles can be accommodated.

COS comment addressed in Presentation Section;

> Automatic car lift operations and
>  Demand Analysis

4. Demand Analysis



# COS comment addressed 1. City of Sydney feedback to date in Presentation Section: Noted – this is no longer being The application proposes the use of a warning system and convex mirrors mounted onto street poles. Measures that reduce the considered for the street amenity for pedestrians and the public space on Castlereagh Street, such as audible signalling and flashing lights, are not frontage, but the building supported. The site should be designed so that it is safe. Any safety devices should be onsite. frontage to help with vehicle sightlines Confirmation should be sought if the driver vacates the vehicle at the car lift or at the car parking area/stacker. 3. Automatic car lift operations Also, confirmation as to whether the automatic parking stacker includes the ability for the vehicle to enter and exit the site in a forward motion (i.e. does it include a turntable?). If so, this must be included in the queue analysis. 8. Bike Parking Provision

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The total required bike parking should be provided at the initial stage of the development. Figure 4-17 of the Transport Report shows that the automatic car parking stackers will need to be converted to accommodate bike parking to achieve compliance with the SDCP 2012. The provision of the required bike parking spaces should be included in the initial stage of the development to establish and promote the use of cycling, towards the City of Sydney's 10 per cent mode share target. Further, it is queried how this would not trigger a Section 4.55 modification to be lodged, to convert car spaces to bike parking bays.

8



## 1. City of Sydney feedback to date COS comment addressed in Presentation Section; The proposal does not comply with Schedule 7, 7.8.1 Service Vehicles of the Sydney DCP 2012. Notionally, 21 servicing and 7. Loading Dock Capacity loading bays would be required (excluding the space for the Metro). It is unclear if all 6 loading bays can be used at the same time. As discussed above, the design of the access to the loading area, driveway, and waiting area for the lifts could potentially lead to 4. Demand Analysis conflicts between the vehicles accessing the car lifts, using the driveway, people leaving their vehicle (although this arrangement requires clarification) and the loading dock. A delivery exclusion period between 7am and 9am is proposed to mitigate this conflict, however, this is the time that deliveries are 3. Automatic car lift operations often at peak which would potentially force delivery and service vehicles into on-street. Justification for the shortfall as shown in Figure 2 below requires further explanation – for example, how have the deductions in spaces been determined? The SDCP 2012 rates include a mix of courier and other bays therefore it is not clear how converting 3 7. Loading Dock Capacity bays into 3 courier bays equates to a reduction of 5 loading and servicing bays. Employ an on-site dock manager Convert 3 bays into courier space re 4-6: Loading bays required with management measures (source: Pitt Street North Dock Activit Assessment - Draft Version 2, 9 April 2018) Figure 2: Snapshot from Appendix v1 Transport Report (Figure4-6)

We also note that the 3 courier bays are accessed via vehicle lift and automatic stackers, which limits their use as they should not be used by visitors. And, the traffic report mentions different maximum use rates for the loading and servicing areas. These should be consistent.

Additionally, the City further requests clarification on the comment in the Traffic Report 'the use of a vehicle in the southern segment 4. Demand Analysis of the loading dock does hinder the use of the northern segment of the loading dock'.

3. Automatic car lift operations



# 2. Pitt Street North Loading Dock

# **Overview of Loading Dock**

## Loading Dock Provision:

- Automatic Car Stacker with 40 vehicle bays. 3 (B99) bays may be used for service vehicle parking specifically to accommodate vehicles with a longer dwell time.
- 1 Sydney Metro Station maintenance bay (B99)
- 3 Courier Service Bays (B99)
- 2 Small Rigid Vehicles (SRV) loading bays
- 1 Medium Rigid Vehicle (MRV) loading bay suitable for a waste vehicle



# Start conveniently

Get in and go - the gate shuts automatically



# Examples of developments with an Automatic Car Lift

Sydney		Australia	International
<b>70 Cronulla St, Cronulla NSW:</b> Fully Automated Shuttle System. 35 Parking Spaces. Completion: 2018. Sammut Developments <u>https://www.youtube.com/watch?v=REPb6</u> <u>d4q5-o</u>	64 Cowper Warf Road, Woolloomooloo NSW Fully Automated Box Cycle System. 25 Parking spaces. Completion 2015 Zadro Construction. <u>https://www.youtube.com/watch?v=0t5k- uFtXvM&amp;t=2s</u>	2-16 Northumberland St, Collingwood MEL. Fully Automated Car Picker System. 136 parking Spaces. Completion 80% (Electrical is being fitted out) Grocon (Australian Made Electrical/Control System)	Geyser, Auckland NZ. <u>Fully Automated Car Picker System</u> 176 parking Spaces. Completion Nov 2012. Mainzeal <u>https://www.youtube.com/watch?v=U51iGq</u> <u>UdzUk&amp;feature=youtu.be</u>
<b>31-33 Wheat St, Darling Harbour NSW:</b> <u>Fully Automated Car Picker System</u> . 170 Parking Spaces. Completion 50% (Machine is manufactured and waiting for site to be ready) Grocon (Australian made Electrical/Control System)	273 Sussex St, Sydney NSW: Fully Automated Horizontal Puzzle System. 20 Parking Spaces. Completion 2019 Kazcon Construction <u>https://www.youtube.com/watch?v=uS9pE</u> <u>VgPcV0&amp;t=</u>	22 Rutland Road, Box Hill MEL Fully Automated Hanging Shuttle System. 20 Parking spaces. Completion 2019 Liberty Builders. <u>https://www.youtube.com/watch?v=0pJE1</u> <u>G_tAM4</u>	
<b>115 Bathurst St, Sydney NSW</b> : Fully Automated Box Cycle System. 53 Parking Spaces. Completion 95% (waiting for permanent power supply) Pro Build. (Australian Made Electrical/Control System)		<b>31 Smith St, Darwin City NT.</b> Fully Automated Shuttle System. 93 Parking Spaces. GRD Group Completion 2016 <u>https://www.youtube.com/watch?v=PeWLN</u> <u>dkARXM&amp;t=26s</u>	



# Examples of developments with an Automatic Car Lift

Sydney		Australia	International
<b>70 Cronulla St, Cronulla NSW:</b> Fully Automated Shuttle System. 35 Parking Spaces. Completion: 2018. Sammut Developments <u>https://www.youtube.com/watch?v=REPb6</u> <u>d4q5-o</u>	64 Cowper Warf Road, Woolloomooloo NSW Fully Automated Box Cycle System. 25 Parking spaces. Completion 2015 Zadro Construction. <u>https://www.youtube.com/watch?v=0t5k- uFtXvM&amp;t=2s</u>	2-16 Northumberland St, Collingwood MEL. Fully Automated Car Picker System. 136 parking Spaces. Completion 80% (Electrical is being fitted out) Grocon (Australian Made Electrical/Control System)	Geyser, Auckland NZ. <u>Fully Automated Car Picker System</u> 176 parking Spaces. Completion Nov 2012. Mainzeal <u>https://www.youtube.com/watch?v=U51iGq</u> <u>UdzUk&amp;feature=youtu.be</u>
IMAX site 'The Ribbon' Darling Harbour, NSW: Fully Automated Car Picker System. 170 Parking Spaces. Completion 50% (Machine is manufactured and waiting for site to be ready) Grocon (Australian made Electrical/Control System)	273 Sussex St, Sydney NSW: Fully Automated Horizontal Puzzle System. 20 Parking Spaces. Completion 2019 Kazcon Construction <u>https://www.youtube.com/watch?v=uS9pE</u> VgPcV0&t=	22 Rutland Road, Box Hill MEL Fully Automated Hanging Shuttle System. 20 Parking spaces. Completion 2019 Liberty Builders. <u>https://www.youtube.com/watch?v=0pJE1</u> <u>G_tAM4</u>	
<b>115 Bathurst St, Sydney NSW</b> : Fully Automated Box Cycle System. 53 Parking Spaces. Completion 95% (waiting for permanent power supply) Pro Build. (Australian Made Electrical/Control System)		<b>31 Smith St, Darwin City NT.</b> Fully Automated Shuttle System. 93 Parking Spaces. GRD Group Completion 2016 <u>https://www.youtube.com/watch?v=PeWLN</u> <u>dkARXM&amp;t=26s</u>	



Examples of developments with an Automatic Car Lift - Melbourne







## Examples of developments with an Automatic Car Lift – IMAX Site 'The Ribbon' Darling Harbour







Examples of developments with an Automatic Car Lift – Sydney CBD





# Typical Automatic Car Lift Access

- · Each lift has the capacity for 21 vehicles per hour
  - Total capacity for two lifts = 42 vehicles per hour
- Typical start to a working day is between 6am and 9am where the peak hour is between 7am and 8am. And typical end of day is between 4pm and 7pm where the peak hour is between 5pm and 6pm.
- Trip generation is based on the RMS Trip Generation Guidelines which indicated that the peak hour demand may range from 13 – 26 vehicles per hour for a car park of 40 bays
- 3 of the 40 bays may be used for service vehicle parking specifically to accommodate vehicles with a longer dwell time.
- Vehicles in Queue probability:



Vehicles in Queue	0	1	2	More than 2
Probability	69%	21%	7%	3%



# 4. Loading Dock Demand Analysis

**Overall Loading Dock Operations** 

- For a development of the size of PSISD North, between 14 and 17 peak hour service vehicle trips are estimated, with the daily maximum number of vehicles estimated as 101 vehicles per day.
- Previous studies for Pitt Street noted an average delivery profile of 24 minutes.





# 4. Pitt Street North Loading Dock

Loading Dock Operations – Service Vehicles in the Automatic Car Stacker

- 1. A service vehicle accessing the automatic car stacker will undertake unloading of goods from the available B99 bays on ground level. Typical service vehicle unloading is not expected to exceed 5 minutes.
- 2. Once goods are unloaded from the service vehicle, the driver will access the Car Stacker Lift (i.e. repark their vehicle).
- 3. Access to the Car Stacker will be facilitated by the Dock Master.
- 4. Once the Service Vehicle is in the Car Stacker Lift, the driver will exit the vehicle and the Dock Master will send the vehicle to the nominated bay within the car stacker.
- 5. In the event that the service worker has forgotten something and needs to access their vehicle, this will be facilitated by the Dock Master.
- 6. The reverse is assumed to occur upon exit.



# 4. Loading Dock Demand Analysis

# Typical Loading Dock Bookings

- The peak service delivery booking changes to account for the movements to/from the automatic car stacker.
- A delivery exclusion period during the peak commercial tenant arrival (i.e. 7 – 9am) is proposed and there is contingency within the loading dock to accommodate the arrival and departure of loading vehicles such that in the event that a vehicle arrives to the loading dock it can still use the loading dock, however the online booking facility is not proposed during this time (except for Sydney Metro Bay access).
- To accommodate the provision of loading dock vehicles which require longer dwell times, access to three B99 bays has been allowed for within the automatic car stacker and access to these will also be booked via the loading dock booking system.





# 4. Loading Dock Demand Analysis

#### Pitt Street North Proposed Typical Loading Dock Bookings



COMBINING THE PRIVATE AND COMMERCIAL VEHICLE MOVEMENTS



# 5. Loading Dock Manager Role

- The Delivery Service Plan will be managed by a dedicated on-site loading dock master through an integrated loading dock digital booking system notifying when deliveries are arriving and time allocation to specific loading requirements.
- The role of the Loading Dock Master is beyond the traditional role of a security guard, and will include knowledge of logistics and traffic management training.





# 6. Loading Dock Operator Movement

- Proposed bollard / wall protection locations
  - Pedestrian Movement within the loading dock (900mm minimum)

Dock master office





# 7. Summary overview of loading dock capacity

Concept SSDA (Stage 1) Approved and Detailed SSDA (Stage 2) Current Design Overview – RMS Guideline

	Stage 1		Detailed SSDA (Stage 2)	
Land Use	(as reference	in section 4.3.1)	Current Design	
	Area (m²)	Service Requirements	Area (m²)	Service Requirements
Commercial	49,120 m <sup>2</sup>	8.6	52,951 m <sup>2</sup>	9.1
Retail	500 m <sup>2</sup>	1.3	1,700 m <sup>2</sup>	4.3
Total	49,620 m <sup>2</sup>	10 bays	54,651 m <sup>2</sup>	13 bays



# 8. Bike Parking Provision



Proportion of trips made by bike					
Indicator	Baseline	Interim targets	2030	Data source	Data frequency
proportion of journeys to work by bike by City residents	1.9% (2008) 3.4% (2016)	5% (2021)	10%	Census	Every 5 years
proportion of journeys to work by bike by people working in the City	1.01% (2006) 1.8% (2016)	3% (2021)	10%	Census	Every 5 years

The earliest the OSD North development will be operational is in 2024, with the opening of the Pitt Street Metro. Linear interpolation of the *City of Sydney Cycle Strategy and Action Plan 2018-2031* using a baseline 2016 value of 1.4% (which is based on the 2016 Census mode share statistics for the Sydney, Haymarket and The Rocks (refer to Figure 3-10)), equates to a target bike mode share of 4.0% in 2024.

The provision for 200 bicycle spaces upon opening corresponds to a mode share of 4.1% for cycling based on the estimated number of staff with the development fully occupied which represents an approximate 300% increase from the travel mode share as measured in 2016.

The development is targeting a significant shift in mode share for cycling, with the provision of sufficient bicycle parking to effect this change.

# Thank you.

