CUMULATIVE IMPACTS

CHAPTER TWENTY-SIX

26 Cumulative impacts

This chapter provides an assessment of the potential cumulative impacts as a result of the project, and identifies mitigation measures to minimise these impacts.

26.1 Secretary environmental assessment requirements

The Secretary's environmental assessment requirements relating to cumulative impacts, and where these requirements are addressed in this Environmental Impact Statement, are outlined in Table 26-1.

Table 26-1 Secretary's environmental assessment requirements – cumulative impacts

Ref.	Secretary's environmental assessment requirements	Where addressed
2. Environmental Impact Statement		
2.1 (m)	an assessment of the cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed (for example WestConnex, Barangaroo, and any approved construction in the relevant precincts)	This chapter, specifically Section 26.3.
2.1 (o)	A chapter that synthesises the environmental impact assessment and provides: ○ the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts.	Appendix G (Synthesis of the Environmental Impact Statement).
3.2(c)	For each key issue the Proponent must: identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts;	This chapter, specifically Section 26.3.
7.1	The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance	Cumulative heritage impacts are described in Section 26.3. Heritage impacts of the project are described in Chapter 14 (Non-Aboriginal heritage) and Chapter 15 (Aboriginal heritage).
10.2	The Proponent must assess impacts from construction and operation on potentially affected properties, approved development applications, businesses, public open space, recreational users and land and water users (for example, recreational and commercial fishers, oyster farmers), including property acquisitions/adjustments, access, amenity and relevant statutory rights.	Approved development applications and potential cumulative impacts are described in Sections 26.2 26.3.
13.1(g)	Details of how construction and scheduling of works are to be coordinated in regard to public events; cumulative traffic impacts resulting from concurrent work on Westconnex, Barangaroo, Sydney Light Rail and other key construction projects in the Sydney CBD;	Cumulative traffic impacts on the Sydney CBD are described in Section 26.3. Construction traffic and transport impact of the project are described in Chapter 8 (Construction traffic and transport).

26.2 Assessment methodology

26.2.1 Overview

Cumulative impacts would occur when impacts from the project interact or overlap with impacts from other projects and potentially resulting in a larger overall impact.

The selection of projects assessed as part of this cumulative impact assessment was based on the following criteria:

- **The project location** – projects in close proximity to the Sydney Metro Chatswood to Sydenham where there is potential for impacts to spatially overlap. This included potential for shared use of roads for construction access
- **The project timeframe and planning approval** – only projects likely to be built concurrently with the Sydney Metro Chatswood to Sydenham project were assessed. This includes relevant projects currently under construction and / or projects that have planning approval. Projects at a conceptual or pre-approval stage were identified for completeness but generally not assessed due to uncertainty around project scope and / or timeframe
- **The project size** – projects considered in this assessment are typically large-scale developments that would involve one or more of the following criteria:
  - Substantial temporary changes to existing traffic conditions, including traffic generation and changes to traffic flows, large truck movements and disruptions to key access routes
  - Substantial temporary changes to the existing noise environment
  - Impacts on numerous and / or significant heritage items
  - Substantial changes to the existing land use
  - Substantial changes to the existing urban landscape.

Key issues (based on the outcomes of the risk assessment in Chapter 28 (Environmental risk analysis)) and any cumulative issues explicitly identified in the Secretary's environmental assessment requirements were considered for all sites as part of the cumulative impact assessment. These key issues were identified as operational traffic and transport, construction traffic and transport, construction noise and vibration, non-Aboriginal heritage, and social impacts and community infrastructure. In addition to these key issues, other impact issues were considered where there was likely to be potential cumulative impacts given the nature of the likely interaction with adjacent projects.

The potential cumulative impact associated with land use and property; Aboriginal heritage; groundwater and geology; soils, contamination and water quality; biodiversity; flooding and hydrology; hazard and risk; waste management; and sustainability were considered to be of a minor nature. The mitigation measures identified in this Environmental Impact Statement are considered appropriate and adequate to address any potential residual cumulative impacts for these other issues.

Projects assessed as part of this cumulative impact assessment are described in Table 26-2 along with their likely timeframe and proximity to the project.

Table 26-2 Projects assessed as part of the cumulative impact assessment

Project and date	Relevant Suburb(s)	Project details and proximity to the project
Sydney Metro Northwest **2013-2019** **(Approved project)**	• Chatswood	The Sydney Metro Northwest project involves the construction of a 23 kilometre metro rail line, including 15.5 kilometre twin tunnels, eight new railway stations and associated car parking facilities between Cudgegong Road and Cherrybrook in Northwest Sydney. The project includes the conversion of the Epping to Chatswood Rail Line to metro standards, various adjustments to Chatswood Station and adjacent rail infrastructure up to the opening of Sydney Metro Northwest in 2019. It also includes a new 33kV underground transmission line between Ausgrid's Willoughby subtransmission substation and Transport for NSW's Chatswood North traction substation. The closest project construction site would be the Chatswood dive site (northern).
WestConnex Stage 2: New M5 (Beverley Hills to St Peters) **2015 – 2019** **(Project approved)**	• Tempe • Sydenham • St Peters	Stage 2 of WestConnex: the New M5 – would run from the existing M5 East corridor at Beverly Hills via a tunnel to St Peters. The New M5 would include: • Twin tunnels that would more than double capacity along the M5 East corridor and provide motorway access to north of Sydney Airport • An interchange at an industrial site at St Peters • Connections from the interchange to key roads, including Campbell Road / Street, Euston Road and across the canal to Bourke Road • Widening of Campbell Road / Street and Euston Road. Work commenced in late 2015, with the upgrading of the M5 – King Georges Road interchange. The closest project construction site would be the Marrickville dive site (southern). While not adjacent, the dive footprint would be close to the St Peters interchange.
WestConnex Stage 3: M4–M5 link **2019-2023** **(Project not yet approved)**	• Alexandria • Erskineville • St Peters	Stage 3 of WestConnex would deliver an 8.5 kilometre motorway tunnel with three lanes in each direction between the first two stages, linking the M4 and M5 corridors. The alignment would provide a western bypass of the Sydney CBD. It would generally run north of the Parramatta Road corridor from Haberfield with connections at Rozelle before heading south near Camperdown and connect to St Peters Interchange. The closest project construction sites would be Central Station and Marrickville dive site (southern).

Project and date	Relevant Suburb(s)	Project details and proximity to the project
CBD and South East Light Rail **September 2015 – 2019** **(Approved project)**	• Surry Hills • Sydney	The 12 kilometre CBD and South East Light Rail project will extend from Circular Quay along George Street to Central Station, through Surry Hills to Moore Park, then to Kensington and Kingsford via Anzac Parade and Randwick via Alison Road and High Street. The project will include: • Light rail stops • Excavation of roadways to relocate utilities • Major interchanges with ferry, heavy rail and bus services • A pedestrian zone on George Street between Bathurst and Hunter streets • Public domain improvements including possible new public spaces, paving, trees, lighting and street furniture • Substations to provide power for the light rail vehicles • A stabling facility in Randwick and a maintenance depot in Rozelle. The closest project construction sites would be Barangaroo, Martin Place, Pitt Street and Central Station.
McMahons Point Wharf Interchange upgrade **(Approved project)**	• McMahons Point • Blues Point	The McMahons Point Wharf Interchange upgrade involves the redevelopment of the wharf interchange at Henry Lawson Avenue, McMahons Point. The main elements will include: • Removal of existing McMahons Point Wharf • Construction of a new Wharf interchange comprising a covered shelter, an uncovered bride and gangway and an uncovered dual berth pontoon • Landside works including realignment of the kerb and gutter on Henry Lawson Avenue. The closest project site would be the Blues Point temporary site.
One Carrington Redevelopment **2015 – 2018** **(Approved project)**	Sydney	The One Carrington project involves upgrading the eastern entries to Wynyard Station and constructing a 27-storey commercial building above a shopping centre. The project also includes refurbishing the adjoining heritage listed buildings, 285 George Street and Shell House. About 85,000m2 of commercial and retail floor area are proposed. The closest project construction site would be Barangaroo Station.

Project and date	Relevant Suburb(s)	Project details and proximity to the project
Barangaroo **Central Barangaroo: mid 2017 – 2023 (Approved concept)** **Barangaroo South: 2012 – 2021 (Approved project)**	Sydney	The 22ha Barangaroo precinct is being redeveloped on the western edge of Sydney Harbour. Barangaroo is divided into three areas (from north to south): • Barangaroo Reserve (complete) • Central Barangaroo • Barangaroo South. The 5.2ha Central Barangaroo will be the last part of Barangaroo to be completed. The current master plan (April, 2014) provides buildings with up to 150,000m2 of gross floor area. Barangaroo South will provide a mixed-use precinct of commercial office buildings, residential apartments, an international hotel, shops, cafes, restaurants, and cultural facilities. Direct public transport connections will be provided including a major pedestrian connection through to Wynyard Station and the city. The closest project construction site would be Barangaroo Station, directly adjacent to the Central Barangaroo development site.
60 Martin Place Redevelopment **2016 – 2019** **(Approved project)**	Sydney	60 Martin Place will be a 32-storey, 40,000m2 office tower with frontages on Martin Place, Phillip Street and Macquarie Street. The project will include demolition of an existing 28-storey office tower. The closest project construction site would be Martin Place Station, with the southern construction site one block to the west of 60 Martin Place.
115 – 119 Bathurst Street Redevelopment **2015 – 2017** **(Approved project)**	Sydney	115-119 Bathurst Street will be a 54 storey mixed-use development, including retail, commercial, residential and hotel accommodation. The project will include the adaptive reuse of an existing heritage-listed Sydney Water building and the partial demolition and redevelopment of an adjacent building. The closest project construction site would be the Pitt Street construction site, which would be one block to the north of 115-119 Bathurst Street.
Sydney Metro City & Southwest Sydenham to Bankstown upgrade **2017 – 2023** **(Project not yet approved)**	• Sydenham • Marrickville	The Sydney Metro Sydenham to Bankstown upgrade would include an upgrade of 13.5 kilometres of the T3 Bankstown Line between Sydenham and Bankstown. The work between Sydenham and Bankstown would include upgrading the corridor and stations, with improvements to wayfinding and signage. The closest project construction site would be the Marrickville dive site (southern), which would adjoin with the eastern extent of the Sydenham to Bankstown upgrade.

Project and date	Relevant Suburb(s)	Project details and proximity to the project
Sydney Metro over station developments **(Project(s) not yet approved)**	• Crows Nest • North Sydney • Sydney	Sydney Metro over station developments are proposed for the following stations: • Crows Nest • Victoria Cross • Martin Place • Pitt Street • Waterloo. The nature of the over station development is not currently known. It is assumed that the construction of the over station development would be concurrent to the Sydney Metro Chatswood to Sydenham project.

Other planned projects that may result in cumulative impact but that have not yet been approved are identified in Table 26-3. A number of local strategic plans have also been considered in Table 26-3 as they influence subsequent development that has the potential to result in cumulative impacts with the Sydney Metro Chatswood to Sydenham project.

Where relevant, these projects have been identified but the potential impacts have not been considered given the uncertainty of the status and timing of these projects.

Table 26-3 Other projects and programs with potential cumulative impacts

Project	Relevant suburb(s)	Project details and proximity to the project
Mowbray Road / Pacific Highway intersection (further upgrade) **(Project not yet approved)**	• Chatswood	Roads and Maritime are currently investigating upgrades to the Mowbray Road / Pacific Highway intersection, that would be additional to those proposed as part of the Sydney Metro Chatswood to Sydenham project. The extent of any future upgrades has not yet been determined.
St Leonards Central **(Project deferred and not yet approved)**	• St Leonards • Artarmon	St Leonards Central is a proposal to consolidate four parcels of land and rail corridor by developing public space and three mixed-use towers over the rail corridor north of The Forum and east of the rail corridor, next to Christie Street. In early 2016 the State government decided not to progress the unsolicited proposal for this development. However, a revised proposal may be made in the future. If progressed, there would be potential for construction timeframes to overlap and for cumulative impacts with the construction of Crows Nest Station.
St Leonards / Crows Nest Planning Study **(Planning study – not a specific project)**	• St Leonards • Crows Nest	In October 2012, North Sydney Council formally adopted the St Leonards / Crows Nest Planning Study, which outlines the strategic objectives for the area to guide development and urban renewal. North Sydney Council resolved in September 2015 to defer planning work on Precinct 4 pending announcements by the NSW Government regarding the location and commissioning of the Metro Station in Crows Nest. Consequently, no detailed project or construction information for potential development in the vicinity of the Crows Nest Metro Station.

Project	Relevant suburb(s)	Project details and proximity to the project
North Sydney Centre Traffic and Pedestrian Study network projects **(Implementation of initiatives not yet approved)**	North Sydney	A detailed transport planning analysis of the existing transport network and travel behaviour has been undertaken in North Sydney. The study recommendations are focused on prioritising pedestrians in the North Sydney centre around the Pacific Highway and Miller Street by improving connectivity, amenity and mobility. The recommendations include a range of initiatives such as: • New mid-block pedestrian crossings • Upgrading of Miller Street • Changes in traffic operation on the Pacific Highway • Opportunities for shared zones • Footpath widening • New taxi ranks. The timing for implementation of recommendations will depend on a number of factors. These include the need for further approvals from council's Traffic Committee or State authority approval, and the possible incorporation of recommendations into existing or planned projects. There is potential for projects associated with this initiative to overlap and have cumulative impacts associated with the construction of Victoria Cross Station.
Brett Whiteley Place development **(Project not yet approved)**	North Sydney	The upgrade of Brett Whiteley Place at the corner of Pacific Highway and Mount Street at North Sydney involves an expanded pedestrian space that includes the existing Brett Whiteley Place and Elizabeth Plaza, as well as portions of the Denison Street and Mount Street shared zones. There is also potential to expand the plaza for retail, creative and public use. The concept plan has been exhibited and is currently being finalised. Indicative dates for this work are not currently available. There is potential for future construction timeframes associated with Stage Two and beyond to overlap and for cumulative impacts associated with the construction of Victoria Cross Station.
AMP Circular Quay redevelopment **(Project partially approved)**	Sydney	The AMP redevelopment at Circular Quay comprises a 1.1ha site that includes 33 Alfred Street, 50 Bridge Street and a number of properties at Young and Loftus streets Stage 1 development approval for the building envelopes and design parameters of the precinct was granted in June 2014. Stage 2 development applications have been lodged for all sites, with the exception of 33 Alfred Street and 12-14 Loftus Street. Stage 2 approvals have been granted for redevelopment of the main AMP tower at 50 Bridge Street. Stage 2. Deferred commencement has been granted on the Stage 2 development application for 2-10 Loftus Street, 16-20 Loftus Street, 9-13 Young Street and 15-17 Young Street. Construction timing is yet to be confirmed, although it is anticipated that construction would start in 2017 and be completed in 2019 or 2020. There is potential for construction timeframes to overlap and cumulative impacts associated with the construction of Martin Place Station.

Project	Relevant suburb(s)	Project details and proximity to the project
Sandstone buildings – Bridge Street, Sydney **(Project not yet approved)**	Sydney	The NSW Government is selling a long term lease of two historic sandstone buildings on Bridge Street that are currently used as government offices. The purchaser of the lease proposes to redevelop the site as a luxury hotel. There is potential for an additional three storeys to be added to the buildings. The project is in the planning phase, with construction timing to be confirmed, although it is anticipated that construction would commence in 2018 and be completed by 2021. There is potential for construction timeframes to overlap and cumulative impacts associated with the construction of Martin Place Station.
410 Pitt Street Redevelopment **(Project not yet approved)**	Sydney	Demolition of an existing building and the construction of a 33 storey hotel is proposed for 410 Pitt Street by a private developer. The proposal is currently in a state of deemed refusal with an appeal to the Land and Environment Court lodged. If the appeal is successful, there is potential for construction timeframes to overlap, with cumulative impacts associated with the construction of Pitt Street Station.
505-523 George Street Redevelopment **(Project not yet approved)**	Sydney	Development of a 70 storey residential and retail tower is proposed for 505-523 George Street by a private developer. The proposal is in the planning phase, with amendments to existing planning controls endorsed by The Central Sydney Planning Committee to enable the development of the proposal. There is potential for construction timeframes to overlap, with cumulative impacts associated with the construction of Pitt Street Station.
116 Bathurst Street Redevelopment **(Project has deferred commencement consent)**	Sydney	A 36 storey mixed-use development is proposed for 116 Bathurst Street by a private developer. The proposal includes the restoration of an existing heritage building on the site and demolition of other existing structures. The proposal has deferred commencement consent. If commencement requirements are met, there is potential for construction timeframes to overlap, with cumulative impacts associated with the construction of Pitt Street Station.
Town Hall Square Precinct Urban Design Strategy **(Strategy – not a specific project)**	Sydney	The City of Sydney Council has investigated the creation of a new civic square opposite Town Hall. This would involve the demolition of several buildings and the creation of a new public domain. The strategy is currently in the planning phase, with construction timing to be confirmed. There is potential for construction timeframes to overlap and cumulative impacts associated with the construction of Pitt Street Station.

Project	Relevant suburb(s)	Project details and proximity to the project
University of Technology Sydney (UTS) Central project **(Concept approved, project not yet approved)**	Ultimo	The UTS Central project involves the extension of the UTS Tower on Broadway to include new private and public space. Construction is anticipated to commence in late 2016 and be complete in 2019. The modification to the approved concept plan (relating to gross floor area, building height and building envelope) was approved in March 2016. There is potential for construction timeframes to overlap and cumulative impacts associated with the construction of the metro platforms at Central Station.
Central Park (future stages) **(Project not yet approved)**	Chippendale	Central Park is a multi-stage $2 billion mixed-use development on the former Carlton and United brewery site. Construction began in 2010 and is due to be finish in 2020. Projects that may be constructed between 2017 and 2020 include Kensington Street and Abercrombie Street student accommodation, and residential apartments on Wellington Street and O'Connor Street. The specific construction timeline for future stages of Central Park is yet to be confirmed. There is potential for construction timeframes to overlap and cumulative impacts associated with the construction of the metro platforms at Central Station.
Central to Eveleigh Urban Transformation and Transport Program **(Projects within program not yet approved)**	• Sydney • Redfern	The Central to Eveleigh Transformation Program is a 30-year project to develop 80ha of largely under-used State Government land in and around the rail corridor between Central, Macdonaldtown and Erskineville stations. The project extends for three kilometres and includes Central and Redfern stations, Australia Technology Park, Eveleigh Rail Yards and the airspace above the railway lines. The program is at the strategic planning stage and the initial construction timeline is yet to be confirmed. There is potential for construction timeframes to overlap and for cumulative impacts associated with the construction of the metro platforms at Central Station and the new station at Waterloo.
Waterloo transformation project **(Project not yet approved)**	Waterloo	The NSW Government plans to transform the area around Waterloo to encourage the introduction of new homes, jobs, parks and community facilities to meet the needs of a growing Sydney. The project is in the initial stages of strategic planning and any construction timeline is yet to be confirmed. There is potential for construction timeframes to overlap and for cumulative impacts associated with the construction of the metro station at Waterloo.

26.3 Potential impacts

This section describes the cumulative impacts based on likely interactions with the projects described in Table 26-2 and Table 26-3.

The cumulative impacts listed would likely arise if these projects were constructed during the same time period as the project. Impacts outlined in each table are unmitigated potential cumulative impacts. Mitigation measures are included in Section 26.4.

26.3.1 Chatswood dive site (northern)

The construction of the Chatswood dive site would have potential cumulative impacts associated with the Sydney Metro Northwest project. Key activities associated with this project that may result in cumulative impacts include:

- Construction activities in the vicinity of Chatswood Station
- Additional buses in the vicinity of Chatswood during the conversion of the Epping to Chatswood Rail Line
- Construction activities associated with the 33 kV feeder from the Willoughby subtransmission substation to the Chatswood North Traction Substation around Artarmon and Chatswood.

These cumulative impacts are identified in Table 26-4.

Table 26-4 Chatswood dive site (northern) – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation
Sydney Metro Northwest	
Operational traffic and transport	• The Chatswood to Sydenham project is an extension of Sydney Metro Northwest. As such, the operation of the two projects would provide cumulative transport related benefits. Further details of the benefits are provided in Chapter 3 (Strategic need and justification).
Construction traffic and transport	• Shared use of key roads by light and heavy construction vehicles including Pacific Highway, Railway Street, Brown Street, Victoria Avenue, Thomas Street, Albert Avenue and Brand Street • Additional delays for general traffic on the Pacific Highway due to construction vehicle movements to and from the construction sites and additional bus movements associated with the Epping to Chatswood Rail Line conversion • Additional traffic delays due to road occupation, eg at Brand Street, Artarmon for the 33 kV works • Potential for additional track possessions, and impacts to rail customers, to carry out works within the rail corridor.
Construction noise and vibration	• Additional temporary increase in noise and vibration around Chatswood Station and Artarmon.
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.
Social impacts and community infrastructure	• No cumulative impacts greater than a minor nature are expected.

If approved, the following proposed project (described in Table 26-3) may result in cumulative impacts with the Chatswood dive site:

- Mowbray Road / Pacific Highway Intersection (further upgrade).

26.3.2 Artarmon substation

There would be no interactions that are expected to result in cumulative impacts between construction of the Artarmon substation and the projects described in Table 26-2 or Table 26-3.

26.3.3 Crows Nest Station

The key cumulative impacts associated with the proposed Crows Nest Station would largely relate to the impacts associated with the proposed over station development. As discussed in Chapter 6 (Project description – operation), impacts of over station development would be assessed under a separate approval process and would also be required to take into account the impacts of this project. Expected cumulative impacts are identified in Table 26-5.

Table 26-5 Crows Nest Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation
Sydney Metro Chatswood to Sydenham over station development	
Operational traffic and transport	• No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	• Shared use of key roads by light and heavy construction vehicles including Pacific Highway, Hume Street, Clarke Street and Oxley Street • Additional delays for general traffic on the Pacific Highway due to construction vehicle movements to and from the construction sites • Additional vehicles turning right onto Oxley Street from the Pacific Highway • Additional temporary road closures on Hume Street.
Construction noise and vibration	• Additional temporary increase in noise and vibration around the Crows Nest Station site.
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.
Social impacts and community infrastructure	• No cumulative impacts greater than a minor nature are expected.
Landscape character and visual impacts	• Additional temporary landscape and visual impacts due to construction occurring at both ground level and above the station • Additional night-time light spill.
Air quality	• Additional temporary reduction in air quality around the Crows Nest Station site.

If approved, the following proposed projects and strategic plans (described in Table 26-3) may result in cumulative impacts with the Crows Nest Station site:

- Projects associated with the St Leonards / Crows Nest Planning Study
- St Leonards Central development.

26.3.4 Victoria Cross Station

The key cumulative impacts associated with the proposed Victoria Cross Station would largely relate to the impacts associated with the proposed over station development. As discussed in Chapter 6 (Project description – operation), impacts of over station development would be assessed under a separate approval process and would also be required to take into account the impacts of this project. Expected cumulative impacts are identified in Table 26-6.

Table 26-6 Victoria Cross Station – potential cumulative impacts

Environmental impact	Projects and potential cumulative environmental impacts without mitigation
Sydney Metro Chatswood to Sydenham over station development	
Operational traffic and transport	• No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	• Shared use of, and additional delays on, key roads by light and heavy construction vehicles, including the Pacific Highway, and McLaren, Miller and Berry streets • Additional temporary road closures around the Victoria Cross Station site.
Construction noise and vibration	• Additional temporary increase in noise and vibration around the Victoria Cross Station site.
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.
Social impacts and community infrastructure	• No cumulative impacts greater than a minor nature are expected.
Landscape character and visual impacts	• Additional temporary landscape and visual impacts due to construction occurring at both ground level and above the station • Additional night-time light spill.
Air quality	• Additional temporary reduction in air quality around the Victoria Cross Station site.

If approved, the following proposed projects (described in Table 26-3) may result in cumulative impacts with the Victoria Cross Station site:

- Projects associated with the North Sydney Centre Traffic and Pedestrian Study Brett Whiteley Place redevelopment.

26.3.5 Blues Point temporary site

The use the Blues Point temporary site may have potential cumulative impacts associated with the proposed McMahons Point Wharf Interchange upgrade. At this stage, the McMahons Point Wharf Interchange upgrade is proposed to commence in 2016 and take around six months to complete, and the Sydney Metro activities at Blues Point are not anticipated to start until early 2019. As such, there is not anticipated to be any overlap of construction timeframes. Additionally, the Blues Point temporary site would not involve any operational infrastructure. Based on the above cumulative impacts are not expected to occur during construction or operation.

26.3.6 Sydney CBD – overview of potential cumulative impacts

The Sydney CBD is experiencing and will continue to experience an unprecedented level of development in the coming years. This includes:

- Changes associated with the implementation of the Sydney City Centre Access Strategy (Transport for NSW, 2013a) including major transport projects such as the CBD and South East Light Rail, the pedestrianisation of George Street between Hunter Street and Bathurst Street, the new CBD Bus Strategy and the cycleway program
- Continuation of the Barangaroo development
- A number of property redevelopments.

The impact assessments carried out for this project have to a large extent already taken into account these other projects where relevant. For example, the construction traffic and transport assessment is based on the closure of George Street to vehicular traffic and other road network changes associated with the CBD and South East Light Rail.

The construction of the project would involve the use of six construction sites through the Sydney CBD, being:

- Barangaroo Station
- Martin Place Station north
- Marin Place Station south
- Pitt Street Station north
- Pitt Street Station south
- Central Station.

With respect to cumulative impacts the main issue for the Sydney CBD is expected to be construction traffic. At this stage, the following potential key conflict points have been identified:

- Hickson Road, Sussex Street and the Western Distributor – as a construction haul route for Barangaroo, CBD and South East Light Rail and the Sydney Metro Barangaroo Station site
- Druitt and Bathurst streets – to access the Sydney Metro Pitt Street Station sites, and the potential interface with CBD and South East Light Rail works on George Street in these locations
- Chalmers Street and Eddy Avenue – to access the Sydney Metro Central Station site, and the interface with the construction of CBD and South East Light Rail on these roads
- Cleveland Street – as a construction haul route for CBD and South East Light Rail and the Sydney Metro Central Station site.

The CBD Coordination Office has been established to coordinate all traffic and transport in the Sydney CBD including decisions, directions and approvals affecting all road and traffic arrangements in the Sydney CBD. The CBD Coordination Office has developed a 'spatial tool' to help manage the potential cumulative impacts of construction with the Sydney CBD. The spatial tool is a GIS based system which takes inputs such as construction programs, construction locations, haul routes and identifies key conflict points between different construction projects.

Sydney Metro has been providing inputs to the CBD Coordination Office including a high level construction program to assist with forward planning for potential conflicts.

Sydney Metro would continue to liaise closely with the CBD Coordination Office during detailed construction planning and throughout construction phase to minimise the potential construction traffic impacts within the Sydney CBD, including potential cumulative impacts with other projects or special events. This would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
  - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
  - Co-ordination of traffic management arrangements between projects.

Further details on other potential cumulative impacts within the Sydney CBD, with respect to each construction site, are provided in the following sections.

26.3.7 Barangaroo Station

The construction of Barangaroo Station would have potential cumulative impacts associated with the following projects and activities:

- Central Barangaroo and Barangaroo South:
  - Construction activities around Barangaroo, especially Central Barangaroo
  - Access and egress using Hickson Road Hickson Road, Sussex Street and the Western Distributor. Barangaroo would also carry out works within Hickson Road

  At the proposed time of the Sydney Metro Barangaroo construction, it is anticipated that multiple elements of Barangaroo Central would also be under construction. It is anticipated that much of the Barangaroo South construction would be complete by 2021 and the precinct largely operational.
- One Carrington:
  - Potential construction access and egress via Hickson Road, Sussex Street and the Western Distributor.
- CBD and South East Light Rail:
  - Access and egress to and from the Circular Quay works may be via Hickson Road, Sussex Street and the Western Distributor.

These potential cumulative impacts are identified in Table 26-7.

Table 26-7 Barangaroo Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Central Barangaroo, Barangaroo South	One Carrington	CBD and South East Light Rail
Operational traffic and transport	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	• Shared use of, and additional traffic delays on, key roads by light and heavy construction vehicles, primarily Hickson Road, Sussex Street and the Western Distributor • Additional temporary road closures on Hickson Road • Additional alteration of pedestrian and cyclist movements and associated impacts on safety and amenity, around Barangaroo including Hickson Road and the approaches to Barangaroo Reserve • Additional loss of parking spaces and loading zones on Hickson Road.	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, primarily Hickson Road, Sussex Street and the Western Distributor.	• Shared use of, and additional traffic delays on, key roads by light and heavy construction vehicles, primarily Hickson Road, Sussex Street and the Western Distributor.
Construction noise and vibration	• Additional temporary increase in noise and vibration around Barangaroo.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Non-Aboriginal heritage	• Potential additional impacts to non-Aboriginal archaeology.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Central Barangaroo, Barangaroo South	One Carrington	CBD and South East Light Rail
Social impacts and community infrastructure	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.
Business impacts	○ Altered access, visibility and amenity of businesses around Barangaroo, including along Hickson Road and on the Central Barangaroo and Barangaroo South sites.	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.
Landscape character and visual impacts	○ Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Barangaroo.	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.
Air quality	○ Additional temporary reduction in air quality around Barangaroo.	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.

None of the unapproved projects in Table 26-3 have the potential to have cumulative impacts at the Barangaroo site.

26.3.8 Martin Place Station

The construction of Martin Place Station would have potential cumulative impacts associated with the proposed over station development and the following projects and activities:

- CBD and South East Light Rail:
  - Potential construction access and egress via Hunter, Castlereagh, Elizabeth and Macquarie streets.
- 60 Martin Place:
  - Construction activities around Martin Place and Elizabeth Street
  - Restrictions to access in and around Martin Place Station
  - Potential construction access and egress via Hunter and Macquarie streets.

These cumulative impacts are identified in Table 26-8.

Table 26-8 Martin Place Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro Chatswood to Sydenham over station development	CBD and South East Light Rail	60 Martin Place
Operational traffic and transport	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	• Shared use of, and additional traffic delays on, key roads by light and heavy construction vehicles, possibly including Castlereagh, Hunter, Macquarie and Elizabeth streets • Additional temporary road closures around Martin Place Station construction sites.	• Shared use of, and additional traffic delays on, key roads by light and heavy construction vehicles, possibly including Castlereagh, Macquarie, Hunter and Elizabeth streets • Additional temporary road closures around Martin Place Station construction sites • Additional bus service delays and changes on Castlereagh Street and Elizabeth Street.	• Shared use of, and additional traffic delays on, key roads by light and heavy construction vehicles, possibly including Macquarie and Hunter streets • Additional temporary road closures around Martin Place Station construction sites • Additional alteration of pedestrian and cyclist movements and associated impacts on safety and amenity, in and around Martin Place Station • Additional closure of an entry and exit point to Martin Place Station • Additional minor bus service delays and changes on Castlereagh Street and Elizabeth Street.
Construction noise and vibration	• Additional temporary increase in noise and vibration around Martin Place Station.	• Additional temporary increase in noise between Martin Place and George Street.	• Additional temporary increase in noise and vibration around Martin Place.
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro Chatswood to Sydenham over station development	CBD and South East Light Rail	60 Martin Place
Social impacts and community infrastructure	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.
Business impacts	○ No cumulative impacts greater than a minor nature are expected.	○ No cumulative impacts greater than a minor nature are expected.	○ Additional altered access, visibility and amenity of businesses around Martin Place Station.
Landscape character and visual impacts	○ Additional temporary landscape and visual impacts due to construction occurring at both ground level and above the station.	○ Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill between Martin Place and George Street.	○ Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Martin Place Station.
Air quality	○ Additional temporary reduction in air quality around Martin Place Station.	○ Additional temporary reduction in air quality between Martin Place and George Street.	○ Additional temporary reduction in air quality around Martin Place.

If approved, the following proposed projects (described in Table 26-3) may result in cumulative impacts with the Martin Place Station site:

- AMP Circular Quay re-development
- Sandstone buildings on Bridge Street, Sydney.

26.3.9 Pitt Street Station

The construction of Pitt Street Station would have potential cumulative impacts associated with the proposed over station development, and the following projects and activities:

- CBD and South East Light Rail:
  - Construction activities on George Street around the intersections of Druitt and Bathurst streets
  - Potential construction access and egress via Druitt and Bathurst streets
- 115-119 Bathurst Street Redevelopment:
  - Construction activities around Bathurst Street
  - Potential construction access and egress via Bathurst and Pitt streets.

These cumulative impacts are identified in Table 26-9.

Table 26-9 Pitt Street Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro Chatswood to Sydenham over station development	CBD and South East Light Rail	115-119 Bathurst Street Redevelopment
Operational traffic and transport	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, possibly including Castlereagh, Bathurst, Pitt and Druitt streets • Additional temporary road closures around the Pitt Street Station construction sites.	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, possibly including Bathurst and Druitt streets • Temporary road closures at George Street / Druitt Street and George Street / Bathurst Street intersections interfacing with the Sydney Metro haul routes • Additional temporary road closures around the Pitt Street Station construction sites • Additional alteration of pedestrian and cyclist movements and associated impacts on safety and amenity, around the Pitt Street Station construction sites.	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, possibly including Bathurst and Pitt streets • Additional temporary road closures around the Pitt Street Station construction sites • Additional alteration of pedestrian and cyclist movements and associated impacts on safety and amenity, around the Pitt Street Station construction sites.
Construction noise and vibration	• Additional temporary increase in noise and vibration around the Pitt Street Station site.	• Additional temporary increase in noise and vibration around the Pitt Street Station site.	• Additional temporary increase in noise and vibration around Bathurst Street.
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro Chatswood to Sydenham over station development	CBD and South East Light Rail	115-119 Bathurst Street Redevelopment
Social impacts and community infrastructure	No cumulative impacts greater than a minor nature are expected.	No cumulative impacts greater than a minor nature are expected.	No cumulative impacts greater than a minor nature are expected.
Business impacts	No cumulative impacts greater than a minor nature are expected.	Additional alterations to access, visibility and amenity of businesses between Pitt Street and George Street.	No cumulative impacts greater than a minor nature are expected.
Landscape character and visual impacts	Additional temporary landscape and visual impacts due to construction occurring at both ground level and above the station.	Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around the Pitt Street Station construction sites and on nearby George Street.	Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Bathurst Street.
Air quality	Additional temporary reduction in air quality around the Pitt Street Station construction sites.	Additional temporary reduction in air quality around the Pitt Street Station site and on nearby George Street.	Additional temporary reduction in air quality around Bathurst Street.

If approved, the following proposed projects (described in Table 26-3) may result in cumulative impacts with the Pitt Street Station site:

- 410 Pitt Street Redevelopment
- 505-523 George Street Redevelopment
- 116 Bathurst Street Redevelopment
- Town Hall Square Precinct Urban Design Strategy.

26.3.10 Central Station

The construction of the metro platforms at Central Station would have potential cumulative impacts associated with the following projects and activities:

- CBD and South East Light Rail:
  - Construction activities on Eddy Avenue and Chalmers Street
  - Access and egress via Cleveland Street, Chalmers Street and Eddy Avenue.

These cumulative impacts are identified in Table 26-10.

Table 26-10 Central Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation
	CBD and South East Light Rail
Operational traffic and transport	• Potential cumulative benefits associated with enhanced modal transport interchange.
Construction traffic and transport	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, including Eddy Avenue, Chalmers Street and Cleveland Street • Temporary road closures on Chalmers Street and Eddy Avenue interfacing with the Sydney Metro haul routes • Additional temporary road closures around Central Station • Additional alteration of pedestrian and cyclist movements and associated impacts on safety and amenity, around Central Station.
Construction noise and vibration	• Additional temporary increase in noise and vibration around Central Station.
Non-Aboriginal heritage	• Additional impacts to the Sydney Terminal and Central Railway Station Group (State heritage listed). CBD and South East Light Rail would impact the setting of Eddy Avenue, the setting of Chalmers Street and directly impact the Elizabeth Street Garden. • Works associated with this project would result in direct impacts to other individual items (removal and reinstatement of platforms 13 to 15, partial removal of canopies on platforms 4 to 23, removal of the Rolling Stock Officers building and garden, minor physical work to the Lost Property Office, and adjustments to overhead wiring structures) within the Sydney Terminal and Central Railway Station Group, indirect visual impacts to Mortuary Station and may also result in impacts to the setting of Eddy Avenue.
Social impacts and community infrastructure	• No cumulative impacts greater than a minor nature are expected.
Business impacts	• Additional alteration to access, visibility and amenity of businesses around Central Station.
Landscape character and visual impacts	• Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Central Station.
Air quality	• Additional temporary reduction in air quality around Central Station.

If approved, the following proposed projects (described in Table 26-3) may also result in cumulative impacts with the Central Station site:

- University of Technology Sydney Tower Extension
- Central Park development (future stages)
- Central to Eveleigh Urban Transformation and Transport Program.

26.3.11 Waterloo

The key cumulative impacts associated with the proposed Waterloo Station would largely relate to the impacts associated with the proposed over station development. As discussed in Chapter 6 (Project description – operation), impacts of over station development would be assessed under a separate approvals process and would also be required to take into account the impacts associated with this project. Expected cumulative impacts are identified in Table 26-11.

Table 26-11 Waterloo Station – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation
	Sydney Metro Chatswood to Sydenham over station development
Operational traffic and transport	○ No cumulative impacts greater than a minor nature are expected.
Construction traffic and transport	○ Shared use of, and additional delays on, key arterial and local roads by light and heavy construction vehicles, including the Botany Road, and Wellington, Cope and Raglan streets ○ Additional temporary road closures around the Waterloo Station site.
Construction noise and vibration	○ Additional temporary increase in noise and vibration around the Waterloo Station site.
Non-Aboriginal heritage	○ No cumulative impacts greater than a minor nature are expected.
Social impacts and community infrastructure	○ No cumulative impacts greater than a minor nature are expected.
Landscape character and visual impacts	○ Additional temporary landscape and visual impacts due to construction occurring at both ground level and above the station ○ Additional night-time light spill.
Air quality	○ Additional temporary reduction in air quality around the Waterloo Station site.

Waterloo transformation project

The Sydney Metro Chatswood to Sydenham project would provide a major opportunity for the Waterloo transformation project, which is anticipated to introduce a significant number of new homes, jobs, parks and community facilities to the Waterloo area. The Waterloo transformation project is in the initial stages of strategic planning and the scope and timeframe for delivery are still under development and would require a full environmental assessment (including operational stage impacts, particularly with respect to traffic and social and community impacts) as part of its own planning approvals process.

However it is expected that the outcome of the Sydney Metro Chatswood to Sydenham project would be highly beneficial with respect to social and community aspects (compared with no metro station and / or transport improvement alternatives to a metro station such as the upgrading of local roads).

If approved, the following proposed projects (described in Table 26-3) may result in cumulative impacts with the Waterloo Station site:

- Central to Eveleigh Urban Transformation and Transport Program
- Waterloo transformation project.

26.3.12 Marrickville dive site (southern)

The construction of the Marrickville dive site would have potential cumulative impacts associated with the following projects and activities:

- Sydney Metro City & Southwest Sydenham to Bankstown upgrade:
  - Construction activities around Sydenham Station and Marrickville industrial area
  - Potential construction access and egress via Princes Highway, May Street and Bedwin Road.

  Additional information relating to Sydenham to Bankstown upgrade is provided in Section 26.3.13
- WestConnex Stage 2: New M5 (Beverley Hills to St Peters):
  - Construction activities to upgrade Campbell Street and in the vicinity of St Peters
  - Access and egress to the construction works around St Peters Interchange via Princes Highway
- WestConnex Stage 3: M4–M5 link:
  - Construction activities in the vicinity of St Peters
  - Potential construction access and egress via Princes Highway.

These cumulative impacts are identified in Table 26-12.

Table 26-12 Marrickville dive site (southern) – potential cumulative impacts

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro City & Southwest Sydenham to Bankstown Upgrade	WestConnex Stage 2: New M5 (Beverley Hills to St Peters)	WestConnex Stage 3: M4-M5 link
Operational traffic and transport	As the two projects form part of the Sydney Metro network the operation of the two projects would provide cumulative transport related benefits. Further details of the benefits are provided in Chapter 3 (Strategic need and justification).	No cumulative impacts greater than a minor nature are expected.	No cumulative impacts greater than a minor nature are expected.

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro City & Southwest Sydenham to Bankstown Upgrade	WestConnex Stage 2: New M5 (Beverley Hills to St Peters)	WestConnex Stage 3: M4-M5 link
Construction traffic and transport	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, including Bedwin Road, May Street and the Princes Highway • Additional temporary road closures around Sydenham • Additional alteration of pedestrian and cyclist movements around Sydenham.	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, including the Princes Highway • Temporary road closures on Campbell Street, potentially interfacing with Sydney Metro haul routes • Additional temporary road closures around Sydenham and St Peters (St Peters Interchange) • Additional alteration of pedestrian and cyclist movements around Sydenham and St Peters (St Peters Interchange).	• Shared use of, and additional traffic delays on, key arterial and local roads by light and heavy construction vehicles, including the Princes Highway • Additional temporary road closures around Sydenham and St Peters (St Peters Interchange) • Additional alteration of pedestrian and cyclist movements around Sydenham and St Peters (St Peters Interchange).
Construction noise and vibration	• Additional temporary increase in noise and vibration around Sydenham.	• Additional temporary increase in noise and vibration around Sydenham and St Peters (St Peters Interchange).	• Additional temporary increase in noise and vibration around Sydenham and St Peters (St Peters Interchange).
Non-Aboriginal heritage	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Social impacts and community infrastructure	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Business impacts	• Altered access, visibility and amenity of businesses around Sydenham.	• Altered access, visibility and amenity of businesses around Sydenham and St Peters (St Peters Interchange).	• Altered access, visibility and amenity of businesses around Sydenham and St Peters (St Peters Interchange).
Landscape character and visual impacts	• Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Sydenham Station.	• Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Sydenham and St Peters (St Peters Interchange).	• Additional temporary visual impacts due to the presence of multiple construction sites and out-of-hours light spill around Sydenham and St Peters (St Peters Interchange).

Environmental impact	Potential cumulative environmental impacts without mitigation		
	Sydney Metro City & Southwest Sydenham to Bankstown Upgrade	WestConnex Stage 2: New M5 (Beverley Hills to St Peters)	WestConnex Stage 3: M4-M5 link
Flooding and hydrology	• The flooding assessment provided in Chapter 21 (Flooding and hydrology) specifically considers the Chatswood to Sydenham project as well as elements of the Sydenham to Bankstown upgrade project located at and to the north of Sydenham Station. As such, the impact assessment reflects the potential flooding impacts of both projects combined.	• No cumulative impacts greater than a minor nature are expected.	• No cumulative impacts greater than a minor nature are expected.
Air quality	• Additional temporary reduction in air quality around Sydenham.	• Additional temporary reduction in air quality around Sydenham and St Peters (St Peters Interchange).	• Additional temporary reduction in air quality around Sydenham and St Peters (St Peters Interchange).

None of the unapproved projects in Table 26-3 have the potential to have cumulative impacts at the Marrickville dive site (southern).

26.3.13 Sydney Metro Sydenham to Bankstown

As identified in Chapter 1 (Introduction), Sydney Metro City & Southwest is comprised of two projects being:

- Chatswood to Sydenham – the subject of this Environmental Impact Statement
- Sydenham to Bankstown upgrade – upgrading the 13.5 kilometre rail line and existing stations from Sydenham to Bankstown which is subject to a separate environmental assessment process.

These two projects would involve a direct interface to the north of Sydenham Station around the Marrickville dive site. At this stage, it is proposed that these projects would be constructed concurrently and would commence operations at the same time.

Sydney Metro are currently progressing the design and Environmental Impact Statement for the Sydenham to Bankstown upgrade as a separate project. As the design and assessment of this project is still being developed, the cumulative impact assessment of the two projects would be documented in detail in the Sydenham to Bankstown upgrade Environmental Impact Statement – it being a later document and being able to take into account greater detail about the impacts of both projects. Relevant cumulative impact issues that would be considered in the Sydenham to Bankstown upgrade Environmental Impact Statement are identified in Table 26-13.

Table 26-13 Sydenham to Bankstown upgrade Environmental Impact Statement scope

Aspect	Sydenham to Bankstown upgrade Environmental Impact Statement scope in relation to cumulative impacts with Chatswood to Sydenham
Strategic need and justification	• A description of the need and justification for Sydney Metro City & Southwest • The strategic benefits of Sydney Metro City & Southwest.
Construction traffic and transport	• Impacts to commuters around Sydenham and the need for rail replacement buses during the conversion of the T3 Bankstown Line • Potential cumulative traffic, pedestrian and cyclists impacts around the Marrickville dive site.
Operational traffic and transport	• An assessment of the strategic impacts and benefits to the traffic and transport network from the operation of Sydney Metro City & Southwest. Implications of this transfer on other transport interchanges including Central Station and Redfern Stations • A description and assessment of the interchange arrangements at the upgraded Sydenham Station.
Construction noise and vibration	• Assessment of the potential cumulative noise and vibration impacts around the Marrickville dive site with the Chatswood to Sydenham project.
Operational noise and vibration	• An assessment of the potential airborne rail noise in the vicinity of the Marrickville dive structure, including consideration the airborne rail noise from train operations associated with the Chatswood to Sydenham project (ie, metro trains operating in the dive structure and tunnel breakout noise).
Land use and property	• Identification and assessment of potential cumulative impacts of any additional land required in the vicinity of the Marrickville dive site and the potential cumulative impacts to the Marrickville industrial area.
Business impacts	• Assessment of any potential cumulative impacts to businesses in the Marrickville industrial area and around Sydenham Station.
Non-Aboriginal heritage	• Assessment of any potential cumulative impacts, particularly to the Sydenham Pit and Drainage Pumping Station 1.
Aboriginal heritage	• Identification and assessment of any potential cumulative impacts to any Aboriginal heritage items, including potential archaeology.
Landscape character and visual amenity	• Assessment of any potential cumulative visual and landscape character impacts in the vicinity of Marrickville dive site.
Groundwater and geology	• Cumulative groundwater and geology impacts are not anticipated to occur. The Sydenham to Bankstown component would be aboveground and would have negligible impacts to groundwater and geology.
Soils, contamination and water quality	• Assessment of any potential cumulative contamination impacts around Marrickville dive site (from the rail corridor).
Social impacts and community infrastructure	• Assessment of any potential cumulative social related impacts (mainly amenity) around the Marrickville dive site.
	• Cumulative impacts to community infrastructure are not anticipated to occur. The Chatswood to Sydenham project would not directly impact any community infrastructure around Marrickville.
Biodiversity	• Assessment of any potential cumulative impacts to microbat roosting habitat around the Marrickville dive site and Sydenham Station.

Aspect	Sydenham to Bankstown upgrade Environmental Impact Statement scope in relation to cumulative impacts with Chatswood to Sydenham
Flooding and hydrology	• As indicated above, the flood modelling carried out as part of this Environmental Impact Statement has included part of the Sydenham to Bankstown project. The Sydenham to Bankstown Environmental Impact Statement would refine and update the flood modelling, if required, in the area between the Marrickville tunnel portal and Sydenham Station.
Air quality	• Assessment of potential cumulative air quality impacts during construction from concurrent construction works around Marrickville dive site and Sydenham Station.
Hazard and risk	• Cumulative hazard and risk impacts are not anticipated to occur. Any additional storage of dangerous goods and hazardous substances for the Sydenham to Bankstown component would remain below the applicable SEPP33 thresholds.
Waste management	• Cumulative waste management impacts are not anticipated to occur. The Sydenham to Bankstown component is not anticipated to generate large volumes of spoil. Other construction wastes would be minor and manageable through standard mitigation measures.
Sustainability	• Cumulative sustainability impacts are not anticipated to occur. The sustainability strategy would be adopted across all components of Sydney Metro City & Southwest.

Potential interim operation

As identified in Chapter 6 (Project description – operation) there may be a situation where this project is constructed and operated in advance of the Sydenham to Bankstown upgrade project. In this situation, a rail track-turnback would be constructed between the Marrickville dive structure and Sydenham Station with Waterloo Station effectively becoming a terminus for all rail passengers in the short term.

In this event, construction impacts would be essentially the same for all construction sites associated with this project with the exception of the Marrickville dive site where impacts would be the same or less.

When operational, the environmental impacts would also be essentially the same if this project opens in advance of the Sydenham to Bankstown upgrade project, with the exception of potential changes to rail airborne noise associated with the turnback facility. The differences in airborne noise levels between a train turnback and a train continuing through to Sydenham Station are expected to be minor. Furthermore, land use in the immediate vicinity of the potential turnback is predominately industrial, with the closest residential areas being across the existing rail tracks, some 150 metres away on Unwins Bridge Road. Accordingly, it is expected that the applicable criteria from the *Rail Infrastructure Noise Guidelines* (EPA, 2013) would be achievable without additional mitigation measures as currently identified.

It is also noted that the approved Sydney Metro Trains Facility in Rouse Hill was for an expanded network and is proposed to be used for this project. There would be no impact on stabling requirements in the event this project operates for a period without the Sydenham to Bankstown upgrade project.

As indicated in Chapter 6 (Project description – operation), should the Chatswood to Sydenham project be opened in advance of the Sydenham to Bankstown project and it is necessary to construct and operate the turnback, a supplementary environmental review / assessment would be carried out and if necessary the appropriate approvals obtained.

26.4 Mitigation measures

Mitigation measures that would be implemented to address potential cumulative impacts are listed in Table 26-14.

Table 26-14 Mitigation measures – cumulative impacts

Ref	Mitigation measure	Applicable location(s)[1]

CU1	Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time. Co-ordination and consultation with the following stakeholders would occur, where required:
	• CBD Coordination Office
	• Department of Planning and Environment
	• Roads and Maritime Services
	• Sydney Trains
	• NSW Trains
	• Sydney Buses
	• Sydney Water
	• Port Authority of NSW
	• Willoughby Council
	• North Sydney Council
	• City of Sydney Council
	• Marrickville Council
	• Sydney Motorways Corporation
	• Barangaroo Delivery Authority
	• Emergency service providers
	• Utility providers
	• Construction contractors.
	Co-ordination and consultation with these stakeholders would include:
	• Provision of regular updates to the detailed construction program, construction sites and haul routes
	• Identification of key potential conflict points with other construction projects
	• Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
	  ◆ Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
	  ◆ Co-ordination of traffic management arrangements between projects.
		All

1 *STW: Surface track works; CDS: Chatswood dive site; AS: Artarmon substation; CN: Crows Nest Station; VC: Victoria Cross Station; BP: Blues Point temporary site; GI: Ground improvement works; BN: Barangaroo Station; MP: Martin Place Station; PS: Pitt Street Station; CS: Central Station; WS: Waterloo Station; MDS: Marrickville dive site; Metro rail tunnels: Metro rail tunnels not related to other sites (eg TBM works); PSR: Power supply routes.*