5 Description of the proposal

This chapter discusses the existing station infrastructure and activities proposed to be undertaken as part of the station upgrade including descriptions of station layout, construction access, staging and methodology. It also identifies works being undertaken by others on behalf of Transport for NSW separate to the works outlined in this REF, such as the early enabling works and Wynyard Walk.

5.1 Existing station infrastructure

The existing configuration of Wynyard Station is shown on **Figure 7** and **Figure 8**. The existing station layout comprises:

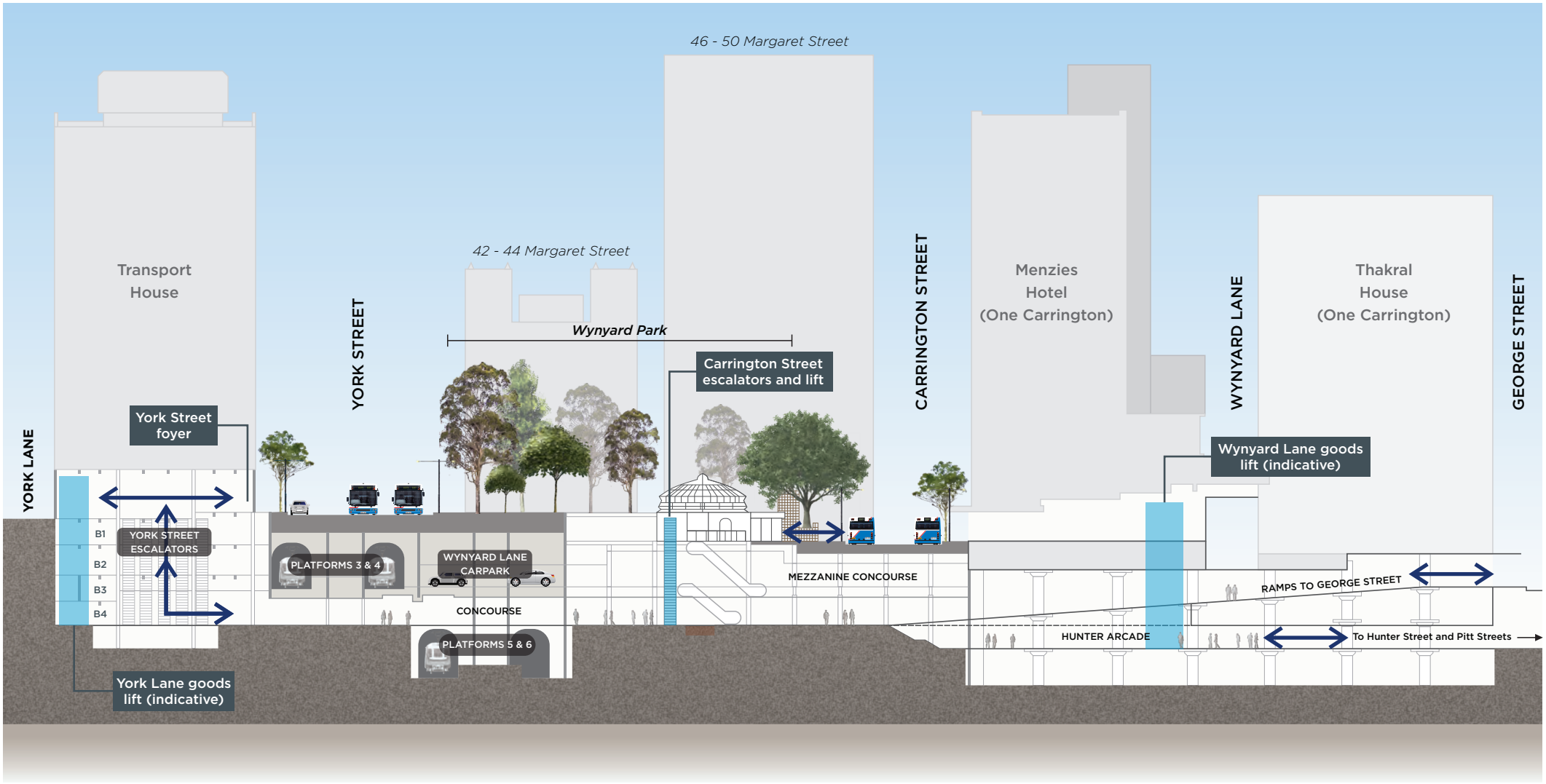
- Pedestrian access via:
    - Four escalators connecting the concourse level with Transport House and York Street.
    - Escalators and stairs to Wynyard Park and Carrington Street.
    - Stairs to the Hunter Arcade tunnel.
    - Direct access to the Metcentre.
    - Direct access via two ramps to George Street.
- Fire stairs and emergency accesses and egresses.
- Station and rail operations systems, such as tunnel lighting, ticket gates, ticket vending machines, customer information systems and CCTV.
- Electrical, communications, mechanical and hydraulic services, such as power, fire systems, ultra-high frequency and mobile telephone services, air conditioning, ventilation and drainage. Services are provided for entrance, concourse and platform areas and are located within roof and/or wall cavity spaces, and in some instances interface with or extend into adjacent properties.
- Public domain areas, including:
    - The unpaid concourse area, which is divided into four areas in this document and referred to as the northern, eastern, southern and western unpaid concourse areas.
    - The paid concourse area, separated from the unpaid concourse area by ticket gates.
    - Platforms 3 and 4, which are located upstairs from the paid concourse area and are accessed via four sets of stairs and a lift.

- Platforms 5 and 6, which are located downstairs from the paid concourse area and are accessed via four sets of stairs and a lift.
- York Street foyer.
- Mezzanine area and Carrington Street entrance (also known as the Wynyard Park dome) which are located upstairs from the eastern unpaid concourse area and accessed via the Carrington Street escalators and lift.

- Station facilities, including:
  - Back-of-house areas:
    - Station Manager's office, staff toilets and amenities, and storage rooms directly north of the paid concourse area.
    - Electrical, communications and plant rooms.
    - Hunter Arcade Electrical Depot.
  - Public facilities, including:
    - Public toilets directly south of the paid concourse area.
    - Other amenities for customers, such as public telephones and ATMs.
  - Station facilities directly south of the paid concourse area.
  - Retail and commercial spaces:
    - Concourse Bar.
    - Individual food, service-related and retail outlets.
- Redundant and remnant features from previous works, including escalator enclosures and stair cases.

Figure 7 - Existing Wynyard Station layout - concourse level

WEST EAST



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NOT TO SCALE

Figure 8 - Wynyard Station cross section

Lift

Current main access

5.2 Early works

Early works would be undertaken prior to the proposal and have been approved under a separate environmental impact assessment approvals process. These works include:

- Establishment and use of a site compound in vacant retail spaces and an existing facility on the Hunter Arcade level.
- Investigations into hazardous materials, structures and building services.
- Removal of hazardous materials.
- Removal of redundant building services.
- Removal of concourse area ceiling tiles and replacement with temporary netting, where required.
- Strip out existing redundant fit out in vacant retail.

The early works are being would be undertaken throughout Wynyard Station the Hunter Arcade and the Menzies Hotel basement. These are expected to be completed by early 2015. Some early works activities would also be undertaken within Transport House as approved under a section 57 of the *Heritage Act 1977*.

5.3 Wynyard Walk

The REF and Submissions Report for Wynyard Walk was determined by Transport for NSW on 16th July 2012. Wynyard Walk is currently under construction and will provide a direct pedestrian link between the Barangaroo development and Wynyard Station. The REF for Wynyard Walk assessed the excavation of the area identified in **Figure 7** and **Figure 9** which will be carried out as part of the Wynyard Walk project. This space would be used as part of the western unpaid concourse area in the upgraded Wynyard Station. Construction staging for the proposal during detailed design would need to consider the Wynyard Walk works, as the two projects are interconnected.

5.4 The proposal

The proposal illustrated in **Figure 9** would:

- Increase concourse capacity for Wynyard Station to meet current and future passenger demand.
- Relieve congestion within the paid concourse area and the platforms by providing effective vertical transportation links between the concourse and the platforms.
- Improve amenity at Wynyard Station, including improved customer experience, station facilities, wayfinding and surveillance.

- Establish a continuous public domain link from Pitt Street and George Street and through to the western CBD and waterfront, that is complementary to the CSELR, Wynyard Walk and the proposed One Carrington Street development and Barangaroo Ferry Hub.

The gateline configuration, as depicted in **Figure 9**, is subject to detailed design. During detailed design, the configuration may undergo refinement to ensure it maximises customer experience, meets operational requirements and delivers a high standard of architectural design.

The proposal assessed in this REF has been developed following careful consideration of options as outlined in **Chapter 3**. The preferred option has been developed to provide certainty of layout for the construction contractor while also enabling flexibility around future fit-out of station facilities during detailed design, noting that fit-out of retail spaces would not form part of this proposal (refer to **Chapter 4**).

5.4.1 Works within the public domain area

The following works are proposed within the public domain area:

- Refurbishment of the York Street foyer, including the ceiling, walls and flooring and installation of new building services, lighting and signage. Works to the York Street escalators are limited to sanding and varnishing to refresh timber panels.
- Widening of the northern unpaid concourse area through the removal of the existing Station Manager's Office, back of house storage, electrical and communications room as well as modifications to a staircase to the lower floors of the station.
- Extension of the paid concourse area to the south. No southern unpaid concourse area would be provided under the final arrangement.
- Widening of the paid concourse area to the east, north and west, involving the demolition of the existing ticket barriers and ticket offices and the installation of new slimline ticket barriers and glazed enclosure.
- Expansion of the western unpaid concourse area to improve pedestrian flows and allow for the extended paid concourse area. This would require partial use of existing retail and commercial spaces (including part of the Concourse Bar and Café) and demolition of the lower portion of a fire stair which services the basement areas of Transport House. The western unpaid concourse area would adjoin the Wynyard Walk project (refer to **Section 5.3**).
- Expansion of the eastern unpaid concourse area to improve pedestrian flows and wayfinding by reducing the width of the station facilities on the northern side of the eastern unpaid concourse area, modifying existing staircases and removing unnecessary structures that obstruct pedestrian flows through the concourse areas.

Figure 9 - Proposed Wynyard Station - concourse layout (indicative)

- General de-cluttering, refurbishment and amenity improvements of the concourse areas, and platform areas, including:
    - Replacement and upgrade of lighting including new decorative lighting.
    - New paint finishes to walls, columns, steel beams and ceilings.
    - Retiling and new tile finishes to walls on some platforms and concourse.
    - Refurbishment of ceilings within the paid and unpaid concourse areas.
    - New floor tiles and tactile indicators throughout the concourse, platforms and stairs.
    - New transparent screens (i.e. glazing) between the paid and unpaid concourse areas.
    - New seating and station furniture.
    - Improved signage and wayfinding.
    - Relocation of fire hydrants and hoses on platforms.
    - Removal of redundant walls and enclosures.
- Demolition of some existing station facilities including ticket offices, staff rooms and some retail spaces to provide additional circulation space on the concourse level.
- Provision of new stairs to Platforms 3 and 4 at the southern extent of the expanded paid concourse area (near the location of the existing accessible toilets).
- Construction of new public toilets including provision of additional accessible toilets.
- Reorientation of the southernmost stairs from the paid concourse area to Platforms 5 and 6 to face southwards from the mid landing.
- Demolition of existing redundant stairs from the paid concourse to underside of car park level (previously blocked off).
- Demolition of the existing redundant structures on Platforms 5 and 6 that were originally intended to house escalators.
- Temporary relocation of advertising signage, ticket vending machines and pay phones during construction.
- Temporary toilets for customers and station staff.

5.4.2 **Works within the station facilities**

The station facilities area would be located along the northern and southern boundaries of the unpaid concourse and at the southern extent of the paid concourse. It would also include an area at the south of the western unpaid concourse area (the existing Concourse Bar) and within the basement levels of Transport House. The proposed works within the station facilities include:

- Construction/refurbishment and/or relocation of station facilities, including:
    - The removal of existing back-of-house and retail spaces.
    - Fit-out of back-of-house areas, including storage areas, Station Manager's Office, toilets and change rooms, services and plant rooms, general office space and meeting rooms.
- Demolition and reconstruction of an existing fire stair between the basement level 3 to basement level 1 of Transport House to provide direct concourse access/egress for station staff.
- Reconfiguration of an existing fire staircase in the south-east corner of the western concourse area to comply with the requirements of the Building Code of Australia.
- Fit-out and installation of building services in the basement levels of Transport House.
- Provision and installation of services described in **Section 5.4.3**.

The final partitioning and fit-out of the station facilities would be subject to detailed design and future commercial negotiations. The division of space between back-of-house, office and storage, services and utilities, and retail would be determined based on station operational, access and safety requirements. The final fit-out of future retail or commercial spaces would be subject to separate assessment, however the proposal includes servicing of these spaces to support their future use.

5.4.3 Ancillary works

Ancillary works would be undertaken within ceiling and wall cavities at all levels across the station and also where there is an interface with adjoining properties. The works would include:

- Low voltage electrical works, including disconnection and removal of existing low voltage power supply and provision of low voltage power to all areas.
- High voltage electrical works, including relocation of the existing feeder cables to accommodate the widened northern unpaid concourse area and exposed ceilings in the paid concourse area as well as high voltage interfaces with Wynyard Walk.
- Lighting system works, removal and replacement or modification of lighting.
- Communications and control system works, including disconnection and relocation of existing communications, reconfiguration of ultra-high frequency and mobile telephone services, and relocation and supply of new communications equipment and cabling.
- Hydraulic services works, disconnection of existing hydraulic services and provision of new services to station facilities.
- Fire system works, including disconnection and reconfiguration of fire systems, provision of new fire systems, reconfiguration of sprinkler zoning and relocation or provision of a new sprinkler system, relocation of fire hydrants and hose reels.

- Fire rating works, including repair or installation of new fire separation elements and repair or application of fire insulation materials to structural elements.
- Water proofing works.
- Structural strengthening and repair where required within all areas of the station.
- Signal works, such as temporary relocation and reinstatement of signal infrastructure on platforms, concourse and back-of-house areas.
- Mechanical ventilation works, including disconnection, reconfiguration and/or relocation of mechanical services and provision of new mechanical services. The works may also include relocation and upgrading of ventilation services.
- Installation of multi-service units to contain combined services such as lighting, cable routes, sprinkler, detection systems and PA speakers.
- Removal, remediation or containment of hazardous materials.
- Temporary works to support the above activities (particularly service changeover) as required.

The upgrade of services to the station may require works to be conducted in the Wynyard Lane car park, Transport House, the Metcentre or Thakral House (the future One Carrington Street development). This would be confirmed during detailed design following discussions with landowners.

5.5 Construction methodology

Construction staging and access would be constrained by the station's location and operational requirements as well as the interaction with the construction of surrounding developments. Construction is underway on Wynyard Walk and 333 George Street. It is anticipated that the CSELR and the proposed One Carrington Street development would start construction during the proposal construction period. This section provides an overview of the construction methodology with a focus on how the operational requirements and interactions with other projects would be managed.

The construction methodology outlined below is based on the concept design and is considered indicative. During detailed construction planning modifications to the methodology may be required to ensure it remains efficient and workable. It is not anticipated that any modifications would be substantial.

5.5.1 Construction requirements

Wynyard Station would remain operational during the upgrade and passenger services would be maintained throughout construction of the proposal. The following key functional requirements would be maintained during construction:

- A safe and operational station.
- Effective flow paths, fire and life safety provision for pedestrians throughout all stages of work.
- Appropriate interfaces with surrounding land uses and developments including the Metcentre, Wynyard Walk, and the proposed One Carrington Street development including the George Street ramps and the Hunter Arcade.
- Minimal disruption, where feasible, to surrounding businesses and properties.

5.5.2 Construction access

There are multiple access points to Wynyard Station that would be used during the construction of the proposal as detailed below. It is anticipated that the primary access points would be used regularly for the duration of construction works, and the secondary access points would be used less frequently. The proposed hours of access are discussed in **Table 5**.

Primary access points

- **Margaret Street and George Street**

  Direct access to the concourse via the George Street ramps (refer to **Figure 10**) would be facilitated by the provision of a works zone on the westbound lane of Margaret Street between George Street and Carrington Street. This would allow materials to be loaded/unloaded and transported from the George Street ramps via the existing footpath using forklifts, skates and trolleys. There may be a need to trim or remove the existing tree adjacent to the loading/unloading area in Margaret Street to accommodate the works. For safety reasons the pedestrian pathway adjacent to Margaret Street may be closed while material is moved from the station via the George Street ramps. Loading/unloading may also occur directly on George Street.

Figure 10 - Construction access points

Wynyard Station
Wynyard Walk (under construction)
Construction access point

- **Wynyard Lane**

  Two access points are proposed on Wynyard Lane, an existing goods lift (located in the Menzies Hotel) and the Wynyard Lane Car Park (refer to **Figure 10**). As part of the Wynyard Lane Car Park access point, a temporary construction hoist would be established between the car park and the station concourse below.

  The material would be transported to/from Wynyard Lane to the goods lift (via an existing driveway) or to/from Wynyard Lane Car Park (to access the temporary construction hoist), using a forklift, skates or trolleys.

  If Wynyard Lane becomes unavailable, heavy vehicles would load and unload on Cumberland Street opposite the current exit of the Wynyard Lane Car Park with material transported to the temporary construction hoist via the car park tunnels. The Cumberland Street access would require the use of space on the westbound lane of Cumberland Street, which currently contains four restricted off street car parking areas (for authorised vehicles).

Secondary access points

- **York Lane**

  Occasional construction access would be provided via York Lane to access Transport House and the York Lane lift (refer to **Figure 10**). Heavy vehicles would load and unload in York Lane. The lift would be used until it is decommissioned and reconstructed as part of the proposal. As York Lane is partly closed due to Wynyard Walk construction, vehicles would need to reverse into the lane under traffic control.

- **York Street**

  An existing loading zone on York Street would be used for the purposes of the project until the zone is removed as part of the Sydney City Centre Bus Infrastructure modifications.

- **Carrington Street**

  Occasional access to the concourse would be provided using the passenger lift and escalators within the Wynyard Park dome via Carrington Street. The material would be transported from Carrington Street to the lift using forklifts, skates or trolleys.

- **Hi-rail access**

  Hi-rail access to Platforms 5 and 6 would be provided via hi-rail on-ramps west of Circular Quay Station. For Platforms 3 and 4, hi-rail access points south of North Sydney Station and north of Central Station would be used. Material would then be transported by rail using on-track plant such as a lifter and trailers to bring in materials. This option would only be accessible when trains are not running, for example, during weekend possessions.

Priority would be given to using existing access points via the George Street ramps and the Wynyard Lane goods lift, together with access via the Wynyard Lane Car Park and the temporary construction hoist constructed from the car park to the concourse (subject to

negotiation with the landowner). Should these access points no longer be available or become insufficient for construction requirements, the proposed Wynyard Park compound, construction hoist and loading zone would proceed (refer to **Figure 11**). The establishment and use of the compound would be subject to the approval of Transport for NSW (TPD Principal Manager Environment). Works associated with the proposed access and compound would also be undertaken in consultation with City of Sydney and relevant transport authorities.

There would also be four internal vertical access points to improve access from the concourse areas to the platforms during construction, including:

- A new construction hoist from the southern concourse area to Platforms 5 and 6 close to the existing disused escalator enclosure.
- A new construction hoist from the southern concourse area to Platforms 3 and 4 via a new aperture in Platforms 3 and 4 that would be used for the proposed new staircase.
- The existing glass lift from the concourse area to Platforms 3 and 4.
- The existing glass lift from the concourse area to Platforms 5 and 6.

Access for personnel and minor hand held deliveries would be via:

- Transport House fire stairs via York Lane.
- Transport House lift via York Street lobby.
- York Street escalators.
- Platform stairs.
- Hunter Arcade tunnel and stairs.
- Metcentre.
- Northern fire stairs from the eastern concourse area to Wynyard Park and Carrington Street.
- George Street ramps.

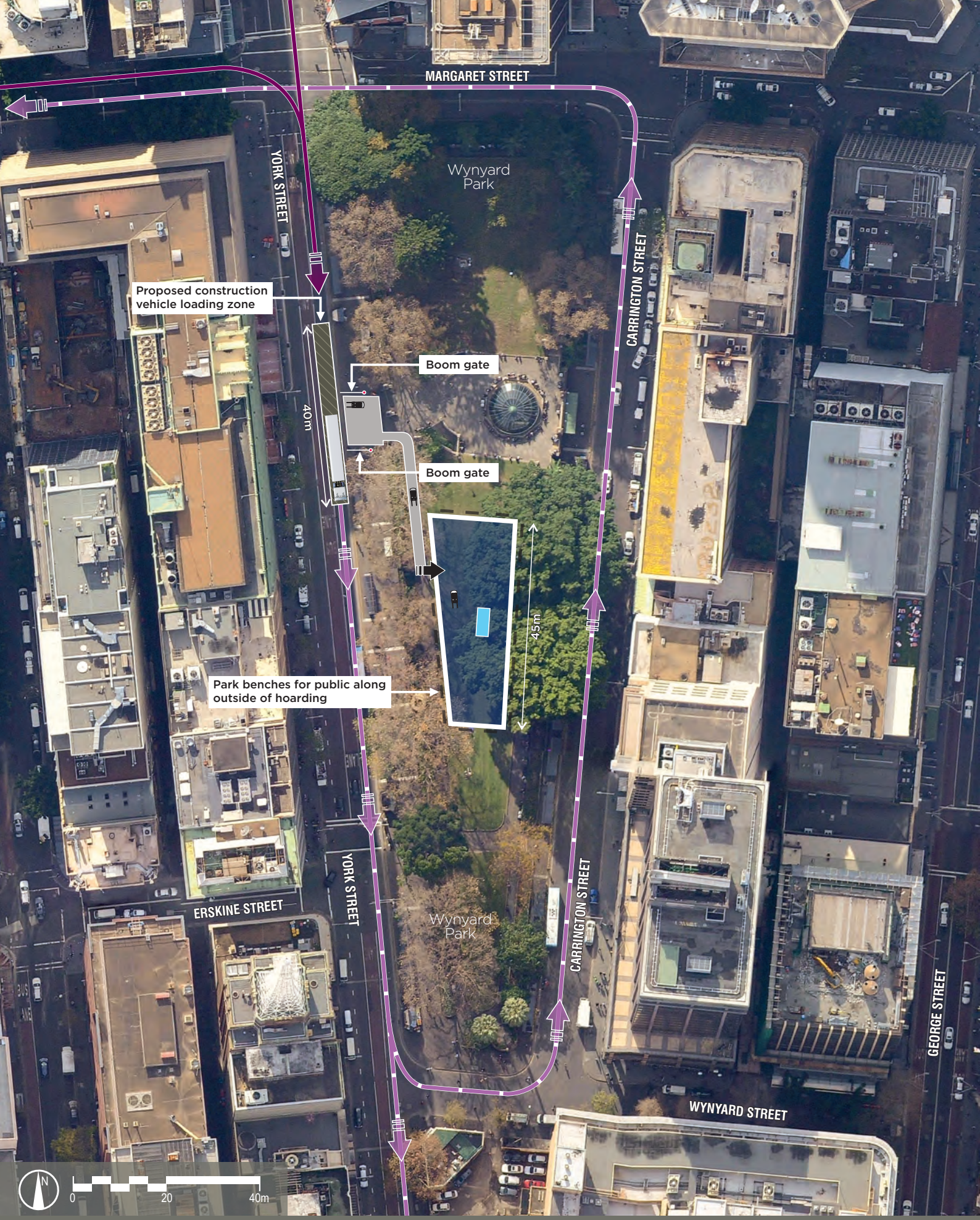

Figure 11 - Wynyard Park compound

Proposed hoist location
Proposed Construction vehicle loading zone
Proposed Construction path (forklift)
Inbound vehicle route
Outbound vehicle route

5.5.3 Construction program

The estimated construction duration of the proposal is approximately 18 months, with site establishment scheduled to begin in the first quarter of 2015. Early works, as described in **Section 5.2**, are expected to be complete in early 2015.

An indicative construction program is provided in **Table 4**. The final staging and works associated with each stage would be determined by the contractor during detailed design and construction planning.

As shown in **Table 4**, a number of construction activities would occur concurrently. However, some activities must occur sequentially to ensure the station remains operational.

Table 4 Construction program

Activity	2015				2016	
	Q1	Q2	Q3	Q4	Q1	Q2
Site establishment and enabling works						
Station platform works						
Unpaid concourse						
- Eastern unpaid concourse						
- Northern unpaid concourse						
- Western unpaid concourse and York Street foyer						
Station facilities construction and fit out, including Transport House basements, and station amenities						
Paid concourse						
- Concourse de-cluttering and refurbishment						
- Widening to the east and ticket gates						
- Widening to the west and ticket gates						
Demobilisation						

5.5.4 Construction activities

The works associated with each stage of the construction program are discussed below.

Site establishment and enabling works

Site establishment works would include the installation of hoarding along the unpaid concourse and platforms, demolition of retail spaces and some back-of-house areas and the installation of temporary toilets. As part of the enabling works, redundant structures and retail spaces located within the eastern unpaid concourse would be removed to increase space for pedestrian flows during construction. Site compounds would also be established at this stage, with necessary works to facilitate access to construction areas. This could include the installation of temporary construction hoists to each platform and a hoist between Wynyard Lane Car Park and the concourse (with a potential extension to Wynyard Park if required).

The southern unpaid concourse would be closed to the general public at this time and the toilets, retail and office spaces located adjacent to the southern concourse demolished. This would be subject to further pedestrian modelling during detailed design to ensure adequate pedestrian flows are maintained. If adequate access cannot be maintained, the final staging strategy would consider alternative approaches.

Enabling activities would include the installation and/or adjustment of utilities and rail systems, as detailed in **Section 5.4.3**. These activities would occur progressively as construction works commence within the public domain and station facilities. Redundant services would be removed following the installation and testing of the new systems.

Platform works

Platform works would involve the de-cluttering and refurbishment of the four station platforms, refurbishment of existing stairs, construction of new stairs and the demolition of redundant stairs.

Unpaid concourse

Works associated with the unpaid concourse would be coordinated with other work areas in the station as well as the Wynyard Walk project. It is likely that works would focus initially on the eastern unpaid concourse. More significant construction works would shift to the northern and western unpaid concourses (including York Street foyer) once the relocated Station Manager's Office is operational. Final works in this area would be carried out once Wynyard Walk excavation works are complete.

A temporary works platform would be constructed above the York Street escalators for construction (such as painting) to be safely undertaken above the escalators.

Station facilities

These works would entail the construction and fit out of the back-of-house areas, works within Transport House basements and the replacement of existing stairs connecting the basement levels of Transport House to York Street and the concourse level. This includes the construction, fit out and commissioning of the new Station Manager's Office to enable the existing office to be demolished as part of the widening of the northern unpaid concourse. Station facilities that would not be used for back-of-house purposes would be serviced.

Paid concourse

The expansion, de-cluttering and refurbishment of the paid concourse area would be coordinated with other work areas in the station including station platforms. Works would generally progress from east to west to reflect works within the unpaid concourse. The majority of the major works, being the widening of the concourse and installation of ticket gates, would be undertaken in the final stages of the program.

Demobilisation

Temporary facilities (such as construction compounds, toilets and hoist structures) would be removed, along with hoarding, and finishing details would be completed.

5.5.5 Construction equipment

Plant and equipment that would typically be required during construction of the proposal would include:

- Concrete mixers
- Forklifts
- Hand tools
- Circular saws
- Hand drills
- Grinders
- Generators
- Elevated work platform
- Disc cutter
- Excavators and breaker
- Pallet trucks
- Compressors
- Hand-held breakers
- Pumps
- Vacuums
- On track plant
- Manual equipment
- Lifting equipment

Additional equipment requirements would be determined during detailed design by the construction contractor.

5.5.6 Construction hours

Construction works are required to be carried out 24 hours, seven days a week to enable the station to remain operational, to avoid unacceptable impacts on the broader Sydney rail network and to manage noise impacts on passengers, station staff, retailers and commercial properties. By virtue of being an underground station, construction access to the station is also constrained and would become increasingly constrained as other developments surrounding the station commence construction.

Works that predominately occur in areas behind hoardings within the concourse area or in areas outside the public domain, or works that are typically less noisy (in order to minimise noise impacts) would be carried out during the following standard construction hours where feasible and reasonable:

- 7 am to 6 pm Monday to Friday.
- 8 am to 1 pm Saturdays.
- No works on Sundays or Public Holidays.

However, as Wynyard Station is a busy underground station that needs to remain operational during the upgrade, many construction activities may potentially be completed at night to minimise pedestrian impacts and noise impacts on rail customers, staff and retail operators (and their customers). For this reason a number of construction activities would be completed outside of standard construction hours. These may include (but are not limited to):

- Installation and removal of hoarding.
- Demolition works.
- Removal of redundant services.
- Installation of utilities (such as lighting), ceiling works and station systems.
- Waterproofing and fire insulation.
- Concrete works (including preparation of reinforced concrete).
- Removal and installation of ticket gates.
- Tiling and other architectural finishes.
- Commissioning of operational systems.
- Deliveries of construction material and plant, and the removal of construction waste.

The use of the Wynyard Park compound (if required) would occur within and outside standard construction hours, however deliveries would only occur between 8pm and 10pm. If the Wynyard Park compound is required, materials handling between the compound and the station below would occur 24 hours a day, 7 days a week

Works that are required to be undertaken outside standard construction hours would be conducted in accordance with Transport for NSW's *Construction Noise Strategy* (2011), where practicable. Out of hours works that have been assessed in this REF would not require a further out of hours work assessment.

Deliveries of plant/equipment and materials to the site would be undertaken outside the peak traffic periods of 7am to 9am and 4pm and 6:30pm, Monday to Friday where feasible, to minimise potential disruption to the local traffic network and bus services in the vicinity of the works. Access during lunchtime (12pm to 2pm) during weekdays would also be avoided where feasible and reasonable. Delivery hours specific to the proposed access points are provided in **Table 5.**

The scheduling of construction activities for the proposal would:

- Maintain safe and adequate access for customers to access and egress the public domain.
- Maintain a sufficient level of noise amenity for customers, station staff and people using the station public domain, adjoining pedestrian arcades and surrounding retail spaces .
- Minimise disruption to the surrounding road and pedestrian network, in particular, the Wynyard bus interchange on York and Carrington Streets.
- Ensure a safe working environment for construction workers within areas that interface with rail systems.
- Minimise conflicts with surrounding businesses or major construction activities, due to competing access requirements.
- Minimise disruption to services within the station or surrounding buildings (for example water and power).

5.5.7 Workforce

The construction workforce would vary depending on the stage of construction. Construction activities would also occur across a day and night shift, with an average of around 120 workers per shift (which includes management staff).

5.5.8 Construction vehicle movements

Generally, construction heavy vehicle movements would be restricted to when accesses are available (as discussed in **Section 5.5.2**). The average daily and maximum heavy vehicles demands associated with each access point are provided in **Section 5.5.9**. The origin and destination of heavy vehicle movements is presently unknown. However, regional access / egress to the construction site for other deliveries to site would be via the Sydney Harbour Bridge, the Eastern Distributor and Western Distributor. This would require the use of streets including (but not limited to) York Street, Wynyard Street, Margaret Street, Hunter Street, George Street, Erskine Street, Kent Street, Essex Street, Carrington Street, Wynyard lane, York Lane and Cumberland Street (refer to **Figure 12**). This may alter once CSELR construction commences.

Heavy vehicles accessing the site via Wynyard Lane would require traffic controls during unloading/loading of the trucks due to the width of the lane relative to the size of the vehicles. Vehicles of up to 10 tonne would be allowed to enter Wynyard Lane; however no heavy vehicles would be allowed to enter the Wynyard Lane Car Park due to height restrictions.

A limited number of heavy vehicles would access the site via York Lane, and would be subject to traffic controls and vehicle restrictions. This includes vehicles of up to six tonne would enter the lane, at a rate of up to two vehicles per day for a three month period to enable the delivery of materials and equipment associated with the replacement of the York Lane lift.

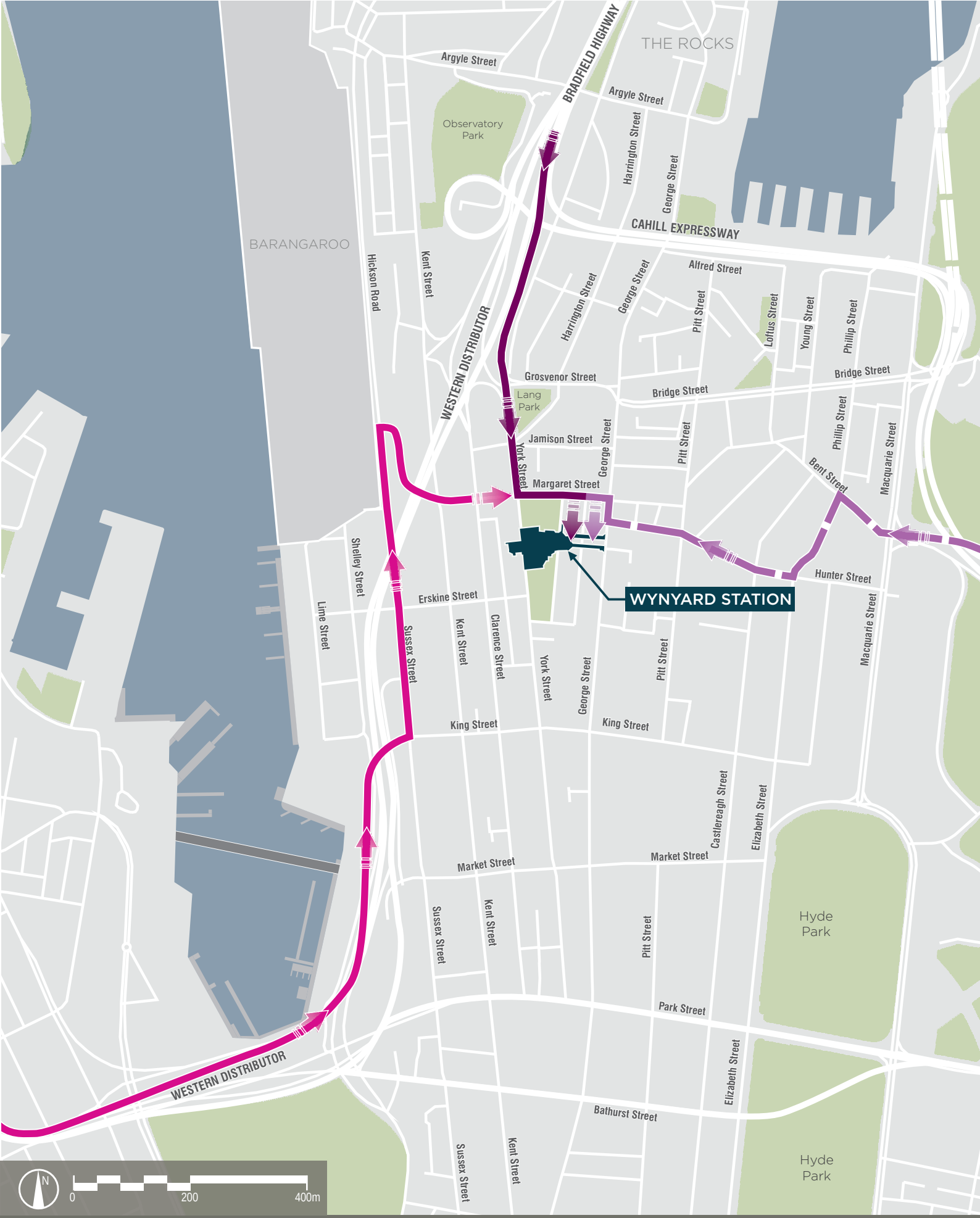

Figure 12 - Potential access routes - inbound from Wynyard Lane

Parks and reserves

Inbound from the north

Inbound from the south

Inbound from the south/west

Heavy vehicles would load and unload material onto forklifts on Wynyard Lane, which would then transfer the material to the construction areas one of two ways, via the goods lift located on Wynyard Lane or via the construction hoist between the Wynyard Lane Car Park and the concourse.

The construction workforce would be encouraged to use public transport, given the limited availability of car parking. However, it is anticipated that approximately 10 light vehicle movements per shift would be required for smaller equipment and deliveries.

Table 5 Construction heavy vehicles

Access point	Proposed hours	Daily heavy vehicle trips		Vehicle size (up to and including)
		Average	Maximum	
Margaret Street to George Street ramp	10pm – 5am, Monday to Thursday	3	7	45 tonne
Wynyard Lane (via goods lift and/or Wynyard Lane Car Park)	24 hours, 7 days a week, excluding 7am – 9am, Monday to Friday and subject to any further hour restrictions imposed by City of Sydney.	12	18	10 tonne
Cumberland Street[1]	24 hours, 7 days a week, excluding 7am – 9am, Monday to Friday	10	20	15 tonne
York Street loading bay	8pm – 10pm, Sunday to Thursday	3	5	15 Tonne
York Lane	9am -10pm, Monday to Friday and 8am – 1pm Saturday	5	10	Six tonne
Wynyard Park compound[2]	8pm – 10pm, Sunday to Thursday	9	18	45 Tonne
Hi-rail ramp from west of Circular Quay Station, south of North Sydney Station and north of Central Station[3]	Weekend track possessions deliveries	15	30	10 Tonne
Hi-rail ramp from west of Circular Quay Station, south of North Sydney Station and north of Central Station	Mid-week (overnight) track possession deliveries	5	10	10 tonne

Note 1: Cumberland Street would only be used if Wynyard Lane is not available for access.

Note 2: The trips associated with the Wynyard Park compound would only occur if access via Wynyard Lane Car Park is not available.

Note 3: During weekend possessions there would be out of hours deliveries to Wynyard Station. This is based on 4 hi-rail movements every three hours over a weekend possession.

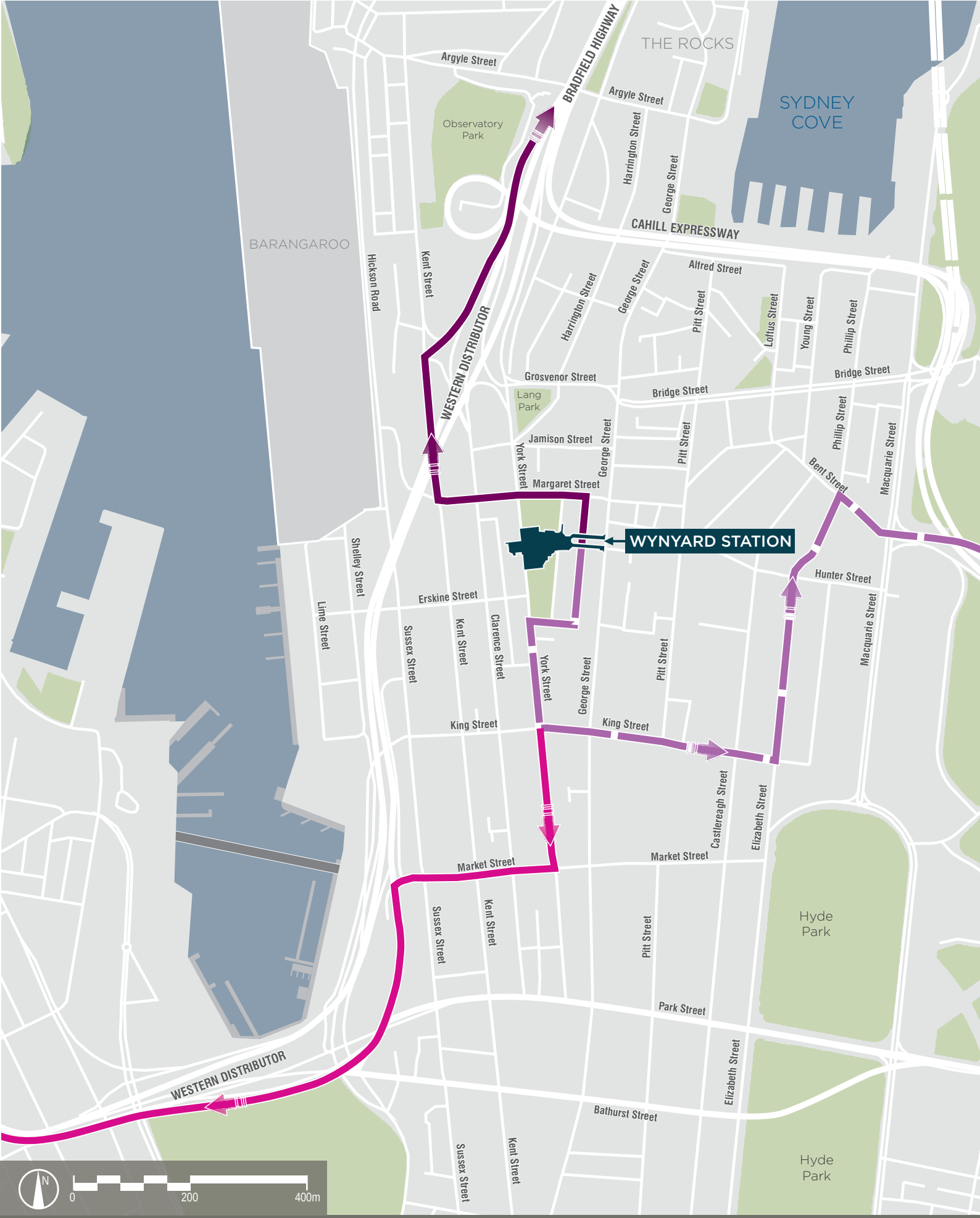

Figure 13 - Potential access routes - outbound from Wynyard Lane

Parks and reserves

Outbound southbound

Outbound northbound

Outbound southbond/westbound

5.5.9 Construction facilities

During construction, laydown and storage areas would be provided at the following locations:

- Basement space below the Menzies Hotel, accessed via the Wynyard Lane goods lift.
- Areas behind hoardings along the unpaid concourse.
- Basement areas of Transport House.
- Wynyard Lane Car Park.
- Wynyard Park.
- Vacant retail spaces.
- Vacant station back of house areas.

Access via Wynyard Lane Car Park or Wynyard Park would be subject to negotiations with Brookfield and would require landowners consent. The use of Wynyard Park would only occur if Wynyard Lane is closed off for construction of the proposed One Carrington Street Development or they become insufficient for construction requirements. If this occurs, it is proposed to access the Wynyard Lane Car Park via Cumberland Street and the existing underground tunnel.

The proposal would also be supported by an off-site compound to ensure the limited space available at the station is efficiently used. This off-site support compound would be used to store materials and waste generated by the proposal. This site is likely to be located in an industrial area in proximity to the CBD with good arterial road access, such as Homebush Bay, White Bay or Port Botany. This would be confirmed during detailed design and would be subject to a separate assessment.

5.5.10 Materials

The source and quantity of materials required for the proposal would be determined during detailed design by the selected contractor. Materials would be sought from local suppliers within Sydney where feasible.

A waste management plan would identify whether demolition materials can be recycled, reused or disposed of and would provide options for the use of recycled materials during construction where practicable. Waste management is discussed further in **Section 7.10**.

5.6 Property ownership

5.6.1 Property ownership

The majority of the proposal would be located on publicly owned land, being held by Railcorp for Wynyard Station, part of the York Street foyer and the lower basement levels of Transport House. However, the proposal would have several interfaces with private property, and in some cases, would be undertaken on or would require access through privately owned property.

To enable the construction works to proceed according to the schedule of works and to account for contingency access arrangements, negotiations / stakeholder liaison would be carried out by Transport for NSW with the following property owners:

- Memo Corporation Australia, for works within Transport House.
- Brookfield for works within the Wynyard Lane Car Park, shared use of fire stair from concourse to street level as well as general access and interfaces.
- Metcentre, should services extend into this building.
- Coles, to enable waterproofing works within ceiling spaces, and works associated with the modifications to staircases between the station and mezzanine level as well as for shared access to the Wynyard Lane goods lift.
- The owner of 33 York Street for day to day and emergency access arrangements.

5.6.2 Property acquisition

The Concourse Bar and Concourse Café are privately owned. Acquisition of this space would be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*, prior to the commencement of construction. There is potential that a small portion of common property within 33 York Street (SP 68608) may also need to be acquired and would be confirmed during detailed design.

5.6.3 Lease terminations

There are 25 retail spaces on the concourse level of Wynyard Station, of which five are outside the proposal construction boundary. Of the remaining 20, 10 are vacant, seven have expired leases, and three have active leases. In order to facilitate the proposal, all 10 retail spaces would be vacated. The three active leases would be terminated via the exercise of the existing lease provision which allows early termination for demolition purposes.

The property occupied by Coles supermarket is leased from RailCorp. As part of ongoing lease negotiations, the loss of the leased area to facilitate the modifications to staircases between the station and the mezzanine level would be considered.

Agreement for the temporary use of Wynyard Lane Car Park would also need to be sought from RailCorp, or from Brookfield and the car park operator who currently lease for this space from RailCorp.

5.6.4 Temporary land requirements

Agreement for the temporary use of land at Wynyard Park for a construction compound, should it be required, would need to be obtained from the landowners of the park. The landowners include the Crown for the majority of the above ground works and for the southern portion of the site below ground. The remaining portions of land that would be occupied by the Wynyard Park compound are owned by RailCorp, including the below ground portions of the shaft.

The management of the park has also been vested to City of Sydney under the *Crown Lands Act 1989*. Agreement from City of Sydney, along with landowners consent, would be required prior to the establishment of the compound.

5.7 Surrounding development

As discussed in **Section 1.1**, there are five key developments currently in planning and construction phases which are proximate to the proposal. A description of these proposed projects and the expected construction timeframes is shown in **Table 6**. Construction of the proposal would likely interface with the construction of each of these projects. The potential cumulative impacts associated with the concurrent construction of the proposal and these projects are assessed in **Section 7.11**.

Table 6 Surrounding Development Works and Construction Timeframes

Project and Developer	Construction Timeframe	Interface with Wynyard Station and surrounds
One Carrington Street development (formerly referred to as the CityOne development) Brookfield	Mid 2015 to 2018	Direct construction interface with the eastern unpaid concourse. Staged closure and re-construction of the George Street ramps and Hunter Arcade. Partial closure of Wynyard Lane during construction. Closure and use of Wynyard Lane Car Park for construction vehicle access. Potential prohibition or restriction of access for other parties to George Street ramps and Wynyard Lane goods lift during construction. Establishment and use of construction loading areas along Margaret, Carrington and Wynyard Streets. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise.

Project and Developer	Construction Timeframe	Interface with Wynyard Station and surrounds
Wynyard Walk Transport for NSW	Currently under construction. Due for completion in 2016.	Direct construction interface with the western and northern unpaid concourse, as well as the York Street foyer. As the project and the proposal are interconnected, there would be ongoing consultation to confirm architectural finish boundaries. Some services and systems are shared between Wynyard Walk and Wynyard Station which are to be incorporated into the design and construction staging. Wynyard Walk opening would be considered in the staging and construction program for the proposal. Restrictions to vehicle and pedestrian access to Wynyard Lane during construction. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration.
CBD South East Light Rail Transport for NSW	2015 to 2019	Closure of George Street, and redistribution of traffic onto surrounding network. Changes to bus infrastructure in proximity to Wynyard Park. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration.
Sydney City Centre Bus Infrastructure modifications Roads and Maritime Services	Late 2014 to mid 2015	Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration. During operation, additional pedestrian movement in the vicinity of Wynyard Station as a result of bus terminations (note the majority of pedestrians are expected to stay above ground).
333 George Street redevelopment Charter Halls Funds Management Ltd	Currently under construction. Due for completion in mid 2016	Increase in construction vehicles on surrounding network (basement car park would be accessed and construction works zone on Wynyard Lane) Contribution to construction noise and vibration.

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6 Consultation

The chapter gives an overview of the community and stakeholder consultation activities that have been carried out, and would continue to be carried out, for the proposal.

6.1 Stakeholder and Community Engagement Strategy

A Community and Stakeholder Engagement Strategy has been prepared for the proposal with the key objective of providing appropriate consideration of stakeholder and community interests. To achieve this, the engagement strategy includes the following consultation objectives:

- identify and engage a wide range of stakeholders and interested parties
- increase community and stakeholder understanding of the project, its objectives and benefits
- keep people informed about the project phases and ensure that project information is communicated to the community and stakeholders in an effective and timely manner
- provide the community and stakeholders with an opportunity to participate in the development of the project through feedback and input
- record, review, comment on and report project responses to feedback
- identify concerns and address them where practical and appropriate
- ensure that community and stakeholder enquiries regarding the project are managed and resolved effectively.

These objectives are in line with *Transport for NSW's Community Engagement Policy* and are supported by Transport for NSW's fundamental communications principles, which are to:

- consult early and often
- encourage community and other stakeholder participation
- listen to feedback, investigate suggestions and report back
- be transparent
- keep the general and local community and other key stakeholders informed of project progress
- engage in a manner that is collaborative, innovative, adaptive and sustainable.

6.2 Consultation process and activities

Stakeholder and community consultation has been undertaken during the development of the REF as outlined in this section.

6.2.1 Infrastructure SEPP consultation

In accordance with Part 2 Division 1 of the Infrastructure SEPP, Transport for NSW is required to consult with councils and other public authorities with regards to potential impacts on infrastructure or services, flood liable land and local heritage. **Table 7** presents the clauses of the Infrastructure SEPP that require consideration and comments on their relevance to the proposal.

Table 7 Consideration of consultation requirements under the Infrastructure SEPP

Clause	Comment
Clause 13 This clause requires consultation with councils where a development impacts on council related infrastructure and the development would: • Substantially impact on stormwater management services. • Generate traffic that would place the capacity of a local road system under strain • Involves a connection to, and a substantial impact on the capacity of, a sewerage system owned by a council • Involves a connection to, and a substantial volume on of water from, any part of a water supply system owned by Council • Involves the installation of a temporary structure on, or the enclosing of, a public space that is under a council's management or control that is likely to cause disruption to pedestrian or vehicular traffic that is not minor or inconsequential. • Involves significant excavation to a road surface or footpath for which Council has responsibility.	There would be limited at-surface works associated with the proposal. As such, the proposal would not substantially impact on stormwater management services. The proposal, in isolation, would not have a significant impact on the surrounding road network, with construction-related movements restricted during the network AM and PM peak, where feasible and reasonable. This is discussed further in **Section 7.3.3**. The proposal may potentially involve the installation of a temporary structure on, or the temporary enclosing of, space within Wynyard Park. Wynyard Park is currently under the management of City of Sydney. Consultation with City of Sydney regarding the use of this space and the potential impacts is required and is ongoing. Measures to minimise impacts on pedestrians have been proposed and are outlined in **Section 7.2.4**. The proposal would involve the construction of new toilets, which would replace existing toilets for staff and commuters. This is not anticipated to have a substantial impact on the sewerage system. There would be no significant excavation to a road surface or footpath for which City of Sydney has responsibility.
Clause 14 This clause requires consultation with councils where development is permitted without consent and would likely have an impact that is not minor or inconsequential on a local heritage item (other than a local heritage item that is also a State heritage item) or a heritage conservation area.	The proposal would have a direct impact on Wynyard Park, which is a locally listed heritage item. As discussed in **Section 7.4**, the impacts would avoid and/or minimise impacts on structures that form part of this listing. Council has also identified the park as having potential archaeological value. The potential for relics is low given the extent of disturbance during the open-cut construction of Wynyard Station in the 1930s. Mitigation and management measures have been recommended to minimise the potential impacts on Wynyard Park. However, the potential impact on Wynyard Park is temporary, minor and inconsequential. Discussions have been held with heritage staff from

Clause	Comment
	City of Sydney, OEH and Sydney Trains concerning the potential impacts on Wynyard Park and Transport House during the preparation of the REF. As Transport House is listed under the Sydney LEP (as the former Railway House) and the State Heritage Register. As such, this clause does not apply. Nonetheless, Transport for NSW will consult with City of Sydney during the exhibition of the REF (refer to **Appendix E**). The potential impacts on Transport House have been considered in **Section 7.4** of this report.
Clause 15 This clause requires consultation with councils where development would impact land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the *Floodplain Development Manual: the management of flood liable land*.	City of Sydney is expected to release draft flood studies for the CBD for public display in 2015. Given the location of the proposal, it is unlikely that the limited works at surface would be susceptible to flooding by the probable maximum flood. Further, the compound would be temporary in nature, and would not be a permanent impediment to stormwater flows. Adequate stormwater overland flow paths would be maintained, if the Wynyard Park compound were required.
Clause 16 This clause requires consultation with certain public authorities where development is specified development, which is defined as: • Development that is adjacent to land reserved under the *National Parks and Wildlife Act 1974*. • Development that is adjacent to a marine park declared under the *Marine Parks Act 1997*. • Development that is adjacent to an aquatic reserve declared under the *Fisheries Management Act 1994.* • Development that is in the foreshore area within the meaning of the *Sydney Harbour Foreshore Authority Act 1998*. • Development that is for the purpose of an educational establishment, health services facility, correction centre or group home, or for residential purposes, in an area that is bush fire prone land.	The proposal is not located on or adjacent to areas nominated in clause 16 of the Infrastructure SEPP, nor is it a type of development that is described in that clause. In particular, the development is not located on land that is defined as foreshore land by the *Sydney Harbour Foreshore Authority Act 1998*.

6.2.2 Key government stakeholder consultation

Consultation has been ongoing with government agencies and other key stakeholders during the development of the proposal and the REF. Transport for NSW has undertaken consultation with the following key state and local government stakeholders:

- Transport for NSW divisions, including Customer Experience , Planning and Programs, and Transport Services.
- Sydney Trains
- Traffic Management Centre
- Roads and Maritime Services
- Office of Environment and Heritage (Heritage Division)
- City of Sydney

Three working groups specific to the proposal have also been established, being the Station Construction Liaison Group, Project Working Group and the Homelessness Working Group (which includes NSW Police and City of Sydney).

6.2.3 Business and other stakeholder consultation

Consultation with businesses, community and other stakeholders was undertaken during the preparation of the REF. A letter was sent in July 2014 to inform all RailCopr's retail tenants at Wynyard Station about the proposal. Project related information has been provided to the following stakeholders, and face-to-face meetings held when requested:

- Memo corporation
- Metcentre
- Brookfield Office Properties
- Educational establishments, including (but not limited to) Navitas Group.
- Body-corporate entities of buildings located near Wynyard Station
- The Committee for Sydney
- Sydney Business Chamber
- Tourism and Transport Forum
- Emergency Services (Ambulance Service of NSW, NSW Police, Fire and Rescue NSW and Paramedical)
- Coles Supermarkets
- NRMA

- Accommodation providers near Wynyard Station, including (but not limited to) the Menzies Hotel, Travelodge Hotel Wynyard, The York by Swiss-Bellhotel, The Amore Hotel, Carrington Apartments, the Clarence, the Occidental and The Wynyard Hotel
- Barangaroo-related stakeholders, including Barangaroo Delivery Authority (BDA), Lend Lease, Barangaroo Community Construction Liaison Group, and Barangaroo Business Construction Liaison Group (Lend Lease and BDA).

6.2.4 Early works stakeholder consultation

In July 2014, the Novo Rail Alliance was engaged to design and deliver $10 million worth of early works for the project. This work includes investigations and surveys in various parts of Wynyard Station. As part of the early works Novo Rail provided monthly construction notifications to directly affected stakeholders, including retail tenants at Wynyard Station (including the station concourse, mezzanine level, and the George Street ramps), Metcentre, Brookfield Office Properties and City of Sydney.

6.3 Summary of issues raised

Table 7 presents a summary of issues raised during Infrastructure SEPP, government and stakeholder, and community consultation. It also indicated where each issue has been addressed in the REF.

Table 8 Summary of Issues Raised during Consultation

Issue	REF Reference
Government Agencies	
City of Sydney	
Potential Wynyard Park impacts, including; • Impacts to assets, trees and utilities as a result of the proposed compound and temporary construction hoist. • Remedial actions required for damage to Council assets. • Loss of open space for passive recreation • Consideration of alternative compound locations, such as nearby vacant land. • Options to minimise land take at the park. • Heritage impacts.	Potential impact to trees near the temporary construction hoist has been considered in **Section 7.5**. Potential impacts associated with the loss of open space, potential impacts on and remedial actions for council assets (such as paving) and other utilities has been considered in **Section 7.6**. The location of the compound and the temporary construction hoist (if required) is dictated by the location of the underlying car park. The size of the compound would be minimised as much as is reasonable and feasible. Transport for NSW would continue to consult with City of Sydney, as the manager of the park, about measures to minimise amenity impacts on users of the park. Potential impacts to heritage values of the park are assessed in **Section 7.4**.
Disruption to pedestrians and traffic during construction, including special events.	Impacts to pedestrians have been assessed in **Section 7.2.2**. Impacts to the road network, including special events, have been assessed in **Section 7.3.3**.

Issue	REF Reference
Cumulative impacts due to multiple construction activities within the precinct, including CSLER, 333 George Street and One Carrington Street development. Interfaces between One Carrington Street development and CSLER with the proposal.	The potential cumulative impacts have been discussed in **Section 7.11**. Ongoing coordination with the surrounding developments and City of Sydney would be required to minimise the potential for cumulative impacts on pedestrians and vehicular traffic.
Heritage impacts on Wynyard Station, in particular what remaining heritage features remain, and what impacts would occur.	The potential impacts on local and State heritage items are discussed in **Section 7.4**.
Conservation Management Plans for the station and Transport House	The preparation of a Conservation Management Plan is a matter for the property owner(s).
Impacts to retail and future fit-out.	The proposal does not entail the fit-out of retail spaces within the station, which would be subject to a separate approvals process. A retail strategy would be prepared by Transport for NSW, which would guide future potential retail development.
Impacts to sensitive receivers, and the potential for residential and education establishment within commercial buildings to be impacted.	As a result of work on Wynyard Walk, sensitive receivers within buildings near Wynyard Station are known. These have been accounted for in the noise and vibration impact assessment (refer to **Section 7.1**).
Access arrangements in Wynyard Lane, the need for road occupancy licences (or equivalent approvals), and vehicle size restrictions.	Additional consultation was undertaken with City of Sydney. There would be a need for necessary approvals for work zones for the proposal. Vehicle sizes and specific working zone requirements would be determined during detailed construction planning.
Community engagement plan is recommended.	A Community and Stakeholder Engagement Strategy has been prepared for the proposal and supporting Community Liaison Plans would be prepared for all stages of the proposal..
Heritage Division, Office of Environment and Heritage	
Justification for impacts to heritage items/features	The need for the proposal is provided in **Chapter 2**.
Architectural design and finishes, including the need for a holistic finishes program for the works, and to retain significant fabric.	Visible heritage features within the station and Transport House are limited and discontinuous. Impacts to some heritage items have been avoided (e.g. York Street escalators) and certain features would be retained within the station design (such as the banisters). Residual impacts would remain, and archival recordings would be required. During detailed design, final finishes of the station areas would be confirmed in consultation with Sydney Trains (Heritage) and the Heritage Division. Further detailed design would also be undertaken for the York Street lobby and Transport House basements.

Issue	REF Reference
Methodology for dealing with the discovery of significant fabric.	Stop work procedures would be implemented, if unexpected finds are made during the removal of more modern finishes. Opportunities to incorporate heritage fabric which is found into the final design would be considered. If this is not reasonable or feasible, archival recordings would be made. The fabric would be retained in-situ where feasible.
Conservation Management Plans for Transport House	Development of a Conservation Management Plan is a matter for the property owner(s).
Transport agencies (Roads and Maritime Services, Transport for NSW (Transport Services) and Traffic Management Centre)	
Access options during construction do not raise significant concerns	Noted.
Preference is to avoid impacts during peak periods for bus services near Wynyard. Any evening or night-time heavy vehicle movements would need to consider night time services that depart from Carrington Street over Friday – Sunday.	Deliveries would not occur during the AM peak, and would be restricted, where feasible during the PM peak period. The proposed Wynyard Park compound, if required, would only involve heavy vehicle loading/unloading during 8pm and 10pm, Sunday to Thursday, to avoid impacts on commuters and pedestrians.
It is suggested that Wynyard Park compound (if required): • Avoids bus stops and use bus layovers. • Does not use two lanes during the load/unloading of heavy vehicles. • Re-consult with Transport Services and Roads and Maritime Services concerning the final location of the loading/unloading area, should it proceed.	Opportunities to use the bus layover areas outside of peak periods would be explored during detailed design and in consultation with Sydney Buses. The loading/unloading area would only use the bus laydown area and would not extend into the dedicated bus lane. Transport for NSW would consult with the Transport agencies/divisions during detailed design planning for the compound, noting the compound would only be used if other accesses are constrained or lost due to surrounding development activities.
Changes to bus routes and scheduling will occur as a result of the Access Strategy. This will result in additional pedestrian volumes due to the termination of certain bus services at Wynyard that currently travel to Town Hall and/or Central.	Noted. This has been discussed in **Section 7.11**. Further consultation will be required with Sydney Buses as it moves to finalise the details of these changes.
Future consultation should be directed with the relevant transport agencies and City of Sydney.	Noted.

Issue	REF Reference
Sydney Trains (Heritage)	
Approaches to deal with unexpected finds should be detailed in the REF, given the experience at Town Hall station upgrade.	Stop work procedures would be implemented, if unexpected heritage finds are made during the removal of modern finishes. Opportunities to incorporate unexpected heritage finds into the final design would be considered. If this is not feasible or reasonable, archival recordings would be made and the fabric retained in-situ where feasible.
The finishes for the station upgrade should consider the relationship of the station with Town Hall Station and other stations on the city circle. It is suggested that colour cues, which are being considered for Town Hall Station, are also applied to Wynyard Station.	Transport for NSW will consult with Sydney Trains (Heritage) during the development of detailed finishes, including the opportunity to incorporate colour cues into the design. The use of the Wynyard heritage blue would be considered during detailed design.
Opportunities to expose the original ceiling treatment should be explored.	Exposed ceilings are being proposed at the York Street foyer, near the escalators on the western unpaid concourse and within the paid concourse area. The feasibility of exposing the original ceiling treatment is subject to the services that need to be accommodated within the ceiling space. The feasibility will be considered during detailed design and in consultation with Sydney Trains.
Design of lighting should consider the original box lighting under the original 1930s design.	Box lighting is proposed within the paid concourse, and within the York Street foyer. Further opportunities to incorporate this style of lighting at the western unpaid concourse near the escalators would be explored during detailed design and in consultation with Sydney Trains.
Opportunities to retain, re-use or reflect the heritage features in back-of-house areas, including the western fire stair.	The opportunities to re-use and/or reflect the original design of the western fire stair with Transport House would be considered during detailed design and in consultation with Sydney Trains. The green tiles (and floor treatment) within back-of-house areas at Transport House would be protected and retained.
Opportunities to reinstate the exposed mezzanine at basement Level 3 of Transport House.	This area needs to remain enclosed given fire and life safety requirements.

Issue	REF Reference
Other stakeholders	
Construction noise impacts, including structure borne noise impacts.	The potential impacts on receivers has been assessed and described in the noise and vibration impact assessment (refer to **Section 7.1**). There would be ongoing consultation with receivers during construction activities.
Operational noise from trains.	The proposal relates to the upgrade of the station to meet current and future demands, and to improve the amenity of the station. Changes to train services (or infrastructure beyond the station domain) do not form part of the proposal.
Disturbance to rat populations due to construction activity, which has been observed as a result of Wynyard Walk construction.	Pests, including rats, are an inherent issue for the CBD. While the proposed demolition works would not be of a similar scale to Wynyard Walk, there remains the risk for rats to be disturbed. Transport for NSW would continue to consult with business owners during construction activities, including the consideration to implement a pest control program.
Power disruptions during construction (and food safety).	Adjustments to the electrical system, and potential disruptions to power to adjoining properties or leased commercial spaces during these works would be coordinated with the affected parties during construction.
Goods lift conflicts with construction activities.	Transport for NSW will consult with Coles Supermarket and the Menzies Hotel regarding use of the goods lift to minimise the potential disruption to these businesses.
If the proposal would be designed to meet demand at Wynyard Station due to current or future developments in the CBD.	The Wynyard Station Upgrade is proposed to meet current and future commuter demand. This is discussed in **Chapter 2**.
Coordination and communication with adjoining projects and building managers.	Transport for NSW would continue to consult with the immediate landowners and building managers, including regular communication. This would include updates on works that may disrupt pedestrian movements and noisy construction works.

6.4 Future consultation

6.4.1 Notification of the REF public display

The community and key stakeholders would be notified of the REF public display using a number of different approaches, including:

- A dedicated project website (www.transport.nsw.gov.au/projects), which would include up-to-date information about the proposal and information on how to provide feedback.
- Advertisement of the REF public display period in local newspapers (Sydney Morning Herald, Daily Telegraph, mX and Sydney City News), with a link to the Transport for NSW project website.
- Distribution of letterbox drops to residents and businesses in close proximity to Wynyard Station outlining the proposal and how to provide feedback.
- Distribution of flyers to customers at Wynyard Station outlining the proposal and how to provide feedback.
- Distribution of email to project email list.
- Direct correspondence with City of Sydney, Sydney, Office and Environment and Heritage (Heritage Division), affected property owners, business organisations and other stakeholders.

6.4.2 Display of the REF

The REF will be on public display for a minimum period of 14 days and will be made available on the project website. It will also be made available at the following locations:

- Transport Projects Division head office: Level 5, Tower A, Zenith Centre, 821 Pacific Highway, Chatswood (Monday to Friday, 9am to 5pm).
- Transport for NSW Community Information Centre, Retail 5, 388 George Street, Sydney located on the corner of King and George Streets (open Monday to Friday, 9am to 5pm).
- City of Sydney: Town Hall House, 456 Kent Street, Sydney (Monday to Friday, 9am to 5pm).
- City of Sydney Customs House Library: 31 Alfred Street, Circular Quay (Monday to Friday, 9am to 5pm, and Saturday to Sunday, 11am to 4pm).

The Transport for NSW Community Information Centre is open 9 am to 5 pm Monday to Friday. Members of the community can visit the information centre during these hours throughout the display period and ask questions about the proposal and provide feedback.

Information on the proposal would also be available through the project Infoline on 1800 684 490 and email address: projects@transport.nsw.gov.au.

Written submissions on the REF should be emailed to projects@transport.nsw.gov.au or sent

to:

Wynyard Station Upgrade
Principal Manager Planning and Assessments
Transport for NSW
Locked Bag 6501
St Leonards NSW 2065

Written submissions must be received by **5:00 pm 19 December 2014.**

6.4.3 Consultation following the REF display

Following the display of the REF, Transport for NSW will collate and respond to all submissions received in a Submissions Report that will be made available on the project website. The issues raised by respondents would be considered by Transport for NSW before determining whether, or how, to proceed with the proposal.

Should Transport for NSW determine to proceed with the proposal, a determination report would be made available on the Transport for NSW website and would summarise the key impacts identified in the REF, demonstrate how Transport for NSW considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the proposal.

During construction, the project team (including the contractor) would keep the community, City of Sydney and other key stakeholders informed of the process, identify further issues as they arise, and develop additional mitigation measures to minimise the impacts of the proposal. Engagement with the community (including the surrounding business community) would be undertaken in accordance with a Community Liaison Plan, which would be developed prior to the commencement of construction.

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7 Environmental impact assessment

7.1 Noise and vibration

This section of the REF summarises the *Wynyard Station Upgrade – Construction Noise and Vibration Impact Assessment* (AECOM, 2014b), which is provided in **Appendix C**.

7.1.1 Existing environment

Located within the Sydney Central Business District, receivers surrounding Wynyard Station are predominately commercial. At the surface, residential uses, educational facilities and hotels in addition to commercial uses, are located in the vicinity of the station. These include (but are not limited to):

- The Menzies Hotel, 2 Carrington Street.
- Residential apartments at 42 – 44 Margaret Street.
- Scots Presbyterian Church, located on the ground floor of 42 – 44 Margaret Street.
- St Phillip's Anglican Church, 2 York Street Sydney.
- Travelodge Wynyard, 7-9 York Street, Sydney.
- The York by Swiss-Belhotel, 5 York Street, Sydney.
- The Carrington Apartments (serviced apartments), 57 – 59 York Street, Sydney.
- Educational establishments at 11-17 and 19 York Street, Sydney, including Navitas Professional, La Trobe University and the Australia College of Applied Psychology.
- The Amora Hotel, 11 Jamison Street, Sydney.

Figure 14 identifies the surrounding land uses.

Below ground, there are multiple retail spaces within the station public domain and facilities as well as within the Metcentre, George Street ramps and Hunter Arcade.

The platforms and concourse areas are located directly below Carrington Street, Wynyard Park and York Street. The western unpaid concourse is located within the basement level of Transport House.

Background noise monitoring was conducted to determine existing background noise levels at sensitive receivers and to establish representative airborne noise goals for the proposal.

Figure 14 - Sensitive and other noise receivers

- Commercial
- Commercial/residential
- Commercial/hotel
- Commercial/educational
- Hotel
- Place of worship/residential
- Place of worship
- Noise monitoring location

Two unattended noise loggers were deployed on:

- The balcony of the 3rd floor of the Travelodge on York Street, Sydney. The noise logger monitored noise levels continuously from 17-23 June 2014.
- A balcony on the second story of Lisgar House, 30-32 Carrington Street, Sydney. The noise levels were logged from 3-13 July 2014.

The loggers measured the noise levels over the sample periods and then determined L_{A10}, L_{A90}, L_{Amax}, and L_{Aeq} levels of the noise environment. The L_{A10} and L_{A90} levels are the levels exceeded for 10 per cent and 90 per cent of the sample period respectively. The L_{Amax} is indicative of the maximum noise levels due to individual noise events such as the pass-by of a heavy vehicle. The L_{A90} is taken as the background noise level (or rating background level (RBL)). The L_{Aeq} level is the equivalent continuous sound level and has the same sound energy over the sample period as the actual noise environment with fluctuating sound levels. This is referred to as the ambient noise level.

The background noise levels and ambient noise levels at each logger location are provided in **Table 9**. The location of each logger location is shown on **Figure 14**. These results exclude extraneous weather conditions, as per the *NSW Industrial Noise Policy* (EPA, 2000).

The noise monitoring results indicate that there are high levels of background noise, which is expected for an inner city location. There was little difference in ambient noise levels at each logger location. Daytime ambient noise levels are around 70 db(A), and drop by around 5dB(A) during night-time periods.

Table 9 Background and ambient noise levels

Logger location	Period	Background noise levels, L_{A90} dB(A) (RBL)	Ambient Noise Levels L_{Aeq}
Logger 1 – 7-9 York Street (Travelodge), Sydney	Day	62	69
	Evening	60	67
	Night	55	64
Logger 2 – 30-32 Carrington Street, Sydney (Lisgar House)	Day	63	70
	Evening	61	69
	Night	56	65

1. Day is defined as 7:00 am to 6:00 pm Monday to Saturday and 8:00 am to 6:00 pm Sundays and Public Holidays.
2. Evening is defined as 6:00 pm to 10:00 pm Monday to Sunday and Public Holidays.
3. Night is defined as 10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 8:00 am Sundays and Public Holidays.

7.1.2 **Assessment criteria**

7.1.3 **Noise management levels**

The EPA's *Interim Construction Noise Guideline* (ICNG) (DECCW, 2009) provides the principal guidance for the assessment and management of construction noise in NSW. This document replaces the previous publication the *Environmental Noise Control Manual*, and is used as the basis for establishing construction noise management levels.

The ICNG provides noise management levels for non-residential receivers and guidance on how to establish noise management levels for residential receivers. For residential receivers, the ICNG requires certain steps to be taken depending on the level of construction noise predicted at a receiver location, and whether construction works are being conducted within recommended construction hours. These steps are summarised in **Table 10**.

Where an exceedance of the management levels is predicted, the ICNG advises that receivers can be considered 'noise affected' and the proponent should apply all feasible and reasonable work practises to minimise the noise impact. The proponent should also inform all potentially impacted residents of the nature of the works to be carried out, the expected noise level and duration, as well as providing contact details for residents to make complaints or seek further information.

Where construction noise levels reach 75 dB(A), residential receivers can be considered as 'highly noise affected' and the proponent should, in consultation with the community, consider restricting hours to provide respite periods (refer to **Table 10)**.

The ICNG defines what is considered to be feasible and reasonable as follows:

- *"Feasible*
  A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
- *Reasonable*
  Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure."

Transport for NSW's *Construction Noise Strategy* (CNS) provides practical guidance on how to minimise, to the fullest extent practicable, the impacts on the community from airborne noise, ground-borne noise and vibration generated during the construction of Transport for NSW projects through the application of feasible and reasonable mitigation measures. Where exceedances are still expected to occur after standard mitigation measures have been applied, the CNS recommends the implementation of additional feasible and reasonable mitigation measures, such as respite periods, notification measures and monitoring.

Table 10 Noise management levels under the Interim Construction Noise Guideline

Time of day	Noise management level LAeq (15min)[1]	Assessment and mitigation steps
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays	Noise affected Rating background level + 10 dB(A)	Where the predicted or measured $L_{Aeq(15\text{-}minute)}$ noise level is greater than the 'noise affected' management level, all feasible and reasonable noise mitigation measures must be applied to the project. Residents that are potentially affected by noise above this noise management level should be informed of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for an appropriate project contact.
	Highly noise affected 75 dB(A)	Where the predicted or measured $L_{Aeq(15\text{-}minute)}$ noise level is greater than the 'highly noise affected' management level, the conditions of approval may require respite periods by restricting the hours that very noisy activities are permitted to occur, taking into account: • Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences). • If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected Rating background level + 5 dB(A)	All construction works outside recommended standard construction hours require strong justification. Where the predicted or measured $L_{Aeq(15\text{-}minute)}$ noise level is greater than the 'noise affected' management level, all feasible and reasonable noise mitigation measures must be applied to the project. Where all feasible and reasonable noise mitigation measures have been applied and noise is more than five dB(A) above the noise affected level, a negotiated agreement should be pursued with affected parties (refer to Section 7.2.2. of the ICNG for further guidance on negotiated agreements).

1 Note: Noise management levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence.

Noise management levels – residential receivers

In determining the noise management levels for the proposal, the lowest background noise level (being noise recorded at noise logger 1) was applied to establish the most stringent noise management levels for residential receivers (refer to **Table 11**). Hotels, although a commercial activity, have been treated as a residential land use. This provides a conservative assumption as the residential noise management level is more stringent.

Table 11 Construction noise management levels – residential receivers

Logging Location	Period	RBL, L_{A90} dB(A)	Standard Hours Noise Management Levels L_{Aeq} dB(A)	Out of Hours Noise Management Levels L_{Aeq} dB(A)
7 – 9 York Street, Sydney (Travelodge)	Day	62	72	67
	Evening	60	N/A	65
	Night	55	N/A	60

Noise management levels – non-residential receivers

The ICNG also specifies noise management levels for non-residential receivers. These have been adopted for the project as summarised in **Table 12.** For other non-residential uses at the surface, the noise management levels in **Table 12** have been applied with the exception of retail spaces below ground that are within or directly adjoin the station public domain. As these retail spaces have open fronts, the noise management level for those receivers has been reduced by 10dB. This is to take account of the fact that the façade are not likely to provide the same noise attenuation as the façade of a standard retail space on street level. The noise management levels for places of worship and internal concourse premises are only relevant when the property is in use.

Table 12 Construction noise management levels – non-residential receivers

Non-residential receiver	Noise management level $L_{Aeq(15\text{-minute})}$ (applies when properties are in use e.g. open)
Places of worship	Internal noise level 45 dB(A) when the property is in use.
Commercial Premises (including offices, retail outlets)	70 dB(A) External noise level
Concourse level commercial premises (including offices, retail outlets)	60 dB(A) External noise level
Passive recreational areas	60 dB(A) External noise level

7.1.4 **Sleep disturbance**

The ICNG requires a sleep disturbance analysis where construction works are planned to extend over more than two consecutive nights. Both the ICNG and the *Road Noise Policy* (RNP) refer to the guidance provided in the now superseded NSW *Environment Criteria for Road Traffic Noise* (EPA, 1999), in conducting a sleep disturbance analysis.

The ICNG specifies a sleep disturbance screening criterion equivalent to the background noise level (rating background level) plus 15 dB(A). If short duration, high intensity noise events (measured as $L_{A1(1\text{-minute})}$) exceed this sleep disturbance criterion, further assessment of potential sleep disturbance is required.

In addition to the guidance provided in the ICNG, the RNP presents the outcomes of research into sleep disturbance based on current studies and concludes that:

- Maximum internal noise levels below 50-55 dB(A) are unlikely to awaken people from sleep.
- One or two noise events per night, with maximum internal noise levels of 65-70 dB(A) are not likely to affect health and wellbeing significantly.

At this location, it is considered reasonable to assume windows would remain closed within residential and hotel buildings during the night-time, due to the existing high road traffic noise levels and the likely use of air conditioning systems for cooling. For this assessment a sleep disturbance screening criterion of 70 dB(A) at the affected façade has therefore been adopted.

7.1.5 **Construction road traffic noise**

The RNP does not provide a direct reference to appropriate criteria to assess the noise arising from traffic generated during the construction period. In the absence of alternate guidance, it has been used to assess the noise arising from construction traffic movements generated by the proposed development. The RNP does not require assessment of noise impact to commercial or industrial receivers.

York, Margaret, Carrington, Clarence and George Streets are located in close proximity to the site. George Street is an arterial road, whereas the remainder are considered to be arterial and sub-arterial roads as per categories within the RNP. York, Carrington, Clarence and George Streets carry significant volumes of bus traffic, particularly during peak travel times.

Table 13 presents the road traffic noise criteria from the RNP. The external noise criteria are applied 1 metre from the external facade of the affected building.

Table 13 Road traffic noise criteria

Road category	Type of project/land use	Assessment criteria, dB(A)	
		Day (7 am to 10 pm)	Night (10 pm to 7 am)
Arterial / Sub-arterial roads	Existing residences affected by additional traffic on existing roads generated by land use developments	$L_{Aeq,15hr}$ 60	$L_{Aeq,9hr}$ 55

In cases where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person. Noise mitigation is therefore not considered where noise increases are less than 2 dB.

In this case, existing road traffic noise levels exceed the RNP criteria and the 2 dB allowance is triggered.

7.1.6 Construction-related vibration assessment criteria

Vibration, at high enough levels, has the potential to cause damage to structures and disrupt human comfort.

Structural damage

At present, no Australian Standards exist for the assessment of building damage caused by vibration. German Standard *DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures* (DIN 4150) provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are presented in **Table 14**. DIN 4150 states that for buildings exposed to higher levels of vibration than recommended, vibration would not necessarily result in damage. Group 3 is typically applied to heritage structures such as Transport House.

Table 14 DIN 4150: Structural damage safe limits for building vibration

Group	Type of structure	Vibration velocity in mm/s			
		At foundation at a frequency of			Vibration at the horizontal plane of the highest floor
		Less than 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Human comfort

The assessment of intermittent vibration is outlined in the NSW EPA's guideline *Assessing Vibration: A Technical Guideline is based on Vibration Dose Values* (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods.

Maximum and preferred VDVs for intermittent vibration arising from construction activities are listed in **Table 15**. The VDV criteria are based on the likelihood that a person would be annoyed by the level of vibration over the entire assessment period.

Table 15 Preferred and maximum vibration dose values for intermittent vibration (m/s$^{1.75}$)

Location	Daytime (7 am – 10 pm)		Night-time (10 pm – 7 am)	
	Preferred	Max	Preferred	Max
Residences	0.2	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.4	0.8	0.4	0.8

7.1.7 Ground-borne noise

Vibration generated by activities such as the use of impact drills and breakers may travel through the building structure and enter building spaces. This causes the floors, walls and ceilings to vibrate and to radiate noise. This noise is commonly referred to as structure-borne or ground-borne noise or regenerated noise. Ground-borne noise is typically low frequency and if audible, is perceived as a 'rumble'.

In general, ground-borne noise level values are relevant only where they are higher than the airborne noise from the construction activities, such as where there is significant shielding from the location where the construction activities are being undertaken. For the proposal, the relevant receivers in relation to ground-borne noise would include users of Transport House and pedestrians in Wynyard Station The ground-borne noise management levels as outlined in the ICNG are adopted for this project and presented in **Table 16**. The structure-borne noise levels are applicable during the evening and night-time periods only for residential receivers, as the objective is to protect the amenity and sleep of people when they are at home.

An additional management level has been developed for commercial and educational receivers for the purposes of this assessment (as shown in **Table 14)**, as these receivers are not covered by the ICNG.

Table 16 Recommended structure-borne noise goals for construction activities

Time	Ground-borne noise goals
Residential receivers	
Evening (6pm to 10pm)	40 dB(A) $L_{Aeq\ (15\ min)}$
Night-time (10pm to 7am)	35 dB(A) $L_{Aeq\ (15min)}$
Commercial receivers[1]	
When in use	45 dB(A) $L_{Aeq\ (15\ min)}$

Note 1: *The ICNG does not present ground-borne noise management levels for commercial spaces. This has been based on a relaxation of 5 dB(A) from the residential criterion*.

7.1.8 **Construction impacts**

Construction works are required to be carried out 24 hours, seven days a week to enable the station to remain operational, to avoid unacceptable impacts on the broader Sydney rail network and to manage noise impacts on passengers, station staff, retailers and commercial properties. By virtue of being an underground station, construction access to the station is also constrained and would become increasingly constrained as developments surrounding the station commence construction. Works that predominately occur in areas behind hoardings within the concourse area, in areas outside the public domain, or works that are typically less noisy (in order to minimise noise impacts on customers) would be carried out during standard construction hours where feasible and reasonable.

However, as Wynyard Station is a busy underground station that needs to remain operational during the upgrade, many construction activities may potentially be completed at night to minimise pedestrian impacts and noise impacts on rail customers, staff and retail operators (and their customers). For this reason a number of construction activities would be completed outside of standard construction hours. These may include (but are not limited to):

- Installation and removal of hoarding.
- Demolition works.
- Removal of redundant services.
- Installation of utilities (such as lighting), ceiling works and station systems.
- Waterproofing and fire insulation.
- Concrete works (including preparation of reinforced concrete).
- Removal and installation of ticket gates.
- Tiling and other architectural finishes.
- Commissioning of operational systems.
- Deliveries of construction material and plant, and the removal of construction waste.

If used, the establishment and use of the Wynyard Park compound would occur within and outside standard construction hours, however deliveries would only occur outside standard hours.

7.1.9 Construction noise

To assess the potential impacts of construction works during standard construction hours and out-of-hours, ten scenarios have been modelled which represent the noisiest or worst-case scenarios (refer **Table 17**). These include noise from:

- Works behind hoardings (within the station).
- Works in open areas (within the station), being works that would generally be undertaken during evening and night periods or during rail possessions.
- Wynyard Park compound.

The loading and unloading activities are excluded from the construction noise assessment as they take place outside the construction site. Given these would occur during sensitive hours of the evening and night, mitigation measures have been recommended.

Table 17 Assessed construction activities

Scenario	Description	Anticipated Noise Level	Time	Equipment	Sound Power Level, dB(A)
Works behind hoardings					
1	Demolition/ Strip Out	High	Night	Excavators	94
				Breaker	109
				Hand-held breaker	108
				Compressor	100
				Disc Cutter	107
				Grinder	108
				Elevated work platform	87
2	Installation of services reticulation	High	Day	Elevated work platform	87
				Chop saw	107
				Grinder	108
				Disc cutter	107
3	Commissioning of operational systems	High	Day and night	Alarms	112
				Sirens	112

Scenario	Description	Anticipated Noise Level	Time	Equipment	Sound Power Level, dB(A)
4	Installation of tiling and architectural finishes	Medium	Day	Elevated work platform	87
				Disc cutter	107
				Hand tools	94
				Lifting equipment	93
Work In Open Areas					
5	Demolition/break-out	High	Night	Excavators	94
				Breaker	109
				Hand-held breaker	108
				Compressor	100
				Disc cutter	107
				Grinder	108
				Elevated work platform	87
6	Installation of services	High	Night	Elevated work platform	87
				Chop saw	107
				Grinder	108
				Disc cutter	107
7	Commissioning of operational systems	High	Day and night	Alarms	112
				Sirens	112
8	Removal / installation of ticket gates (nights)	Medium	Night	Forklift	93
				Pallet trucks	98
				Breaker	112
				Grinder	108
				Lifting equipment	93

Scenario	Description	Anticipated Noise Level	Time	Equipment	Sound Power Level, dB(A)
Wynyard Park					
9	Excavation of Wynyard Park access shaft	High	Night[1]	Excavator	94
				Cranes	99
				Concrete saw	110
				Breaker	109
10	Use of Wynyard Park during site deliveries[2]	Low	Night	Forklift	93
				Winch/lift	96

Note 1 – This activity may be completed during the daytime or night-time, however a night-time assessment has been undertaken to provide a worst case scenario.

Note 2 – This scenario includes random bangs and clangs from delivery activities.

Commercial and residential receivers

Noise levels have been predicted for residential and hotel receivers near the proposal site. This includes (but is not limited to) 42 – 44 Margaret Street, the Travelodge on York, Menzies Hotel, and 40 – 50 Clarence Street.

Noise associated with the required construction works and hours is predicted to comply with the noise management levels applicable for residential and commercial receivers for the assessed scenarios (refer to **Table 18** and **Table 19**), except for the commissioning of operational systems. During this scenario, noise levels up to 79dB(A) are predicted at 11 – 17 York Street, Sydney, which is approximately 9dB(A) above the noise management level for commercial receivers (refer to **Table 20**). Commissioning of operational systems would involve the testing of alarms and sirens, which already occurs occasionally and would only be for a short duration. **Table 21** shows the noise levels for Wynyard Park compound during site deliveries are predicted to comply with the residential and commercial noise management level, whereas **Table 22** shows exceedances of up to 2dB have been predicted during the installation of services behind hoardings.

For construction activities that would occur outside standard construction hours, noise levels are predicted to comply with the noise management levels and sleep disturbance criterion at all residential and hotel receivers.

Table 18 Construction L_{Aeq} airborne noise level results (external) – Demolition / break out works in open areas

Worst Affected Receiver	Type	Time[1]	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
42-44 Margaret Street	Church / Residential	Night	60[1]	42	
2-12 Carrington Street	Hotel	Night	60	41	

Note 1: Places of worship have internal noise levels, which are discussed later in this report.

Table 19 Construction L_{Aeq} airborne noise level results (external airborne noise levels) – Installation of services in open areas

Worst Affected Receiver	Type	Time 1	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
42-44 Margaret Street	Church / Residential	Night	60[1]	43	
2-12 Carrington Street	Hotel	Night	60	40	

Note 1: Places of worship have internal noise levels, which are discussed later in this report.

Table 20 Construction L_{Aeq} noise level results (external airborne noise levels) – Commissioning of operational systems

Worst Affected Receiver	Type	Time[1]	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
11-17 York Street	Commercial/ Educational	Day	70[2]	79	9
19 York Street	Commercial/Educational	Day	70[2]	57	-
33-35 York Street	Commercial	Day	70	48	-
42-44 Margaret Street	Church / Residential	Night	60[2]	48	-
46-50 Margaret Street	Commercial	Day	70	46	-
2-12 Carrington Street	Hotel	Night	60	45	-
14-28 Carrington St	Commercial	Day	70	45	-
37 York Street	Commercial	Day	70	45	-
30-32 Carrington Street	Commercial	Day	70	44	-
34-36 Carrington Street	Commercial	Day	70	44	-
50 Carrington Street	Commercial	Day	70	43	-
5 York Street	Hotel	Night	60	42	-
2 York Street	Commercial / Residential	Night	60	42	-
39-41 York Street	Commercial	Day	70	42	-

Worst Affected Receiver	Type	Time[1]	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
273 George Street	Commercial	Day	70	41	-
54-62 Carrington St	Commercial	Day	70	41	-
341 George St Street	Commercial	Day	70	40	-

Note 1: The most stringent criterion which aligns with a period when the receiver is occupied has been applied.

Note 2: Places of worship and educational establishments have internal noise levels, which are elsewhere in this report.

Table 21 Construction L_{Aeq} noise level results (external airborne noise levels) – Wynyard Park during site deliveries

Worst Affected Receiver	Type	Time[1]	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
14-28 Carrington St	Commercial	Day	70	50	-
30-32 Carrington Street	Commercial	Day	70	50	-
37 York Street	Commercial	Day	70	50	-
33-35 York Street	Commercial	Day	70	49	-
34-36 Carrington Street	Commercial	Day	70	49	-
50 Carrington Street	Commercial	Day	70	49	-
39-41 York Street	Commercial	Day	70	48	-
19 York Street	Commercial	Day	70[1]	47	-
54-62 Carrington St	Commercial	Day	70	47	-
45-47 York Street	Commercial	Day	70	45	-
43 York Street	Commercial	Day	70	45	-
2-12 Carrington Street	Hotel	Night	60	45	-
11-17 York Street	Commercial	Day	70[1]	44	-
42-44 Margaret Street	Church / Residential	Night	60[1]	44	-
46-50 Margaret Street	Commercial	Day	70	44	-
49-51 York Street	Commercial	Day	70	44	-
341 George St Street	Commercial	Day	70	42	-
53-55 York Street	Commercial	Day	70	42	-
5 York Street	Hotel	Night	60	41	-
57-59 York Street	Hotel	Day	60	41	-

Worst Affected Receiver	Type	Time[1]	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
7A York Street	Commercial	Day	70	41	-
7-9 York Street	Hotel	Night	60	41	-
273 George Street	Commercial	Day	70	40	-
61 York Street	Commercial	Day	70	40	-

Note 1: The most stringent criterion which aligns with a period when the receiver is occupied has been applied,

Note 2: Places of worship and educational establishments have internal noise levels, which are elsewhere in this report.

Table 22 Construction L_{Aeq} noise level results (internal airborne noise) – Installation of services reticulation works behind hoardings

Worst Affected Receiver	Type	Time 1	NML, $L_{Aeq\ 15\ min}$	Predicted, $L_{Aeq\ 15\ min}$ dB(A)	NML exceed-ance
Coles	Retail	Day	60	58	-
Retail in north-east corner of the concourse area	Retail	Day	60	62	2

Note 1: The most stringent criterion which aligns with a period when the receiver is occupied has been applied,.

Educational establishments and places of worship

Internal noise levels are predicted to be met during all assessed scenarios at other sensitive noise receivers (such as the church at 42 – 44 Margaret Street) with the exception of 11 – 17 York Street, during the commissioning of operational systems. At 11-17 York Street, internal noise levels of up to 59dB(A) are predicted, which is above the internal noise management level of 45dB(A). Again, this would only occur during the commissioning of operational systems which already occurs as part of station management. No exceedances are anticipated for the modelled construction activities.

Passive recreational areas

For Wynyard Park, existing background and ambient noise levels are higher than the passive recreation criteria. Therefore construction noise is not expected to impact significantly on the use of the park.

Within the station and surrounds

For receivers within the station public domain, mezzanine level (Coles and other retail) and surrounding pedestrian arcades, airborne noise levels are within the noise management levels, except during the installation of services behind hoardings. During these activities, noise exceedances of up to 2dB have been predicted for retail receivers in the north-eastern corner of the unpaid concourse.

For the majority of receivers within the station and surrounding pedestrian arcades, exposure to elevated noise levels would be temporary given the transitory use of these spaces. However, workers within the station and nearby retail spaces, and customers of certain retail businesses (such as cafes), could be exposed for a longer duration depending on the location of the works relative to these receivers. Works that generate significant levels of noise have already been scheduled outside standard hours to minimise such exposure. However, feasible and reasonable noise mitigation would be investigated where noisy works occur during standard construction hours and/or during extended retail hours (such as Thursday night). Further, work health and safety (WHS) requirements would provide an additional framework for construction noise management. Where there is potential for continued elevated noise levels (including structure-borne noise), consultation with affected retail premises would be undertaken to determine periods of low retail activity and schedule work accordingly, thus minimising potential impact. This is discussed further in **Section 7.1.14.**

7.1.10 Structure-borne noise

Structure-borne noise, in addition to airborne noise, can be a significant source of noise for construction projects within buildings. In contrast to airborne noise the propagation path for structure-borne noise is through structural elements of the building. The vibration energy after travelling through the building may then re-radiate as sound energy from large surfaces such as walls, ceilings and floors.

A typical structure-borne noise path is illustrated in **Figure 15**. In this figure, vibration is generated by the impact from a jackhammer. The vibration transfers through the floor and walls of the structure and is re-radiated as noise in a nearby room.

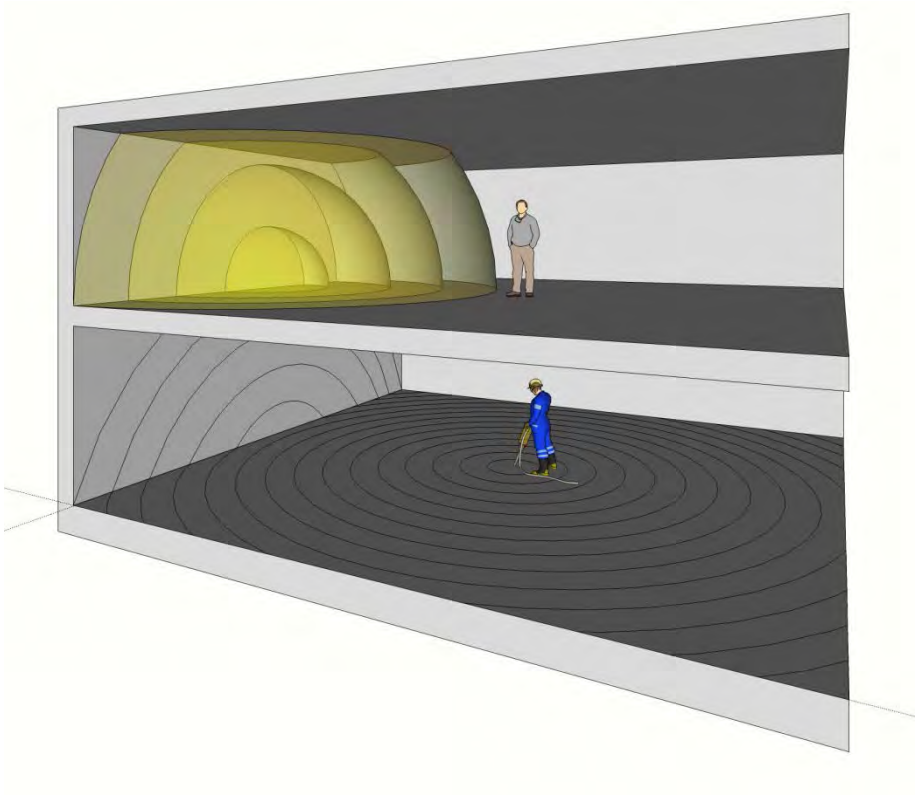


Figure 15 An example of a structure-borne noise path

The predicted structure-borne noise levels are presented in **Table 23** for the most vibration intensive construction equipment at the most affected receivers. An assessment was undertaken for three types of equipment, a hammer drill with chisel point, a hammer drill with drill bit and an angle grinder. **Table 23** shows noise levels based on the equipment with the greatest exceedance, a hammer drill with drill bit.

It is predicted that regenerated noise levels may exceed the noise management levels at the nearest retail receivers, in the foyer of Transport House and the NSW Service Centre. These exceedances may range from 11 – 28 dB. Retail receivers within adjoining pedestrian arcades (such as the Metcentre) are expected to experience structure-borne noise levels that are lower than those predicted for retail receivers located within the concourse areas.

Exceedances are not predicted at the educational establishment on level 2 of Transport House or at the nearest residential receiver at 50 Clarence Street.

Table 23 Predicted regenerated noise levels at selected receivers

Receiver	Location	Predicted structure-borne noise levels	NML	Exceedance
Retail	Concourse level	73	45	28
Retail - Coles	Mezzanine level	73	45	28
Retail	Carrington Street (Wynyard Dome)	61	45	16
11-17 York Street	Foyer – York Street level	56	45	11
19 York Street	NSW Service Centre – York Street level	56	45	11
11 – 17 and 19 York Street	Educational establishment – Level 2	45	45	-
Residence	50 Clarence St – Level 12	< 30	35	-

7.1.11 Construction vibration

The assessment of construction vibration shows levels are not expected to exceed the VDV management levels (or human comfort) at the nearest receivers. As these VDV management levels are more stringent than structural damage criteria, the assessment also demonstrates that the predicted vibration levels would be below structural damage criteria.

7.1.12 Construction traffic

The average and maximum construction heavy vehicle numbers are provided in **Section 5.5.8**. Due to the significant existing traffic volumes on George, York and Margaret Streets, the increase in noise as a result of construction traffic is expected to be negligible (less than 1 dB).

Wynyard Lane may be closed for construction of the One Carrington Street development. If this occurs, it is proposed to access the Wynyard Lane Car Park via Cumberland Street and the existing underground tunnel. The additional construction traffic movements would be offset by a reduction in private vehicles exiting the car park as the car park would be closed to private vehicles. In addition, existing road traffic noise levels are very high in this area due to the significant volumes of traffic using the Bradfield Highway (Sydney Harbour Bridge). Construction traffic would therefore have a negligible effect on road traffic noise levels at residential receivers in this area.

7.1.13 Operational impacts

The proposed upgrade to Wynyard Station would not result in an increase in train movements at the station, and would only involve the replacement of existing train systems such as signal infrastructure on platforms, concourse and back-of-house areas. As such, rail noise (including regenerated noise) would not change and has not been assessed as part of this proposal.

The replacement and/or relocation of existing plant and substations, the installation of building services systems within new office spaces, as well as the installation of additional operational plant (such as water treatment plant), could introduce additional noise sources within back-of-house areas. However, these are not expected to give rise to increased operational noise levels within the station or to nearby sensitive receivers given they would be installed within enclosed existing plant rooms underground and/or away from public areas. Work occupational health and safety requirements would provide an additional framework for the management of internal noise levels within these spaces.

Emergency ventilation systems would also be installed within the modified or new staircases. As these would only be used during times of an emergency (for example, during a fire), these systems have not been assessed. However, any such system would need to be installed in accordance with Australian Standards, which provide a maximum sound pressure levels within occupied spaces and fire isolated exits.

7.1.14 Management and mitigation measures

During construction of the proposal, the mitigation measures would be implemented as detailed in **Table 24**.

Table 24 Noise and vibration mitigation and management measures

ID No.	Mitigation and management measures
NV1	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Transport for NSW *Construction Noise Strategy* and the *Interim Construction Noise Guideline*. The CNVMP would include all reasonable and feasible mitigation options to manage the noise emissions from the site and also any complaints which may occur due to the construction activity noise. The CNVMP would include the following: - Identification of nearby residences, other sensitive land uses (e.g places of worship) and businesses (e.g retailers). - Description of approved hours of work. - Description and identification of all construction activities, including work areas, equipment and duration. - Description of work practices (generic and specific) to be applied to minimise noise and vibration.

ID No.	Mitigation and management measures
	- Details of any necessary out-of-hours work required would form part of the CNVMP. - A complaints handling process. - Noise and vibration monitoring procedures.
NV2	All receivers impacted by noise from the proposed works which are expected to exceed the construction NMLs would be consulted about the project prior to the commencement of the particular activity, with the highest consideration given to those that are predicted to be most affected as a result of the works. The information provided to the receivers would include: - Programmed times and locations of construction work. - The hours of proposed works. - Construction noise and vibration impact predictions. - Construction noise and vibration mitigation measures being implemented on site. Consultation would be consistent with the requirements of Transport for NSW *Construction Noise Strategy* and the Community Liaison Plan (refer to **Section 6.4.3**). The highest consideration would be given to receivers that are predicted to be most affected as a result of the works.
NV3	Induction and training would be provided to relevant staff and sub-contractors outlining their responsibilities with regard to noise. Construction workers would be briefed in order to create an awareness of the locality, the location of receivers and noise mitigation measures.
NV4	Particularly noisy activities should be scheduled for times when they would have the least impact where feasible and reasonable. Where there is potential for continued elevated noise levels (including structure-borne noise), consultation with affected retailers, other businesses premises and Sydney Trains personnel would be undertaken to complete noise or vibration intensive activities outside retail business hours, during periods of low retail activities and low passenger numbers, where reasonable and feasible. This would result in additional works being undertaken outside standard construction hours. Undertaking works outside of standard working hours is advantageous as it reduces the impact on retail premises and Sydney Trains' staff and passengers. Negotiations should be undertaken with retail premises within and around the station to determine if periods of respite are appropriate.

ID No.	Mitigation and management measures
NV5	Activities which may need to be conducted outside of standard construction hours, and have not been assessed in this report, would be subject to out-of-hours approval as identified in the Transport for NSW *Construction Noise Strategy*.
NV6	The selection of plant and equipment can have a significant impact on construction noise (including structure-borne levels). Appropriate plant would be selected for each task to minimise the noise contributions.
NV7	Alternative works methods would be considered and implemented where feasible and reasonable (e.g. saw cutting instead of impact hammering would reduce structure-borne noise). The use of alternative machines that perform the same function e.g. electric/hydraulic in place of diesel; rubber wheeled in place of steel tracked plant) would be considered.
NV8	Equipment would be regularly inspected and maintained to ensure it is in good working order.
NV9	At Wynyard Park compound, noisy equipment would be orientated away from residential and hotel receivers and/or shielded behind structures where feasible and reasonable.
NV10	Where possible, noisy construction works should be conducted behind hoardings subject to the final construction staging strategy. The hoardings should be full height and be constructed from ≥10 mm plywood or similar.
NV11	Truck drivers would be advised of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (i.e. minimising the use of engine brakes, and no extended periods of engine idling).
NV12	Construction sites would be arranged to limit the need for reversing associated with regular / repeatable movements (e.g. trucks transporting spoil) to minimise the use of reversing alarms. Where feasible and reasonable, non-tonal reversing alarms would be used (particularly for vehicles reversing down York Lane), taking into account the requirements of the WHS legislation.

ID No.	Mitigation and management measures
NV13	A noise monitoring program would be considered and implemented to assist in confirming and controlling the site specific potential for disturbance at particularly sensitive receivers, at the commencement of activities identified as having the potential to result in exceedances and periodically during the construction program as the works progress. Measurements would also be undertaken in response to complaints. The results would be reviewed to determine if additional mitigation measures are required. All measurements would be undertaken in accordance with Australian Standard 1055.1-1997 – Acoustics – Description and measurement of environmental noise, Part 1: General procedures. A noise monitoring program would be presented in the CNVMP.

7.2 Pedestrian access

This section provides a summary of the *Wynyard Station Pedestrian Modelling – Analysis of Pedestrian Level of Service* report undertaken by AECOM (2014a), *Wynyard Station Upgrade – Pedestrians, Traffic and Transport* (AECOM, 2014c) (refer to **Appendix D**) and *Wynyard Station Upgrade Pedestrian Simulation Modelling – Existing layout (with Wynyard Walk)* undertaken by AECOM (2014d). It describes the existing pedestrian movements and LoS at Wynyard Station and assesses the potential changes to pedestrian movements as a result of the proposal.

Existing environment

Pedestrian access to Wynyard Station is described in **Section 1.3.3** and **Figure 2**. As discussed, there are five key access points, escalators connecting to Transport House and York Street, escalators to Wynyard Park and escalators and stairs to Carrington Street, the George Street ramps, the Hunter Arcade and the Metcentre. Pedestrian movements within the proposal site include entry and exit movements to and from Wynyard Station as well as pedestrians passing through the public domain of the station (referred to as through movements). Through movements within the station are varied and examples could include movements from York Street via the York Street escalators through to the Metcentre or from George Street via the George Street ramps and exiting to Carrington Street via the escalators and stairs. Through movements within the public domain are most prevalent during the lunch time period, as it is likely that the station is used to access surrounding retail businesses. In the unpaid concourse areas, pedestrians show a preference to the northern unpaid concourse over the southern unpaid concourse.

Pedestrian modelling has been undertaken to determine the existing pedestrian numbers accessing the station for the various pedestrian movements. **Table 25** presents the current pedestrian movements at Wynyard Station in the AM and PM 1-hour peak periods in 2014. Data is provided for the concourse areas (which includes rail and non-rail related movements) and for the platforms (which includes rail related movements only). It is noted that the closure of the Kent Street tunnel for the construction of Wynyard Walk has led to a reduction in the level of demand within the northern unpaid concourse associated with through movements during the lunch time peak. This reduction has been estimated at approximately 50 per cent based on a comparison of results from a 2008 and 2014 survey (AECOM 2014a). Increased demand for the northern unpaid concourse is expected once Wynyard Walk is operational.

Table 25 Existing pedestrian movements at Wynyard Station during the 1-hour peak period (AECOM, 2014)

Location	AM 1-hour Peak	PM 1-hour Peak
Concourse	28,300	24,500
Platforms 3 and 4	14,650	12,950
Platforms 5 and 6	10,500	8,400

The pedestrian movement numbers and an analysis of the LoS results within the public domain areas, show that Wynyard Station already experiences pedestrian congestion.

Fruin LoS criteria were used for the analysis of pedestrian movement and congestion. Fruin (1987) defines the required LoS by outlining the quantified area needed for pedestrians to comfortably walk, queue, wait or travel through pedestrian spaces (such as station platforms, elevators, stairways, walkways and other public spaces). LoS A indicates the least congestion and represents a situation where people move relatively freely and are not placed in situation of high density or discomfort. LoS E and F indicate the most congestion and are considered acceptable for short time periods or emergency conditions. LoS heat maps were used to determine the level of performance at different locations within the station, with the target being LoS B or C. The LoS measured represents the peak 20 minutes within the measured 1 hour peak period.

The results show that the paid concourse currently operates at LoS C, 21 per cent of the time and LoS D or worse, 36 per cent of the time. The unpaid concourse operates at LoS C, 24 per cent of the time and LoS D or worse, 13 per cent of the time. A key concern associated with this congestion is the queuing of alighting passengers along the platforms and stairs as they wait to exit the station. Similarly the closure of the Kent Street tunnel has added to the level of congestion experienced at the York Street escalators.

Rail and pedestrian movements through Wynyard Station are expected to increase as a result of development currently being constructed and proposed in the immediate surrounds to the station and the wider precinct. To this end the performance of the station in the year 2021 has been assessed, which includes growth in demand associated with key rail network improvements (including the completion of the SWRL and NWRL and increased train frequency across much of the network), the CSELR scheme and Sydney City Centre Bus Infrastructure modifications, as well as Barangaroo, the One Carrington Street development and the opening of Wynyard Walk.

Table 26 shows the pedestrian movements modelled for 2021 at Wynyard Station. The number of pedestrian movements within the concourse area is expected to increase by around 40 per cent compared to the existing situation. The use of Platforms 3 and 4 is expected to increase by around 20 per cent and Platforms 5 and 6 in the order of 70 per cent. This increase in passenger numbers would further exacerbate pedestrian congestion at Wynyard Station and

reduce the LoS from that currently experienced were no upgrade of the station undertaken. In the 2014 baseline scenario (AM peak), where no works progress at the station, the paid concourse is expected to experience a LoS C 21 per cent of the time and LoS D or worse 36 per cent of the time. By 2021, in the absence of the proposal and with the completion of Wynyard Walk, the paid concourse is expected to experience in the AM peak a LoS C of 19 per cent of the time and LoS D or worse 54 per cent of the time (refer to **Table 27**). This indicates that there would be significant crowding at the paid concourse as a result of the increased demand.

Table 26 2021 modelled pedestrian movements at Wynyard Station during the 1-hour peak period (AECOM, 2014a)

Location	AM 1-hour Peak	PM 1-hour Peak
Concourse	41,100	35,750
Platforms 3 and 4	17,800	16,050
Platforms 5 and 6	18,300	14,200

Table 27 Comparison of 2014 and 2021 modelled pedestrian movements at Wynyard Station during AM 20 minute peak average (AECOM, 2014b)

	2014 without project		2021 without project[1]	
Location	LoS C	LOS D or more	LoS C	LOS D or more
Unpaid concourse	24%	13%	26%	10%
Paid concourse	21%	36%	19%	54%
Platforms 3 and 4	9%	6%	13%	12%
Platforms 5 and 6	7%	3%	15%	30%

Note 1: Includes Wynyard Walk

7.2.2 Construction impacts

The construction of the proposal would see temporary disruptions to pedestrian access to various areas within the station. As described in **Section 5.5.3**, the staging of construction activities would require the installation of hoardings and the temporary closure of areas within the public domain. The primary impact would occur with the closure of the southern unpaid concourse, which would be permanent as it becomes part of the expanded paid concourse in the final scheme. This closure would occur prior to the expansion of the northern unpaid concourse and as a result has the potential to increase pedestrian congestion in that area. This approach is subject to modelling of staging to demonstrate adequate, safe pedestrian flow during peak periods.

Increased congestion in the northern unpaid concourse could have implications for pedestrian safety arising from overcrowding. Congestion and reduced pedestrian flows could also

discourage the use of the Wynyard Station public domain for through movements between York and Carrington streets and the Metcentre, George Street and the Hunter Arcade. As lunch time movements within the Wynyard Station public domain are prevalent as well as the morning and afternoon peak periods, the avoidance of peak hours for particular works is critical for minimising potential impacts. Potential impacts to surrounding businesses from changes in pedestrian movements have been assessed in **Section 7.6**.

It is not anticipated that a significant number of customers would alter travel patterns to avoid construction activity at the station, due to the walking distance between stations within the CBD and interchange with bus services at Wynyard Park. The staging of construction activities within the public domain would therefore be critical in terms of maintaining adequate and safe movement of customers. Accordingly, construction staging has been scheduled such that the works which would be most impactful on public areas would be undertaken during night time. This would be documented within a detailed construction staging strategy and pedestrian management plan that would be prepared during detailed design, incorporating aforementioned staging modelling, as is reflected in **Section 7.2.4**.

Construction of the proposal and the installation of hoardings also have the potential to impact wayfinding within and through the station. The disruption of sightlines and closure of certain access ways (such as the southern unpaid concourse area) would change the existing pedestrian access within the station. However, the primary pedestrian desire line (through the northern unpaid concourse area) would remain open when the station is operational and would be signposted during construction. Further, appropriate signage and wayfinding material would be installed throughout the station for the duration of the construction period to ensure the public are aware of the changed pedestrian flows and conditions.

Conflicts with pedestrians and construction activities may also occur at the surface. However, a Construction Traffic and Pedestrian Management Plan would be implemented to manage traffic and pedestrian movements, should this occur. This would primarily be associated with potential heavy vehicle deliveries at Wynyard Park between 8pm and 10pm, and deliveries during evening periods at George Street, Wynyard Lane, York Lane and York Street. It would be necessary to install and dismantle pedestrian barriers and site fencing at the beginning and end of each shift in order to allow for longitudinal pedestrian access along the street footpaths during the day. Pedestrians would be diverted around the Wynyard Park construction site through Wynyard Park or via Margaret Street, Carrington Street and Wynyard Street. Appropriate signage would be erected during these periods. However, given the diversions would be occurring during evening and night time periods, this is not expected to cause significant disruption to pedestrians.

Coordination between other surrounding projects would also be required to ensure cumulative impacts on pedestrian movements are appropriately managed. This includes wayfinding strategies, coordination at direct construction interfaces and coordination with Sydney Buses in light of the anticipated changes to bus scheduling within the CBD.

7.2.3 Operational impacts

The proposal would improve the layout of the public domain (both concourse and platforms) by removing pedestrian pinch points and improving sightlines, wayfinding, pedestrian flow and LoS. The key layout improvements would include:

- An increase in the total public domain area, primarily through the removal of retail and commercial space in the eastern and western unpaid concourse areas.
- Widening of the western unpaid concourse at the approach to the Wynyard Walk tunnel and connection to the completed Wynyard Walk.
- Widening of the northern concourse area.
- An increased number of ticket gates and widened paid concourse.
- An additional staircase connecting the paid concourse to Platforms 3 and 4.
- Changed directional flow of the southern-most staircase to Platforms 5 and 6 and removal of the unused escalator enclosures to improve the use of space on those platforms.

These design improvements were modelled using the expected pedestrian movements presented in **Table 26** to determine the expected LoS. The outcomes of this modelling are provided in **Table 28**.

Table 28 Existing and modelled pedestrian movements at Wynyard Station during AM 20 min peak average

Concourse	Level of Service	No upgrade (2021 – existing with Wynyard Walk)	With upgrade (2021 - modelled)
Paid	C	19%	24%
	D or worse	54%	27%
Unpaid	C	26%	26%
	D or worse	10%	10%

These results show a general improvement in pedestrian flows in comparison to the existing situation for the paid concourse, primarily a substantial reduction in time spent under LoS D conditions in the paid concourse. The minor increases in LoS C within the paid concourse are considered acceptable given that this is the target LoS and the substantial improvement in customer time experiencing a LoS D or worse.

Improved pedestrian flows within the paid concourse would be the result of the widening of the paid concourse area as well as an increased number of ticket gates. These improvements would address the current concerns associated with passengers queuing along stairs and platforms.

However, even with the pedestrian flow improvements in the paid concourse, the LoS on all platforms would still be expected to deteriorate by 2021 given the strong growth in rail demand expected over this period. This would be a direct result of passenger demand increasing by over 70 per cent on Platforms 5 and 6 and 40 per cent on Platforms 3 and 4. As discussed in **Chapter 2**, these are whole of network capacity issues that are not able to be addressed through improvements to the existing Wynyard Station alone. There are longer term strategies to increase capacity and relieve congestion on the rail network in the Sydney CBD, including the completion of a new tunnel under the Harbour and a new Sydney CBD rail line (Transport for NSW, 2012).

7.2.4 Management and mitigation measures

During construction of the proposal, the mitigation measures would be implemented as detailed in **Table 29**.

Once operational, the proposal would generally improve pedestrian flows and the passenger experience at Wynyard Station. As a result, mitigation measures to manage operational impacts would not be required.

Table 29 Pedestrian mitigation and management measures (construction)

ID No.	Mitigation and management measures
P1	Pedestrian access would be maintained to Wynyard Station at all times when the station is open. Adjustments to regular pedestrian routes to and within the Station (e.g. movement of hoardings) would occur outside commuter peak periods.
P2	A pedestrian flow analysis would be completed prior to the commencement of construction based on the final staging strategy. This would assist in identifying minimum width passageways within the public domain based on peak and off-peak commuter movements and to confirm that adequate flows can occur following the closure of the southern concourse, prior to the widening of the northern concourse.
P3	A Construction Traffic and Pedestrian Management Plan (CTPMP) would be prepared and would be developed in consultation with the Roads and Maritime Services and City of Sydney prior to the commencement of construction. This would be supported by a pedestrian flow analysis and construction wayfinding strategy for the final staging strategy for the proposal: - The establishment and implementation of minimum width walkways within the public domain based on peak and off-peak commuter movements to enable safe passage of pedestrians, guided by the pedestrian flow analysis. - Early removal of redundant structures within the station to minimise unnecessary obstructions to pedestrian flows. - Installation of appropriate signage to support wayfinding and allow public

ID No.	Mitigation and management measures
	awareness of changed pedestrian flows and conditions. - Managing staging of works to accommodate high-demand special events (e.g. Vivid, New Years Eve) during which public transport is provided in addition to timetabled services and for extended hours. - Monitoring procedures to assess the effectiveness of management measures, and the implementation of corrective action(s) if required.
P4	Pedestrian access would be maintained to Wynyard Station at all times when the station is open. Where possible, construction work within the public domain would be undertaken outside of peak commuter periods to minimise congestion and maintain pedestrian safety. Adjustments to regular pedestrian routes to and within the Station (e.g. movement of hoardings) would occur outside commuter peak periods.
P5	As part of the Community Liaison Plan (refer to **Section 6.4.3**), procedures would be implemented to provide advance notice of upcoming works that would restrict or disrupt pedestrian movements, and these would be clearly signposted ahead of the construction activity.
P6	Temporary changes to bus infrastructure, as a result of this proposal, would also be communicated to bus commuters using methods such as signage, website updates, transport applications and real time text / SMS updates. The required communication protocols and methods would also be detailed within the CTPMP.

7.3 Traffic and access

This section provides a summary of the *Wynyard Station Upgrade – Pedestrians, Traffic and Transport* (AECOM, 2014c), found in **Appendix D**.

7.3.1 Existing environment

Wynyard Station has no direct interface with the surrounding surface road network, and is primarily accessed via pedestrian arcades and escalators. A goods lift, accessed off Wynyard Lane, is used by Sydney Trains to deliver materials required for station maintenance and associated back-of-house activities, and to remove waste. This lift is shared with the Menzies Hotel and Coles supermarket. The York Lane goods lift provides access to the basement levels of Transport House.

At the surface, Wynyard Station is surrounded by George Street, York Street, Clarence Street, Carrington Street, Wynyard Street, Erskine Street, and Margaret Street. Service lanes (Wynyard Lane and York Lane) provide rear access to buildings fronting these streets, including Transport House and Wynyard Station. **Figure 2** provides an overview of the road network immediately surrounding the proposal.

George Street, York Street, Clarence Street and Erskine Street are key roads that distribute traffic within and through the CBD. Margaret Street (between Clarence and George) provides a link between these major roads, whereas Carrington and Wynyard Streets provide access to surrounding buildings.

During the AM and PM peaks, the surrounding network carries high volumes of traffic and key intersections are located along York, Clarence and Kent Streets between Erskine and Margaret Streets. When assessed as part of the Wynyard Walk REF in 2011 these roads were found to operate with a LoS B to LoS F during the AM peak and PM peak (Parsons Brinkerhoff, 2012).

George Street is a major two-way arterial road and the primary north-south corridor through the CBD. It is also currently a key bus corridor CBD and has continuous bus lanes in both north and southbound directions. During the peak period, George Street carries around 1,950 vehicles and 360 buses per hour (Jacobs, 2014). This will change once construction of the CSELR commences.

York Street and Clarence Street are key north-south sub-arterial roads that provide connections to/from the Sydney Harbour Bridge. York Street is one way (southbound) and carries around 1,010 vehicles and 370 buses per hour during the peak period (Jacobs, 2014). Clarence Street is one way (northbound), and carries around 720 vehicles and 280 buses per hour during the peak period (Jacobs, 2014). Both York and Clarence Streets have continuous bus lanes.

Erskine and Margaret Streets provide access to the western areas of the CBD including Barangaroo and the King Street Wharf area. Both streets are sub-arterial two way roads, which provide access for vehicles travelling to/from Sussex Street, Kent Street, Clarence Street and York Street. Wynyard Lane, which runs parallel to George Street and Carrington Street, is a

rear service lane that connects Margaret Street and Wynyard Street. It is a one way street, and is narrow (around five to six metres in width).

York Lane is a rear service lane that connects Erskine Street and Clarence Street. It is a narrow (around six metres in width), one way road (southbound). A number of businesses (bars, food outlets) have frontages on York Lane, and as a result it carries more frequent pedestrian traffic than some lanes. The lane also provides access to car parks and loading docks for buildings that back onto York Lane. Access to York Lane has become restricted as a result of construction activities associated with the Wynyard Walk project.

All roads in the vicinity of Wynyard Station are controlled by City of Sydney Council, however RMS is responsible for the operation of all traffic signals in NSW including within the City of Sydney.

The Wynyard bus stops are centred along York Street and Carrington Street adjacent to Wynyard Park, and occupy the full length of kerb from Margaret Street to Wynyard Street (refer to **Figure 2**). During the evening peak buses also layover on the western side of York Street to the south of the Wynyard Station pedestrian entry / exit. Taxi ranks and loading zones occupy the eastern kerb of Carrington Street. The interchange handles significant volumes of buses and commuters during the AM and PM peak.

Dedicated cycle paths in the vicinity of Wynyard Station are located on Kent Street and King Street. However, York Street, Clarence Street and George Street are identified as cycle paths on City of Sydney's cycling map (City of Sydney, 2014).

The surface road network is used extensively by pedestrians. This is discussed separately in **Section 7.2**.

7.3.2 Future changes to the road network

The CSELR development includes a plan to close George Street to vehicles between Hunter and Bathurst Streets. A light rail stop would be provided, south of Hunter Street and generally opposite the George Street ramps.

As part of the Access Strategy (Transport for NSW, 2013), buses from George Street would be redirected to other CBD roads to facilitate the construction of the CSELR. This has resulted in proposed modifications to existing bus infrastructure in the vicinity of Wynyard Station, which would be completed in mid 2015. This includes:

- Installation or removal of bus stops and bus shelters north of Margaret Street and south of Wynyard Street.
- Provision of new bus layovers, including areas along York Street near Wynyard Park.
- Removal or relocation of parking, loading zones and/or taxi zones, including parking and an off-peak taxi zone on York Street opposite Wynyard Park.

Longer term, the area generally encompassing the bus interchange, rail station and light rail

station at Wynyard would be further developed as a strategic interchange precinct under the Access Strategy. This may result in further changes at the surface to provide ease of access for commuters using public transport services.

7.3.3 Construction impacts

As described in **Section 5.5.6**, construction activities would need to be undertaken outside standard construction hours. This includes the delivery of materials and plant, and the removal of waste from the construction site, which is driven by the restrictions to construction access points.

The origin and destination of heavy vehicle movements is presently unknown. However, regional access / egress to the construction site would be available via the Sydney Harbour Bridge, the Eastern Distributor and Western Distributor. This would require the use of streets including (but not limited to) York Street, Wynyard Street, Margaret Street, Erskine Street,Kent Street and Hunter Street. This may alter once CSELR construction commences. Indicative heavy vehicle construction routes are provided in **Figure 12**, which would be confirmed during detailed design by the contractor.

The total maximum number of construction vehicles movements that would occur during construction would be around 30 heavy vehicles trips (or 60 heavy vehicle movements) during peak construction periods. This would reduce to around 15 heavy vehicle trips (or 30 movements) during average construction periods. The maximum and average daily movements are provided in **Section 5.5.8**. Heavy vehicle movements would not occur between 7am and 9am and would be spread across the rest of the 24 hour period given the access constraints to construction areas and the need to minimise potential impacts on the surrounding road network. As such, the maximum number of heavy vehicles trips within any one hour would be around three heavy vehicles while the Wynyard Park compound is not operational.

As the road network immediately surrounding the proposal site is already heavily used (particularly by buses) and congested during peak periods, construction traffic would be scheduled, where feasible and reasonable, to occur outside AM and PM peak periods. This would be critical in minimising disruption to other transport services.

If the Wynyard Park compound is required, the overall maximum and average movements per day would not increase as these would be redistributed from other access points. At this stage, the maximum trip generation per hour would increase from three to nine heavy vehicles per hour. However, these movements would occur between 8pm and 10pm, Sunday to Thursday.

The location and operating hours for the construction access points has been proposed to avoid and/or minimise the potential for adverse impacts on the surrounding road network (and road based public transport, particularly buses). The expected maximum daily and hourly heavy vehicle trips are relatively low in comparison to traffic volumes on the surrounding network (for example, York Street carries around 1,010 vehicles and 370 buses per hour (Jacobs, 2014) during the peak period). The proposed use of a staging compound (subject to any necessary

separate approvals process) would also assist in scheduling deliveries and prevention of heavy vehicles queuing along the immediate road network. As such, the proposal (in isolation) is not expected to result in significant road network impacts.

Cumulative impacts may arise given the proximity to other major projects and the impacts to site access. This is discussed further in **Section 7.11**.

7.3.3.1 Deliveries

Access points for construction are identified in **Section 5.5.2**.

Road space that would be temporarily occupied by heavy vehicles loading/unloading would need to be negotiated with City of Sydney (as roads authority) and Sydney Harbour Foreshore Authority, and coordinated with Sydney Buses. Traffic control measures would also need to be implemented during loading/unloading activities, and signage erected to notify motorists. After commencement of construction of the CSELR and the proposed One Carrington Street development, access from George Street would have to be negotiated with each construction contractor.

At Wynyard Lane, the size of construction vehicles accessing Wynyard Lane and the Wynyard Lane Car Park would be restricted, given the size of the laneway and the former tram tunnels. Conflicts with other service vehicles and private vehicles using the laneway (and car park) could occur while deliveries are in progress, and this would need to be managed under traffic control to ensure adequate access is maintained. However, once One Carrington Street development construction commences, Wynyard Lane would be partially closed and alternative arrangements would be made to access and egress the car park via Cumberland Street (refer to **Section 7.11)**. A works zone on Carrington Street would require the temporary occupation of up to four on-street parking spaces.

York Lane would also be used for the delivery of the materials and equipment required for the upgrade of the York Lane goods lift in addition to occasional deliveries. York Lane is partially closed as a result of Wynyard Walk construction, and as such, heavy vehicles delivering equipment and materials for the proposal would need to reverse down York Lane from Erskine Street. In a worst case scenario, the sweep path of the vehicle would block oncoming traffic on Erskine Street as vehicles up to six tonnes reverse into York Lane.

These movements would occur under traffic control during which time Erskine Street and York Lane would be temporarily closed. The closure and reopening of Erskine Street would likely take up to 10 minutes. York Lane would be closed while the vehicle remains within the laneway, which would be around 30 to 40 minutes in duration. Given the function and use of Erskine Street in the CBD road network and the limited lane capacity (for vehicle storage) between York Street and Clarence Street, the delivery of material to York Lane would need to be limited to the evening period or during the daytime on weekends. The final arrangements and required traffic control measures would be subject to negotiation with City of Sydney.

For the Wynyard Park compound, it would be necessary to use part of York Street to provide two heavy vehicle spaces for deliveries. Preference would be given to the use of bus laydown areas to avoid disruption to bus stops, however, this would be confirmed during detailed design and in negotiation with City of Sydney and Sydney Buses. The occupation of the road space is planned to only be used during the evening when there is reduced bus demand (between 8pm and 10pm, Sunday to Thursday). If bus stops are impacted, this would require bus stop relocation during the evenings. The location of the heavy vehicle spaces for deliveries and for the alternative temporary bus stops would be subject to further investigation by Transport for NSW. In order to ensure that bus passengers are fully informed of these changes, notification arrangements would be developed in collaboration with the Transport Management Centre and bus operators including advance notification via signage, web updates and other communication channels.

During periods where buses replace train services (such as during significant service breakdowns or rail possessions), the temporary heavy vehicle parking spaces may not be available due to increased bus demand. Construction scheduling would need to be coordinated with scheduled rail possessions (which are likely to be a time of high construction activity for this proposal) and procedures prepared to respond to incidents or emergencies that require increased bus services (such as a rail network breakdown).

With the proposed changes to the CBD bus network during construction of the CSELR, it would be necessary to undertake detailed analysis of the evening / night time bus stop arrangements to ensure that bus services can continue. Given that bus scheduling for these services is under development, analysis cannot be progressed further at this point in time. As details of these changes are made available, construction traffic and pedestrian management plans would be updated and additional mitigation measures implemented (if required).

7.3.4 Events

The CBD hosts several major events, which affect visitor numbers in the area, and involve special event changes to the road network as well as increased demand on the public transport network. Events include Anzac Day services, Vivid Festival, New Years Eve, annual running events and Australia Day. Where construction activities overlap with these events, works affecting station access or bus infrastructure would be minimised.

7.3.5 Operational impacts

Once operational, the proposal would not impact on the road network performance as the proposal would not alter surface roads or change public transport operations in the area. Impacts to pedestrian movements would occur as a direct result of the proposal as discussed in **Section 7.2.3**.

7.3.6 Management and mitigation measures

Table 30 outlines the mitigation and management measures that would be implemented to response to potential impacts on the surrounding road network. These measures are to be read in conjunction with **Table 29**.

Table 30 Traffic and access mitigation and management measures (construction)

ID No.	Mitigation and management measures
T1	A Construction Traffic and Pedestrian Management Plan (CTPMP) would be prepared identifying the mitigation and management measures to manage potential traffic and transport impacts. This would be integrated within the broader construction staging strategy. The CTPMP would be developed in consultation with Roads and Maritime Services and City of Sydney. The CTPMP measures would include: - Signage (for example, deploying temporary speed restrictions, changes to the road environment, traffic management controls). - Traffic control plans for access points and Wynyard Park compound, if used. - Scheduling heavy vehicle movements outside the morning and evening peak periods, where feasible and reasonable. - Temporary bus infrastructure changes in the vicinity of Wynyard Park to accommodate access to the construction compound. Any such changes would be coordinated with Sydney Buses, and would account for rail possessions. - Driver protocols and communication methods to avoid queuing of heavy vehicles on the road network. - Managing staging of works to accommodate high-demand special events (e.g. Vivid, New Years Eve) during which public transport is provided in addition to timetabled services and for extended hours. - Monitoring procedures to assess the effectiveness of management measures, and the implementation of corrective action(s) if required. - Contingency measures that would be implemented to manage construction site access in the event that an emergency requires bus services to replace train services at Wynyard Station.
T2	Where feasible, construction vehicle movements would be scheduled outside the weekday peak (7am – 9am, 4pm – 6pm) to minimise disruption to surrounding road network.

ID No.	Mitigation and management measures
T3	Necessary approvals to temporarily occupy Wynyard Lane, York Street, Margaret Street, York Street, York Lane and Cumberland Street (such as Road Occupancy Licences) would be obtained from the relevant authority (City of Sydney and Sydney Harbour Foreshore Authority) prior to works that would require the possession of a road. These would be supported by traffic control plans.
T4	Transport for NSW and the contractor would coordinate with Sydney Buses, any other relevant bus operators and the Traffic Management Centre on required changes to bus infrastructure around Wynyard Park resulting from the Sydney City Centre Bus Infrastructure modifications proposal and Access Strategy. If the establishment of the Wynyard Park compound is required, the same parties would be consulted. This would be considered within the CTPMP.
T5	Consultation with key authorities, including Roads and Maritime Services and City of Sydney, in addition to contractors responsible for the delivery of the CSELR and the proposed One Carrington Street, would be undertaken to manage potential cumulative traffic and transport impacts in the vicinity of Wynyard Station. If necessary, forums, such as a CBD Transport Taskforce, would also be utilised.
T6	The traffic management plan will be developed in consultation with Brookfield and Coles supermarket for the use of Wynyard Lane Car Park, Wynyard Lane goods lift and Cumberland Street.
T7	Opportunities to enable deliveries to occur via the George Street ramps would be explored with the CSELR contractor.
T8	As part of the Community Liaison Plan (refer to **Section 6.4.3**), procedures would be implemented to provide advance notice of upcoming works that would restrict or disrupt the road network, and these would be clearly signposted ahead of the construction activity.

7.4 Heritage

This section provides a summary of the *Wynyard Station Upgrade – Statement of Heritage Impact* (FuturePast Consulting Pty Ltd, 2014), found in **Appendix E**.

7.4.1 Existing environment

As outlined in **Section 4.4.1**, there are four listed heritage items located within the proposal site:

- Transport House, a listed State Heritage item and local heritage item under the Sydney LEP 2012. This item is listed as the former Railway House, but is referred to as Transport House for the purposes of this report.
- Wynyard Station, listed on the former RailCorp section 170 Heritage and Conservation Register.
- Wynyard Park, a listed local heritage item under the Sydney LEP 2012.
- The Former Wynyard Tram Tunnels listed on the former RailCorp section 170 Heritage and Conservation Register.

The curtilage of the Former Wynyard Tram Tunnels, as shown on plans prepared by the former Railcorp, extends from the north to just north of the Wynyard Park Dome. However, the curtilage prepared by former Railcorp states that there is no warranty that the plan is free from error or omission. As such, for the purposes of this assessment, the curtilage of the Former Wynyard Tram Tunnels is considered to extend south of the Wynyard Park dome.

Overview

Construction of Wynyard Station and the associated railway lines commenced in 1917 in response to an increasing number of commuters and public pressure to provide an efficient connection between the harbour and Central Station. Construction was delayed by the onset of World War I, and as a consequence was opened in stages, with the Central to Wynyard section opening in 1932, and the city loop through to Circular Quay, St James and Museum opening in 1956.

Wynyard Station

Wynyard Station originally comprised six platforms, four train platforms which serviced the North Shore line and City Loop line, and two tram platforms which serviced the North Shore tram service, running across the Sydney Harbour Bridge. The four train platforms, Platforms 3 through 6, are still operational today. Platforms 1 and 2 ceased to be operational in 1958 as trams were discontinued across the city network. Once the tram station was decommissioned, the Platform 1 and 2 tunnels were converted into an underground car park for the railway station.

When it was constructed, Wynyard Station was decorated in such a way that was consistent with the overall design principal of the Sydney underground network, however also had unique decorative tiling which distinguished it from other stations. The majority of this tiling was removed during works to upgrade the station in the 1970's and 1980's, but a small number of these tiles remain in two fire escape stairways located near the escalators leading from the western concourse to York Street.

Between the 1950's and 1990's Wynyard Station went through a number of upgrades to facilitate movement into and around the station as patronage increased. These upgrades included installation of additional escalators and an extension of the existing goods lift to provide access to the new hotel and retail above the station (now the Menzies Hotel), reconfiguration of concourse areas, new pedestrian subways and movement of the ticket barriers. Since the 1990's there have only been minimal changes made to the station area, although the retail areas have evolved continuously.

The underground pedestrian network that was developed as part of Wynyard Station was a popular construction concept at the time, in essence creating a 'multilevel, underground city'.

It is important to note that when it was originally developed, Wynyard Station was not designed purely as a utilitarian commuter station, but as a place where people could wait in comfort for their trains, with a milk bar, buffet and grill room (known as the Railway Refreshment Rooms). These areas were significant for their art deco detailing, marble walls and mirrors. The milk bar, buffet and grill room were replaced by retail spaces in past station upgrades.

Site inspections of the station found little of any original fabric remaining. Images of the original and current station are provided in **Figure 16** to **Figure 21**, which illustrate the changes that have occurred over time.

On the station platforms, original fabric is in the form of riveted steel I-beam girders, stair balustrades and a small number of original timber doors. However, no other original fabric or finishes were found during site inspections on the platforms, and remaining fabric has been painted over in non-original colours.

Within the paid concourse area, there is little of the original fabric remaining, other than the original structure or concourse footprint, stairs and stair balustrades. The treatment of walls, ceilings and walls are not original fabric. However, there is the potential for remnant finishes to exist within concealed areas or behind more recent fabric. A clock remains, but it does not appear to be consistent with a 1930's design.

In the unpaid concourse areas, treatment of walls and ceilings are not original. Remnant ceiling finishes are visible in some of the retail spaces along the northern side of the eastern unpaid concourse (associated with the former Grill Room of the Railway Refreshment Rooms). However, these are fragmented and appear to be the only original remaining fabric of the Railway Refreshment Rooms. There is potential for remnant finishes to exist within concealed areas or behind more recent fabric.

Source: FuturePast / State Records of NSW: Photo Investigator, ID #12685_a007_a00704_8735000035r).

Figure 16 Wynyard Station paid concourse in 1932

Figure 17 Eastern unpaid concourse, present day

Source: State Records of NSW (accessed 2/9/2013, http://www.environment.nsw.gov.au/heritageapp/HeritageItemImage.aspx?ID=4803268#ad-image-6)

Figure 18 Platforms 3 and 4, immediately prior to opening in 1932

Source: State Heritage Register database, accessed 2/9/2014 (http://www.environment.nsw.gov.au/heritageapp/HeritageItemImage.aspx?ID=4803268#ad-image-0)

Figure 19 Platforms 3 and 4, present day

Source: FuturePast Consulting Image source: Art In Australia, August 15th 1936

Figure 20 The Railway Refreshment Rooms, in 1936

Source: FuturePast Consulting

Figure 21 The original moulded ceiling in retail spaces in the northern unpaid concourse, present day.

Transport House

Transport House was constructed in the early 1930's, and opened in 1935 above the recently completed Wynyard Station. It was designed as the administrative home of the New South Wales Government Railways to house all departments that were previously situated at Central. It was designed by a prominent Sydney architectural firm from the time, H E Budden and Mackey, and won the Sulman award for the design in 1936.

When it was built, Transport House was considered to be one of the most modern buildings in Sydney, with cutting edge design features. Much of the interior art was in art deco style and above ground level the building was clad in green terracotta tiles.

During the past 70 years of operation, the formal aesthetic qualities of Transport House have been impacted upon as a result of:

- addition and integration of a new building to the northern end of Transport House in 1973
- internal alterations and additions, including the installation of new fire stairs and lifts
- loss of the original Art Deco 1935 lift lobby, lift, furniture and fit-out components.

York Street Foyer

The main entrance from York Street into Transport House led to the York Street Foyer (shown in **Figure 22**). Six high-speed elevators were installed in the foyer, and it was decorated in an Art Deco design with marble walls and sand blasted glass lighting.

The York Street entrance and street doors, the original foyer and lift lobby interiors were all removed during renovation works in 1973. During the 1980's and 1990's further refurbishments and adjustments to the original design have also taken place. At present, the public access, escalators to Wynyard Railway Station concourse and the arcade to York Lane are the only features from the original York Street Foyer design which remain intact. The arcade to York Lane is currently closed due to construction works being undertaken for the Wynyard Walk project.

Original green and black tiles, and the original floor treatment, remains along the western corridor of the York Street lobby (which is not publically accessible) (refer to **Figure 23**). Some tiles have been damaged,

Figure 22 York Street foyer

Figure 23 Transport House, western corridor, York Street lobby

Escalators

The original York Street escalators are bank of three escalators (with provision for a fourth). The escalators connect the York Street foyer to the ground floor of Transport House to Wynyard Station below (refer to **Figure 24**). The escalators are original to the 1932 design, and are encased in timber veneer panelling and have timber treads (refer to **Figure 25**). Wall and floor finishes on the escalators have been replaced during the course of the past 80 years, however it is possible that original finishes may have survived concealed in some areas. Tiling adjacent to the escalators is not original.

Basements

There are four basement levels in Transport House, as shown in **Figure 8**. These basements have been operational since 1932, and have various functions, such as storage areas and back of house, office spaces, access for service areas, and the western unpaid concourse (discussed in more detail below).

A number of the office spaces retain their original timber doors and architraves, and glass window stencilling which are of great significance to the history of Transport House and its use. Other items of heritage significance include an original fire door on basement Level 2, and some remnant tiling on all basement levels (including a bathroom/kitchenette on basement Level 1), the eastern fire staircase and the western fire staircase. Aside from these items and the original office spaces, there is minimal original fabric left in these basement areas.

Photos from the site inspection are provided in **Figure 26** to Figure **30**.

Source: State Records of NSW (accessed 2/9/2013,

http://www.environment.nsw.gov.au/heritageapp/HeritageItemImage.aspx?ID=4803268#ad-image-5)

Figure 24 York Street escalators, viewed from the western unpaid concourse

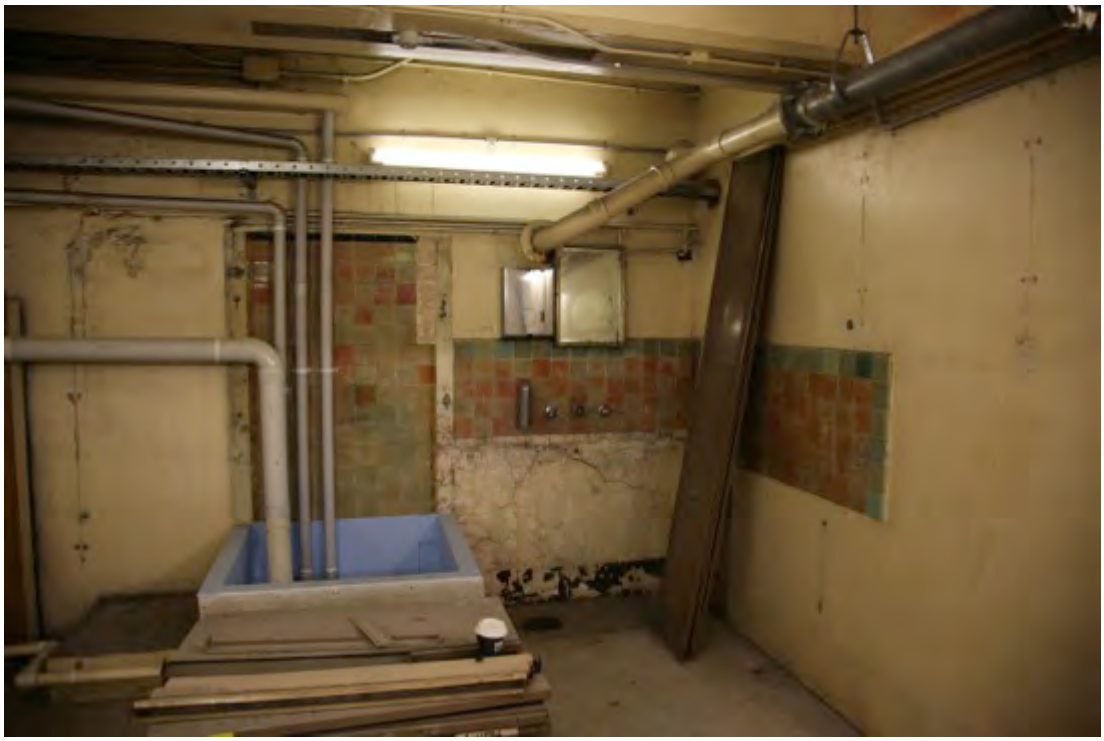
Figure 25 York Street escalators, viewed from the western unpaid concourse

Source: FuturePast Consulting

Figure 26 Transport House, basement Level 1

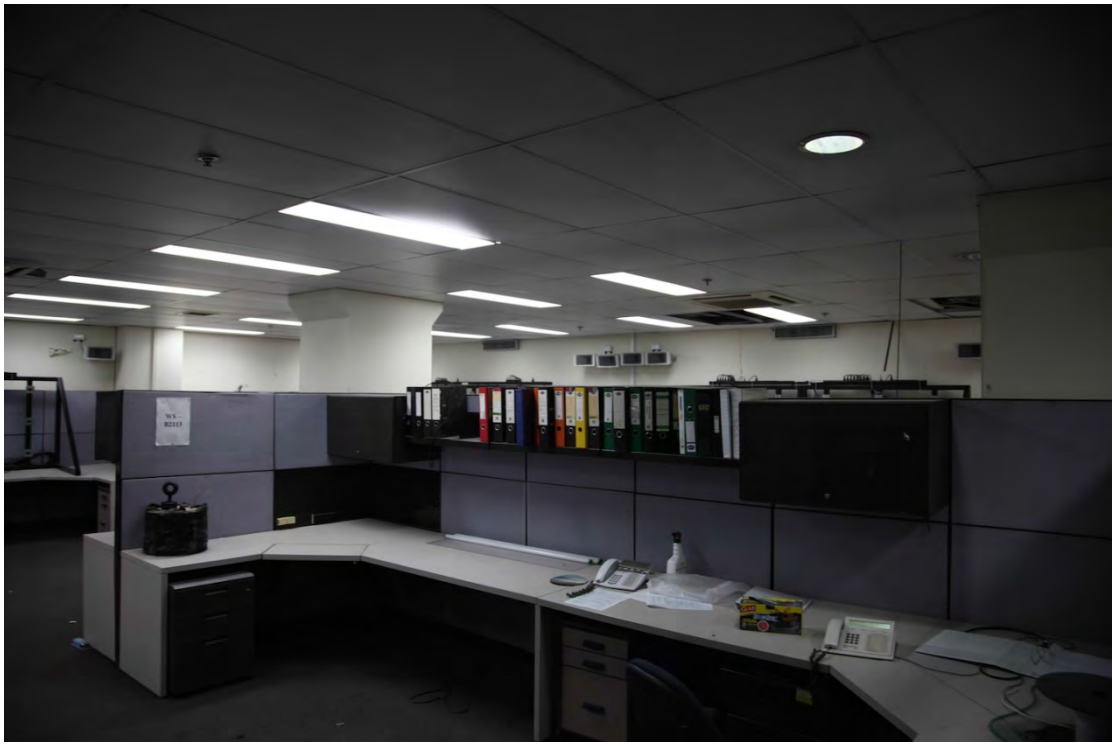
Source: FuturePast Consulting

Figure 27 Transport House, basement Level 1



Source: Futurepast Consulting

Figure 28 Transport House, bathroom/kitchenette area on basement Level 1



Source: FuturePast Consulting

Figure 29 Transport House, basement Level 2

Source: AECOM

Figure 30 Transport House, basement Level 3

Western Concourse

The western unpaid concourse (as shown in **Figure 7)** is the basement Level 4 of Transport House. The current footprint of the western unpaid concourse has been retained since the 1930's. At present the western unpaid concourse consists of the Concourse Bar, the York Street escalators, small irregular shaped retail outlets and various back of house areas.

In the north-eastern corner of the western unpaid concourse there is a section of wall that has been covered by a plasterboard temporary wall. Hidden behind this wall is some tiling and a column with decorative profiled capital that have been retained from the original design of Transport House. This is the only known section of capitol of this kind in the station (however comparable sections may have been similarly covered). Part of this area (including the capitol) is within the construction footprint of Wynyard Walk, and would be directly impacted by that project.

A retail and commercial area which currently houses Concourse Bar was constructed subsequent to the original building and lies outside of the curtilage of the heritage item.

Fire Escape Stairways

Adjacent to the escalators and to the immediate south, two fire escape stairways retain elements of the station's original tiled colour scheme of cream tiles with decorative blue banding.

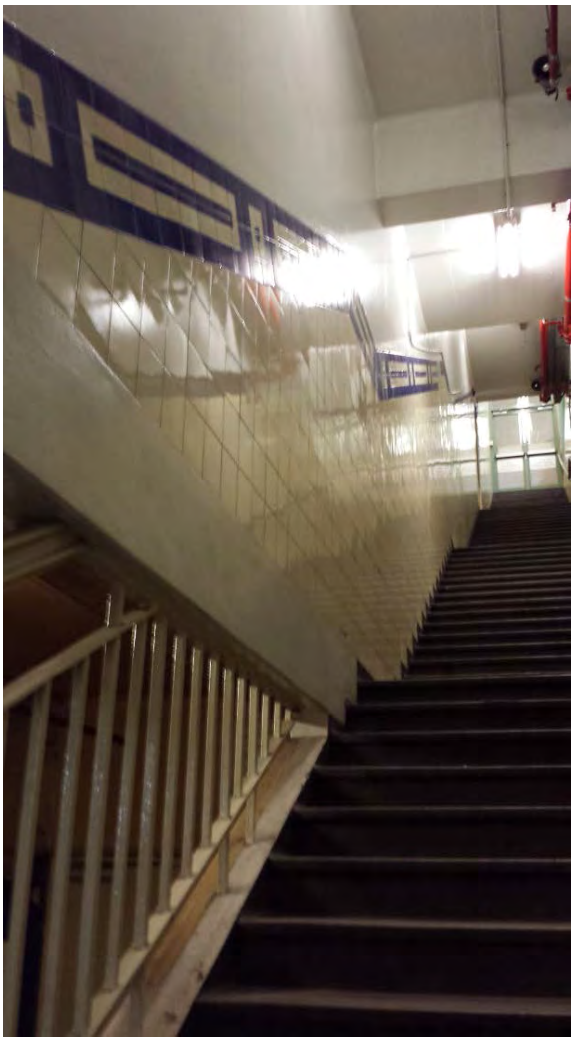


Figure 31 Transport House, western fire stair, basement Level 3 to York Street foyer

Wynyard Park

Wynyard Park is of historic, cultural and aesthetic significance, listed on the Sydney LEP 2012. The park has a history of use as open space with its first recorded use as a military parade ground in 1792. In 1887 it was dedicated as an open space for public recreation, a function it has maintained to the present day.

Between 1917 and the early 1930's, the construction of Wynyard Station saw much of Wynyard Park taken out of operation and excavated. During this time, the park was not publicly accessible due to the high level of construction related disturbance, and was reinstated over the station subsequent to it's opening in 1932. The park has subsequently been disturbed by the extension of the City Circle line in the 1950's.

7.4.2 **Construction impacts**

Wynyard Station

As described in **Section 7.4.1**, Wynyard Station has undergone modifications since its original construction in the 1930's but retains some original fabric. There is also the potential for original fabric to be hidden behind more modern fabric or in concealed areas.

The potential impacts are summarised in **Table 31**. There would be a permanent loss of some original fabric, and the reconfiguration of the station would alter the original layout of the item. However, given the changes that have occurred as a result of previous upgrades in the 1970s and 1990s (which saw a substantial reconfiguration of the space and the loss of most of the original fabric) and the extent of impacts associated with this proposal, the impacts to the heritage values of the item is not considered to be significant.

In the unpaid concourse areas, the proposal would replace fabric which is of low significance or recent fabric that is worn and of low quality. The modern interpretation of the unpaid concourse area together with the reinstatement of the historic ceiling and lighting within the paid concourse would provide a contrast between the historic and modern fabric. The transition zone between the western unpaid concourse (located in Transport House) to the modern design of the unpaid concourse elsewhere would provide a suitable expression of the historic character if the station. In fact, the reinstatement of the historic ceiling and lighting configuration is a positive heritage impact. Other remaining heritage features, including areas on station platforms and the platform staircases would be retained. These features are considered to be of greater historic significance than other areas of the station, given the extent of changes to the station over time.

Any loss in heritage values is considered to be acceptable given the benefits to pedestrian flows, customer safety and comfort, and to the general aesthetic context of the station. As some original fabric would be impacted, such as the ceiling treatments within the Grill Room of the former Railway Refreshment Rooms, mitigation measures and heritage archival recordings requirements have been recommended. This is discussed further in **Section 7.4.3**.

Based on recent experience at other station upgrades, there remains the potential for unexpected finds during construction activity, which may reveal original fabric behind more recent finishes. Stop work procedures would need to be implemented, should this occur.

Table 31 Potential impacts on Wynyard Station heritage item

Location	Works	Impact	Significance
Station facilities, station platforms and unpaid concourse	Reconfiguration of concourse and back-of-house areas, including: • the removal or reduction in areas used for back-of-house on concourses and platforms • widening of the northern concourse • incorporation of the southern concourse • relocation of the Station Manager's office.	These works would result in the partial removal of original fabric, however, the fabric is functional in nature and no longer retains its original finishes or aesthetic values. Providing increased concourse and platform spaces for customers is essential for performance, safety and amenity reasons. Impacts associated with the reconfigured paid concourse have been assessed separately below.	The removal of non-contributory original fabric and the change in station configuration would impact the heritage value of the station. However, this impact is considered to be unavoidable and acceptable given the benefits would outweigh any loss in heritage value. Mitigation measures have been recommended.
Unpaid concourse	Re-configuration of the northern area of station facilities and the reconfiguration of fire stairs.	This area would be re-configured to provide a more even setback to improve pedestrian flows. The ceiling treatment within the retail areas located in this area is original fabric from the 1930's and is associated with the Grill Room original Railway Refreshment Rooms, as described in **Section 7.4.1**. The footprint and configuration of this space has been previously impacted by past upgrades, and the remaining space is only a fragment of the original extent of the Grill Room original Railway Refreshment Rooms. The proposal would further reduce the remaining space. There is also potential for original wall finishes to remain intact behind the current fabric.	The loss of the remaining portions of the ceiling treatment would have a minimal impact on the overall significance of the item, given the previous changes to the space formally used by the Railway Refreshment Rooms. Further, the retention of any remaining portions of the ceiling would allow interpretation of the stylistic intention of the ceiling. The loss would require mitigation. Mitigation and management measures would be required to respond to any unexpected finds.

Location	Works	Impact	Significance
Unpaid concourse	Re-tiling and paint finishes, architectural finishes, lighting treatments and ceiling treatments within the public domain. The removal of redundant features, the de-cluttering of the station platforms and the concealment of services.	A modern ceiling would be established below the original ceiling grid to enable the concealment of services. New finishes and lighting would be used. The proposed materials and colour scheme have been selected for durability and to provide a modern aesthetic. Fabric within these spaces relates to more recent additions and upgrades in the unpaid concourse. A cleaner and more streamlined appearance of the public domain would be in keeping with the original aesthetic qualities of the station. There is potential that original fabric may be present behind more modern finishes or within concealed areas.	The proposal involves the reconfiguration of the unpaid concourse (and paid concourse), which has been reconfigured by previous upgrades to the station. The proposed modern interpretation of the unpaid concourse would provide a contrast between the historic fabric (displayed within the paid concourse and the western unpaid concourse). Overall, there is not substantive adverse heritage impact. Mitigation and management measures would be required to respond to any unexpected finds.

Location	Works	Impact	Significance
Paid concourse	Widening of the paid concourse, and reduction in the unpaid concourse Installation of glazed glass screens and other barriers between the paid and unpaid concourse. A curved ticketgate line design. Exposure of the original structural grid of the ceiling, with lantern (box) lighting. The removal of redundant features, the de-cluttering of the public domain and the concealment of services. Re-tiling and paint finishes, architectural finishes and ceiling treatments.	The proposed design and widening of the paid concourses represents a departure from the current rectilinear design and the original configuration, which was itself largely driven by the nature of the structural grid itself. This structural grid would be retained and the original ceiling form of the concourse would be revealed within the new paid concourse area. Exposure of the original structural grid and lighting would re-establish the original design aesthetic and lighting design. Columns would be tiled in a modern tile, with a light blue colour reflective of the original colour design for Wynyard Station. It is anticipated that modern terrazzo tile with a blue fleck (or similar) would continue this decorative motif. A cleaner and more streamlined appearance of the public domain would be in keeping with the original aesthetic qualities of the station.	The changes to the paid concourse footprint would result in a potential loss of association with the historic configuration of the station. However, the de-cluttering of the paid concourse, and design treatment of the paid concourse would reinstate much of the original design intent for the paid concourse. This impact is considered to not result in a substantive adverse heritage impact. The loss would require mitigation.

Location	Works	Impact	Significance
Platforms and paid concourse	The partial demolition and reorientation of one staircase to Platforms 5 and 6. The removal of an unused escalator enclosure on Platforms 5 and 6	The partial demolition of the stair and the removal of the unused escalator enclosure would result in the removal of original non-contributory fabric. Most of the materials at this staircase are associated with more recent upgrades. The balustrades at this location are not original. The change in the staircase configuration would result in a minor change to the original station layout. The fabric associated with the unused escalator enclosure is functional in nature and no longer retains its original finishes or aesthetic values. Providing increased concourse and platform spaces for customers is essential for performance, safety and amenity reasons.	The removal of original fabric would impact the heritage value of the station. However, this fabric does not significantly contribute to the overall significance of the station This impact is considered to be unavoidable and acceptable given the benefits would outweigh any loss in heritage value.
Platforms and paid concourse	Construction of a new stair to Platforms 3 and 4.	New stairs would be constructed where back-of-house uses are currently located. These spaces do not retain any original finishes or aesthetic qualities. It would also alter the original layout of the station.	The removal of original fabric would impact the heritage value of the station. However, this fabric does not significantly contribute to the overall significance of the station This impact is considered to be unavoidable and acceptable given the benefits would outweigh any loss in heritage value.

Location	Works	Impact	Significance
Platforms	Re-tiling and paint finishes, architectural finishes and lighting treatments. The removal of redundant features, the de-cluttering of the public domain and the concealment of services. New station furniture.	A cleaner and more streamlined appearance of the public domain would be in keeping with the original aesthetic qualities of the station. No original light fittings remain on the platforms, and are not proposed to be reinstated. There is potential that original fabric may be present behind more modern finishes or within concealed areas.	The removal of redundant features, the de-cluttering of the public domain and the concealment of services would have a positive impact on the item where such elements detract from the visual aesthetic of the station. There would be no substantive adverse impacts resulting from this work.
Platforms	Changes to original balustrading at platforms stairs to Platforms 3 and 4	The balustrades would be retained at all staircases; however, additional railings would be required to meet the requirements of the Building Code of Australia. It is probable that the paint on the balustrades is not original and has been repainted on a number of occasions. It is unlikely that any original colours exist under recent coats. The timber railings have also been previously painted over in some instances. This has resulted in a negative impact to the original heritage fabric.	The treatment of the balustrades would be confirmed during detailed design. Changes to the balustrades could have an adverse impact on the original fabric (including painting of the timber railings) and would require mitigation.
Platforms	Treatment of the original steel girders (painting)	The original steel girders would be left exposed and painted.	The original fabric would be retained in situ.

Location	Works	Impact	Significance
Platforms	Upgrade to platform doors	A small number of original doors remain on the station platforms, which would be replaced to meet current fire safety requirements.	The removal of the remaining original doors would have an impact on the heritage value of the station. However this impact is considered to be acceptable as the loss is unavoidable. Mitigation measures are recommended to minimise the loss of this fabric on the heritage values of the item.
Paid concourse/ platforms	Construction of a temporary construction hoist from the concourse to platforms, and removal following the completion of construction.	The partial demolition of the floors/ceiling of the concourse and platforms would result in the removal of original non-contributory fabric. The proposed temporary construction hoist would result in a minor temporary change to the original station layout, which would be removed following the completion of construction.	The changes to the station configuration would be temporary and are required to provide sufficient access during construction. Any impact is considered acceptable as it would be temporary and within an area that would be impacted by the proposal. Mitigation and management measures would be required to respond to any unexpected finds.

Transport House

The basement levels of Transport House and the York Street foyer have been heavily modified by previous works and contain late 20th century finishes in generally poor condition. Further changes have resulted due to the construction of Wynyard Walk, which have been approved under Section 60 of the Heritage Act. Similar to the Wynyard Station heritage item, there remains the potential for original significant fabric to be revealed once the more modern finishes are removed, particularly in York Street foyer and the western unpaid concourse.

The majority of the proposed works within Transport House would largely affect modified areas and finishes, and utilitarian spaces which do not contribute to the overall significance of the item (refer to **Table 32**). As such, the proposal would not have significant impacts to the heritage item. The design of the York Street foyer and the western unpaid concourse would have a positive impact through the reinstatement of original design features, or through design features that reflect the original art deco design of Transport House.

The York Street foyer has also already undergone modification by previous upgrades and does not reflect the overall art deco design of Transport House. The design objectives for the foyer is to re-instate (if any fabric remains) or to incorporate design features that better reflect the original period of the building. This includes the exposure of the ceiling beams, new box lights and use of certain materials and finishes. This would have a positive impact on Transport House. Coordination would be required with Wynyard Walk to effectively integrate the spaces. This would occur during detailed design.

Table 32 Potential impacts on Transport House heritage values

Location	Works	Impact	Significance
Basement level 4 (Western concourse) York Street escalators	Widening of the western concourse. Re-tiling and paint finishes, architectural finishes, lighting treatments and ceiling treatments within the public domain. The removal of redundant features, the de-cluttering of the public domain and the concealment of services.	The widening of the western concourse is required to accommodate the new position of the gateline for the paid concourse, and to provide for future pedestrian flows. Works on the York Street escalators are discussed later in this table. The current modern ceiling at the concourse level would be removed to expose an area of the original cross beam ceiling.	The original fabric does not contribute to the overall significance of the building. Any loss is considered to be acceptable given the benefits to the functioning of the station. Exposure of the ceiling would have a minor positive impact on Transport House. Mitigation and management measures would be required. This includes an unexpected finds procedure.
Basement level 4 (Western concourse)	Partial demolition of the eastern fire stair.	The fire stair is original to Transport House and retains a small amount of decorative tiling on the walls of the stairwell. The demolition of the stair is required to provide improved circulation in the western unpaid concourse, while accommodating the widening of the paid concourse. The widening of the paid and unpaid concourse is required to ensure adequate flow of customers, particularly following the opening of Wynyard Walk.	The tiling is not remarkable and is non-contributory to the overall significance of the building. Any loss is considered to be acceptable given the benefits to the functioning of the station. Mitigation and management measures would be required.

Location	Works	Impact	Significance
York Street foyer	Refurbishment of the York Street foyer, including re-tiling, painting, architectural finishes, lighting and wayfinding signage.	As a result of previous upgrades, the appearance of the York Street foyer is not consistent with the art deco style of Transport House. The current modern features do not contribute to the overall heritage value of the item. The existing drop ceiling would be removed to expose the original cross beam ceiling design, and would be highlighted with new art deco style ceiling box lights. The design of the foyer would reflect the art-deco stylistic and architectural detailing that remains prevalent elsewhere within Transport House. There is potential for art deco features to remain under the more recent fixtures and fittings. A back-of-house area on this level would also be refurbished, however, the original tiles and flooring would be protected and retained as part of the final finishes.	The removal of non-significant modern fabric, and the design approach to York Street foyer would have a positive impact on Transport House. Any incorporation of original fabric, if found and if feasible, would be beneficial.
Basement levels 3 and 4	Reconfiguration of the original stair at the south-west corner of the western unpaid concourse (basement level 4) to meet the requirements of the Building Code of Australia.	The current stair is original but is non-compliant with current requirements of the Building Code of Australia. The original balustrade would be salvaged and re-used in the new stair.	While original, the fabric does not contribute to the overall significance of the item.

Location	Works	Impact	Significance
Basement levels 1 to 3	Reconstruction of a new set of stairs to the west of the York Street escalators, which would require the demolition of the existing staircase.	The new stair is required to provide access to new back-of-house areas within the basement levels of Transport House to the unpaid concourse. The stair would have a dual function for fire evacuation in addition to providing functional requirements for staff to have immediate access to the concourse level of the station. The reconstruction of the stairs would require the demolition of the existing stair case, removal of original fabric (such as tiles) and some areas of existing wall partitions.	While the new staircases would impact on original fabric, the fabric that would be impacted does not contribute to the overall significance of the item. Further, the practical benefits would outweigh the impacts to this fabric. The impacts are considered to be acceptable. Mitigation and management measures would be required.
Basement Level 1 - 4	Basement levels 1 to 4 would be reconfigured and fit out to accommodate permanent staff facilities.	This proposed work involves the reconfiguration of back of house spaces through the demolition of existing walls or the enclosure of existing doorways and access points. Reconfiguration of the back of house rooms would result in a more efficient space and improves the operational needs for rail employees. Two original doors would be impacted, and would be re-used elsewhere within the basement level 1. Original tiles would also be impacted within basement level 1. There is potential for original fabric to be uncovered during works.	The reconfiguration and demolition work would have very little effect on the significance of the heritage item. The loss of a small section of wall tiles represents a minor acceptable impact, and the reuse of the historic joinery, architraves and doors would have a positive impact. While the works would remove original fabric, the fabric is functional in nature and is a low-contributory feature to Transport House. Mitigation and management measures would be required.
Escalators	Removal of an existing bulkhead above the escalators and	A bulkhead, while original, is non-contributory to the heritage values of the building and is of low	The removal of non-contributory original fabric is a minor impact which is

Location	Works	Impact	Significance
	installation of a viewing window from basement Level 1. Temporary scaffolding and works platform during construction would be provided. Sanding and varnishing of the escalators.	significance. Removal of the bulkhead would allow for the office space behind it to have an external window, improving the conditions and facility of the room, which is currently fully enclosed. The walls and ceilings would be refreshed similar to the design within the concourse area. The escalators would be sanded and varnished. The temporary works platform would have a minor visual impact during construction. Works required to fix the work platform to Transport House would have minor impact to the reinforced concrete, which would be repaired.	outweighed by the practical benefits of the work and as such, the heritage impact arising from this proposed item of works is minor and acceptable. There would be minor impacts to the structure for the temporary works platform. Mitigation and management measures would be required.

Wynyard Park and the Former Tram Tunnels

If required, a compound with temporary construction hoist would be installed within the curtilage of Wynyard Park and the former Tram Tunnels. The construction hoist would require excavation between the park and Wynyard Lane Car Park, and the car park to the station concourse. Following completion of these works, the areas would be closed and re-instated.

Although identified in *Central Sydney Archaeological Zoning Plan* (City of Sydney, 1992) as having archaeological potential, the construction of the station in the 1930's and the further works in 1950's, disturbed the archaeological fabric within the park. The archaeological significance retained within this area is mostly in reference to the area's association with the original military parade grounds. As such, the archaeological significance of the southern half of Wynyard Park is negligible and therefore an excavation permit under Section 139 of the Heritage Act for works proposed within Wynyard Park is not required. However, mitigation is recommended given the site has been listed as an item of local significance.

The open space of the park is also recognised for its cultural and aesthetic significance under the Sydney LEP 2012. The important key fabric of the park, being the mature vegetation, statue and remnant sandstone retaining walls, would not be directly impacted by the establishment of the compound. However, the compound would temporarily disrupt some view lines to and from public spaces and buildings surrounding the heritage item. Minor impacts may occur to nearby fig trees due to the temporary construction hoist, depending on the location of the root system. As this impact would be restricted to one area of the compound and would be temporary, any

impacts to the heritage item are considered to be minor. Measures to minimise impacts on tree health are identified in **Section 7.5.4**.

The proposed Wynyard Park compound and temporary goods lifts would not have a direct impact on fabric contained within the curtilage of the tram tunnels.

7.4.3 Management and mitigation measures

Original fabric would be directly impacted by the proposal, and in some instances, permanently removed. **Table 33** outlines the measures that would be implemented to avoid, mitigate and manage potential impacts to heritage during construction. **Table 33** also includes procedures to record heritage fabric that would be directly impacted, and procedures that are to be implemented should original fabric or unexpected finds be uncovered during construction.

Table 33 Heritage mitigation and management measures

Id No.	Mitigation and management measures
General Requirements	
H1	A Heritage Construction Environmental Management Plan (HCEMP) would be prepared and would be developed in consultation with Sydney Trains (Heritage), the OEH (Heritage Division) and City of Sydney prior to the commencement of construction. The HCEMP would be prepared by a suitably qualified heritage specialist. The HCEMP would include (but is not limited to): • Identification of heritage items, and known heritage fabric. • Description of work practices (generic and specific) to be applied to avoid and minimise impacts to heritage fabric. • Stop work procedures that would be implemented should original fabric or unexpected historical archaeological relics are discovered during construction. • Procedures to monitor works in sensitive areas, including reporting and notification of accidental damage to heritage fabric.
H2	Prior to the commencement of any demolition works (including reconfiguration of spaces), refurbishment works (including painting) and/or re-purposing of spaces within Wynyard Station and Transport House, annotated plans and a photographic recording would be undertaken of all areas to be modified by the proposal. This includes: • Plans and photographs illustrating the current layout and uses. • Plans and photographs of the original art deco ceiling treatment within the former Railway Refreshment Rooms and the preparation of a Reflected Ceiling

Id No.	Mitigation and management measures
	Plan which would record the remaining features of the ceiling prior to demolition. • A historic paint test analysis of heritage fabric that would be impacted by the proposal.
H3	Prior to works commencing, contractors shall be briefed as to the sensitive nature of the site and any recommended mitigation measures or controls required.
H4	In the event that any unexpected historical archaeological relics or original fabric is discovered during construction at the site (including Wynyard Park), works in the affected area(s) would cease and the OEH (Heritage division) would be notified. Further assessment, documentation or approval may be required before site works could recommence in the affected area(s). Records of any original finishes exposed during works should be lodged with Transport for NSW. This should include photos, location plans and samples of finishes, as appropriate.
H5	In the event that original fabric is discovered in Wynyard Station or Transport House, the following steps and considerations would be undertaken in consultation with a suitably experienced heritage practitioner as part of the stop work procedures: • If original finishes are discovered, the finishes are to be recorded and sampled in accordance with relevant OEH (Heritage Division) guidelines. • In-situ retention of the features and incorporation into the proposal design, where feasible and reasonable, would be investigated. • If in-situ retention is feasible, methods to remove modern finishes that minimise potential damage to the original fabric would be implemented.
H6	A lighting design for the unpaid concourse would be developed during detailed design in consultation with a suitably experienced heritage practitioner and in consultation with Sydney Trains. The lighting design would include a sympathetic response and transition between the western unpaid concourse (within Transport House) and other areas of the station.
Transport House	
H7	An approval under Section 60 of the *Heritage Act 1977* would be obtained prior to any works associated with the proposal commencing within Transport House.
H8	No structural modifications to the façade of Transport House (along its York Street and York Lane façade) is permitted as part of this proposal.

Id No.	Mitigation and management measures
H8	During detailed design, the refurbishment of the York Street foyer, reconstruction of the western fire staircase and fit out of the basement levels of Transport House (including the western unpaid concourse) would be finalised in consultation with a suitably experienced heritage practitioner and Sydney Trains (Heritage). The design of York Street foyer would investigate opportunities for salvage of any original fabric and/or heritage interpretation associated with Transport House, as well as the integration with Wynyard Walk.
H10	Original tiles and flooring within the western corridor of the York Street foyer are to conserved and retained in-situ, and protected during construction to prevent damage.
H11	An experienced heritage practitioner would supervise the removal of modern fittings within Transport House, including the York Street foyer.
H12	The position of service utilities (such as power and air conditioning) within the basement levels of Transport House would use existing openings within ceilings/walls where feasible. The location of final openings would be determined in consultation with an experienced heritage practitioner.
H13	Two timber doors located within basement Level 1 of Transport House, which would be removed (after necessary archival recordings have been completed) to accommodate toilet amenities, would be re-used within basement Level 1. All other timber doors found in basement levels of Transport House impacted by the proposal would be retained in situ during the works. Where there is a preventative need to remove them, the doors are to be packed and stored to prevent damage to the doors. The door frames and architraves are to be temporarily protected with a localised timber hoarding/casing.
H14	During detailed design, consideration would be given to feasibility of incorporating design features that meet BCA requirements and reflect the original design of the western fire staircase, including the art deco tiling, stair design and re-use of the original balustrade.
H15	Structural changes below stairs and escalators within Transport House is to be subject to a structural assessment prior to any demolition or modification work being undertaken to prevent damage to remaining heritage fabric.

Id No.	Mitigation and management measures
Wynyard Station	
H16	The extent of disturbance to the decorative profiles of original art deco ceiling treatments associated with the Railway Refreshment Rooms (including the former Grill Room) would be minimised. Remaining portions of the ceiling are to be retained and protected within modern ceiling finishes.
H17	Original balustrades would be retained and protected in situ, or retained and re-used within the station design where direct impacts are anticipated. Original remnant timber handrails, that have not been previously painted, are to be kept as exposed timber. Additional treatments to original balustrades that are required to comply with Building Code of Australia would not significantly obstruct views of the railings.
H18	Original tiles that would be impacted would be recorded and salvaged for re-use elsewhere within the station domain. Where original tiles would require removal, methods to remove the original tiles in a manner that avoids or minimises the potential for damage to the tiles would be implemented.
H19	Where repainting works would involve the stripping of painted original metal elements within the station, testing would be undertaken to ensure no original finishes remain. If original finishes are uncovered, the unexpected finds procedure would apply.
H20	Where original timber doors on station platforms are to be removed and replaced with modern fire safety compliant doors, an example of the original doors is to be retained either in storage on site, or relocated to Transport Heritage NSW's movable heritage collection
H21	Where feasible, new doors for back-of-house areas on station platforms would be designed to include a heritage styled sheeting to replicate the appearance of the original panelled doors.
H22	Removal or reduction of the rooms below the staircases on the station platforms is to be subject to a structural assessment prior to any demolition or modification work being undertaken to prevent damage to remaining heritage fabric.
H23	The incorporation of station platform signage that reflects the original signage of Wynyard Station would be considered as part of the wayfinding design on Platforms 3 and 4, and Platforms 5 and 6.

Id No.	Mitigation and management measures
Wynyard Park and the former Wynyard Tram Tunnels	
H24	All remnant sandstone and landscape elements within Wynyard Park in proximity to the compound and access route are to be protected during construction works within the curtilage of Wynyard Park (if the compound is required).
H25	The area excavated for the temporary construction hoist at Wynyard Park is to be photographically recorded prior to the demolition of the car park surface, and following the establishment of the cross section which provides depths and stratigraphy, to inform the future management of the area.

7.5 Visual quality and urban design

This section describes the existing visual environment at Wynyard Station and assesses the potential impacts to visual amenity and the urban design characteristics of the proposal.

7.5.1 Existing environment

Wynyard Station is primarily located underground and it is generally not visible from street level. Elements of Wynyard Station that are visible from street level include entrance foyers and station signage on York Street, Carrington Street and George Street as well as station infrastructure, a glass dome and signage within Wynyard Park. These elements are not visually dominant features of the surrounding CBD landscape.

The visual environment of the underground station comprises station infrastructure the column grid and such as ticket offices, ticket gates, information boards and signage. Station facilities including retail shops, station infrastructure and offices add to the visual clutter in the station. Over time the station has been upgraded in a piecemeal manner and is generally run down with poor sightlines and indirect connections between the unpaid and paid areas of the station and surrounding streets. The existing station architecture and amenity is not considered adequate and the existing station environment does not provide the level of amenity befitting a major CBD railway station. As discussed in **Section 7.4**, there is limited evidence of the original construction and most of the tiles and finishes within the public domain are not original.

7.5.2 Construction impacts

Construction would generally be undertaken within the underground station and would therefore be primarily visible to those accessing the station or those using the station concourse as a thoroughfare. Within the public domain areas of the station, the majority of construction activities would be undertaken behind hoardings or outside standard construction hours, and therefore would not be directly visible to the general public during the busier times of the day. However, active construction works within the public domain and the use of hoardings would change the visual quality of the station and could impact on the visual amenity. Narrowed walkways and hoarding could reduce light levels which would impact on the overall visual environment of the station, however minimum lux levels would be maintained for pedestrian safety.

Potential impacts would include a reduction in the public domain space available during construction and the removal of retail space. Reduced public domain may lead to pedestrian congestion and use of hoardings, or visible works above hoardings (for example in roof areas), could further increase the visual clutter of the station thus reducing visual amenity. The loss of retail space and the erection of hoarding would also reduce the vibrancy of the station during construction. Mitigation measures have been recommended to respond to this potential impact (refer to **Section 7.2.4**).

At street level, there would be some works within the entrance foyers which have the potential to have visual impacts for the high volume of pedestrians accessing the entrance foyers during day-time hours. In an effort to minimise visual and other impacts in the entrance foyers, the majority of these works would be scheduled during the night-time. This, combined with the short duration of works in the entrance foyer, would be expected to minimise the visual impact of the works.

There may be the need to trim or remove a tree on Margaret Street to safely accommodate a works zone for the proposal.

7.5.2.1 Wynyard Park compound

The primary visual amenity impact at street level would be the temporary use of Wynyard Park as a construction compound, if required. The establishment of the Wynyard Park compound would reduce the amount of publicly available space within the park and would introduce a distinct new feature to the park. Given the overall size of the park, proximity to surrounding roads and frequent use of this space by the surrounding population, this would have a temporary adverse impact on the visual amenity of the park and an impact on views of the park from surrounding streets and buildings that overlook this space. To ameliorate this potential temporary visual impact, the compound has been located so as to avoid direct impacts on mature trees and other significant structures within the park.

The construction compound would be used during the day, evening and night time periods. Lighting would be required to ensure a safe working environment and to provide site security. Any lighting would be temporary, and the position of lighting at the site would need to consider potential light spill impacts on the nearby residential building and hotels.

Hoardings within the public domain of the station and at Wynyard Park may also present a graffiti risk, which may further impact on the visual amenity of these spaces. Mitigation measures have been recommended to respond to this potential impact (refer to **Section 7.2.4**).

The temporary construction hoist would also require the excavation of a small grassed area. The depth of the soil between the Wynyard Lane Car Park and the park is estimated at around one to two metres (Sydney City Council, 1997). The location of the hoist is guided by the location and layout of the modern addition to the underlying car park, and the avoidance of converted tram tunnels.

A number of trees are located along the perimeter of the park, including two large fig trees (Moreton Bay Figs). The proposed hoist location is located within the drip line of one of these fig trees. The trunks of each fig tree are located slightly below the current finished level of the grassed area.

The planter tree species, located along the York Street frontage, are unlikely to be impacted given the location of the temporary construction hoist.

Fig trees are known to be a resilient plant species to disturbance, and are known to grow in disturbed areas typically considered to be of poor condition. Fig trees are also known to have extensive root systems, with roots known to extend far beyond the drip line of the tree canopy. Typically, roots would be within the first 0.5 metres of the top soil.

There is the potential for impacts to occur to the fig trees, but the extent of impact would be dependent on the size of the roots within the area of excavation. Generally, impacts to roots with a diameter of 50 mm or less would be unlikely cause a noticeable impact on the individual tree. Impacts to roots greater than 50 mm in diameter should be avoided, if possible. If these cannot be avoided, this could have a noticeable impact on the canopy (either in terms of areas of dieback or the dropping of leaves) in the short to medium term (approximately five years or longer). However, as noted earlier, fig species are known to be resilient and the size of the excavation would unlikely cause the death of the tree or result in stability issues.

7.5.3 **Operational impacts**

The proposal would improve the presentation and quality of the customer environment at Wynyard Station and provide an integrated urban design context for the station within its broader CBD setting. A key aim of the architectural design of the proposal is to open up, de-clutter, refresh and brighten the space, improving amenity and wayfinding and enhancing the customer experience at the station. The proposal would include the following amenity improvements:

- Removal of obstructions such as retail spaces and ticket vending machines from the middle of the concourse to open up the space and provide long lines of sight through the public domain to assist wayfinding.
- Removal of suspended ceilings within the paid concourse at a minimum to reveal the original ceiling structure (refer to Error! Reference source not found.).
- Replacement of the ceilings within the unpaid concourse (refer to **Figure 32**).
- Removal of station infrastructure and offices from public domain areas in line with the existing ticket gates and inclusion of these services in the station facilities along the boundary of the proposal site (refer to **Figure 32**).
- Replacement of the existing full height partitions between the paid and unpaid concourse areas with glazed screens that are not full height and which would have a slim line framing profile to improve visual connectivity and wayfinding through the public domain (refer to **Figure 33**).
- Removal of the existing ticket gates and installation of more Opal gates in a configuration that responds to pedestrian flow paths and desire lines and the existing column grid to maximise customer convenience and operational efficiency whilst creating a positive relationship with the existing structure.

- De-cluttering and renovation of station platforms (refer to **Figure 34**).
- General amenity improvements throughout the station with new tiling, painting, signage, lighting and station furniture.

The layout, as depicted in **Figure 9**, is not confined to the structural grid of the station and is responding to the opportunity to maximise customer convenience and operational efficiency. The design is at concept design level and is subject to more detailed design to ensure a well-designed result that balances operational and customer needs with the constraints of an existing structure. This includes ensuring a positive relationship with the existing configuration of the concourse space, and avoiding awkward junctions resulting from the current column grid of the station. The further development of the final design would be subject to regular reviews by the Transport Projects Design and Sustainability Review Panel.

Figure 32 to **Figure 34** shows the indicative architectural design for the proposal. As well as the overall improvements to the architecture and customer environment of the station, this proposal would integrate the station with surrounding developments, such as Wynyard Walk and the One Carrington Street development by providing visual and aesthetic continuity via a sequence of contemporary urban spaces.

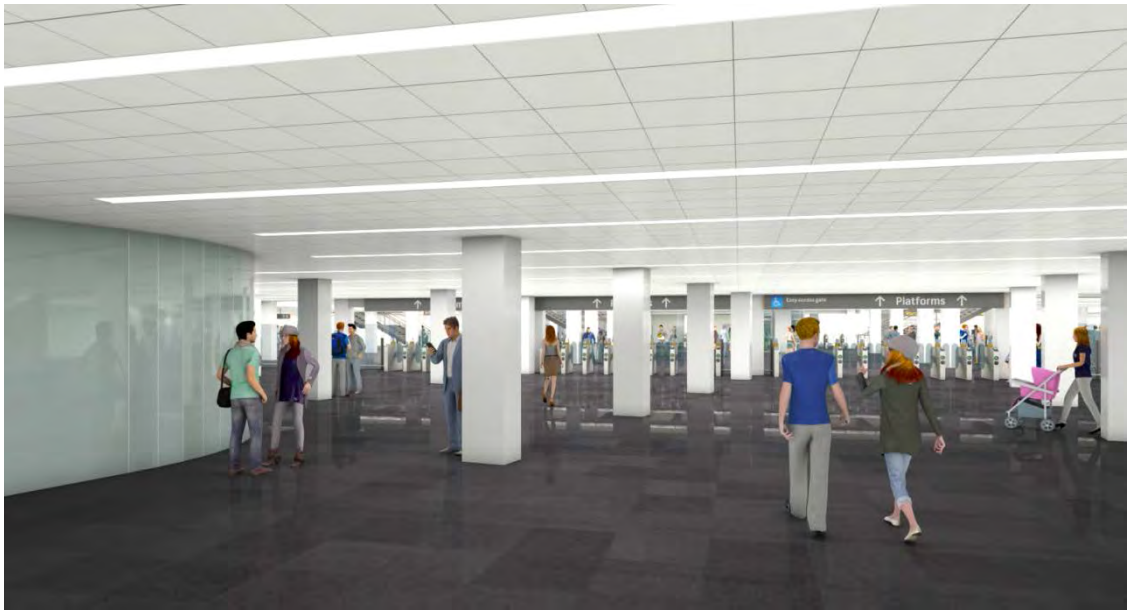


Figure 32 Architectural Render of the eastern unpaid concourse

Figure 33 Architectural Render of the northern paid concourse

Figure 34 Architectural Render of Platforms 5 and 6

7.5.4 Management and mitigation measures

Potential impacts to visual amenity within the station would be managed in accordance with the following mitigation and management measures detailed in **Table 34** and would be in addition to those provided in **Section 7.2.4**.

As the proposal would improve the overall visual quality and urban design of Wynyard Station, mitigation measures would not be required in the long term.

Table 34 Visual amenity and urban design mitigation and management measures

ID No.	Mitigation and management measures
Construction	
V1	Construction site hoarding would be regularly maintained, including the prompt removal of graffiti.
V2	Quality finishes and design features would be incorporated into hoardings at appropriate prominent locations within the station public domain and Wynyard Park. This may include project information.
V3	Work spaces within the public domain within the station would be regularly maintained, and where possible, the consolidation of materials and equipment storage behind hoarding.
V4	Lighting levels within public domain areas within the station would be considered to ensure pedestrian amenity and safety is maintained.
V5	Temporary structures and compounds would be removed as soon as practicable. The reinstatement works for Wynyard Park would be determined in consultation with City of Sydney.
V6	Should the tree on Margaret Street be removed for the purposes of a works zone for the proposal, tree would be replaced following the completion of construction or at a time to be agreed by City of Sydney. The replacement tree would consist of locally endemic native species (unless otherwise agreed by the Principal Manager Environment) and following consultation with City of Sydney (as landowner).

ID No.	Mitigation and management measures
V7	Should construction access be required through Wynyard Park, urban design features would be investigated to minimise impacts associated with the temporary loss of public space and a reduction of visual amenity. These would include: • Provision of public seating around the hoardings. • Treatment of hoardings to minimise the intrusion into the visual environment and to minimise graffiti risk.
V8	The area impacted by the Wynyard Park compound (if required) would be minimised as much as possible, and would be reinstated to its original condition as soon as practicable once the compound is no longer required for construction. City of Sydney would be consulted concerning the treatment of the compound hoardings and re-instatement works.
V9	The use of artificial lighting would be minimised wherever possible at Wynyard Park, with all lighting designed and installed in accordance with the requirements of *Australian Standard AS4282 Control of the Obstructive Effects of Outdoor Lighting*. Lighting would be directed to ensure glare and light spill is minimised beyond the compound footprint.
V10	To manage potential impacts on trees close to the excavation of the temporary construction hoist in Wynyard Park, the following mitigation measures would be implemented: • Prior to the excavation of the concrete ceiling of the underlying car park, soil would be carefully removed to expose the underlying root system. A qualified arborist would be present on site during the soil excavation, and would determine the appropriate method to manage roots within the excavation area to minimise impacts to tree health. • Should roots above 50 mm diameter be discovered within the excavation area, opportunities to adjust the location of the excavation area would be considered, where feasible and reasonable, to avoid the tree roots. Adjustments would need to consider the underlying car park and other nearby trees.
V11	Tree protection measures would be considered for other at-surface activities associated with the Wynyard Park compound during detailed planning and implemented with reference to *Australian Standard AS 4970 – Protection of Trees on Development Sites.*
Operation	

ID No.	Mitigation and management measures
V12	Spaces with direct interfaces with the public domain that are not used for back-of-house activities would be subject to the conditions of a retail strategy currently being prepared by Transport for NSW.
V13	Following the completion of construction, spaces that are not used for back-of-house purposes would be managed until a permanent use has been established, including the prompt removal of graffiti

7.6 Land use and business impacts

This section describes the land uses and business activities currently undertaken within and surrounding Wynyard Station and assesses the potential impacts of the proposal on these activities.

7.6.1 Existing environment

Wynyard Station is a major transport hub within the Sydney CBD with the dominant land use being rail activities. There are also a number of commercial and retail land uses located within and surrounding the station.

There are currently 25 retail spaces on the concourse level of Wynyard Station, all of which are owned by RailCorp. Fifteen spaces are leased to retailers, and 10 spaces are currently vacant. The leased spaces are occupied by food and clothing retail stores, as well as service providers, such as drycleaners and ATMs. Separate, but adjacent to the concourse are the Concourse Café and Concourse Bar which are both privately owned. The mezzanine level contains a Coles supermarket and a number of ATMs.

Of the 15 active retailers on the concourse level, five are located outside the proposal construction footprint (which includes one space leased for an ATM). Of the 10 retail spaces that are currently occupied and inside the proposal construction footprint, seven have expired leases and three have active leases. All of the businesses with an expired lease are currently operating under month to month arrangements.

The Carrington Street entrance foyer contains an additional six retail spaces, one of which is used by Transport for NSW and the rest of which are leased to other retailers.

Surrounding Wynyard Station there are numerous commercial and retail activities. These include commercial buildings such as the upper levels of Transport House, the Menzies Hotel and retail spaces on the George Street ramps leading to the unpaid concourse, within the Metcentre and on streets surrounding the station. As part of the One Carrington Street development, retail spaces along the George Street ramps would be vacated to make way for the redevelopment of this space. The Wynyard Lane Car Park is commercially operated and is currently publicly accessible.

Wynyard Park is located immediately above Wynyard Station, and is bound by York Street and Carrington Street to the east and west respectively and Margaret Street and Wynyard Street to the north and south. The park, a local heritage item, is zoned RE1 Public Recreation under the *Sydney Local Environmental Plan 2012* and provides public open space. Grassed areas with seating and shade trees are well patronised during weekday lunchtimes. There is also a paved area around Wynyard dome which provides access to Wynyard Station as well as pedestrian access between York Street and Carrington Street.

The land tenure of Wynyard Station, Transport House and Wynyard Park is discussed in **Chapter 5**.

7.6.2 Construction impacts

Construction of the proposal would have both direct and indirect impacts on the land use and business activities within and surrounding the proposal site. Direct impacts would occur to Wynyard Park and Wynyard Lane Car Park, as discussed below. The removal of retail spaces within the station concourse would be permanent impacts, and as such has been dealt with in the operational impact assessment in **Section 7.6.6**.

There is also the potential for impacts to utilities, if present within the area proposed for the temporary construction hoist within Wynyard Park. The presence of utilities would be confirmed prior to excavation, and adjustments made to the excavation area if required.

7.6.3 Direct property impacts – businesses

Direct temporary impacts to Wynyard Lane Car Park would occur during construction to facilitate the installation of a temporary construction hoist to the station areas below, as well as to provide a designated area for deliveries, parking, set down and storage. The car park is owned by RailCorp but is under a lease agreement with Brookfield. A commercial agreement would be sought with the car park operator and Brookfield for the use of this space. The final details on the amount of space used by the proposal is subject to these negotiations, however the use of a number of parking spaces within the car park would be sought. The car park forms part of the One Carrington Street development. The reinstatement of this space would be undertaken in consultation with Brookfield.

Ancillary construction activities are expected to extend into neighbouring properties (refer to **Section 7.6.6**). As such, the construction contractor would consult with the property owners (and tenants) concerning the works required and scheduling to minimise disruption to the relevant business.

Direct permanent impacts on businesses as a result of the proposal are discussed in **Section 7.6.6**.

7.6.4 Direct property impacts – open space

Temporary direct impacts to Wynyard Park would occur should the use of the park be required for construction access (refer to in **Section 5.5.2**). Following the completion of construction, the area would be re-instated for recreational purposes, in consultation with City of Sydney.

The establishment of the compound would reduce the amount of available open space at the park, which is used primarily during the daytime by the surrounding workforce and commuters. The majority of the park, including structures and trees, would not be directly impacted. However, the compound has the potential to impact the amenity and visual quality of the park which may discourage the use of the remaining space. Mitigation measures would assist in minimising the potential impacts on the amenity (and use) of the park space. The potential impacts and mitigation measures are discussed further in **Section 7.5**.

As described in **Section 5.6**, the land to be occupied by the Wynyard Park compound is owned by the Crown. The management of the park has been vested to City of Sydney under the *Crown Lands Act 1989*. If the compound is needed, agreement from City of Sydney, along with landowners consent, would be required prior to its establishment.

Materials would be moved to/from the Wynyard Park compound (if required) by forklifts and trolleys, which could damage the underlying paving if suitable protection is not provided to spread the load of the equipment of materials. Mitigation and management measures have been recommended to minimise the risk to Council assets and pedestrians (due to trip hazards).

7.6.5 Indirect property impacts – property and businesses

The construction of the proposal has the potential to cause temporary indirect noise and vibration impacts to businesses surrounding the station as well as traffic impacts and changes to pedestrian flows.

Construction noise and vibration impacts have the potential to affect commercial, and retail activities remaining in the eastern unpaid concourse area, the mezzanine level and Carrington Street entry to the station (also referred to as the Wynyard Park dome), the George Street ramps, the NSW Service Centre and the Metcentre (refer to **Section 7.1**). Noise exceedances are not predicted at the educational establishment on level 2 of Transport House or at the nearest residential receiver at 50 Clarence Street.

It should be noted that impacts would be temporary, with elevated noise levels associated with certain activities. A number of activities would also be undertaken during evening and night time periods, when a large proportion of businesses are not operational. Feasible and reasonable noise mitigation would be implemented, where necessary.

Increased traffic flows as a result of construction of the proposal have the potential to affect access to surrounding businesses. However, given the location of the proposal within the Sydney CBD, it is considered likely that customer and employee access to these businesses would generally be via public transport or on foot and would not be disrupted by construction vehicle movements. Construction vehicle movements would be relatively low and the majority of the accesses would only be used during the evening. As a result, increased traffic flows would be expected to have minimal impact on the operation of businesses surrounding the proposal site.

There is potential that the proposal would impact truck access and deliveries to surrounding businesses. This would primarily affect Coles, the Menzies Hotel and other businesses that use Wynyard Lane and the associated goods lift for access and deliveries (noting this access could become restricted during the proposed One Carrington Street development if it proceeds). Use of this lift during the construction of the proposal would be undertaken in consultation with surrounding businesses and delivery access to all businesses would be maintained during construction.

Potential also exists for construction of the proposal to change pedestrian movements to, from and through the proposal site as well as access to surrounding businesses. While access to all remaining businesses would be maintained during construction, changed station arrangements and potential pedestrian congestion may discourage the use of the station for through movements (refer to **Section 7.2**). The disruption to through movements could impact visitation to surrounding businesses such as those located on the George Street ramps and in the Metcentre.

Construction of the proposal would not be expected to greatly alter the number of customers using Wynyard Station. Therefore changes to the incidental visitation from customers passing businesses on their way to or from the station would be minimal. Maintaining key pedestrian routes, the de-cluttering of the eastern concourse early in the construction program and a construction wayfinding strategy would assist in minimising impacts or changes to pedestrian flows (and therefore businesses).

7.6.6 Operational impacts

The majority of retail spaces on the concourse level would be vacated, with the exception of four retail spaces and an ATM along the eastern extent of the proposal site. This would equate to direct permanent impacts to 10 occupied retail spaces.

Construction of the proposal would require acquisition of the Concourse Bar, Concourse Café and potentially part of the common property of Strata Plan 68608 which are currently the subject of commercial negotiations. The Coles supermarket located on the mezzanine level of Wynyard Station currently leases this space from RailCorp. To allow for the construction of a new staircase between the concourse and mezzanine levels, a renegotiation of the current lease agreement between the two parties would be required. Given the small extent of acquisition, this would be unlikely to have a significant impact on the operation of the supermarket.

The proposal would provide the opportunity for new retail uses in station facilities not required for back-of-house uses. Fit out of retail space is not part of the proposal, although services would be provided to all station facilities spaces, as discussed in **Section 4.2.1**.

7.6.7 Management and mitigation measures

During construction and operation of the proposal, the mitigation and management measures detailed in **Table 35** would be implemented.

Impacts to Wynyard Park would be addressed through the urban design measures provided in **Section 7.5.4**.

Permanent property acquisition required for the proposal would be subject to commercial negotiation and as such further mitigation would not be required. The remaining station facilities that are not required for back of house purposes could be used for retail purposes. Any such fit-out of these spaces would be subject to separate approval under Part 4 of the EP&A Act.

Table 35 Property use and business mitigation and management measures

ID No.	Mitigation and management measures
Construction	
L1	As part of the Community Liaison Plan (refer to Section 6.4.3), surrounding businesses would be consulted to provide details regarding construction activities, scheduling and timing of works including timing of noise or traffic intensive activities.
L2	Appropriate signage would be installed to support wayfinding and maintain public awareness of businesses which remain operational during construction.
L3	Building condition surveys would be completed both before and after the works at potentially affected properties, to identify existing damage and any project related damage.
L4	The termination and/or vacation of the remaining leases on the concourse is to be staged so that areas are made available to the proposal only as they are needed.
L5	A 'dial before you dig' search would be completed for the excavation area associated with the Wynyard Park compound (if required). If necessary the excavation area would to be adjusted, if required, to avoid utilities and with consideration to the underlying car park and tree roots (refer to **Table 34**).
Operation	
L6	Property acquisition (where required), including compulsory acquisition, would be undertaken in accordance with *Land Acquisition (Just Terms Compensation) Act 1991*.

7.7 Hazards and risk

This section provides an overview of the potential hazards and risks associated with the construction and operation of the proposal.

7.7.1 Existing environment

A *Hazardous Materials Risk Assessment* (Noel Arnold & Associates, 2014) was undertaken to identify the location, nature and amount of hazardous materials in accessible areas and identify the likelihood of hazardous materials in inaccessible areas. The following materials were identified as occurring or likely to occur within Wynyard Station:

- Asbestos (friable and non-friable).
- Synthetic mineral fibres (SMF).
- Polychlorinated biphenyls (PCBs).
- Lead paint.
- Ozone-depleting substances (ODSs).

Air quality monitoring was also undertaken within the concourse areas to establish the presence of asbestos, inhalable and respirable dust, lead, and volatile organic compounds (VOCs) in the air. The assessment concluded that all materials tested were below reporting limits or exposure standards.

The assessment found no above or underground storage tanks located in accessible areas within the station. However, it was concluded that there are flammable or combustible materials within the station, located within safely accessible areas.

Existing operation and maintenance activities undertaken at Wynyard Station require the use and storage of hazardous materials, which may include (but is not limited to) cleaning products, paints, solvents, oils, refrigerants and fuels.

7.7.2 **Construction impacts**

Construction activities could give rise to the following hazards and risks:

- Exposure to or inappropriate removal of hazardous materials that exist within the station areas requiring demolition or renovation. Materials identified at the proposal site are listed in **Section 7.7.1**.
- Improper transport, storage or handling of hazardous materials required during construction. These may include (but would not be limited to):
    - Diesel fuels.
    - Oils, greases and lubricants.
    - Gases (such as oxy-acetylene).
    - Paints and epoxies.
- Hazards for construction personnel and members of the public utilising the site, including:
    - Slips, trips and falls within construction work zones or where construction is required within areas accessed by the general public.
    - Reduced public safety as a result of decreased space within the unpaid concourse areas causing crowding and congestion.

Where possible, the removal of hazardous materials would be undertaken as part of early works prior to the construction of the proposal (refer to **Section 5.2**). Specialist contractors skilled in hazardous materials removal would be engaged for the handling and removal of hazardous materials to address risks to human health and the surrounding environment.

Should any unidentified hazardous materials be exposed during construction of the proposal, these would be managed under strict protocols set out in the CEMP for the proposal.

The other identified hazards and risks would also have the potential to impact human health and the surrounding environment. Overall, the likelihood of these impacts occurring is considered to be low given the provision of appropriate control measures in the CEMP and the implementation of the mitigation measures provided in **Section 7.7.4**.

7.7.3 **Operational impacts**

Operation of the proposal would not be expected to change the existing requirements for the use of hazardous materials at the station. Hazardous materials used during operational and maintenance activities at the station would continue to be stored and managed in accordance with the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*. This would minimise the risk of inappropriate handling or storage of hazardous materials during operation.

Certain hazardous materials would be removed during the early works phase and as part of the proposal, thus providing a safer operational and working environment.

7.7.4 Management and mitigation measures

During construction and operation of the proposal, the mitigation and management measures detailed in **Table 43** would be implemented. These measures are to be read in conjunction with **Section 7.10.3** (Waste management).

Table 36 Risk and hazards mitigation and management measures

ID No.	Mitigation and management measures
Construction	
R1	The storage, handling and use of hazardous materials would be undertaken in accordance with the *Work Health and Safety Act 2011,* the *Work Health and Safety Regulation 2011* and the *Storage and Handling of Dangerous Goods – Code of Practice* (WorkCover, 2005).
R2	The Construction Environmental Management Plan would include measures to ensure the appropriate control and management of hazardous materials: • Cease work immediately in affected areas should suspected asbestos or other hazardous materials be encountered. • Prepare site specific work health and safety plans and safe work method statements. • Provide training for all construction personnel, including safe management of hazardous materials and location and use of spill management equipment where required. • Provide secure, bunded areas for the storage of fuels, oils, paints and other hazardous materials. • Locate construction worksites behind hoardings where practicable. Where possible, works required within areas accessed by the general public would be undertaken outside of peak periods. The work area would be made safe for public access immediately following the work. • Ensure worksites are kept clean and tidy at all times.
R3	All construction works which are near or around utilities would be carried out in accordance with the following, but not limited to: • *Work Health and Safety Act 2011* • Work near Underground Assets Guide (WorkCover, 2007) • Dial before You Dig Assets Protection Guidelines.

ID No.	Mitigation and management measures
Operation	
R4	The management of hazardous materials during the operation of the proposal would be consistent with the existing management practices at Wynyard Station and would comply with the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*

7.8 Greenhouse gas and sustainability

This section provides an assessment of both the potential impacts of climate change on the proposal and the impacts of the proposal on climate change, due to the release of greenhouse gas (GHG) emissions.

7.8.1 Methodology

7.8.1.1 Greenhouse gas

A GHG gas assessment has been conducted in accordance with the legislation and international reporting guidelines.

GHG emissions associated with the construction and operation of the proposal were calculated as follows:

- Identify the assessment boundary and the sources of GHG emissions associated with the proposal (construction).
- Determine the quantity of each emissions source (fuel, electricity, construction materials, waste) using relevant sources (preferably Australian but also international).
- Quantify the GHG emissions associated with each GHG source using equations specified in the *National Greenhouse Accounts (NGA) Factors 2014* (DoE, 2014).
- Present the GHG emissions associated with the proposal, for both scopes and emissions sources.
- Identify opportunities (mitigation measures) which may reduce the GHG emissions associated with the proposal.

The *Greenhouse Gas Inventory Guide for Construction Projects* (TfNSW, 2014) provides a consistent methodology for estimating the GHG emissions for rail or rail related infrastructure construction projects. The steps involved in undertaking a GHG assessment in accordance with the guide have been adopted for this assessment.

GHG emissions are reported in this assessment as tonnes of carbon dioxide equivalent (t CO2-e).

Emissions sources were categorised into three different scopes (in accordance with the GHG protocol) to differentiate between 'direct' and 'indirect' emissions sources. These scopes are:

- Scope 1 – direct GHG emissions, which are emissions generated by sources owned or controlled by the project.
- Scope 2 – indirect GHG emissions, which are the emissions from the generation of electricity which would be purchased from the grid.
- Scope 3 – indirect upstream GHG emissions, which are the emissions generated in the wider economy due to third party supply chains, as a consequence of proposal activities occurring within the proposal boundary.

Operational GHG emissions have not been assessed at this stage due to the nature of the works. Being an upgrade, the works are not expected to interfere substantially with the existing profile of operational emissions (i.e. before construction). However, operational emissions should be easier to define at a later stage in the proposal.

7.8.1.2 Climate change

A high level climate change risk assessment has been undertaken in line with relevant standards and current guidelines. The following key steps were undertaken to complete the climate change risk assessment:

- Identification of key climate variables (such as temperature and extreme events) and the climate variability that differentiates regional climate zones.
- Identification of potential climate change scenarios, based on the latest climate science, that broadly identify how each climate variable may change over the design life of the proposal.
- Identification of climate-based risks that may impact on the project, as a result of climate change.
- Assessment of potential impacts of priority climate change risks based on the consequence and likelihood of each risk.
- Recommendation of broad actions to mitigate climate risks.

Due to the nature of the proposal, and that Wynyard Station is an underground station, the implications of climate change are limited but have been included as a consideration in accordance with *Transport for NSW's Sustainable Design Guidelines* (Transport for NSW, 2013).

7.8.2 Potential impacts

7.8.2.1 Sustainability

Transport for NSW's Sustainable Design Guidelines (TfNSW, 2013) identify a range of initiatives and outcomes to improve the sustainability performance of transport infrastructure in NSW. This is achieved by ensuring sustainability initiatives are embedded into the design, procurement and construction stages of new transport infrastructure projects.

The Sustainable Design Guidelines have been applied to the proposal and an initial assessment has been completed with the aim to achieve a Gold rating. Sustainability initiatives include (but are not limited to):

- Water efficient fittings and controls to reduce water use.
- Energy efficiency measures, such as motion sensors, LED lighting and selection of high energy efficient plant.
- Maximisation of recycled content in construction materials.

7.8.2.2 Greenhouse gas emissions during construction

Activities that would generate GHG emissions during the construction of the project include:

- The combustion of diesel fuel in heavy vehicles used to deliver materials and remove waste, to and from site.
- The combustion of petrol for the use of project vehicles by labourers.
- Grid electricity consumption for the use of electric forklifts and electric pallet lifters to move materials from trucks to various precincts within Wynyard Station.
- The embodied energy of construction materials associated with the offsite mining and/or production of materials (excluding their transport to the site) to be used in the construction of the project.

The results of the assessment estimated the construction of the project would generate approximately 7,704 tonnes of carbon dioxide equivalent (CO_2-e), which consists of:

- 366 tonnes of CO2-e Scope 1 GHG emissions, which are emissions generated by sources owned or controlled by the proposal.
- 6 tonnes of CO2-e Scope 2 GHG emissions, which are the emissions from the generation of electricity which would be purchased from the grid.
- 7,332 tonnes of CO2-e Scope 3 GHG emissions, which are indirect upstream or downstream emissions (for example, mining, production and transport of materials).

The results indicate that the majority of GHG emissions are associated with Scope 3 GHG emissions which are largely associated with the use of steel sheets for ventilation ducts and cable trays. This can be attributed to the indirect offsite mining and production of steel, which are emissions-intensive processes. This is likely to increase once the procurement of heating, ventilation and air condition (HVAC) equipment, communications equipment and electrical equipment can be quantified during detailed design.

Scope 1 and Scope 2 contributions are presently low, however, these may increase during detailed design and construction planning. For example, Scope 1 and Scope 2 emissions may increase once consumption of electricity or diesel fuel associated with site offices, equipment and other uses is better understood.

7.8.2.3 Greenhouse gas emissions during operation

Operational GHG emissions were not quantified for this project due to the nature of the proposal (being an upgrade of an existing facility). However, the upgrade of the proposal is likely to change various aspects of the operational emissions profile of the Wynyard Station site. These are summarised below:

- Additional equipment installed as part of the proposal indicates that there could be an increase in electricity consumption over the operational stage of the project life cycle. This would contribute an increase in GHG emissions during the operational life cycle of the station.
- Future maintenance works for the site may or may not directly alter the state of operational emissions from existing maintenance works for the site (i.e. prior to the proposal). It is unknown whether or not the upgrades would make future maintenance works more or less frequent, but is worth considering should an analysis be required in the near future.

7.8.2.4 Climate change risk assessment

The nature of the proposal, primarily comprising upgrade works to an existing underground station, is likely to offer protection from a number of climate impacts (for example, solar radiation, storm events), however certain climate variables such as rainfall, temperature and extreme weather events could have an impact on construction and operation of the proposal.

Station infrastructure is particularly vulnerable to very high temperatures and extreme weather events. **Table 37** presents a high level desktop risk assessment of projected climate change and associated impacts to key project components. Key risks to the project have been assessed in terms of low (acceptable), medium (tolerable), and high (undesirable) risks, as a result of impacts from projected climate change scenarios. In summary the climate risk assessment identifies mainly low risks, with the exception of one medium risk for the proposal.

Table 37 Climate change risks and potential impacts

Climate change risk	Possible impacts / consequences	Risk rating for 2030	Risk rating for 2070
Increased temperatures and increased frequency and severity of extreme temperature days (days over 35 ºC)	Increased temperatures and extreme temperature days could increase the risk of heat stress conditions for passengers, operational staff and/or maintenance workers, which may lead to injury or, in a worst case scenario, fatality.	Low (acceptable)	Medium (tolerable)
	Increased temperatures and extreme temperature days are likely to reduce the energy efficiency of electrical equipment, increasing the consumption of electricity, and the risk of faults, equipment failure and power outages.	Low (acceptable)	Low (acceptable)
	Increased temperatures and extreme temperature events may affect the efficiency and function of vehicles (during construction) and trains (during operation), increasing the risk of vehicles overheating and breaking down (therefore causing a delay to the construction schedule). Higher temperatures may also result in an increased rate of fuel consumption due to the increased use of air conditioning and the reduced efficiency of vehicle engines, particularly for older models potentially increasing the cost of vehicle maintenance.	Low (acceptable)	Low (acceptable)
Increased intensity and frequency of extreme rainfall events	An increase in the frequency and severity of extreme rainfall events could increase risks to vehicle safety, particularly as the incidence of collisions increases in wet weather conditions (Austroads, 2004). This could place workers at risk and delay the construction schedule. Increased extreme rainfall events have the potential to put stress on existing drainage infrastructure, depending on the drainage capacity.	Low (acceptable)	Low (acceptable)

The risks to infrastructure described above may also generate knock-on effects or additional risks, such as (Maddocks et al, 2010):

- Interruption or delays to customer travel.
- Increased maintenance and replacement costs.
- Increased liability resulting from damage to station infrastructure.
- Higher insurance costs for transport authorities.

Given the interconnected nature of climate variables, the risks identified are likely to occur in combination, resulting in amplified impacts on station infrastructure. Mitigation measures identified below are identified to minimise the risk of climate change impacts on the proposal. Incorporating sustainability elements to the design of the Wynyard Station Upgrade has been a key management measure to minimise and mitigate environmental impacts resulting from the construction and operation of the project. This is particularly so with regards to the management of greenhouse gas and climate change.

The design and subsequent procurement stages of the project are where sustainability measures are most likely to be successfully incorporated. There are numerous mitigation opportunities for the proposal during the detailed design and construction stages of the proposal.

7.8.3 Management and mitigation measures

Table 38 outlines the mitigation and management measures that would be implemented to minimise greenhouse gas emissions, and to address climate change risks, during the construction and operation of the proposal. Scope 3 emissions (the greatest contributor to the overall proposal GHG emissions) would be targeted for mitigation opportunities during the procurement process.

Table 38 Greenhouse gas and sustainability mitigation and management measures

ID No.	Mitigation and management measures
Greenhouse gas	
G1	Opportunities to minimise the overall greenhouse gas emissions would be investigated during procurement, design and construction stages of the proposal. These would include: • Use of construction materials containing recycled content, such as recycled aggregates in bricks, or recycled steel, where reasonable and feasible. • Use of more energy efficient equipment during construction. • Use of electrical energy derived from a renewable source or the purchasing of Green Power, if available.

ID No.	Mitigation and management measures
	• Minimising travel distances for the transportation of materials and waste by using local sources for materials and local disposal areas for waste. • Minimising the number of movements associated with the transport of materials and/or waste from the site. • Use of energy efficient electrical operational systems and HVAC systems to maximise energy efficiencies during the operational stage of the proposal (for example, zoned lighting and sensored heating/cooling).
G2	Project planning would be undertaken to ensure that the vehicle movements and construction activities have been planned efficiently and to minimise double handling of materials and waste, haulage distances and fuel use.
Sustainability	
S1	Risks of future climate change would be considered during detailed design by the construction contractor. Where medium or high risks to proposal infrastructure have been identified, the construction contractor would review existing design policies, specifications or practices to consider the impacts of climate change. This would include the incorporation of energy efficiencies into the design to offset or otherwise reduce the impact of energy losses associated with temperature increases.
D2	Stop work thresholds for construction and operation activities (for example, for extreme heat or storm events) would also be implemented in line with current workplace health and safety practices.
S3	Provide information for workers driving during high rainfall, elevated temperature or extreme weather events which could result in vehicle breakdown. Information should also be provided to passengers, particularly in relation to elevated temperature (hot days).

7.9 Air quality

This section provides a qualitative assessment of the potential air quality impacts of the proposal. The assessment focuses on the following pollutants:

- Carbon monoxide (CO).
- Oxides of nitrogen (NO_x).
- Particulate matter (dust) (PM_{10} and $PM_{2.5}$).

Exposure to varying levels of these substances is known to be harmful to health over time. The NSW EPA therefore sets ground level concentration criteria for pollutants to minimise these effects. The criteria for the assessed pollutants are provided in **Table 39**.

7.9.1 Existing environment

The existing air quality near the proposal site can be categorised as being typical of a highly urbanised environment. The primary surrounding land uses are commercial and residential developments and roads and railways. A search of the National Pollutant Inventory has been undertaken with the closest polluting facility to the proposal site located approximately five kilometres away. Given the distance from the site, surrounding industrial facilities are not expected to substantially influence the air quality and the proposal site and therefore the dominant source of pollution has been assumed to be motor vehicles.

The NSW EPA collects and records air quality data from a number of monitoring stations across the state. The closest monitoring station to the proposal is located at Rozelle, which is approximately three kilometres west of the site. **Table 39** provides the EPA's criteria together with the air quality monitoring data recorded at the Rozelle monitoring station between 2008 and 2012. Levels of $PM_{2.5}$ are not measured at the Rozelle monitoring station.

Table 39 Air Quality Data from the EPA monitoring station in Rozelle between 2008 and 2012

Year	Maximum Recorded		
	8 Hour CO (mg/m^3)	1 Hour NO_2 (pphm)	24 Hour PM_{10} ($\mu g/m^3$)
EPA Criteria	***10 mg/m³***	***12 pphm***	***50 µg/m³***
2008	1.5	4	43.1
2009	2.3	4.9	**1,562.8***
2010	1.8	4.9	37.6
2011	1.4	5	39.4
2012	2.2	6.2	40.7
Maximum 2008-12	2.3	6.2	43.1

Bold text denotes exceedance of EPA criteria

***** Excluded from assessment as data represents atypical conditions

The monitoring data shows that the ambient air quality at the Rozelle monitoring station meets the EPA criteria for CO and NO_2. In 2009, the maximum recorded 24 hour average concentrations of PM_{10} were above the EPA criteria. Considering that particulate levels are affected by environmental factors such as bush fires and dust storms, the high level recorded in 2009 has been considered an anomaly and has been excluded from the assessment. The next highest particulate level recorded was well below the EPA criteria.

7.9.2 Construction impacts

Demolition and construction works for the proposal would generate air pollutants. Dust or particulate matter would be the primary pollutant generated, however diesel plant and equipment used on site would also generate NO_2, SO_2, PM_{10} and $PM_{2.5}$. Specific pollutant generating activities would include:

- Excavation and earthworks within Wynyard Park (if required).
- Demolition of the existing facades, ceilings and tiling.
- Removal or relocation of services and utilities.
- Demolition of structures and stairwells, which would require concrete cutting and/or breaking.
- Demolition of existing station infrastructure, such as ticket barriers and offices.
- Construction and internal fit out within the concourse and platforms.
- Materials handling when transporting demolition rubble.

The primary pollutant generating activity would be the excavation and earthworks required to construct the temporary construction access through Wynyard Park (if required), and dust emissions associated with loading waste onto trucks at the Wynyard Park construction compound, should it be required. These excavation and waste removal activities would potentially result in the release of dust into the surrounding environment. The required excavation would be localised and temporary and potential dust emissions would be controlled through the mitigation measures in **Section 7.9.4**.

The majority of remaining demolition and construction works would be undertaken underground, within the station concourse and platforms. Underground works have the potential to have air quality impacts on construction staff or pedestrians, however are considered manageable with appropriate mitigation and management measures, such as extraction or ventilation. Given the majority of works would be undertaken underground, air pollutants generated by the proposal would be unlikely to impact the surrounding above-ground environment.

The potential impacts of the proposal would therefore relate to dust emissions affecting members of the public, Sydney Trains employees and construction workers. There is also potential for dust to be deposited within the concourse and platform areas causing amenity and safety impacts.

7.9.3 Operational impacts

The proposal would not change the day to day operation of the station or impact the number of trains that pass through the station. Therefore, once operational, the proposal would not impact the overall air quality in the vicinity of Wynyard Station.

7.9.4 Management and mitigation measures

Table 40 outlines the mitigation and management measures that would be implemented to minimise and manage air quality impacts during the construction of the proposal.

Given that the operation of the proposal would not be expected to produce measureable air quality impacts from the current situation and that local pollutant levels are within the relevant criteria, specific operational mitigation measures would not be required.

Table 40 Air quality mitigation and management measures (construction)

ID No.	Mitigation and management measures
A1	The Construction Environmental Management Plan would include management measures to prevent or control the release of pollutants and minimise air quality impacts during construction. These measures would include: • Implementation of dust management measures during excavation and earthworks in Wynyard Park. Measures may include wetting down exposed soil and stockpiles, covering exposed stockpiles, stopping work during windy weather and using hoardings to prevent the spread of soil outside of the work area. • Loading, unloading and operating trucks in a manner that minimises dust impacts to surrounding environment, such as covering loads and utilising skips. • Implementation of dust management measures during demolition, such as provision of hoardings or containment to minimise the spread of dust, wetting down surfaces during demolition and concrete cutting works. • Provision of appropriate extraction and ventilation during demolition and construction works in underground areas particularly during dust intensive activities such as concrete cutting and excavation. • Provision of appropriate extraction, ventilation and personal protective equipment during removal of hazardous materials. • Sweeping and cleaning of the construction areas as well as the broader station areas to minimise the spread of dust. • Maintaining all plant and equipment in good working order in accordance with manufacturer's specifications. • Switching off all plant and equipment when not in use.

7.10 Waste

Reducing resource consumption and waste generation in design, construction and operation is a key objective of Transport for NSW's *Transport Project Division Sustainability Framework* and the *NSW Sustainable Design Guidelines v.3.0* (Transport for NSW, 2014). In addition legislation and guidelines that govern waste management and reuse in NSW include:

- *Waste Avoidance and Resource Recovery Act 2001* (WARR Act).
- *Protection of the Environment Operations Act 1997.*
- *Protection of the Environment Operations (Waste) Regulation 2005.*
- *NSW Government Resource Efficiency Policy* (OEH, 2014)
- *Waste Classification Guidelines* (DECCW, 2009).
- *Contaminated Land Management Act 1997.*

Waste streams are generally categorised into six categories as defined in Part 1: Classifying Waste of DECCW, (2009). These include:

- Special waste
- Liquid waste
- Hazardous waste
- Restricted solid waste
- General solid waste (putrescible)
- General solid waste (non-putrescible).

7.10.1 Construction impacts

Construction of the proposal has the potential to generate waste from numerous sources including:

- Demolition waste, such as concrete, bricks, tiles, pipes, metal, rock and soil.
- Construction waste, such as packaging material, scrap metal, plastics, timber formwork and cardboard.
- Hazardous waste, such as asbestos, dust containing lead contaminants, paints, solvents, chemicals and chemical containers. It is noted that the majority of hazardous materials would be removed from the proposal site as early works prior to the commencement of construction of the proposal.
- General office waste, such as food, paper, cardboard and food and beverage containers.
- Liquid waste from plant and vehicle maintenance, such as fuels and oils.

The generation of waste from the construction of the proposal has the potential to impact the surrounding environment if not appropriately managed. Given the confined, underground nature of the site, the likelihood of this impact would be low. However, there would be potential for waste to be exposed to the environment when it is transported from the site. Waste generated on site would be managed in accordance with the mitigation measures provided in **Section 7.10.3**, minimising the risk of occurrence of these impacts.

7.10.2 Operational impacts

Operational waste types and volumes are expected to be consistent with current operations. Waste generated during operation would generally consist of office waste, food waste and paper from passengers and waste materials from public amenities. All waste streams generated during operation would be managed in accordance with existing waste management practices.

7.10.3 Management and mitigation measures

Table 41 outlines the mitigation and management measures that would be implemented to minimise and manage waste-related impacts during the construction and operation of the proposal.

Table 41 Waste mitigation and management measures

ID No.	Mitigation and management measures
W1	Waste materials requiring removal from site would be classified, handled and stored onsite in accordance with *Waste Classification Guidelines* (DECCW, 2009) and *NSW Government Resource Efficiency Policy* (OEH, 2014). Waste generated by the proposal would be disposed to a suitably licensed landfill or waste disposal facility.

W2	A Waste Management Plan (WMP) would be developed as part of the CEMP in accordance with the WARR Act, the legislation and relevant guidelines. The WMP would include the following management measures for each waste stream:
	• Demolition waste and construction waste:
	  • Ensure correct quantities are ordered and delivered to the site.
	  • Investigate the use of recycled materials, including concrete and other construction materials.
	  • Transport concrete and other suitable materials (such as scrap metals and tiles) to designated crushing and recycling plants and concrete and other suitable materials (such as scrap metals and tiles) to designated crushing and recycling plants.

ID No.	Mitigation and management measures

	• General waste and domestic waste:
	  • General waste and recycling bins would be provided on site for construction waste and litter and would be regularly collected and disposed of appropriately.
	• Hazardous waste:
	  • Management of asbestos containing material (ACM) would be undertaken in accordance with:
	  ▪ *Work Health and Safety Act 2011.*
	  ▪ Code of Practice for the Safe Removal of Asbestos 2nd Edition (National Occupational Health and Safety Commission, 2005a).
	  ▪ Code of Practice for the Management and Control of Asbestos in Workplaces (NOHSC, 2005b).
	  ▪ *Protection of the Environment Operations (Waste) Regulation 2005* – clause 42 special requirements relating to asbestos waste.
	  ▪ AS2601:2001 Demolition of Structures.
	  • Removal of ACM would generally involve the following:
	  ▪ Development of a site specific asbestos removal control plan.
	  ▪ Establishing asbestos removal boundaries with appropriate security signage and barriers.
	  ▪ Preparation of the work area.
	  ▪ Use of the wet removal method where feasible and reasonable.
	  ▪ Removal of ACM in sections and placement in suitably labelled and properly sealed asbestos waste containers.
	  ▪ Decontamination of the workplace, tools and personal protective equipment.

W3	Waste management during the operation of the proposal would be consistent with the existing waste management practices at Wynyard Station.

7.11 Cumulative construction impacts

This section presents an assessment of potential cumulative impacts that may arise should the construction of the proposal coincide with the construction of other developments surrounding the proposal site.

7.11.1 Surrounding development proposals

There are five key projects that are located immediately adjacent to the proposal site and would have the potential to coincide with the construction of the proposal. These projects and their expected construction timeframes are listed in **Table 42**. While there are numerous other commercial, residential and infrastructure developments being undertaken within the Sydney CBD, the construction of these five projects would directly interact with the construction of the proposal.

Table 42 Surrounding development proposals and expected construction timeframes

Project and developer	Construction timeframe	Potential impacts and interaction with Wynyard Station
One Carrington Street development (formerly referred to as the CityOne development) Brookfield	Mid 2015 to 2018	Direct construction interface with the eastern unpaid concourse. Staged closure and re-construction of the George Street ramps and Hunter Arcade. Partial closure of Wynyard Lane during construction. Closure and use of Wynyard Lane Car Park for construction vehicle access. Prohibition or restriction of access for other parities to George Street and Wynyard Lane goods lift during construction. Establishment and use of construction loading areas along Margaret, Carrington and Wynyard Streets. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise.

Project and developer	Construction timeframe	Potential impacts and interaction with Wynyard Station
Wynyard Walk Transport for NSW	Currently under construction. Due for completion in 2016.	Direct construction interface with the western and northern unpaid concourse, as well as the York Street foyer. This would require consultation to confirm architectural finish boundaries. Some services and systems are shared between Wynyard Walk and Wynyard Station which are to be incorporated into the design and construction staging. Key aspects of the proposal would be completed prior to the opening of Wynyard Walk to cater for the pedestrian flows from this project. Restrictions to vehicle and pedestrian access to Wynyard Lane during construction. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration.
CBD South East Light Rail (CSELR) Transport for NSW	Mid 2015 to 2019	Closure of George Street, and redistribution of traffic onto surrounding network. Changes to bus infrastructure and bus routes in proximity to Wynyard Park, including a potential increase in bus terminations. Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration.
Sydney City Centre Bus Infrastructure modifications Roads and Maritime Services	Late 2014 to mid 2015	Increase in construction vehicle movements on the surrounding road network. Contribution to construction noise and vibration. During operation, additional pedestrian movement in the vicinity of Wynyard Station as a result of bus terminations (note the majority of pedestrians are expected to stay above ground).
333 George Street redevelopment Charter Halls Funds Management Ltd	Currently under construction. Due for completion in mid 2016	Increase in construction vehicles on surrounding network Works zone on Wynyard Lane Increase in noise and vibration.

7.11.2 Cumulative construction impacts

Potential direct and indirect cumulative impacts from the simultaneous construction of the proposal with the projects listed above would relate to noise and vibration, and pedestrian and traffic access.

7.11.2.1 Noise and vibration

Concurrent construction activities associated with the projects above and the proposal have the potential to increase noise levels at surrounding sensitive receivers. Increased heavy vehicle movements from all projects could also increase noise levels at nearby sensitive receivers, given that road traffic from these projects may use some common routes within the CBD in the immediate vicinity of the proposal.

Construction works associated with One Carrington Street development, Wynyard Walk, the CSELR and 333 George Street redevelopment include substantial surface works compared to the proposal and are therefore likely to generate higher levels of construction noise than the proposal at sensitive receiver locations. However, during periods where the proposal would be the dominant source of construction noise, the greatest increase in construction noise levels resulting from contributions from the other projects would be 3 dB(A).

7.11.2.2 Pedestrian access

Table 43 provides an overview of the potential impacts of other projects on Wynyard Station and the potential cumulative impacts to pedestrian flows.

There is the potential for cumulative impacts to pedestrian flows along surface roads, such as pedestrian congestion or the re-distribution of flows along surface roads as pedestrians attempt to avoid construction zones. This is likely to be compounded by an increase in pedestrian flows near Wynyard Station as a result of permanent changes to bus routes under the Access Strategy. This would include an increase in the number of buses now terminating at or near Wynyard Station.

The potential impacts would be largely attributed to other major construction works or public transport initiatives at the surface, given the majority of works associated with the proposal are located underground. Commuters would still need to access the station and it is not anticipated that a significant number of commuters would alter travel patterns to avoid construction activity at or near the station (due to distances to other train stations). As such, coordination between the major construction projects and the proposal would be critical in ensuring adequate pedestrian flows to/from the station are maintained. This would be particularly important where there are direct interfaces with the One Carrington development and indirect interfaces with CSELR.

Changes to bus routes and bus scheduling, as a result of the Access Strategy, are still under development by Sydney Buses. Until these changes have been confirmed, the potential impacts cannot be fully defined. However, it is expected that pedestrian flows at the surface would increase, including along York Street, Wynyard Street, Regimental Square, and Martin Place as commuters walk to destinations further south. A percentage of commuters may choose to travel by train via Wynyard Station. Impacts arising from permanent bus service changes would be accommodated by the infrastructure upgrades identified in the Sydney City Centre Bus Infrastructure modifications, or would be addressed through longer-term initiatives for Wynyard

interchange precinct as identified in the Access Strategy. The timing and potential interfaces associated with the changes to bus services would be confirmed during detailed design and in consultation with Sydney Buses.

Table 43 Potential negative impacts on Wynyard Station and cumulative impacts

Development/Project and the Potential Impact on Wynyard Station	Cumulative Impact
Wynyard Walk Wynyard Walk is currently under construction, and the resulting closure of Kent Street tunnel has resulted in a reduced number of through movements within the station domain. Staging of construction for the proposal is linked to the opening of Wynyard Walk to ensure commuters using the project are catered for. The final stages of construction activity associated with the proposal would still be underway once Wynyard Walk is commissioned. This may result in through movements within the station domain increasing over time.	• Key aspects of the proposal would be completed prior to the opening of Wynyard Walk to cater for the pedestrian flows from this project. The timing of related activities would be decided in consultation with Wynyard Walk. • Changes to pedestrian flows at the surface may result in cumulative impacts, as through movements are further discouraged during construction.

Development/Project and the Potential Impact on Wynyard Station	Cumulative Impact
One Carrington Street The proposed project would involve the staged partial closure of George Street ramps and a temporary full closure of the Hunter Arcade, which would result in: - Redistribution of some pedestrian flows to the Metcentre and Carrington Street escalators. - During the full closure of Hunter Arcade (estimated at around four months), pedestrians that would otherwise use this arcade would be required to use surface roads, such as George Street and Hunter Street to access areas to the east of George Street. - Impact to minor pedestrian movements along Wynyard Lane.	• Increased potential for pedestrian congestion during peak commuter periods given the direct interface between the two projects. • Increased demand on other alternative pedestrian accesses, such as the Metcentre and the Carrington Street escalators, given increased potential for congestion or general disruption. • Re-distribution of through movements in the station domain to the surface. • Increased “green walk time” at intersections along diverted pedestrian routes such as the intersection of York and Margaret Streets may be required to clear pedestrians
CSELR It is unlikely that this project would directly impact or close any accesses to Wynyard Station. However, there is potential for pedestrian access along George Street to be affected by its construction. However, access would be maintained as part of that project, given the high pedestrian flows and the number of businesses along George Street.	• Increased demand on alternative pedestrian accesses to the George Street ramps, such as the Metcentre, the Carrington Street escalators and York Street lobby, given increased potential for general disruption along George Street.
Sydney City Centre Bus Infrastructure / Access Strategy Along with the associated changes to the bus network under the Access Strategy, there would be an increase in the number of	• The construction of the Sydney City Centre Bus Infrastructure works are expected to be complete prior to construction of the

Development/Project and the Potential Impact on Wynyard Station	Cumulative Impact
buses that would terminate in the vicinity of Wynyard Station. A number of bus routes would also be re-routed along York and Clarence Streets. The exact bus routes that would be impacted in this way is yet to be confirmed by Sydney Buses	proposal. • The re-routing of bus services and increase in terminating services at Wynyard would increase the number of pedestrians alighting in and around Wynyard Station adding to pedestrian volumes at this location and potential impacts during construction. • It is expected that only a small percentage of pedestrians that alight from these bus services would access Wynyard Station for the purposes of modal change onto a rail service to access their final destination. However, this would be dependent on the final changes to bus routes and time tabling. • Given the access restrictions resulting from construction works during the construction of the station upgrade, the majority of pedestrians that alight from bus services (that do not have to continue their journey via train) would likely chose to travel along the surface road network rather than underground through the station.
333 George Street redevelopment Pedestrian thoroughfares have been maintained along George Street and Regimental Square. However, the scaffolding has been erected along the site boundaries and the columns along the George Street frontage restrict pedestrian capacity along George Street. The construction of this project would not have a direct interface or impact on Wynyard Station.	• The re-distribution of pedestrian flows that could result from a combination of all projects could increase pedestrian flows through Regimental Square, which is already a key pedestrian route between the Wynyard bus interchange, George Street and Martin Place.

7.11.2.3 Traffic and access

Simultaneous construction of the proposal and the projects listed in **Table 42** would increase the number of construction vehicles accessing a restricted area of the Sydney CBD and would result in cumulative traffic impacts. Cumulative impacts would include further congestion in the areas around the station from increased heavy vehicle movements as well as competing demands from changed traffic conditions, including road and access closures.

The following increases in heavy vehicle movements would be expected as a result of each of the projects:

- The One Carrington Street development would see the generation of approximately 100 heavy vehicles per day at the peak of construction activities (concrete pours), reducing to typically around 60 vehicles per day (GTA consultants, 2014). Building construction works requiring concrete pours would commence around a year into the project construction (mid-2016) (GTA consultants, 2014). Vehicles accessing or departing the site would use Wynyard Lane, York Street, Carrington Street, Margaret Street and Wynyard Street. Work zones would be established on Carrington Street, Wynyard Street and Margaret Street to accommodate construction vehicles (GTA consultants, 2014).
- Wynyard Walk heavy vehicle movements would peak at approximately 178 heavy vehicles per day (or 18 vehicles per hour), and approximately 30 to 50 heavy vehicles per day (or nine vehicles per hour) during non-peak stages of construction (Parsons Brinckerhoff, 2012). Streets between York Street and Hickson Road would be used by heavy vehicles to access and egress construction compounds. There would be some overlap of the peak construction period of the Wynyard Walk with the construction program for this proposal.
- CSELR (First Fleet Park Worksite) heavy vehicle movements would likely peak at around 80 to 100 vehicles per day within the CBD, but would average around three to six heavy vehicles per day (Booz & Company and AECOM, 2013). Heavy vehicle movements would primarily use the Cahill Expressway, George Street (north of Bridge Road) and Hickson Road to access and egress the main site compound in the CBD (located at Circular Quay). However, broader road network implications would be more significant, given the exclusion of general traffic from George Street. The CSELR construction program would overlap with the proposal. Main construction activities for the CSELR would commence approximately two years following the commencement of construction of the proposal.
- Construction has commenced for the 333 George Street redevelopment, which also involves a works zone on Wynyard Lane.

Given the relatively low volumes of construction vehicles associated with the proposal and the restriction of construction activities during commuter peaks, the proposal would not significantly contribute to any potential cumulative impacts.

Minimising potential cumulative impacts on the broader road network in the CBD would be more effectively targeted at the major trip generators, should the peak periods of these projects overlap. However, there would be the need to ensure changes in the road network, construction site access or activities that may impact road performance, are coordinated with the construction activities immediately adjacent to the project.

Construction of the proposal would be impacted by competing construction access restrictions and closures of access points to the station. Construction of the proposed One Carrington Street development would require the partial closure of Wynyard Lane, closure of the Wynyard Lane Car Park, staged closure of the George Street ramps and would impact on access to the Wynyard Lane goods lift. There would also be competing demands within Wynyard Lane Car Park, as well as proposed works zone on Margaret Street. Construction of the CSELR would also restrict the ability to load/unload directly on George Street.

A construction access strategy has been developed for the proposal and is described in **Section 5.5.2**. This involves the adaptive management of construction access as surrounding developments commence, and would be developed further during detailed design and construction staging.

Should simultaneous construction occur, joint access arrangements to the Margaret Street works zone, Wynyard Lane and Wynyard Lane Car Park would need to be coordinated and negotiated with Brookfield so that adverse cumulative impacts do not arise. This would include the level of access that could be provided to the proposal once access to the car park is restricted to Cumberland Street, which would be used jointly used by Brookfield as well as Coles supermarket until the Wynyard Lane goods lift has been replaced (GTA consultants, 2014). Large vehicles would also be unable to use this access, given height restrictions, the small radius at the entry/exit point, the inability to cater for two-way movements and the absence of u-turn movements facilities within the car park (GTA consultants, 2014). If this access can be negotiated with Brookfield, a joint traffic management plan would need to be implemented with the participation of Coles supermarket.

7.11.3 Management and mitigation measures

To address the potential cumulative impact, a coordinated approach is required to environmental management to address noise, traffic and access issues involving Transport for NSW, Brookfield, 333 George Street and construction contractors. This would include a consultative approach to the preparation and review of CEMPs in addition to the following mitigation measures provided in **Table 44**.

Table 44 Cumulative impact mitigation and management measures

ID No.	Mitigation and management measures
C1	The Construction Noise and Vibration Management Plans for surrounding developments would be reviewed to understand the timing of noisy construction activities, and considered in preparing the CVMP for the proposal.
C2	Consultation with key authorities, including Roads and Maritime Services, Sydney Buses and City of Sydney, in addition to Brookfield and contractors responsible for the delivery of the CSELR and the proposed One Carrington Street development, to: • Manage and coordinate changes to the surface road network in the vicinity of Wynyard Station. • Manage and coordinate changes to pedestrian access to and in the vicinity of Wynyard Station, • Ensure access to is maintained at all times and undertake changes to pedestrian access to Wynyard Station outside of commuter peak periods. Outcomes of the consultation would be incorporated into the Construction Environmental Management Plan for the proposal. Forums, such as a CBD Transport Taskforce, would be used where necessary to facilitate coordinated approaches to pedestrian and traffic impact mitigation.
C3	Transport for NSW would continue to consult with Sydney Buses concerning permanent changes to bus routes and scheduling, and potential implications on construction activities associated with the proposal and implement additional measures if necessary
C4	Shared construction traffic access would be negotiated with Brookfield for the use of Wynyard Lane, Wynyard Lane Car Park, Wynyard Lane goods lift and Cumberland Street. If access can be negotiated, a combined Traffic Management Plan would be prepared including engagement with Coles supermarket.
C5	If possible, negotiate a common vehicle loading area on Margaret Street and/or George Street to be used by both the proposal, Brookfield and CSELR, to minimise disruption to construction activities (due to the limited space). Site safety procedures and controls would need to be maintained by both parties.

8 Environmental management

This chapter of the REF identifies how the environmental impacts of the proposal would be managed through environmental management plans and mitigation measures. **Section 8.2** lists the proposed mitigation measures to be implemented in the construction and operational phases of the proposal to minimise the potential impacts of the proposal as identified in **Section 7**.

8.1 Environmental Management Plan

The Construction Environmental Management Plan (CEMP) would provide a centralised mechanism of procedures and controls to manage environmental impacts during construction. It would be prepared within the framework provided by the *Transport for NSW Environmental Management System* (EMS) and the contractor's EMS. It would include, as a minimum, the following components:

- traffic and transport, including pedestrian management
- noise and vibration
- heritage
- waste management
- community and stakeholder communication
- sustainability.

The CEMP would incorporate, amongst others, all environmental mitigation measures identified in **Table 45**, any conditions from licences or approvals required by legislation, and a process for demonstrating compliance with such mitigation measures and conditions. It would be prepared prior to the commencement of construction.

8.2 Mitigation measures

Mitigation and management measures that would be implemented during the construction of the proposal are detailed in **Table 45**.

Table 45 Summary of mitigation measures

ID No.	Mitigation measure
General	
G1	The construction of Wynyard Station Upgrade would be undertaken in accordance with the Transport for NSW Environmental Management System (EMS) and the contractor's EMS.
G2	A Construction Environmental Management Plan (CEMP) would be prepared prior to the commencement of construction.
G3	Methods for the management of impacts would be incorporated into site inductions, training and commencement briefings. .
G4	A Community Liaison Plan would be prepared and implemented to manage consultation during construction. This would detail procedures for the seeking and receiving feedback from the community and businesses, and for procedures to respond to any enquiries or complaints
G5	Contact details for a 24-hour construction response line, project info line and email address would be provided for ongoing stakeholder contact throughout the construction stage. Complaints during construction would be managed in accordance with Transport for NSW's *Community Engagement Policy*.
Noise and vibration	
NV1	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Transport for NSW *Construction Noise Strategy* and the *Interim Construction Noise Guideline*. The CNVMP would include all reasonable and feasible mitigation options to manage the noise emissions from the site and also any complaints which may occur due to the construction activity noise. The CNVMP would include the following: • Identification of nearby residences, other sensitive land uses (e.g places of worship) and businesses (e.g retailers). • Description of approved hours of work. • Description and identification of all construction activities, including work areas, equipment and duration. • Description of work practices (generic and specific) to be applied to minimise noise and vibration. • Details of any necessary out-of-hours work required would form part of the CNVMP. • A complaints handling process. • Noise and vibration monitoring procedures.

ID No.	Mitigation measure
NV2	All receivers impacted by noise from the proposed works which are expected to exceed the construction NMLs would be consulted about the project prior to the commencement of the particular activity, with the highest consideration given to those that are predicted to be most affected as a result of the works. The information provided to the receivers would include: • Programmed times and locations of construction work. • The hours of proposed works. • Construction noise and vibration impact predictions. • Construction noise and vibration mitigation measures being implemented on site. Consultation would be consistent with the requirements of Transport for NSW *Construction Noise Strategy* and the Community Liaison Plan (refer to mitigation measure G4). The highest consideration would be given to receivers that are predicted to be most affected as a result of the works.
NV3	Induction and training would be provided to relevant staff and sub-contractors outlining their responsibilities with regard to noise. Construction workers would be briefed in order to create an awareness of the locality, the location of sensitive receivers and noise mitigation measures.
NV4	Particularly noisy activities should be scheduled for times when they would have the least impact where feasible and reasonable Where there is potential for continued elevated noise levels (including structure-borne noise), consultation with affected retailers, other businesses premises and Sydney Trains personnel would be undertaken to complete noise or vibration intensive activities outside retail business hours, during periods of low retail activities and low passenger numbers, where reasonable and feasible. This would result in additional works being undertaken outside standard construction hours. Undertaking works outside of standard working hours is advantageous as it reduces the impact on retail premises and Sydney Trains' staff and passengers. Negotiations should be undertaken with retail premises within and around the station to determine if periods of respite are appropriate.
NV5	Activities which may need to be conducted outside of standard construction hours, and have not been assessed in this report, would be subject to out-of-hours approval as identified in the Transport for NSW *Construction Noise Strategy*.
NV6	The selection of plant and equipment can have a significant impact on construction noise (including structure-borne levels). Appropriate plant would be selected for each task to minimise the noise contributions.

ID No.	Mitigation measure
NV7	Alternative works methods would be considered and implemented where feasible and reasonable (e.g. saw cutting instead of impact hammering would reduce structure-borne noise). The use of alternative machines that perform the same function e.g. electric/hydraulic in place of diesel; rubber wheeled in place of steel tracked plant) would be considered.
NV8	Equipment would be regularly inspected and maintained to ensure it is in good working order.
NV9	At Wynyard Park compound, noisy equipment would be orientated away from residential and hotel receivers and/or shielded behind structures where feasible and reasonable.
NV10	Where possible, noisy construction works should be conducted behind hoardings subject to the final construction staging strategy. The hoardings should be full height and be constructed from ≥10 mm plywood or similar.
NV11	Truck drivers would be advised of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (i.e. minimising the use of engine brakes, and no extended periods of engine idling).
NV12	Construction sites would be arranged to limit the need for reversing associated with regular / repeatable movements (e.g. trucks transporting spoil) to minimise the use of reversing alarms. Where feasible and reasonable, non-tonal reversing alarms would be used (particularly for vehicles reversing down York Lane), taking into account the requirements of the WHS legislation.
NV13	A noise monitoring program would be considered and implemented to assist in confirming and controlling the site specific potential for disturbance at particularly sensitive receivers, at the commencement of activities identified as having the potential to result in exceedances and periodically during the construction program as the works progress. Measurements would also be undertaken in response to complaints. The results would be reviewed to determine if additional mitigation measures are required. All measurements would be undertaken in accordance with Australian Standard 1055.1-1997 – Acoustics – Description and measurement of environmental noise, Part 1: General procedures. A noise monitoring program would be presented in the CNVMP
Pedestrian management	
P1	Pedestrian access would be maintained to Wynyard Station at all times when the station is open. Adjustments to regular pedestrian routes to and within the Station (e.g. movement of hoardings) would occur outside commuter peak periods.
P2	A pedestrian flow analysis would be completed prior to the commencement of construction based on the final staging strategy. This would assist in identifying minimum width passageways within the public domain based on peak and off-peak commuter movements and to confirm that adequate flows can occur following the closure of the southern concourse, prior to the widening of the northern concourse.

ID No.	Mitigation measure
P3	A Construction Traffic and Pedestrian Management Plan (CTPMP) would be prepared and would be developed in consultation with the Roads and Maritime Services and City of Sydney prior to the commencement of construction. This would be supported by a pedestrian flow analysis and construction wayfinding strategy for the final staging strategy for the proposal: • The establishment and implementation of minimum width walkways within the public domain based on peak and off-peak commuter movements to enable safe passage of pedestrians, guided by the pedestrian flow analysis. • Early removal of redundant structures within the station to minimise unnecessary obstructions to pedestrian flows. • Installation of appropriate signage to support wayfinding and allow public awareness of changed pedestrian flows and conditions. • Managing staging of works to accommodate high-demand special events (e.g. Vivid, New Years Eve) during which public transport is provided in addition to timetabled services and for extended hours. • Monitoring procedures to assess the effectiveness of management measures, and the implementation of corrective action(s) if required.
P4	Pedestrian access would be maintained to Wynyard Station at all times when the station is open. Where possible, construction work within the public domain would be undertaken outside of peak commuter periods to minimise congestion and maintain pedestrian safety. Adjustments to regular pedestrian routes to and within the Station (e.g. movement of hoardings) would occur outside commuter peak periods.
P5	As part of the Community Liaison Plan (refer to mitigation measure G4), procedures would be implemented to provide advance notice of upcoming works that would restrict or disrupt pedestrian movements, and these would be clearly signposted ahead of the construction activity.
P6	Temporary changes to bus infrastructure, as a result of this proposal, would also be communicated to bus commuters using methods such as signage, website updates, transport applications and real time text / SMS updates. The required communication protocols and methods would also be detailed within the CTPMP.

ID No.	Mitigation measure
Traffic and access	
T1	A Construction and Pedestrian Management Plan (CTPMP), as identified in mitigation measure P3, would be also include mitigation and management measures to manage potential traffic and transport impacts. The CTPMP measures, specific to traffic and access impacts, would include: • Signage (for example, deploying temporary speed restrictions, changes to the road environment, traffic management controls). • Traffic control plans for access points and Wynyard Park compound, if used. • Scheduling heavy vehicle movements outside the morning and evening peak periods, where feasible and reasonable. • Temporary bus infrastructure changes in the vicinity of Wynyard Park to accommodate access to the construction compound. Any such changes would be coordinated with Sydney Buses, and would account for rail possessions. • Driver protocols and communication methods to avoid queuing of heavy vehicles on the road network • Contingency measures that would be implemented to manage construction site access in the event that an emergency requires bus services to replace train services at Wynyard Station.
T2	Where feasible, construction vehicle movements would be scheduled outside the weekday peak (7am – 9am, 4pm – 6pm) to minimise disruption to surrounding road network.
T3	Necessary approvals to temporarily occupy Wynyard Lane, York Street, Margaret Street, York Street, York Lane and Cumberland Street (such as Road Occupancy Licences) would be obtained from the relevant authority (City of Sydney and Sydney Harbour Foreshore Authority) prior to works that would require the possession of a road. These would be supported by traffic control plans.
T4	Transport for NSW and the contractor would coordinate with Sydney Buses, any other relevant bus operators and the Traffic Management Centre on required changes to bus infrastructure around Wynyard Park resulting from the Sydney City Centre Bus Infrastructure modifications proposal and Access Strategy. If the establishment of the Wynyard Park compound is required, the same parties would be consulted. This would be considered within the CTPMP.
T5	Consultation with key authorities, including Roads and Maritime Services and City of Sydney, in addition to contractors responsible for the delivery of the CSELR and the proposed One Carrington Street development, would be undertaken to manage potential cumulative traffic and transport impacts in the vicinity of Wynyard Station. If necessary, forums, such as a CBD Transport Taskforce, would also be utilised.

ID No.	Mitigation measure
T6	The traffic management plan will be developed in consultation with Brookfield and Coles supermarket for the use of Wynyard Lane Car Park, Wynyard Lane goods lift and Cumberland Street.
T7	Opportunities to enable deliveries to occur via the George Street ramps would be explored with the CSELR contractor.
T8	As part of the Community Liaison Plan (refer to mitigation measure G4), procedures would be implemented to provide advance notice of upcoming works that would restrict or disrupt the road network, and these would be clearly signposted ahead of the construction activity.
Heritage	
H1	A Heritage Construction Environmental Management Plan (HCEMP) would be prepared and would be developed in consultation with Sydney Trains (Heritage), the Office of Environment and Heritage (Heritage Division) and City of Sydney prior to the commencement of construction. The HCEMP would be prepared by a suitably qualified heritage specialist. The HCEMP would include (but is not limited to): • Identification of heritage items, and known heritage fabric. • Description of work practices (generic and specific) to be applied to avoid and minimise impacts to heritage fabric. • Stop work procedures that would be implemented should original fabric or unexpected historical archaeological relics are discovered during construction. • Procedures to monitor works in sensitive areas, including reporting and notification of accidental damage to heritage fabric.
H2	Prior to the commencement of any demolition works (including reconfiguration of spaces), refurbishment works (including painting) and/or re-purposing of spaces within Wynyard Station and Transport House, annotated plans and a photographic recording would be undertaken of all areas to be modified by the proposal. This includes: • Plans and photographs illustrating the current layout and uses. • Plans and photographs of the original art deco ceiling treatment within the former Railway Refreshment Rooms and the preparation of a Reflected Ceiling Plan which would record the remaining features of the ceiling prior to demolition. • A historic paint test analysis of heritage fabric that would be impacted by the proposal.
H3	Prior to works commencing, contractors shall be briefed as to the sensitive nature of the site and any recommended mitigation measures or controls required.

ID No.	Mitigation measure
H4	In the event that any unexpected historical archaeological relics or original fabric is discovered during construction at the site (including Wynyard Park), works in the affected area(s) would cease and the Office of Environment and Heritage (Heritage division) would be notified. Further assessment, documentation or approval may be required before site works could recommence in the affected area(s). Records of any original finishes exposed during works should be lodged with Transport for NSW. This should include photos, location plans and samples of finishes, as appropriate.
H5	In the event that original fabric is discovered in Wynyard Station or Transport House, the following steps and considerations would be undertaken in consultation with a suitably experienced heritage practitioner as part of the stop work procedures: • If original finishes are discovered, the finishes are to be recorded and sampled in accordance with relevant OEH (Heritage Division) guidelines. • In-situ retention of the features and incorporation into the proposal design, where feasible and reasonable, would be investigated. • If in-situ retention is feasible, methods to remove modern finishes that minimise potential damage to the original fabric would be implemented.
H6	A lighting design for the unpaid concourse would be developed during detailed design in consultation with a suitably experienced heritage practitioner and in consultation with Sydney Trains. The lighting design would include a sympathetic response and transition between the western unpaid concourse (within Transport House) and other areas of the station.
Transport House	
H7	An approval under Section 60 of the *Heritage Act 1977* would be obtained prior to any works associated with the proposal commencing within Transport House.
H8	No structural modifications to the façade of Transport House (along its York Street and York Lane façade) is permitted as part of this proposal.
H9	During detailed design, the refurbishment of the York Street foyer, reconstruction of the western fire staircase and fit out of the basement levels of Transport House (including the western unpaid concourse) would be finalised in consultation with a suitably experienced heritage practitioner and Sydney Trains (Heritage). The design of York Street foyer would investigate opportunities for salvage of any original fabric and/or heritage interpretation associated with Transport House, as well as the integration with Wynyard Walk.
H10	Original tiles and flooring within the western corridor of the York Street foyer are to conserved and retained in-situ, and protected during construction to prevent damage.
H11	An experienced heritage practitioner would supervise the removal of modern fittings within Transport House, including the York Street foyer.

ID No.	Mitigation measure
H12	The position of service utilities (such as power and air conditioning) within the basement levels of Transport House would use existing openings within ceilings/walls where feasible. The location of final openings would be determined in consultation with an experienced heritage practitioner.
H13	Two timber doors located within basement Level 1 of Transport House, which would be removed (after necessary archival recordings have been completed) to accommodate toilet amenities, would be re-used within basement Level 1. All other timber doors found in basement levels of Transport House impacted by the proposal would be retained in situ during the works. Where there is a preventative need to remove them, the doors are to be packed and stored to prevent damage to the doors. The door frames and architraves are to be temporarily protected with a localised timber hoarding/casing.
H14	During detailed design, consideration would be given to feasibility of incorporating design features that meet BCA requirements and reflect the original design of the western fire staircase, including the art deco tiling, stair design and re-use of the original balustrade.
H15	Structural changes below stairs and escalators within Transport House is to be subject to a structural assessment prior to any demolition or modification work being undertaken to prevent damage to remaining heritage fabric.
Wynyard Station	
H16	The extent of disturbance to the decorative profiles of original art deco ceiling treatments associated with the Railway Refreshment Rooms (including the former Grill Room) would be minimised. Remaining portions of the ceiling are to be retained and protected within modern ceiling finishes.
H17	Original balustrades would be retained and protected in situ, or retained and re-used within the station design where direct impacts are anticipated. Original remnant timber handrails, that have not been previously painted, are to be kept as exposed timber. Additional treatments to original balustrades that are required to comply with Building Code of Australia would not significantly obstruct views of the railings.
H18	Original tiles that would be impacted would be recorded and salvaged for re-use elsewhere within the station domain. Where original tiles would require removal, methods to remove the original tiles in a manner that avoids or minimises the potential for damage to the tiles would be implemented.
H19	Where repainting works would involve the stripping of painted original metal elements within the station, testing would be undertaken to ensure no original finishes remain. If original finishes are uncovered, the unexpected finds procedure would apply.

ID No.	Mitigation measure
H20	Where original timber doors on station platforms are to be removed and replaced with modern fire safety compliant doors, an example of the original doors is to be retained either in storage on site, or relocated to Transport Heritage NSW's movable heritage collection
H21	Where feasible, new doors for back-of-house areas on station platforms would be designed to include a heritage styled sheeting to replicate the appearance of the original panelled doors.
H22	Removal or reduction of the rooms below the staircases on the station platforms is to be subject to a structural assessment prior to any demolition or modification work being undertaken to prevent damage to remaining heritage fabric.
H23	The incorporation of station platform signage that reflects the original signage of Wynyard Station would be considered as part of the wayfinding design on Platforms 3 and 4, and Platforms 5 and 6.
Wynyard Park and the former Wynyard Tram Tunnels	
H24	All remnant sandstone and landscape elements within Wynyard Park in proximity to the compound and access route are to be protected during construction works within the curtilage of Wynyard Park (if the compound is required).
H25	The area excavated for the temporary construction hoist at Wynyard Park is to be photographically recorded prior to the demolition of the car park surface, and following the establishment of the cross section which provides depths and stratigraphy, to inform the future management of the area.
Visual amenity	
V1	Construction site hoarding would be regularly maintained, including the prompt removal of graffiti.
V2	Quality finishes and design features would be incorporated into hoardings at appropriate prominent locations within the station public domain and Wynyard Park. This may include project information.
V3	Work spaces within the public domain within the station would be regularly maintained, and where possible, the consolidation of materials and equipment storage behind hoarding
V4	Lighting levels within public domain areas within the station would be considered to ensure pedestrian amenity and safety is maintained.
V5	Temporary structures and compounds would be removed as soon as practicable. The reinstatement works for Wynyard Park would be determined in consultation with City of Sydney.
V6	Should the tree on Margaret Street be removed for the purposes of a works zone for the proposal, tree would be replaced following the completion of construction or at a time to

ID No.	Mitigation measure
	be agreed by City of Sydney. The replacement tree would consist of locally endemic native species (unless otherwise agreed by the Principal Manager Environment) and following consultation with City of Sydney (as landowner).
V7	Should construction access be required through Wynyard Park, urban design features would be investigated to minimise impacts associated with the temporary loss of public space and a reduction of visual amenity. These would include: - Provision of public seating around the hoardings. - Treatment of hoardings to minimise the intrusion into the visual environment and to minimise graffiti risk.
V8	The area impacted by the Wynyard Park compound (if required) would be minimised as much as possible, and would be reinstated to its original condition as soon as practicable once the compound is no longer required for construction. City of Sydney would be consulted concerning the treatment of the compound hoardings and re-instatement works.
V9	The use of artificial lighting would be minimised wherever possible at Wynyard Park, with all lighting designed and installed in accordance with the requirements of *Australian Standard AS4282 Control of the Obstructive Effects of Outdoor Lighting*. Lighting would be directed to ensure glare and light spill is minimised beyond the compound footprint
V10	To manage potential impacts on trees close to the excavation of the temporary construction hoist in Wynyard Park, the following mitigation measures would be implemented: - Prior to the excavation of the concrete ceiling of the underlying car park, soil would be carefully removed to expose the underlying root system. A qualified arborist would be present on site during the soil excavation, and would determine the appropriate method to manage roots within the excavation area to minimise impacts to tree health. - Should roots above 50 mm diameter be discovered within the excavation area, opportunities to adjust the location of the excavation area would be considered, where feasible and reasonable, to avoid the tree roots. Adjustments would need to consider the underlying car park and other nearby trees.
V11	Tree protection measures would be considered for other at-surface activities associated with the Wynyard Park compound during detailed planning and implemented with reference to *Australian Standard AS 4970 – Protection of Trees on Development Sites*
V12	Spaces with direct interfaces with the public domain that are not used for back-of-house activities would be subject to the conditions of a retail strategy currently being prepared by Transport for NSW.
V13	Following the completion of construction, spaces that are not used for back-of-house purposes would be managed until a permanent use has been established, including the

ID No.	Mitigation measure
	prompt removal of graffiti
Land use and business impacts	
L1	As part of the Community Liaison Plan (refer to mitigation measure G4), surrounding businesses would be consulted to provide details regarding construction activities, scheduling and timing of works including timing of noise or traffic intensive activities
L2	Appropriate signage would be installed to support wayfinding and maintain public awareness of businesses which remain operational during construction
L3	Building condition surveys would be completed both before and after the works at potentially affected properties, to identify existing damage and any project related damage
L4	The termination and/or vacation of remaining leases on the concourse is to be staged so that areas are made available to the proposal only as they are needed
L5	A 'dial before you dig' search would be completed for the excavation area associated with the Wynyard Park compound (if required). If necessary the excavation area would to be adjusted, if required, to avoid utilities and with consideration to the underlying car park and tree roots.
L6	Property acquisition (where required), including compulsory acquisition, would be undertaken in accordance with *Land Acquisition (Just Terms Compensation) Act 1991*.
Hazards and Risk	
R1	The storage, handling and use of hazardous materials would be undertaken in accordance with the *Work Health and Safety Act 2011,* the *Work Health and Safety Regulation 2011* and the *Storage and Handling of Dangerous Goods – Code of Practice* (WorkCover, 2005).
R2	The Construction Environmental Management Plan would include measures to ensure the appropriate control and management of hazardous materials: - Cease work immediately in affected areas should suspected asbestos or other hazardous materials be encountered. - Prepare site specific work health and safety plans and safe work method statements. - Provide training for all construction personnel, including safe management of hazardous materials and location and use of spill management equipment where required. - Provide secure, bunded areas for the storage of fuels, oils, paints and other hazardous materials. - Locate construction worksites behind hoardings where practicable. Where possible, works required within areas accessed by the general public would be undertaken outside of peak periods. The work area would be made safe for public access immediately following the work. - Ensure worksites are kept clean and tidy at all times.

ID No.	Mitigation measure
R3	All construction works which are near or around utilities would be carried out in accordance with the following, but not limited to: - *Work Health and Safety Act 2011* - Work near Underground Assets Guide (WorkCover, 2007) - Dial before You Dig Assets Protection Guidelines.
R4	The management of hazardous materials during the operation of the proposal would be consistent with the existing management practices at Wynyard Station and would comply with the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*
Greenhouse gas	
G1	Opportunities to minimise the overall greenhouse gas emissions would be investigated during procurement, design and construction stages of the proposal. These would include: - Use of construction materials containing recycled content, such as recycled aggregates in bricks, or recycled steel, where reasonable and feasible - Use of more energy efficient equipment during construction. - Use of electrical energy derived from a renewable source or the purchasing of Green Power, if available. - Minimising travel distances for the transportation of materials and waste by using local sources for materials and local disposal areas for waste. - Minimising the number of movements associated with the transport of materials and/or waste from the site. - Use of energy efficient electrical operational systems and HVAC systems to maximise energy efficiencies during the operational stage of the proposal (for example, zoned lighting and sensored heating/cooling).
G2	Project planning would be undertaken to ensure that the vehicle movements and construction activities have been planned efficiently and to minimise double handling of materials and waste, haulage distances and fuel use.
Sustainability	
S1	Risks of future climate change would be considered during detailed design by the construction contractor. Where medium or high risks to proposal infrastructure have been identified, the construction contractor would review existing design policies, specifications or practices to consider the impacts of climate change. This would include the incorporation of energy efficiencies into the design to offset or otherwise reduce the impact of energy losses associated with temperature increases.
D2	Stop work thresholds for construction and operation activities (for example, for extreme heat or storm events) would also be implemented in line with current workplace health and safety practices.

ID No.	Mitigation measure
S3	Provide information for workers driving during high rainfall, elevated temperature or extreme weather events which could result in vehicle breakdown. Information should also be provided to passengers, particularly in relation to elevated temperature (hot days).
Air Quality	
A1	The Construction Environmental Management Plan would include management measures to prevent or control the release of pollutants and minimise air quality impacts during construction. These measures would include: - Implementation of dust management measures during excavation and earthworks in Wynyard Park. Measures may include wetting down exposed soil and stockpiles, covering exposed stockpiles, stopping work during windy weather and using hoardings to prevent the spread of soil outside of the work area. - Loading, unloading and operating trucks in a manner that minimises dust impacts to surrounding environment, such as covering loads and utilising skips. - Implementation of dust management measures during demolition, such as provision of hoardings or containment to minimise the spread of dust, wetting down surfaces during demolition and concrete cutting works. - Provision of appropriate extraction and ventilation during demolition and construction works in underground areas particularly during dust intensive activities such as concrete cutting and excavation. - Provision of appropriate extraction, ventilation and personal protective equipment during removal of hazardous materials. - Sweeping and cleaning of the construction areas as well as the broader station areas to minimise the spread of dust. - Maintaining all plant and equipment in good working order in accordance with manufacturer's specifications. - Switching off all plant and equipment when not in use
Waste Management	
W1	Waste materials requiring removal from site would be classified, handled and stored onsite in accordance with *Waste Classification Guidelines* (DECCW, 2009) and *NSW Government Resource Efficiency Policy* (OEH, 2014). Waste generated by the proposal would be disposed to a suitably licensed landfill or waste disposal facility

ID No.	Mitigation measure

W2	A Waste Management Plan (WMP) would be developed as part of the CEMP in accordance with the WARR Act, the legislation and relevant guidelines. The WMP would include the following management measures for each waste stream:
	• Demolition waste and construction waste:
	  • Ensure correct quantities are ordered and delivered to the site.
	  • Investigate the use of recycled materials, including concrete and other construction materials.
	  • Transport concrete and other suitable materials (such as scrap metals and tiles) to designated crushing and recycling plants and concrete and other suitable materials (such as scrap metals and tiles) to designated crushing and recycling plants.
	• General waste and domestic waste:
	  • General waste and recycling bins would be provided on site for construction waste and litter and would be regularly collected and disposed of appropriately.
	• Hazardous waste:
	  • Management of asbestos containing material (ACM) would be undertaken in accordance with:
	  ▪ *Work Health and Safety Act 2011.*
	  ▪ Code of Practice for the Safe Removal of Asbestos 2nd Edition (National Occupational Health and Safety Commission, 2005a).
	  ▪ Code of Practice for the Management and Control of Asbestos in Workplaces (NOHSC, 2005b).
	  ▪ *Protection of the Environment Operations (Waste) Regulation 2005* – clause 42 special requirements relating to asbestos waste.
	  ▪ AS2601:2001 Demolition of Structures.
	  • Removal of ACM would generally involve the following:
	  ▪ Development of a site specific asbestos removal control plan.
	  ▪ Establishing asbestos removal boundaries with appropriate security signage and barriers.
	  ▪ Preparation of the work area.
	  ▪ Use of the wet removal method where feasible and reasonable.
	  ▪ Removal of ACM in sections and placement in suitably labelled and properly sealed asbestos waste containers.
	  ▪ Decontamination of the workplace, tools and personal protective equipment.

W3	Waste management during the operation of the proposal would be consistent with the existing waste management practices at Wynyard Station.

ID No.	Mitigation measure
Cumulative Impacts	
C1	The Construction and vibration management plans for surrounding developments would be reviewed to understand the timing of noisy construction activities, and considered in preparing the CVMP for the proposal.
C2	Consultation with key authorities, including Roads and Maritime Services, Sydney Buses and City of Sydney, in addition to Brookfield and contractors responsible for the delivery of the CSELR and the proposed One Carrington Street development, to: - Manage and coordinate changes to the surface road network in the vicinity of Wynyard Station. - Manage and coordinate changes to pedestrian access to and in the vicinity of Wynyard Station, - Ensure access to is maintained at all times and undertake changes to pedestrian access to Wynyard Station outside of commuter peak periods. Outcomes of the consultation would be incorporated into the Construction Environmental Management Plan for the proposal. Forums, such as a CBD Transport Taskforce, would be used where necessary to facilitate coordinated approaches to pedestrian and traffic impact mitigation.
C3	Transport for NSW would continue to consult with Sydney Buses concerning permanent changes to bus routes and scheduling, and potential implications on construction activities associated with the proposal and implement additional measures if necessary
C4	Shared construction traffic access would be negotiated with Brookfield for the use of Wynyard Lane, Wynyard Lane Car Park, Wynyard Lane goods lift and Cumberland Street. If access can be negotiated, a combined Traffic Management Plan would be prepared including engagement with Coles supermarket.
C5	If possible, negotiate a common vehicle loading area on Margaret Street and/or George Street to be used by both the proposal, Brookfield and CSELR, to minimise disruption to construction activities (due to the limited space). Site safety procedures and controls would need to be maintained by both parties.
Other	
O1	If Wynyard Park compound is required, an erosion and sediment control plan would be prepared using the principles in the Blue Book – Managing Urban Stormwater Soils and Construction (Landcom, 2004).

9 Conclusion

This REF has been prepared in accordance with the provisions of section 111 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposal.

The proposal would:

- Increase concourse capacity for Wynyard Station to meet current and future passenger demand.
- Relieve congestion within the paid concourse area and the platforms by providing effective vertical transportation links between the concourse and the platforms.
- Improve amenity at Wynyard Station, including improved customer experience, station facilities, wayfinding and surveillance.
- Establish a continuous public domain link from Pitt Street and George Street and through to the western CBD and waterfront, that is complementary to the CSELR, Wynyard Walk and the proposed One Carrington Street development and Barangaroo Ferry Hub.

The gateline configuration is subject to detailed design. During detailed design, the configuration may undergo refinement to ensure it maximises customer experience, meets operational requirements and delivers a high standard of architectural design.

The key environmental impacts of the proposal, which would mostly have a temporary impact, include:

- Heritage impacts, including impacts to Transport House, Wynyard Station and Wynyard Park.
- Disruptions to pedestrian flows during construction, including due to the cumulative impacts of surrounding developments.
- Minor disruptions to traffic on the surrounding road network given the increase in construction vehicles and the cumulative impacts that could arise.
- Noise and vibration, and the associated impacts on customer and business amenity.
- Visual impacts during construction due to changes to view lines and the potential temporary loss of open space at Wynyard Park.

This REF has considered and assessed these impacts in accordance with clause 228 of the *Environmental Planning and Assessment Regulations 2000* and the requirements of the EPBC Act (refer to **Chapter 4**). Should the proposal proceed, these impacts would be localised primarily during the construction stage of the proposal and effectively managed through the implementation of the CEMP, mitigation measures and any conditions of approval. The scheduling of construction activities primarily outside peaks would minimise disruption to the

public transport network and customers. While construction works would result in noise and vibration during more sensitive periods of the day, these impacts are minor and manageable. Impacts on heritage items are also considered to be minor and acceptable given the benefits of the proposal. As there would be loss of certain heritage fabric, archival recording and additional measures have been recommended to further minimise any impact on the heritage values of these items.

As a result, the impacts of the proposal are not considered to be significant. Accordingly an environmental impact statement is not required, nor is the approval of the Minister for Planning and the Environment. Approval under the EPBC Act is not required.

The proposal has taken into account the principles of ecologically sustainable development. These would be considered further in the design, procurement, construction and operational phases of the proposal. This would enable the proposal to be delivered in a sustainable manner which maximises community benefits, is cost effective and minimises adverse impacts on the environment.

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Appendix A – Consideration of clause 228(2) factors

Factor	Impact
a. **Any environmental impact on a community**?	
Some adverse impacts on the community are anticipated during construction, particularly with respect to pedestrian movement, noise and visual amenity. Mitigation measures are outlined in Chapter 8 to manage and minimise adverse impacts. The proposal would also result in long term positive impacts given the increase in capacity at the station to cater for the existing and future domain, the general improvements to pedestrian flows through the station domain, and the connectivity to other main pedestrian links and employment areas such as Wynyard Walk.	Minor short term negative and long term positive impacts.
b. **Any transformation of a locality?**	
The public domain would be transformed as a result of the visual improvements to the station. This is anticipated to provide an improved urban environment. Some impacts would occur to the heritage values of items of the station fabric. However, opportunities to retain and/or integrate heritage features (where appropriate) would maintain the heritage values of these buildings. Above ground, there would not be a significant transformation to the locality in the long term. However, Wynyard Park would be used temporarily for construction purposes. However, no structures or trees would be removed to cater for this compound and the area of park would be reinstated.	Minor short term negative and long term positive impacts.
c. **Any environmental impact on the ecosystems of the locality?**	
The proposal is located in a highly urbanised environment with limited ecological value. The majority of the site is located underground. Above ground works would be undertaken in Wynyard Park.	If Wynyard Park is used there may be some short term noise impacts on fauna proximate to the works, however given the highly urbanised nature of the park these impacts would be negligible. Any potential impact on the fig tree would be dependent on the impacted root zone but would unlikely result in long lasting impacts on the tree. Mitigation to ensure adequate protection is provided to supporting features such as tree roots would be implemented.

Factor	Impact
	A tree on Margaret Street may need to be trimmed or removed. If removed, the tree would be replaced with a species as agreed with City of Sydney. The removal of the tree would have a minor negative impact.
d. **Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?**	
The proposal would transform the station aesthetic and would improve the visual quality of this space. Transport House and Wynyard Station are also valued for historic reasons. However, the areas impacted by the proposal have undergone previous upgrades that have impacted on the heritage fabric of these spaces. The proposal would retain, where possible, remaining examples of the heritage fabric. The proposal would impact on Wynyard Park, which has recreational, aesthetic and heritage values. However, no structures would be directly impacted and impacts would be temporary while the construction compound is required.	Minor negative impact
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	
As detailed above, there would be impacts on the heritage values of Wynyard Station, Transport House and Wynyard Park. These impacts are considered to be minor, and mitigation and management measures are detailed in Chapter 7 and Chapter 8.	Minor short term negative impact
f. Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?	
A search of the Atlas of NSW wildlife identified two endangered fauna populations listed under the Threatened Species Conservation Act, 1995 that have been recorded, or their potential habitat recorded proximate to Wynyard Station. These are the White-fronted Chat and the Long-nosed Bandicoot.	As the majority of the works for the proposal would be undertaken underground, and where works are undertaken above ground they would be undertaken on highly disturbed land in and around Wynyard Park and Wynyard Station, the proposal is not expected to have an impact on protected fauna habitat.
g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	

Factor	Impact
Nil	Nil
h. Any long-term effects on the environment?	
Given the highly urbanised environment of the proposal site, the proposal is unlikely to result in significant long term effects on the environment.	Nil
i. Any degradation of the quality of the environment?	
The proposal would result in impacts on the local environment of the surrounding areas during construction, such as noise and vibration. This would have a minor negative impact.	Minor negative impact
j. Any risk to the safety of the environment?	
Safety hazards would be managed during construction in accordance with appropriate safet work method statements (or similar). Management and mitigation measures have been recommended to minimise risks to the environment as a result of construction activities. Potential safety impacts for pedestrians and commuters would be minimised primarily through construction scheduling. Positive safety impacts would also occur as a result of the proposal, given the improvements to pedestrian flows within the station domain.	Minor short term negative and long term positive impact
k. Any reduction in the range of beneficial uses of the environment?	
Given the highly urbanised environment of the proposal site, the proposal would not reduce the range of beneficial uses of the environment.	Nil
l. Any pollution of the environment?	
There is the potential for short-term noise and air pollution during construction. These impacts would be managed through the implementation of the recommended mitigation and management measures. The operation of the proposal is not anticipated to result in any pollution to the environment as the station would not increase the frequency of train services.	Minor short term negative and long term positive impact

Factor	Impact
m. Any environmental problems associated with the disposal of waste?	
All waste would be managed and disposed in accordance with the EPA *Waste Classification Guidelines*. Mitigation measures and sustainability objectives have been proposed in Chapter 7 and Chapter 8. This would be implemented to ensure waste is reduced, recycled or re-used where applicable.	Minor short term negative impact
n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	
There would be no significant demand on resources for the construction of the proposal that would result in a short supply of resources (natural or otherwise)	Minor short term negative impact
o. Any cumulative environmental effect with other existing or likely future activities?	
Cumulative impacts have been identified in Section 7.11. There would be short term negative impacts given construction activities associated with Wynyard Walk, CSLER and One Carrington Street development. Where feasible, environmental management measures would be coordinated, and construction access negotiated.	Minor short term negative impact
p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	
The proposal is primarily underground and would not affect, or be affected by, coastal processes or coastal hazards, including those under projected climate change conditions.	Nil

Appendix B – Consideration of national environmental significance

Factor	Impact
a. Any impact on a World Heritage property?	
There would be no impact on World Heritage Properties as a result of the proposal as there are no World Heritage Properties in the vicinity of the station. The closest World Heritage Properties to Wynyard Station is the Sydney Opera House 1.4 kilometres north-east.	Nil
b. Any impact on a National Heritage place?	
There are no World Heritage Places within the vicinity of or adjacent to Wynyard Station, thus there would be no impact on any property currently on the Department of the Environment Heritage Lists.	Nil
c. Any impact on a wetland of international importance?	
There would be no impact to wetlands of international importance as a result of the proposal. The closest Ramsar wetland is the Towra Point Nature Reserve, located 15 kilometres south of Wynyard Station, at Kurnell.	Nil
d. Any impact on a listed threatened species or communities?	
One listed threatened ecological community has been recorded in the area surrounding the proposal, the Western Sydney Dry Rainforest and Moist Woodland on Shale. 57 listed threatened species have either been recorded, or their potential habitat recorded proximate to Wynyard Station. As the majority of the works for the proposal would be undertaken underground, and where works are undertaken above ground they would be undertaken no highly disturbed land in and around Wynyard Park and Wynyard Station, the proposal would not have an impact on Commonwealth listed threatened species and ecological communities.	Nil
e. Any impacts on listed migratory species?	
60 listed migratory species have either been recorded, or their potential habitat has been recorded within the area surrounding the proposal. As the majority of the works for the proposal would be undertaken underground, and where works are undertaken above ground they would be undertaken no highly disturbed land in and around Wynyard Park and Wynyard Station, the proposal would not have an impact on Commonwealth listed threatened species and ecological communities.	Nil

Factor	Impact
f. Any impact on a Commonwealth marine area?	
The proposal is not located within or adjacent to a Commonwealth marine area. There would be no direct or indirect impact upon a Commonwealth marine area arising as a result of the works.	Nil
g. Does the proposal involve a nuclear action (including uranium mining)?	
The proposal would not involve any nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	
No. It would also not involve a coal seam gas or coal mining development.	Nil