sydney METRO | city & southwest

SYDENHAM TO BANKSTOWN

ENVIRONMENTAL IMPACT STATEMENT

> Volume 1A – Main Volume

NSW GOVERNMENT

Transport for NSW

Sydney Metro City & Southwest

Sydenham to Bankstown upgrade

Environmental Impact Statement

Volume 1A – Parts A and B

Volume 1 – Main Environmental Impact Statement

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Technical Paper 9 – Biodiversity assessment report

Certification

Submission of environmental impact statement

Prepared under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW).

Environmental impact statement prepared by:

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Qualifications:	BSc(Hons), Master of Urban and Regional Planning	BEng(Civil)(Hons)
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Responsible person (proponent):	Rodd Staples Program Director Sydney Metro Transport for NSW Level 43, 680 George St, Sydney NSW 2000	

Address of the land to which the statement relates:

Land within the Inner West and Canterbury-Bankstown local government areas as described within this Environmental Impact Statement.

Description of the infrastructure to which this statement relates:

Construction and operation of the Sydenham to Bankstown upgrade component of the Sydney Metro City & Southwest project.

Environmental impact statement:

An environmental impact statement is attached addressing all matters in accordance with Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW) and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (NSW).

Declaration:

I certify that I have prepared this environmental impact statement in accordance with the Secretary's environmental assessment requirements dated 23 March 2017. The environmental impact statement contains all available information that is relevant to the environmental assessment of the infrastructure to which the statement relates. To the best of my knowledge, the information contained in the environmental impact statement is neither false nor misleading.

Signature:		
Name:	Amanda Raleigh	Greg Marshall
Date:	7 September 2017	7 September 2017

Executive summary

Overview

The NSW Government has committed to building a significant piece of transport infrastructure by constructing Sydney Metro, a new standalone rail network identified in *Sydney's Rail Future*, providing 66 kilometres of metro rail line and 31 metro stations.

The NSW Government is currently delivering two stages of Sydney Metro – Sydney Metro Northwest (between Rouse Hill and Chatswood), and Sydney Metro City & Southwest (between Chatswood and Bankstown). The Sydney Metro Northwest project is currently under construction and will be operational in 2019.

Sydney Metro City & Southwest will extend Sydney Metro beyond Chatswood to Bankstown. Sydney Metro City & Southwest comprises two core components – the Chatswood to Sydenham project, and the Sydenham to Bankstown upgrade. Planning approval for the Chatswood to Sydenham project was granted in January 2017, with construction activities commencing in 2017.

Figure ES.1 shows the components of the Sydney Metro network.

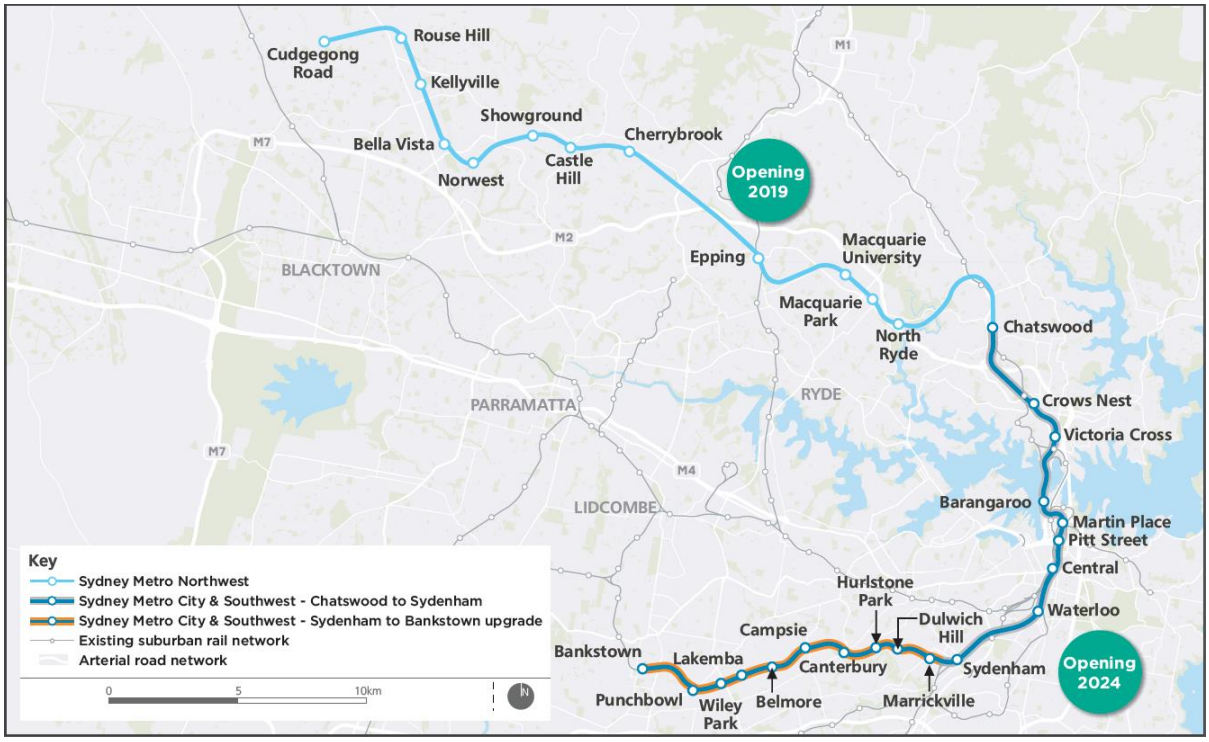


Figure ES.1 Sydney Metro

It is noted that the approved Chatswood to Sydenham project did not involve provision of additional stabling facilities, changes to the Sydney Trains tracks in the vicinity of Sydenham, or works to Sydenham Station prior to the Sydenham to Bankstown component of Sydney Metro City & Southwest being delivered. These works are currently the subject of an application to modify the Chatswood to Sydenham planning approval, to provide the opportunity for Sydney Metro City & Southwest to open in two phases. The first phase would involve services between Chatswood and Sydenham stations, while the second phase could extend Sydney Metro services to Bankstown.

Sydney Metro City & Southwest is planned to be completed by the end of 2024. This Environmental Impact Statement considers the potential impacts of the Sydenham to Bankstown

upgrade ('the project'). It has been prepared to support Transport for NSW's application for approval of the project in accordance with the requirements of Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Sydney Metro City & Southwest was declared to be critical State significant infrastructure in December 2015 due to its importance to the State, and is subject to approval by the NSW Minister for Planning. The Environmental Impact Statement addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment, dated 23 March 2017.

Sydney Metro

Sydney Metro is part of the NSW Government's infrastructure investment program to respond to the growth in transport demand in Sydney. Sydney Metro, together with other signalling and infrastructure upgrades across the Sydney rail network, will greatly increase the capacity of train services entering the Sydney CBD, from about 120 services an hour today, up to 200 services beyond 2024. This is an increase of up to 60 per cent capacity across the network to meet demand.

Sydney's existing suburban rail system can reliably carry 24,000 people an hour per line. Similar to other metro systems worldwide, Sydney Metro will have a long-term target capacity of about 40,000 customers per hour in each direction.

Sydney Metro will transform Sydney, cutting travel times, reducing congestion, and delivering economic and social benefits for generations to come. Sydney Metro will boost economic activity by more than $5 billion a year, supporting major jobs and business growth along its route, by:

- improving access to jobs
- changing the way people move about the city and reducing congestion
- allowing people to travel quickly and easily from one key centre to another
- enabling housing and employment growth along Sydney's Global Economic Corridor and west to Bankstown
- encouraging greater commercial development and jobs in key areas
- delivering huge flow-on benefits across productivity, wages, and the state's overall economic performance.

Need for the project

Key challenges

Sydney is experiencing sustained population and economic growth. The need for Sydney Metro is driven by the challenges being experienced in responding to this growth, including the existing and future capacity of Sydney's transport infrastructure.

Over the next 15 years, Sydney will require transport infrastructure to support 40 per cent more train trips, 30 per cent more car trips, and 31 per cent more households.

The rail network is heavily congested, with customers on most rail lines regularly experiencing significant crowding on trains and station platforms during the morning and evening peaks.

As population and employment continue to grow, rail is forecast to experience the highest growth in travel demand, with an additional 100,000 trips expected during the morning peak by 2036.

It is forecast that without further investment, Sydney's rail network will reach capacity in the Sydney CBD and on critical suburban rail lines by the mid to late 2020s (Transport for NSW, 2012a).

The T3 Bankstown Line creates a significant bottleneck for the existing rail network. The line effectively slows down the network because of the way it merges with other railway lines close to the Sydney CBD, including the T2 Airport, Inner West & South Line.

In addition, parts of the T3 Bankstown Line are over 120 years old, with existing infrastructure in varying conditions. A key challenge for this line is customer accessibility, with five of the stations not having lifts. A number of the stations between Marrickville and Bankstown also have very large gaps between the platforms and trains, which makes access difficult for some customers, particularly the disabled, elderly, and those travelling with young children and prams.

Project need

The NSW Government's strategy for accommodating Sydney's future population growth over the next 20 years aims to ensure that a competitive economy is fostered with world-class services and transport. The Sydney Metro system would improve infrastructure and remove existing bottlenecks, providing faster and more reliable connections to jobs, education facilities, health services, and sports and recreation facilities.

As part of Sydney Metro, the project is a key component of *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

The project is needed to further progress implementation of *Sydney's Rail Future* and Sydney Metro City & Southwest, enabling the provision of necessary public transport infrastructure to respond to the identified challenges and future demands. With at least 15 trains an hour or a train at least every four minutes in the peak when services start in 2024, the upgrade of the T3 Bankstown Line would deliver benefits across Sydney's rail network. These benefits would further increase when the number of trains increases to 20 per hour as part of the ultimate operations.

By converting the T3 Bankstown Line to metro and delivering greater efficiency and reliability along the line, the project would play a role in encouraging transit oriented urban development around stations between Sydenham and Bankstown. It would facilitate realisation of urban renewal priorities and objectives under the *Sydenham to Bankstown Urban Renewal Corridor Strategy* (Department of Planning and Environment, 2017).

A key element of the project is upgrading all stations along the corridor between Marrickville and Bankstown, to allow better and safer access for more people, by providing new concourses, level platforms, platform screen doors and lifts at all stations. Improvements would also be undertaken within the immediate area surrounding the stations to provide accessible interchange with other forms of transport.

Options considered

Option development has been an integral part of the overall design process for the project. The option selection process has formed part of each design stage, and has taken into account issues raised during consultation with key stakeholders, including government agencies and the community. Options were assessed against a range of criteria, including customer focus, constructability, operation, environmental impacts, accessibility, heritage and place-making considerations, risk and cost effectiveness.

Options were considered for station designs, constructability, track alignment, temporary transport arrangements, and construction programming. The station design process involved consideration of a range of options, in consultation with heritage stakeholders, to minimise the potential impacts

on heritage values. This included refinements to the design to allow the retention of heritage elements where practicable.

The design process also involved recognising the important place-making role of the stations, and consideration of a range of options for the design of key elements at each station, to respond to local place, the surrounding urban context, the functioning of local town centres and input from the community.

Transport for NSW will continue to develop the project to a greater level of detail in conjunction with the appointed design contractor. Transport for NSW will challenge the contractor to develop innovative solutions to detailed design and construction to achieve improved outcomes.

The detailed design and construction methodology proposed to deliver the project would be assessed for consistency with this Environmental Impact Statement and the terms of any approval granted by the Minister for Planning. If the detailed design or construction impacts are not considered to be consistent with any approval granted for the project, an application to modify the project would be lodged.

Place making and urban design

The design of the project has been informed by a detailed analysis of existing and future urban design, community, heritage, engineering, planning, constructability, financial, and environmental considerations. The design has been, and would continue to be, guided by the Sydney Metro City & Southwest Sydenham to Bankstown Design Guidelines (included as Appendix C to this EIS). The design guidelines emphasise the need to respond to place and context, acknowledge the existing conditions, and promote the need to improve the urban interfaces at each station. The overarching project design principle is to 'create welcoming, secure and well maintained public domain spaces and station buildings with an attractive sense of place that responds to the distinct cultures of each station precinct.'

Developing the project design involved a comprehensive urban design analysis. For each station, the design has taken local conditions and place-making opportunities into account, unified by an overall architectural style for Sydney Metro that supports each centre. An example of an artist's impression of a station is provided in Figure ES.2.

Council public domain plans for centres were considered, as well as the emerging character and likely built form of each centre, articulated by the NSW Government's urban renewal strategy for the Sydenham to Bankstown corridor (Department of Planning and Environment, 2015).

The urban design aspects would continue to be developed and refined during future design stages, taking into account considerations such as each station's place making role, future urban development opportunities, heritage, links to the surrounding town centres, and feedback from stakeholders and the community. To reflect local conditions and heritage values, heritage interpretation, public art, and landscaping would be incorporated into the design of each station, in accordance with the design guidelines, and based on consultation with local stakeholders.

Figure ES.2 Artist's impression of Punchbowl station

The project

The project involves upgrading 10 existing stations west of Sydenham (Marrickville to Bankstown inclusive), and a 13 kilometre long section of the Sydney Trains T3 Bankstown Line, between west of Sydenham Station and west of Bankstown Station, to improve accessibility for customers and meet the standards required for metro operations. The project would enable Sydney Metro to operate beyond Sydenham to Bankstown.

The location of the project is shown in Figure ES.3.

Project objectives

The primary objectives of the project are to:

- improve the quality of the transport experience
- provide a system that is able to satisfy long-term demand
- improve the resilience of the transport network

Secondary objectives are to:

- grow public transport patronage and mode share
- support the productivity of the Global Economic Corridor
- serve and stimulate urban development
- improve the efficiency and cost effectiveness of the public transport system
- implement a feasible solution recognising impacts, constraints and delivery risks.

The project also aims to

- deliver accessible, modern, secure and integrated transport infrastructure
- contribute to the accessibility and connectivity of existing and future communities.

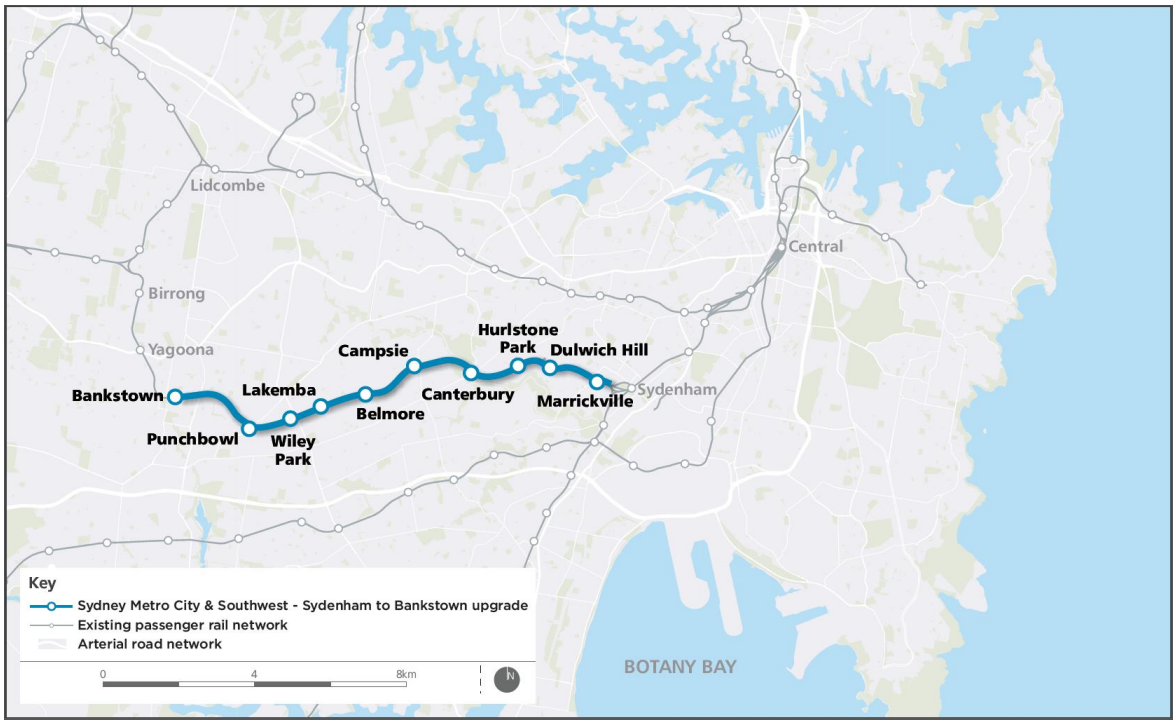


Figure ES.3 Location of the project

Works to upgrade access at stations

The project includes upgrading the 10 stations from Marrickville to Bankstown as required, to meet legislative requirements for accessible public transport, including the requirements of the *Disability Discrimination Act 1992* and the *Disability Standard for Accessible Public Transport 2002*. The proposed works include:

- works to platforms to address accessibility issues, including levelling and straightening platforms
- new station concourse and station entrance locations, including:
  - new stairs and ramps
  - new or relocated lifts
- provision of additional station facilities as required, including signage and canopies.

Works would also be undertaken in the areas around the stations to better integrate with other modes of transport, improve travel paths, and meet statutory accessibility requirements. This would include provision of pedestrian, cyclist, and other transport interchange facilities; as well as works to the public domain, including landscaping.

Works to convert stations and the rail line to Sydney Metro standards

Station works

In addition to the station upgrades to improve accessibility, works to meet the standards required for metro services would be carried out, including:

- installation of platform screen doors
- provision of operational facilities, such as station services buildings.

Track and rail system facility works

Upgrading the track and rail systems to enable operation of metro services would include:

- track works where required along the rail corridor, including upgrading tracks and adjusting alignments, between west of Sydenham Station and west of Bankstown Station
- new turn back facilities and track crossovers
- installing Sydney Metro rail systems and adjusting existing Sydney Trains rail systems
- overhead wiring adjustments.

Other works

Other works proposed to support Sydney Metro operations include:

- upgrading existing bridges and underpasses across the rail corridor
- installation of security measures, including fencing
- installation of noise barriers where required
- modifications to corridor access gates and tracks
- augmenting the existing power supply, including new traction substations and provision of new feeder cables
- utility and rail system protection and relocation works
- drainage works to reduce flooding and manage stormwater.

Active transport corridor and future rail corridor development

The project would also deliver:

- sections of an active transport corridor located around the station areas, to facilitate walking and cycling connections to each station and between Marrickville and Bankstown
- enabling works to support future rail corridor development at Campsie Station.

Construction of the project

Stages and timing

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in early 2018) and would include the following stages of work:

- enabling works, including site establishment and building removal
- main construction works, including the station, track, and other works described above
- finishing works, including demobilisation, rehabilitation, landscaping and testing and commissioning.

Upgraded stations would be progressively delivered from 2019 until 2024. During this period, works to upgrade other infrastructure, such as bridges, embankments and drainage, would also be undertaken. An indicative construction program is provided in Figure ES.4.

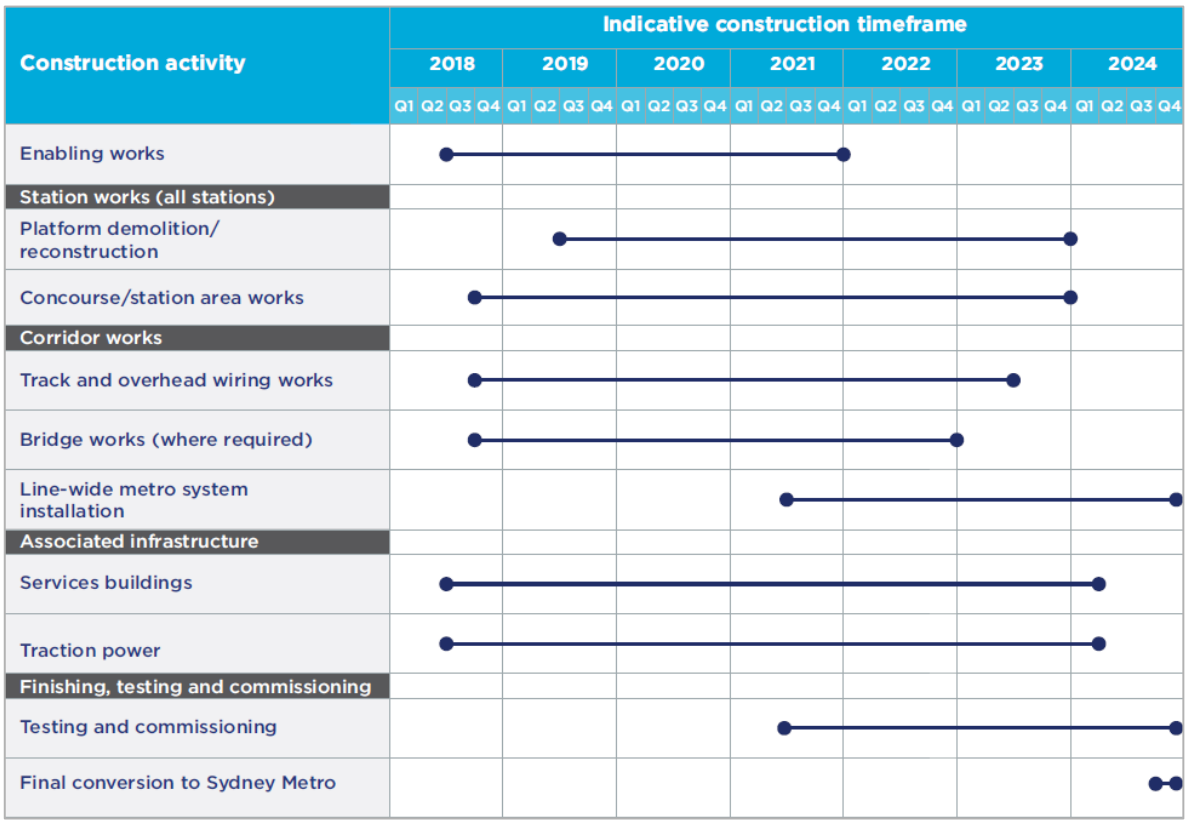


Figure ES.4 Indicative construction program

Possession periods

The T3 Bankstown Line would remain operational during the majority of the construction period. However, to ensure that works are completed as efficiently and safely as possible, and to accommodate works that cannot be undertaken when trains are operating, it is proposed to undertake some work during rail possession periods (i.e. periods where trains are not operating on the line). These works would include major station works, track works, and bridge works. It is anticipated that these rail possession periods would comprise the normal weekend maintenance possession periods (four each year), together with some longer possession periods during school holidays when rail patronage is lower.

A final, longer possession of about three to six months would also be required. This would involve full closure of the line to enable it to be converted to metro operations. This final possession period is to enable works that can only be completed once Sydney Trains services are not operating. It would include works such as the installation of new signalling, communication systems, and platform screen doors.

The indicative possession program would be reviewed during tendering, detailed design, and construction planning to ensure the available possessions are sufficient to complete the works and that the overall impacts to the community are reduced as far as possible.

During each possession period, a temporary transport management plan would be implemented, in accordance with the Temporary Transport Strategy (described below), to provide alternative public transport arrangements, and ensure that rail customers can still reach their destinations.

Prior to the final possession period, Transport for NSW would seek to have the first phase of Sydney Metro City & Southwest in operation, with metro services provided between Cudgegong Road Station in Rouse Hill and Sydenham Station.

Temporary Transport Strategy

A Temporary Transport Strategy (provided in Appendix G) has been developed to guide alternative public transport arrangements during construction, to minimise impacts on rail customers during possession periods and station closures. These arrangements would be detailed within a temporary transport management plan developed for each temporary closure of the rail line. The strategy includes:

- objectives for customers and replacement transport services
- customer markets to be served by the temporary transport management plans
- potential options to maintain public transport connections to and from all affected rail stations
- potential impacts associated with temporary transport options
- temporary transport facilities and measures required
- the process for developing temporary transport management plans, including stakeholder and community consultation
- performance outcomes for the temporary transport management plans.

The strategy would continue to be informed by stakeholder and community input, with the approach refined based on understanding customer needs and ongoing development of alternatives to deliver improved customer outcomes.

The components of the Temporary Transport Strategy are shown in Figure ES.5. The components include:

- buses that stop at all stations along the corridor
- buses that only stop at a limited number of stations before continuing as an express service to the end of the journey
- buses that move passengers to another rail line, such as the T2 Airport, Inner West & South Line, and the T1 North Shore, Northern & Western Line
- an increase in the frequency of existing bus services at specific locations, acknowledging that some customers may prefer to use those instead of the rail replacement bus service.

Operation of the project

Sydney Metro City & Southwest is expected to be fully operational by 2024. Once operational, metro trains would run between Chatswood and Bankstown stations in each direction, at least every four minutes in peak periods, averaging around 15 trains per hour. Customers would be able to interchange with Sydney Trains services at Sydenham and Bankstown stations as required to reach other destinations.

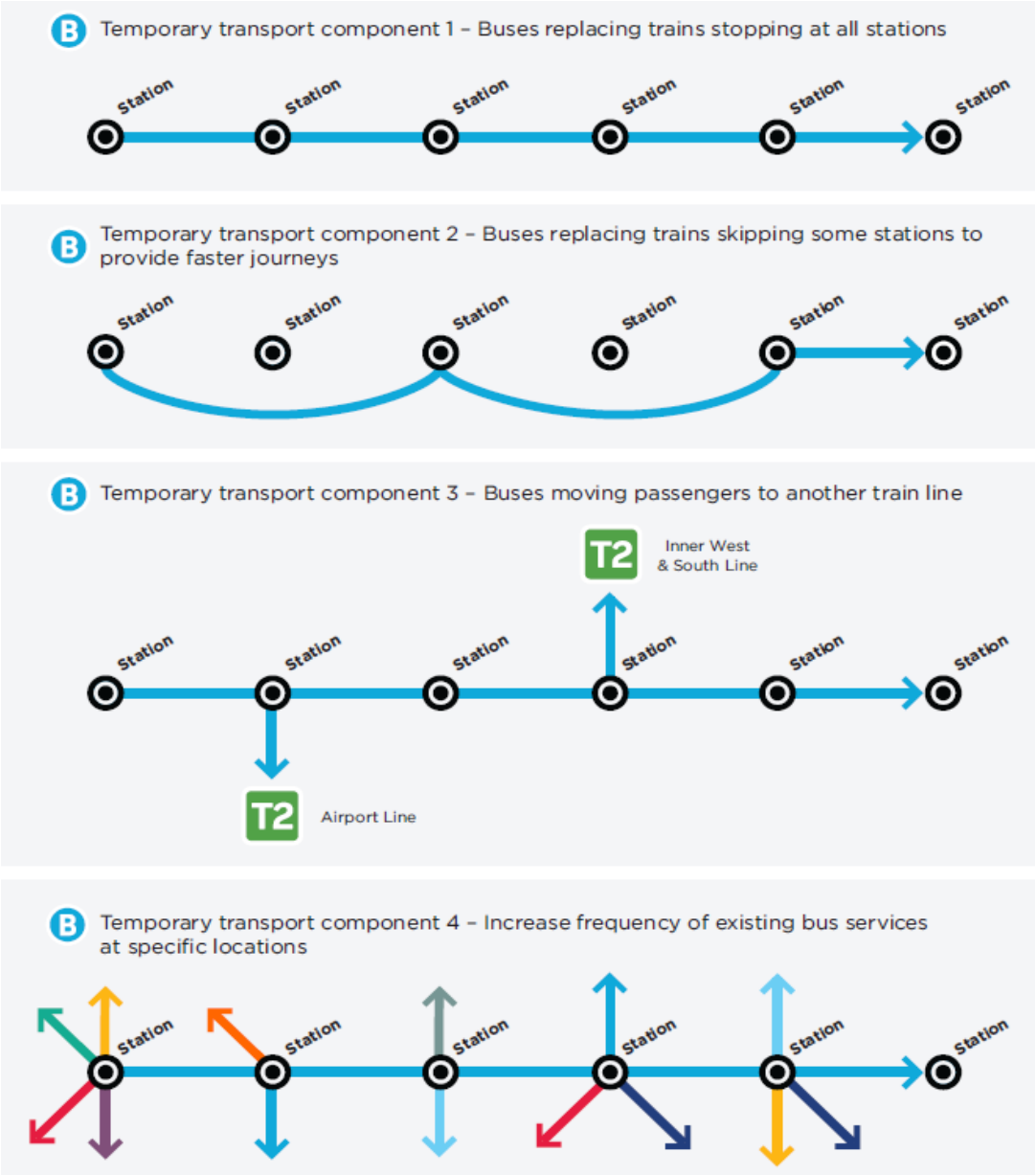


Figure ES.5 Components of the Temporary Transport Strategy

Stakeholder and community consultation

Stakeholder and community consultation for Sydney Metro is an ongoing process that commenced with the release of *Sydney's Rail Future* in 2012. Consultation with stakeholders and the community has occurred during the development of the project and preparation of this Environmental Impact Statement. The consultation strategy has been designed to inform the community and key stakeholders about the project, and encourage participation.

The following consultation activities were undertaken during preparation of the Environmental Impact Statement:

- a project update distributed in February 2017
- community information displays between January 2017 and May 2017
- a planning focus meeting in February 2017
- a community survey seeking feedback on alternative transport arrangements during the construction period

- meetings with relevant government agencies and key stakeholders
- engagement with customer focus groups to inform the designs of stations.

Transport for NSW will continue to work closely with key stakeholders and the community to minimise impacts or issues of concern. Consultation activities will continue as the project progresses to detailed design and construction.

During public exhibition of the Environmental Impact Statement, the community and other stakeholders will be invited to make written submissions about the project. Following exhibition, issues raised in these submissions will be summarised in a submissions report. Transport for NSW will consider the issues raised, and may make changes to the project as a result of submissions or to reduce impacts on the environment. The Minister for Planning will then make a decision about whether to approve the project.

If the project proceeds, Transport for NSW will continue to liaise with key stakeholders and the community during the detailed design and construction. This ongoing engagement process will play an important role in reducing the potential impacts and enhancing the benefits of the project for all stakeholders.

Summary of the key findings

The following sections provide a summary of the key findings of the environmental assessment. The environmental assessment considers the potential for impacts to the project area (defined as the area that would be directly impacted by construction of the project, and including the location of operational infrastructure), as well as the broader study area, where relevant. The environmental assessment was informed by specialist technical assessments of the key environmental issues defined by the Secretary's environmental assessment requirements, and an assessment of other potential issues identified in the State Significant Infrastructure Application Report. The potential impacts of construction and operation were assessed.

Traffic, transport and access

The project area is located within a highly urbanised environment, comprising a number of main roads, and a range of other transport facilities and infrastructure, including the T3 Bankstown Line, train stations, bus stops, light rail, freight rail, pedestrian, and cycle facilities.

Key potential construction impacts

During construction, there would be some impacts to the road network and intersections within and/or connected to the project area. The impact assessment for road traffic during construction considered:

- the use of the road network by construction vehicles, including worker transport
- the combined effects of the construction vehicles with road diversions and lane closures resulting from the proposed works to bridges that cross the corridor
- the potential impacts on the road network of alternative transport arrangements during possessions and/or station closures, guided by the Temporary Transport Strategy.

The assessment concluded that only one intersection, near Lakemba Station, has the potential to experience major delays during construction as a result of construction vehicles. Despite this prediction, it is expected that traffic would redistribute to other intersections, without the need for modification.

The project includes works to bridges located along the rail corridor, which would require partial or full closures at certain times to undertake the works. To minimise congestion and potential delays, these works would generally need to be undertaken outside of peak periods, and potentially at night.

Construction works and the final conversion of the T3 Bankstown Line to support a metro system would require temporary closures of the train line, involving a range of weekend and school holiday possession periods, and a final longer possession period of about three to six months. During these possession periods, about 100,000 customer journeys would be affected each day.

The proposed Temporary Transport Strategy (provided in Appendix G) would guide the provision of alternative public transport arrangements during construction, to minimise impacts on customers during possession periods and station closures. Each temporary transport management plan would be developed to guide the provision of alternative transport arrangements during a specific possession period, in consultation with relevant stakeholders and the community.

Specific initiatives and detailed alternative transport arrangements would be defined by the temporary transport management plans. These initiatives may include:

- increasing train services on other lines
- improving cycle facilities at stations on other lines, for customers who want to continue cycling as part of their journey
- potential road network enhancements and/or bus interchange improvements to support replacement bus operations and reduce their impact on the road network.

Transport for NSW would continue to work to ensure that construction traffic, transport, and access impacts, including disruptions to customers' travel plans and delays to road users, are minimised.

Key potential operation benefits

Once operational, the project would provide more than twice as many trains per hour in peak periods, reducing the waiting time for customers, and significantly improving the capacity and reliability of the rail network. The travel time savings resulting from the project are one of the factors that would encourage people to use Sydney Metro, reducing travel times and providing customers better access to job opportunities and housing choices across Sydney, with fast, more frequent, and direct connections.

The other significant benefit of the project is the accessibility improvements that would be provided along paths to, and within, stations which will provide safe and accessible public transport for all users. The station access hierarchy, shown in Figure ES.6, was used as the basis for the design to ensure that the design of stations, and their integration with other transport modes, gives the highest priority to walking and cycling, followed by public transport. Active transport to stations would continue to be prioritised, with upgrades to pedestrian and cycle facilities to make paths safer and more accessible. The station and train carriage design would also cater for vision and mobility impaired customers.

Figure ES.6 Station access hierarchy

Transport for NSW will work with the Department of Planning and Environment to support the development of an active transport corridor, including walking and cycling infrastructure. As part of the project, Transport for NSW would deliver sections of the active transport corridor around stations. This would facilitate walking and cycling connections to important destinations in the local area and region. When complete, the active transport corridor will link public transport interchanges between Marrickville and Bankstown, and encourage more active, healthier lifestyles.

The project would also benefit bus customers by enhancing connections between bus and rail services, and providing bus stops as close as practicable and with accessible paths to station entries.

Other accessibility benefits of the project include:

- improving the interchange with bus, light rail, pedestrian, and cycling networks, and provision of additional and more convenient taxi, kiss and ride, and bike parking facilities at all stations
- enhancing the accessibility of each station precinct with regard to walking and cycling
- providing infrastructure to ensure that the travel paths between different transport modes meet statutory accessibility requirements.

Noise and vibration

The project area is located in an established urban environment already subject to various sources of noise, including noise generated by the movement of trains along the rail corridor (both passenger and freight trains where relevant), and traffic on the road network. Numerous noise sensitive receivers, including residences and commercial premises, are located close to the project area.

Key potential construction impacts

Potential noise emissions from construction activities were predicted by the noise and vibration assessment in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), by

assuming that the loudest plant for each activity operates at the edge of the work site closest to the receiver, which represents a conservative assessment approach.

The project includes works which cannot be safely undertaken while the rail network is operational. While works would be undertaken during the recommended standard hours defined by the *Interim Construction Noise Guideline*, there would also be a need to undertake works during evenings, at night, and on weekends and public holidays, particularly during rail possession periods.

The noise and vibration assessment concluded that construction activities have the potential to impact surrounding noise sensitive receivers. Exceedances were predicted at most sites for the majority of construction scenarios modelled, with a number of exceedances at residential receivers being greater than 20 decibels above the relevant criteria during the day and night. However, these predictions identify noise levels at the most exposed receiver, which may not be reached, or only infrequently reached, during the construction period. The use of noise intensive construction equipment was found to broadly correlate with construction activities resulting in exceedances of the noise criteria. It is noted that noise intensive construction equipment would not be used for the majority of the construction period. Construction planning would endeavour to minimise the use of this equipment during more sensitive periods.

Road traffic noise was assessed using the preliminary estimate of construction traffic volumes and implementation of alternative transport arrangements during a rail possession period. This assessment found that construction vehicles, rail replacement buses, or a combination of both would result in an increase of greater than two decibels above existing noise conditions along 10 roads. These roads are located in the vicinity of stations east of and around Campsie Station.

A large number of buildings adjacent to the project area are predicted to be located within the recommended offset distance for potential amenity and cosmetic damage resulting from vibration. These impacts are predicted in the event that large hydraulic rock breakers are used at the edge of the work site closest to the receiver. In practice, this may not be necessary and vibration impacts would be intermittent over the duration of construction.

For structures where the vibration levels are predicted to exceed the criteria, a more detailed assessment of the structure and vibration monitoring would be undertaken during detailed design and construction, to ensure that vibration levels remain within appropriate limits.

Given the proximity of construction to a number of heritage items, particularly at stations, there is the potential for vibration impacts if appropriate mitigation measures are not implemented. For heritage items, a more detailed assessment would be undertaken to identify necessary mitigation and monitoring requirements, taking into account the heritage values of the item.

A Construction Noise and Vibration Strategy (provided in Appendix E) has been developed for the Sydney Metro program to provide a framework for implementing appropriate mitigation measures. The strategy provides for the preparation of detailed construction noise impact statements once construction methods are defined at each location, and more detailed assessments of the potential for vibration impacts. Further measures to minimise and manage construction noise and vibration impacts would be identified during detailed design and construction planning in close consultation affected receivers.

Key potential operation impacts

Predictions of future rail noise levels without the project indicate that noise levels would be generally close to, or exceed, the trigger levels identified by the *Rail Infrastructure Noise Guideline* (EPA, 2013) (‘the RING’). It is predicted that future noise levels would exceed the RING trigger levels in eight of the twelve noise catchment areas in the study area. Overall, the addition of the project is not predicted to result in significant increases in rail noise – in most instances, the

increase in noise as a result of the project would be less than two decibels which would be barely perceptible.

The majority of exceedances are predicted to occur in the Punchbowl and Bankstown noise catchment areas. These exceedances would be minimised by implementing noise mitigation measures. Feasible and reasonable mitigation measures, such as noise barriers and at-property treatments, would be considered where exceedances have been identified. The final form and location of mitigation measures would be determined during detailed design.

While exceedances of groundborne noise criteria are predicted, airborne noise levels would be more substantial and therefore no mitigation is required. No exceedances of vibration criteria are predicted.

Non-Aboriginal heritage

The project area contains substantial historical resources of significance. All 10 railway stations in the project area are heritage listed. Three stations (Marrickville, Canterbury and Belmore stations) are listed on the State Heritage Register, and the others are subject to listings on local environmental plans and/or a State agency Section 170 heritage register.

Two items listed on the State Heritage Register (Sewage Pumping Station 271 in Marrickville and the Old Sugarmill in Canterbury) are located adjacent to the project area. A number of other locally listed items are located adjacent to, or within 25 metres of the project area. In addition, the project area passes through or adjacent to two heritage conservation areas.

The approach to the design has been to retain as many significant heritage items and/or elements as possible, with particular focus given to items listed on the State Heritage Register. Potential adaptive reuse for the retained items would be determined during detailed design. The design process for the project involved significant work to minimise direct impacts to heritage items as far as possible. However in some instances, to meet accessibility standards and Sydney Metro operational requirements, there has been no alternative to the changes proposed. For example, platforms need to be reconstructed along the alignment to provide safer and easier access to trains.

The main potential for impacts to non-Aboriginal heritage would occur during the construction phase. The project would result in the removal of one or more heritage elements at each station, which would directly impact on heritage listed items as follows:

- a major direct and visual impact to the State Heritage Register listed Marrickville Railway Station Group, mainly as a result of upgrading the Illawarra Road overbridge
- moderate direct and visual impacts to the State Heritage Register listed Canterbury and Belmore railway station groups as a result of the removal some heritage elements associated with these items
- major direct and visual impacts to four locally listed heritage items (Dulwich Hill, Hurlstone Park, Wiley Park, and Punchbowl railway station groups) as a result of the removal of heritage elements associated with these items
- moderate direct and visual impacts to three locally listed heritage items (Campsie, Lakemba, and Bankstown railway station groups) as a result of the removal of some heritage elements associated with these items.

Despite these impacts, the assessment concluded that the T3 Bankstown Line would continue to retain some of its heritage values and demonstrate the historical phases of development of the line. The most significant stations (Marrickville, Canterbury, and Belmore), dating from the first

development period, would retain their significant, near-identical brick buildings of exceptional significance.

Stations representing the second period of development of the line would be conserved largely in their existing states. Lakemba and Bankstown's island platform configurations and platform buildings would be retained. Punchbowl Station would be subject to greater impacts as it would be fully redeveloped.

Stations representing the inter-war development period would be impacted, with Wiley Park Station being fully redeveloped. The inter-war phase of redevelopment of Dulwich Hill Station would also be altered, with the loss of the overhead booking office and major visual impacts on the station building, although the building and the island platform configuration would be conserved.

Examples of each significant platform building type between Marrickville and Bankstown would be conserved.

The project would also have a moderate direct impact on the locally listed Canterbury (Cooks River) Underbridge, as a result of the proposed removal and replacement of the parapets during bridge maintenance and protection works.

The assessment concluded that all State heritage listed items would continue to meet the threshold for State significance following completion of the project. However, two locally listed items (Wiley Park and Punchbowl railway station groups) would no longer meet the threshold for local significance and would likely be de-listed.

In addition to archival recording, additional management and mitigation measures would be implemented to minimise heritage impacts. Measures include considering opportunities for the retention, conservation, and/or reuse of original and significant heritage fabric where impacts are unavoidable. Appropriate landscape treatments, architectural design, and heritage interpretation would be incorporated into the detailed design. A conservation management plan would be prepared for all State Heritage Register listed stations, in accordance with NSW Heritage Council guidelines.

Aboriginal heritage

No listed Aboriginal sites are located within the project area. The closest previously recorded Aboriginal heritage site is a potential archaeological deposit (PAD) (the Fraser Park PAD) located about 650 metres north-east of the project area boundary. Two areas of potential archaeological deposits were identified during field surveys near Belmore and Punchbowl stations (S2B PAD 01 and S2B PAD 02 respectively).

The archaeological significance of the project area within the existing rail corridor is considered to be low as a result of the high levels of ground disturbance. S2B PAD 01, which is located outside the project area is considered to have low to moderate significance, while S2B PAD 02 is considered to have moderate significance, and low to moderate potential for intact archaeological deposits to be identified.

The main potential for impacts to Aboriginal heritage would occur during the construction phase. Construction of the project would not impact any previously recorded Aboriginal heritage sites, however S2B PAD 02 would be impacted by the proposed new access way from Punchbowl Road to Punchbowl Station, and proposed landscaping works. S2B PAD 01 would not be impacted.

Appropriate mitigation measures have been recommended to manage this impact, including preparation of an Aboriginal Cultural Heritage Assessment Report, and archaeological test excavation where impacts cannot be avoided.

Land use and property

The study area consists of a varied and relatively dense mix of land uses, including residential, commercial, industrial, transport infrastructure, community, health, education, and recreation. The majority of the project area is used for transport purposes (rail and road) and is public land managed by State Government agencies.

The design of the project has had regard to relevant strategic planning policies and strategies, and proposed future land uses provided by these strategies, including *A Plan for Growing Sydney* (NSW Government, 2014), the draft *Sydenham to Bankstown Urban Renewal Corridor Strategy*, and relevant district plans prepared by the Greater Sydney Commission.

Key potential construction impacts

Property acquisition would occur during the project planning and pre-construction phases.

A direct impact on property and land use is expected where land would be acquired at Marrickville and Punchbowl stations for the provision of station entrances, plazas, and shared zones. To enable development of the proposed western entrance, concourse, and shared zone at Marrickville Station, three privately owned lots (one residential and two commercial lots) would need to be acquired, and a portion of publicly owned land (in Station Street) would also need to be acquired. All acquisitions would be managed in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.

Similarly, a portion of publicly owned land in Station Street, Marrickville and two parcels of public land at Warren Reserve at Punchbowl Station would be required to enable development of the new station entrances and concourse areas.

The majority of construction sites would be located within the existing rail corridor to minimise direct impacts on land use and property. However, direct impacts on land use during construction would include temporary land take and the short term presence of construction equipment, plant, vehicles, and fenced work sites along the proposal site. During construction, the use of the land would change from a transport corridor (the main land use of the majority of the project area) to a construction site. Land subject to acquisition would change from its existing use (commercial, residential, public road, and reserve) to a construction site. Public access would be restricted. The impacts to Warren Reserve would be limited to a small portion of the overall reserve, located adjacent the existing rail corridor.

Other temporary land use impacts during construction would include construction of an underground detention basin in the north-western portion of McNeilly Park in Marrickville, which would restrict the use of this land during construction of the basin. The area above the basin would be restored and returned to public use when construction of the basin is complete.

Key potential operation impacts

Direct operational impacts on land use would be limited to the change in use for those areas of land and properties that would be acquired for the location of permanent operational infrastructure. Land acquired near Marrickville Station would change use, from commercial, road, and residential, to transport. Land acquired near Punchbowl station would change use from reserve/open space to transport.

Although the project would have no major direct operational impacts on land use or properties, it could act as a catalyst for urban renewal and future development. This could stimulate population growth, increase the demand for higher density living along the corridor, and positively affect future property values. In most cases, the project would lead to improvements in accessibility to stations and better integration of the rail network with existing and improved pedestrian, cycle and bus

networks. The project would play a part in facilitating the future development envisaged by the broader urban renewal program.

In terms of future land uses, the project presents opportunities for positive change within the vicinity of the stations, supporting urban renewal, and creating attractive, vibrant and highly accessible places. The relationship between the project and surrounding land uses is mainly being addressed through the planning and land use integration process that commenced with the draft *Sydenham to Bankstown Urban Renewal Corridor Strategy.* Overall, the project is anticipated to integrate positively with the initiatives proposed by the urban renewal corridor strategy, by providing a public transport facility that can meet future needs.

Socio-economic and business impacts

The project area extends through a highly urbanised, densely populated, and ethnically diverse area. It is located within 11 suburbs in the Inner West and the Canterbury-Bankstown local government areas. In 2011, the Sydenham to Bankstown corridor provided about 19,700 jobs. Each station is located within/close to a commercial/retail centre. Businesses of varying types are located close to each station. A small retail business is located at six stations (Dulwich Hill, Belmore, Lakemba, Wiley Park, Canterbury, and Punchbowl). Campsie station is directly adjoined by a number of buildings (located on land owned by RailCorp), which are used for a variety of retail/commercial purposes.

Key potential construction impacts

Both socio-economic benefits and impacts are expected to result from construction of the project. Construction would result in substantial economic benefits by way of job generation and construction multipliers. Some local businesses would expect to receive a direct stimulus from construction workers requiring food and beverage supplies and other goods and services.

There would also be adverse impacts on a number of businesses where acquisition and lease cessation is required. Land requirements to undertake the project would include business interests, as follows:

- full acquisition of two commercial lots near Marrickville Station
- cessation of one existing commercial retail lease at each of six stations (Dulwich Hill, Belmore, Lakemba, Wiley Park, Canterbury, and Punchbowl stations)
- cessation of 31 commercial leases in the building adjacent to Campsie Station.

The project would have the potential to impact community infrastructure located near the project area mainly as a result of impacts to amenity and access arrangements. The former Canterbury Bowling and Community Club would be directly impacted. The majority of the club building and all the surrounding open space is proposed for use as a construction compound and site office. This would mean that the majority of the facility would not be available for community use for the duration of the construction period.

Closure of the rail line and/or stations during possession periods has the potential to impact on the community, which has higher levels of public transport use compared to the Sydney average. It would also have the potential to affect businesses dependent on passing trade generated by rail customers. Implementation of a small business owners support program would assist in mitigating this impact.

Impacts would also include temporary access restrictions; amenity issues, such as increased traffic congestion, noise, vibration and dust; and changes to parking availability.

Management measures would be implemented to minimise the potential impacts of construction on the community and businesses. These measures would include Place Managers tasked with

working with businesses and the wider community during the construction period; implementation of a workforce development plan to promote local employment and skills development; and implementation of business management plans for each locality, detailing location specific mitigation measures.

Key potential operation impacts

Operation of the project as part of Sydney Metro would generate significant local and regional benefits and opportunities, as a result of the enhanced capacity and frequency of transport services, and improved access to the Sydney CBD and the wider transport network. During operation, community access and connectivity are expected to greatly improve through the provision of new, efficient, high capacity public transport and accessible station designs.

In addition to these broader operational benefits, key local benefits would include:

- Marrickville – improved access to Schwebel Street and Illawarra Road resulting in better safety and accessibility outcomes, and a more inviting station entrance in Station Street.
- Dulwich Hill – new accessible, cross corridor access link to facilitate community cohesion, and a new entrance closer to the light rail stop to facilitate interchange between the different transport modes.
- Hurlstone Park – provision of an enlarged station forecourt for safer gathering and interaction, and new pedestrian crossings to facilitate access to surrounding areas.
- Canterbury – improved access to the potential new town centre via a new station entrance on Broughton Street, promoting accessibility, community interaction, and cohesion.
- Campsie – the new station entrance would be more open to Beamish Street, which would further consolidate the station as a focal point for the community.
- Belmore – new station plaza and accessible cross-corridor link to promote community cohesion and gathering, and the proposed improvements to the Tobruk Avenue station frontage would improve connectivity with surrounding streets, the Burwood Road shopping area, and the Belmore Sportsground.
- Lakemba – improved access, new station entrance forecourts, and upgrades to the existing courtyard and memorial space to promote community identify.
- Wiley Park – new station entrance and public domain improvements would provide a more comfortable and safe station access.
- Punchbowl – the new station entrance and forecourt to The Boulevarde would improve pedestrian access to the station, and improve safety by increasing visibility and opportunities for passive surveillance.
- Bankstown – new, at grade cross-corridor link to improve access, cohesion, and integration.

The project would enhance local amenity and character in the areas surrounding the stations as a result of the focus on place making and promotion of active transport in the design development process. The project also has the potential to stimulate growth, new development, and urban renewal around stations, including new housing, employment opportunities, public places, community facilities, and integration with other transport infrastructure. This would provide the opportunity to enhance the health and wellbeing of the broader community.

As one of the two components of Sydney Metro City & Southwest, the project would contribute to economic growth by providing direct benefits to customers through reduced travel time and better reliability. The project would also deliver wider economic benefits by facilitating access to education and employment opportunities, increased connectivity, land development opportunities, and business logistics improvements, particularly for knowledge-based businesses.

Impacts to businesses during operation would largely be positive at the local and regional level, as a result of the enhanced capacity and frequency of transport services. Adverse impacts for local businesses during operation would include the potential for increased commercial rents, increased levels of competition, and changes to customer access and parking. The project may facilitate increased retail investment in local business precincts, due to improved customer access and an enlarged customer base enabled by Sydney Metro. The potential for redevelopment within the local business precincts, would provide subsequent opportunities for businesses to leverage off a growing resident and worker population base.

Landscape character and visual amenity

The existing visual environment is characterised by its highly developed urban nature, which includes existing rail and road infrastructure, and a range of built forms. Landscape character varies along the project area, with a number of different landscape character areas identified by the landscape and visual impact assessment. The landscape character areas are influenced by the nature of the urban form (including residential and commercial areas, and a variety of different built forms), natural features (the Cooks River), and the presence of areas of open space and parks.

Key potential construction impacts

Temporary visual impacts would be experienced during construction in the vicinity of construction work areas, compounds, and work sites. Visible elements would include machinery and equipment, site hoardings, partially complete structures, and other works. However, these impacts would be temporary and limited to the construction period. In addition, the majority of the works would be viewed within the context of a highly developed and dynamic urban environment, where construction and associated works are frequent occurrences.

A number of trees of varying sizes would potentially need to be removed to facilitate the upgrades of stations and station areas. Removal of trees would also be required to occur in sections of the rail corridor. Some of these trees contribute to the amenity and character of the local area and/or screen views from properties surrounding the project area. The removal of these trees would have the potential to reduce some screening between residential dwellings and the rail corridor, and impact on existing amenity. The final number of trees to be removed would be confirmed during detailed design and final construction planning. Impacts to trees would be minimised where practicable in accordance with the tree management strategy. It is noted that minimising tree removal will be key requirement of the construction contract.

Where removal of trees is unavoidable, trees would be replaced in accordance with the proposed tree management strategy, which would be prepared in consultation with relevant stakeholders, including the Inner West and Canterbury-Bankstown councils. This strategy would ensure that any trees that need to be removed would be replaced, and where possible, increased in number. This would include preparation of comprehensive tree reports by a qualified arborist where trees around station areas require protection, or pruning to guide the approach to managing each tree during construction.

In addition, as described below, biodiversity offsets are proposed to mitigate the loss of ecological values as a result of clearing in the rail corridor.

Key potential operation impacts

With the introduction of upgraded stations and new infrastructure in the project area, the project has the potential to result in changes to landscape character and visual amenity. The project would result in changes to the appearance (to differing degrees) of stations, and the addition of new infrastructure along the rail corridor.

The design of the stations and associated facilities has been undertaken to reinforce their role. As new vibrant spaces and destinations, the stations would fit with the NSW Government's transformation and renewal vision for the Sydenham to Bankstown corridor. They could serve as a catalyst for regeneration in the surrounding neighbourhoods and along the road corridors connecting to the stations, reflecting a high level of land use and transport integration. The detailed design of the project would include measures to integrate the changes to the stations into the surrounding urban fabric.

Hydrology, flooding and water quality

The majority of the project area, between Marrickville and Punchbowl stations, is located in the Cooks River catchment. The project area crosses the Cooks River about 400 metres west of Canterbury Station. Between Punchbowl and Bankstown stations, the project area is located within the Georges River catchment.

Around Marrickville Station, the rail corridor and surrounding lands are subject to regular and extensive flooding. Other areas where flooding of the rail corridor may occur are located to the west of Campsie Station, between Campsie and Canterbury stations, and to the east of Canterbury Station, however the frequency and extent is less than at Marrickville. Flooding issues generally result from the limited capacity of existing drainage infrastructure, including infrastructure within and crossing the rail corridor.

As a consequence of the heavily urbanised nature of the drainage catchments, the water quality of major watercourses is generally considered relatively poor, with stormwater runoff fouling the river systems with litter, petroleum derivatives, excess nutrients, and other pollutants.

Key potential construction impacts

A number of construction compounds and worksites would be located in areas that are currently subject to hazardous flooding conditions. However, as a result of the size of these areas relative to the overall floodplain, and the nature of activities proposed, no noticeable changes in floodplain function or storage are predicted. Further investigation and modelling would be undertaken during detailed design to ensure that the function of the floodplain is not materially affected by construction of the project. As far as possible, to minimise potential impacts to existing flooding conditions, all new drainage infrastructure would be constructed and operational prior to disconnection of existing infrastructure. Contingency management plans would also be developed and would include consideration of flooding, ensuring that appropriate arrangements are in place to manage any contingency events should they occur.

During construction, the potential for water quality impacts would be managed by implementing standard erosion and sediment management measures, in accordance with *Managing Urban Stormwater: Soils and Construction*.

Key potential operation impacts

Flood modelling conducted for the study area in the vicinity of Marrickville Station indicated that during the one per cent annual exceedance probability event, flood depths and velocities would generally remain the same or reduce as a result of the upgraded drainage infrastructure to be provided by the project. This would include increasing the capacity of culverts and installing detention basins in key locations.

Preliminary consultation was undertaken with the Inner West and Canterbury-Bankstown councils, and the NSW State Emergency Service, regarding existing flood evacuation routes and the potential impacts of the project. Some roads that currently provide emergency access near Marrickville Station are subject to flooding under existing conditions. Modelling predicted that the project would result in negligible changes to the flood level at the majority of these roads, and a

decrease in the flood level in the vicinity of Marrickville Road (including surrounding roads). Flood emergency management would be incorporated into the design of station infrastructure and the project's operational emergency management plans. Flood modelling of other areas along the rail corridor, including appropriate allowance for climate change, would be undertaken during detailed design.

The project would include installation of water quality treatment measures at stations to capture pollutants, including litter, sediments, phosphorous, hydrocarbons, and nitrogen, to meet water quality targets, which are in keeping with relevant guidelines. However, as a result of the small size of station catchments compared to the much larger overall drainage catchment, there is expected to be no noticeable effect on water quality in receiving waters.

Biodiversity

The majority of the study area has been heavily modified by past and ongoing disturbances associated with urban development and the active rail corridor. The majority of vegetation in the project area and surrounding study area comprises exotic or planted native species on highly modified landforms. There are small isolated patches of remnant or regrowth native vegetation in small portions of the study area associated with rail cuttings with less disturbed soil profiles.

About 0.6 hectares of the native vegetation in the project area matches two threatened ecological communities listed under the *Threatened Species Conservation Act 1995* (TSC Act). No listed threatened flora species were recorded in the project area. Around 650 stems of the endangered Downy Wattle, which is listed as a vulnerable species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the TSC Act, are located near the project area. One threatened fauna species, the Grey-headed Flying-fox, was recorded during site surveys.

The main potential for biodiversity impacts would occur during construction. Potential impacts on biodiversity have been minimised by designing the project to minimise the potential for impacts outside the rail corridor. This included refining the location of project near Punchbowl and Bankstown stations to avoid impacts on Downy Wattle.

A biodiversity impact assessment was undertaken for the Environmental Impact Statement in accordance with the *Framework for Biodiversity Assessment* (OEH, 2014a). It was assumed for the purpose of the assessment that construction would require removal of all vegetation within the rail corridor in the project area. This would involve removal of 29.8 hectares of vegetation. The majority of this vegetation comprises exotic plants (about 21.5 hectares) or planted, often non-indigenous, native species on fill material (about 7.3 hectares). Removing all vegetation in the rail corridor would impact one hectare of native vegetation.

The project would also require the removal of street trees, mainly around station areas. This potential impact is considered above (under landscape character and visual amenity).

The assessment concluded that the project would not significantly impact any listed ecological community or species.

To mitigate potential impacts to biodiversity as a result of clearing of native vegetation in the rail corridor, the proposed Biodiversity Offset Strategy would be implemented in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014b). The offset strategy requires the purchase and retirement of biodiversity credits calculated in accordance with the *Framework for Biodiversity Assessment*.

Sustainability and climate change

For infrastructure projects, 'infrastructure sustainability' is defined by the Infrastructure Sustainability Council of Australia as 'infrastructure that is designed, constructed and operated to optimise environmental, social and economic outcomes of the long term'.

The assessment undertaken for the Environmental Impact Statement considers the application of sustainability principles to the project, and opportunities to achieve sustainability targets and outcomes aligned with best practice infrastructure projects. Sustainability principles have been incorporated throughout the design process. A project-specific environment and sustainability strategy has been developed, and is provided in Appendix F.

Sydney Metro is targeting an 'Excellent' rating under the Infrastructure Sustainability Council of Australia's Infrastructure Sustainability framework. To assist in achieving this rating, a range of sustainability initiatives and targets would be implemented, including:

- provision of solar systems
- incorporating carbon and energy management into the project design
- reduction of greenhouse gas emissions by 20 per cent
- rainwater harvesting and water saving features
- waste reduction targets for different types of waste.

Project contractors would be required to clearly identify how they would achieve specific sustainability objectives, initiatives, and targets. This approach would encourage industry to develop innovative value-for-money sustainability solutions. Key sustainability themes would include governance, carbon and energy management, pollution control, climate change resilience, resources (water efficiency and waste and materials), biodiversity conservation, heritage conservation, liveability, community benefit, supply chain, workforce development, and economic factors.

A climate change risk assessment and a greenhouse gas assessment were also undertaken. The climate change risk assessment identified risk treatments that would be incorporated into the detailed design of the project, including ensuring that adequate flood modelling is carried out and integrated into the design.

The greenhouse gas assessment concluded that operation and maintenance of the project would result in increased emissions of greenhouse gas through increased electricity use. However, the project has the potential to reduce greenhouse gas emissions by providing a reliable and efficient alternative to private car travel. An iterative process of greenhouse gas assessments and design refinements would be carried out during detailed design and construction to identify opportunities to minimise greenhouse gas emissions.

Cumulative impacts

A number of major projects are proposed or are being undertaken in the vicinity of the project area, including the Sydney Metro City & Southwest Chatswood to Sydenham project, and two stages of WestConnex.

The Chatswood to Sydenham project would involve works close to the project area, as both projects are located adjacent to each other east of Marrickville Station. The main potential cumulative impacts associated with construction of the two projects include:

- traffic impacts, due to the movement of construction vehicles and the operation of buses to replace rail services during possession periods
- hydrology and flooding impacts, which are assessed as part of the hydrology assessment.

Both projects would provide cumulative transport-related benefits, including a major increase in the capacity of Sydney's rail network.

There is considered to be limited potential for cumulative impacts with the WestConnex projects, due to the distance between the surface works for these projects and the Sydenham to Bankstown upgrade.

Cumulative impacts would be highly dynamic and time/activity specific, so are difficult to define in detail at this stage of the assessment process. Transport for NSW would continue to work closely with relevant stakeholders to manage and co-ordinate the interface with other major projects under construction at the same time, and would consult with a range of state and local government agencies.

Other issues

In addition to the above, other environmental issues, including contamination, air quality; hazards, risk and safety; and waste management, were also considered to develop a comprehensive environmental management framework for the project. These and other impacts would be managed by the implementation of appropriate environmental management measures included in the construction environmental management plan for the project.

Environmental mitigation and management

The detailed design for the project would be undertaken with the objective of minimising potential impacts on the environment and the community. The design and construction methodology would continue to be developed with this objective in mind, taking into account the input of stakeholders.

To minimise and manage the potential impacts identified by the Environmental Impact Statement, the assessment chapters outline a range of mitigation and management measures, including those that have been successfully applied to other major infrastructure projects in Sydney. Chapter 28 summarises the environmental mitigation and management measures that would be implemented prior to and during construction and operation. These include implementation of the:

- Sydenham to Bankstown Design Guidelines (Appendix C)
- Construction Environmental Management Framework (Appendix D)
- Construction Noise and Vibration Strategy (Appendix E)
- Temporary Transport Strategy (Appendix G)
- Utilities Management Framework (Appendix H).

Next steps

During the public exhibition period, stakeholders and the community are encouraged to make written submissions to the Department of Planning and Environment in relation to the project. Following the exhibition period, Transport for NSW will consider the issues raised in submissions and will respond to community feedback in a submissions report. The report will also document the outcomes of any ongoing investigations and design work identified following the exhibition of in the Environmental Impact Statement.

Should changes to the project be proposed during the exhibition period, a preferred project report would be prepared to assess the impacts of any changes. The submissions report would be integrated into this report.

If the project is approved, it would be undertaken in accordance with the mitigation measures proposed in the Environmental Impact Statement, the submissions/preferred infrastructure report, and the conditions of approval.

Part A

Introduction and background

1. Introduction

1.1 Background

The New South Wales (NSW) Government is implementing *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of rail customers into the future.

Sydney Metro is a new, standalone rail network identified in *Sydney's Rail Future*, providing 66 kilometres of metro rail line and 31 metro stations. The NSW Government is currently delivering the first two stages of Sydney Metro, shown in Figure 1.1, which consist of Sydney Metro Northwest (between Rouse Hill and Chatswood) and Sydney Metro City & Southwest (between Chatswood and Bankstown).

Sydney Metro Northwest is currently under construction. Sydney Metro Northwest services will start in the first half of 2019, with a metro train running every four minutes in the peak period. Services will operate between a new station at Cudgegong Road (beyond Rouse Hill) and Chatswood.

Sydney Metro City & Southwest will extend the Sydney Metro system beyond Chatswood to Bankstown, delivering about 30 kilometres of additional metro rail, a new crossing beneath Sydney Harbour, new railway stations in the lower North Shore and Sydney central business district (CBD), and the upgrade of existing stations from Marrickville to Bankstown. Sydney Metro City & Southwest comprises two core components (shown in Figure 1.1):

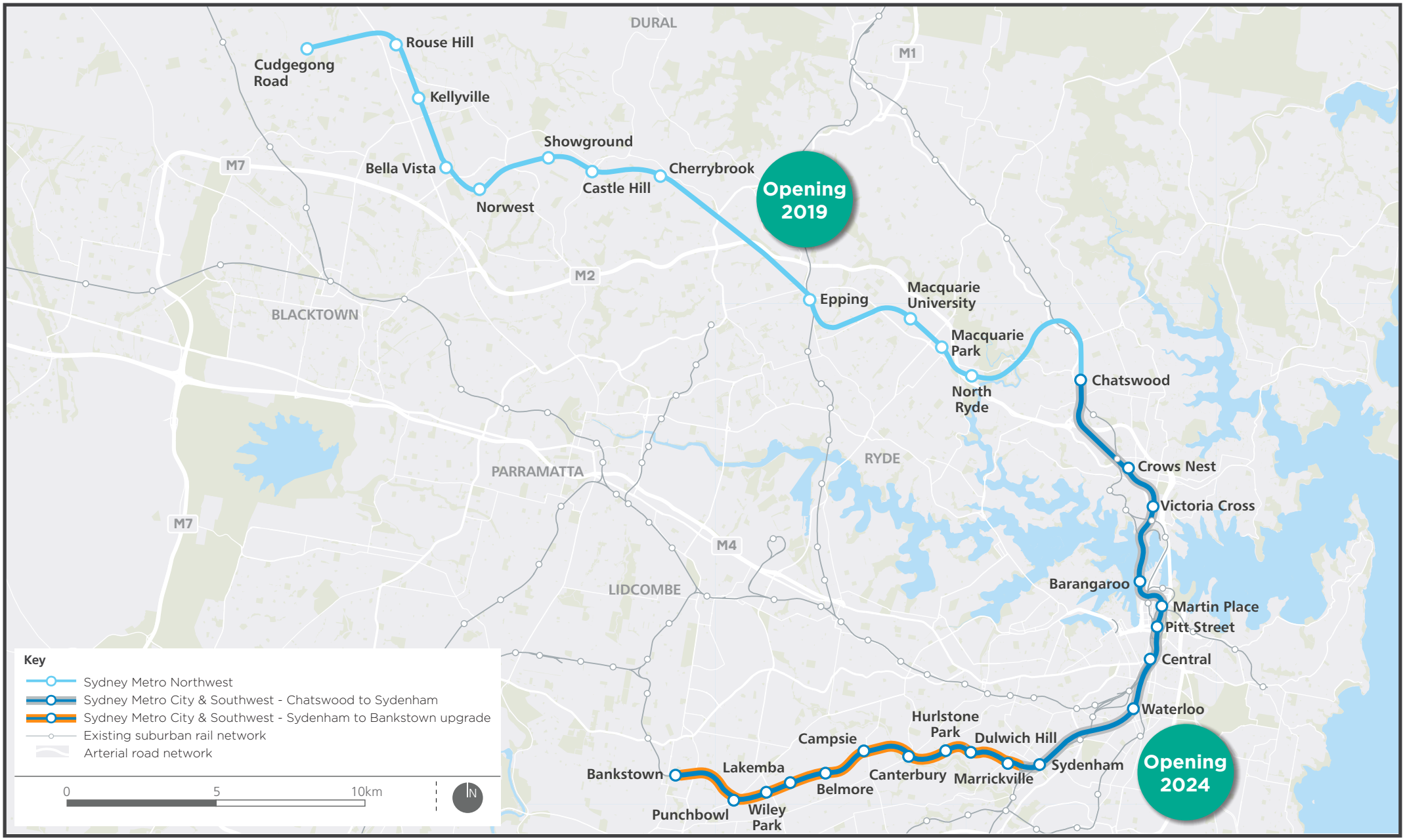
- the Chatswood to Sydenham project
- the Sydenham to Bankstown upgrade (the subject of this Environmental Impact Statement).

Planning approval for the Chatswood to Sydenham project, which includes 15.5 kilometres of new underground rail line and seven new stations between Chatswood and Sydenham, was received in January 2017, with construction activities commencing in 2017. The approved Chatswood to Sydenham project includes the dive structure and tunnel portal located between Sydenham Station and Bedwin Road, Marrickville (the Marrickville dive structure). The approved project does not currently include changes to Sydney Trains tracks in the vicinity of Sydenham (at Sydenham Junction), works to Sydenham Station, or the provision of stabling facilities (the Sydney Metro Trains Facility).

The Sydenham to Bankstown State Significant Infrastructure Application Report noted that works to support the phased opening of the Chatswood to Sydenham project could be accelerated under a separate planning approval. To enable this to occur, Transport for NSW proposes to include the works at Sydenham Junction and Sydenham Station, and construction of the Sydney Metro Trains Facility, as part of the scope of the Chatswood to Sydenham project. A modification to the Chatswood to Sydenham project is currently underway to include these works as part of the scope of that project.

Planning for Sydney Metro West is also currently underway. Sydney Metro West is proposed to be an underground metro railway that will link the Parramatta and Sydney CBDs, and communities in between.

The Sydney Metro Delivery Office, part of Transport for NSW, is managing the planning, procurement and delivery of the Sydney Metro network, as shown in Figure 1.2.



sydney METRO | city & southwest

The Sydney Metro network

FIGURE 1.1

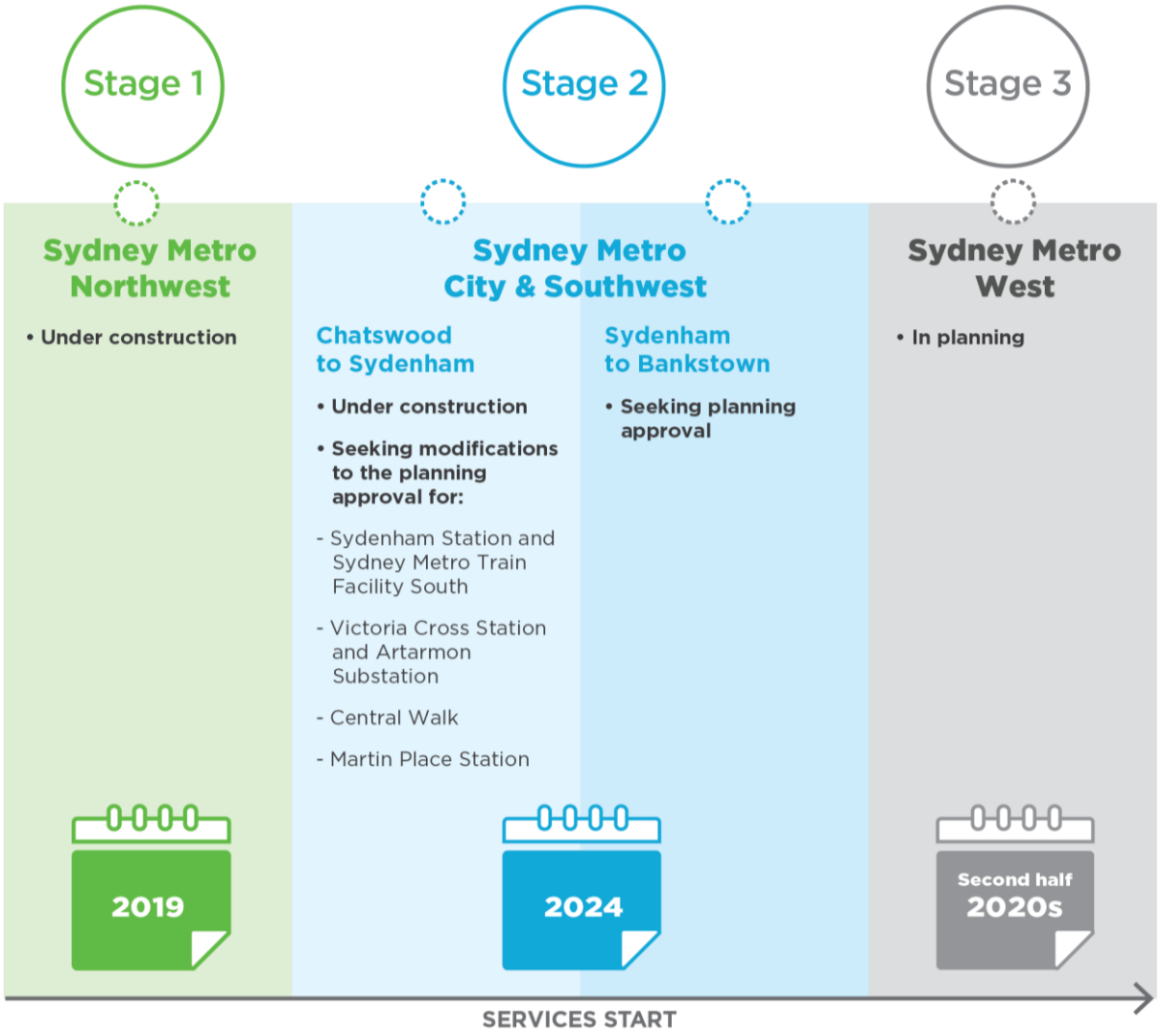


Figure 1.2 The Sydney Metro network – status

1.2 The project for which approval is sought

1.2.1 The project

To further progress implementation of *Sydney's Rail Future* and Sydney Metro City & Southwest, Transport for NSW ('the proponent') is seeking approval to construct and operate the Sydenham to Bankstown upgrade component of Sydney Metro City & Southwest ('the project').

The project involves upgrading 10 existing stations west of Sydenham (Marrickville to Bankstown inclusive), and a 13 kilometre long section of the Sydney Trains T3 Bankstown Line, between west of Sydenham Station and west of Bankstown Station, to improve accessibility for customers and meet the standards required for metro operations. The project would enable Sydney Metro to operate beyond Sydenham, to Bankstown.

A key element of the project is upgrading stations along the corridor from Marrickville to Bankstown, to allow better access for more people, by providing new concourses, level platforms, and lifts at all stations. These upgrades aim to provide a better, more convenient, and safer experience for public transport customers, by delivering:

- stations that are accessible to people with a disability or limited mobility, the elderly, people with prams, and people travelling with luggage
- upgraded station buildings and facilities for all transport modes that meet the needs of a growing population

- interchanges that support an integrated transport network and allow seamless transfers between different modes for all customers.

In December 2015, Sydney Metro City & Southwest (including the project) was declared to be critical State significant infrastructure by the NSW Minister for Planning under *State Environmental Planning Policy (State and Regional Development) 2011*. As critical State significant infrastructure, the project is permissible without development consent, and is subject to assessment and approval by the Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2.2 Location

The location of the project is shown in Figure 1.3. The key elements of the project are located mainly within the existing rail corridor, from about 800 metres west of Sydenham Station in Marrickville, to about one kilometre west of Bankstown Station in Bankstown. The project is located in the Inner West and Canterbury-Bankstown local government areas.

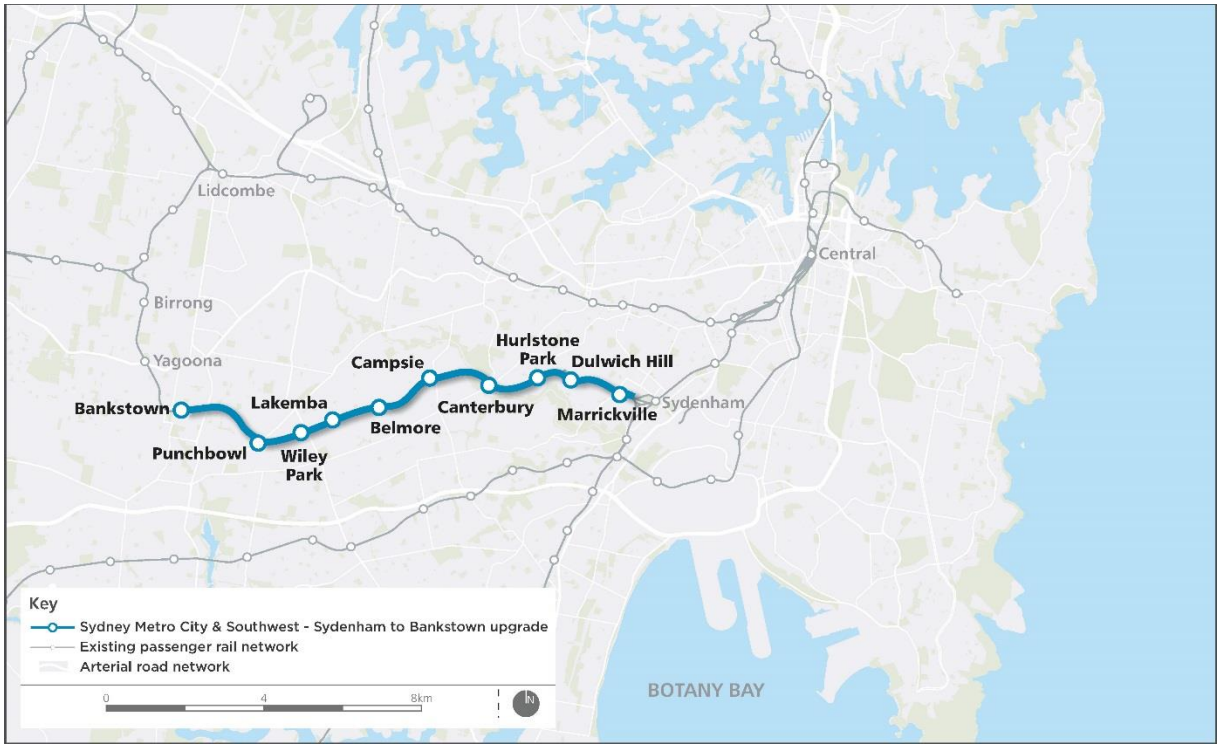


Figure 1.3 Location of the project

1.2.3 Key features of the project

The key features of the project are summarised below and are shown in Figure 1.4.

Works to upgrade access at stations

The project includes upgrading the 10 stations from Marrickville to Bankstown as required, to meet legislative requirements for accessible public transport, including the requirements of the *Disability Discrimination Act 1992* and the *Disability Standard for Accessible Public Transport 2002*. The proposed works include:

- works to platforms to address accessibility issues, including levelling and straightening platforms
- new station concourse and station entrance locations, including:
  - new stairs and ramps

  - new or relocated lifts
- provision of additional station facilities as required, including signage and canopies.

Works would also be undertaken in the areas around the stations to better integrate with other modes of transport, improve travel paths, and meet statutory accessibility requirements. This would include provision of pedestrian, cyclist, and other transport interchange facilities; as well as works to the public domain, including landscaping.

Works to convert stations and the rail line to Sydney Metro standards

Station works

In addition to the station upgrades to improve accessibility, works to meet the standards required for metro services would be carried out, including:

- installation of platform screen doors
- provision of operational facilities, such as station services buildings.

Track and rail system facility works

Upgrading the track and rail systems to enable operation of metro services would include:

- track works where required along the rail corridor, including upgrading tracks and adjusting alignments, between west of Sydenham Station and west of Bankstown Station
- new turn back facilities and track crossovers
- installing Sydney Metro rail systems and adjusting existing Sydney Trains rail systems
- overhead wiring adjustments.

Other works

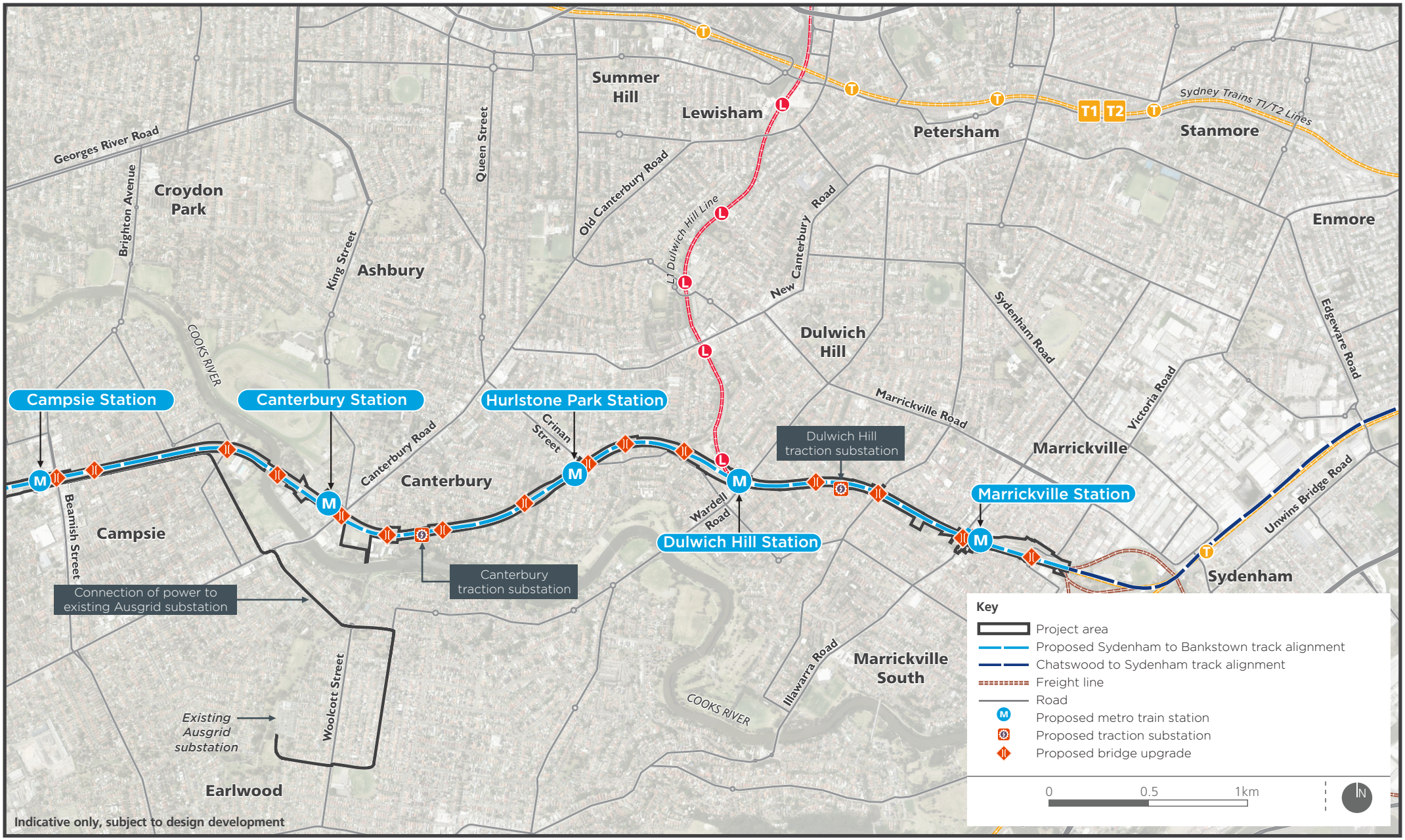
Other works proposed to support Sydney Metro operations include:

- upgrading existing bridges and underpasses across the rail corridor
- installation of security measures, including fencing
- installation of noise barriers where required
- modifications to corridor access gates and tracks
- augmenting the existing power supply, including new traction substations and provision of new feeder cables
- utility and rail system protection and relocation works
- drainage works to reduce flooding and manage stormwater.

Active transport corridor and future rail corridor development

The project would also deliver:

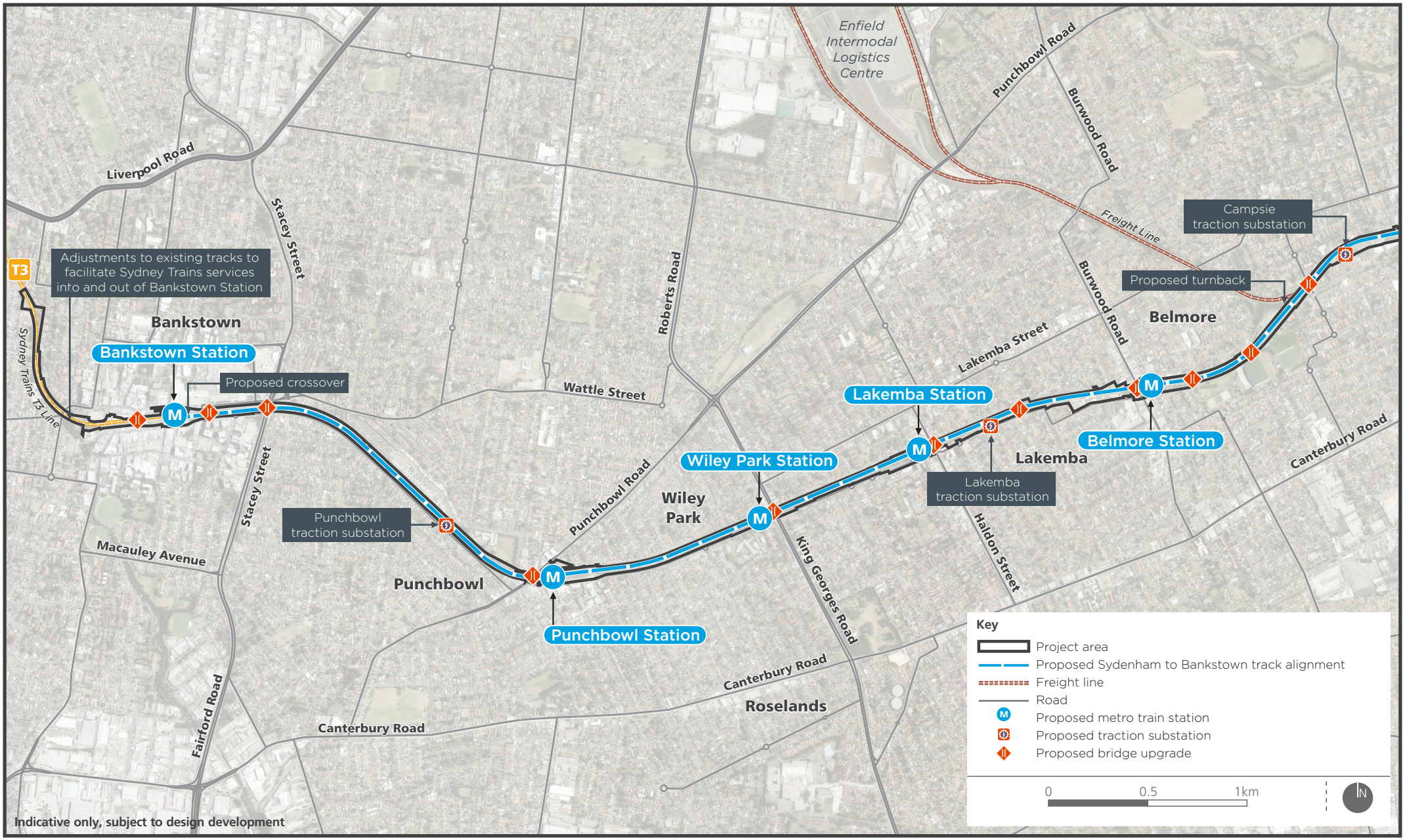
- sections of an active transport corridor located around the station areas, to facilitate walking and cycling connections to each station and between Marrickville and Bankstown
- enabling works to support future development at Campsie Station (future development would be subject to separate approval).



sydney METRO | city & southwest

Overview of the project - map 1

FIGURE 1.4



sydney METRO | city & southwest

Overview of the project - map 2

FIGURE 1.4

Temporary works during construction

During construction, the project would involve:

- provision of temporary facilities to support construction, including construction compounds and work sites
- implementation of alternative transport arrangements for rail customers during possession periods and/or station closures, guided by the Temporary Transport Strategy.

1.2.4 Project objectives and aims

The primary objectives of the project are to:

- improve the quality of the transport experience
- provide a system that is able to satisfy long-term demand
- improve the resilience of the transport network.

Secondary objectives are to:

- grow public transport patronage and mode share
- support the productivity of the Global Economic Corridor
- serve and stimulate urban development
- improve the efficiency and cost effectiveness of the public transport system
- implement a feasible solution recognising impacts, constraints and delivery risks.

The project also aims to

- deliver accessible, modern, secure and integrated transport infrastructure
- contribute to the accessibility and connectivity of existing and future communities.

1.2.5 Construction

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in 2018). Upgraded stations would be progressively delivered from 2019 until 2024, with the main station upgrade works estimated to take about two years for each station. During this period, works to upgrade other infrastructure, such as tracks, bridges, embankments and drainage, would also be undertaken.

The T3 Bankstown Line and freight tracks operated by Australian Rail Track Corporation (ARTC) (between Marrickville and west of Campsie) would remain operational for the majority of the construction period. However, to ensure the station and infrastructure upgrade works are completed as efficiently and safely as possible, and to accommodate works that cannot be undertaken when trains are operating, it would be necessary to undertake some work during rail possession periods, when trains are not operating. It is anticipated that these rail possession periods would comprise the routine weekend maintenance possessions scheduled by Sydney Trains (and ARTC), together with some longer possession periods during periods of reduced patronage such as school holidays.

A final, longer possession of about three to six months would also be required. This would involve full closure of the line to enable it to be converted to metro operations. This final possession period is to enable works that can only be completed once Sydney Trains services are not operating. It would include works such as the installation of new signalling, communication systems, and platform screen doors.

During each possession period, a temporary transport management plan would be implemented to provide alternative transport arrangements and ensure that customers can continue to reach their destinations.

1.2.6 Operation

The project would connect with the Chatswood to Sydenham project within the existing rail corridor, about 800 metres to the west of Sydenham Station.

The project would operate in conjunction with Sydney Metro Northwest and the Sydney Metro City & Southwest Chatswood to Sydenham project, which, subject to the modification described in Section 1.1, is proposed to extend from Chatswood Station to Sydenham Station.

Sydney Metro Northwest will be operational between Cudgegong Road and Chatswood stations by 2019. Sydney Metro City & Southwest would be fully operational by 2024, with the opportunity for operation to commence in two phases. Initially, Sydney Metro Northwest services would be extended by the City & Southwest project, and would operate from Chatswood Station to Sydenham Station. Some months later, metro operations would extend from Sydenham Station to Bankstown Station, with both phases planned to be completed before the end of 2024. The opportunity for phased opening of the project would enable metro trains to operate from Cudgegong Road Station to Sydenham Station prior to the final conversion of the T3 Bankstown Line to metro operations.

Once the project is operational, Sydney Trains services would no longer operate between Sydenham and Bankstown stations. Metro trains would run between Sydenham and Bankstown stations in each direction, at least every four minutes in peak periods, averaging around 15 trains per hour. Customers would be able to interchange with Sydney Trains services at Sydenham and Bankstown stations. Sydney Trains services to and from Bankstown Station to Liverpool and Lidcombe stations would not be affected.

More information on the project is provided in Chapter 8 (Project description – operation) and Chapter 9 (Project description – construction).

1.2.7 Project cost estimate

The indicative cost range for Sydney Metro City & Southwest, comprising both the Chatswood to Sydenham project and the Sydenham to Bankstown upgrade, is estimated to be $11.5 to $12.5 billion. The final project budget will be confirmed once all major contracts have been awarded, following the same process used for the $8.3 billion Sydney Metro Northwest.

1.3 Project need and benefits

1.3.1 Transforming Sydney

Over the next 15 years, NSW will require infrastructure to support 40 per cent more train trips, 30 per cent more car trips and 31 per cent more households.

Sydney's current suburban rail system can reliably carry 24,000 people an hour per line. Sydney Metro, together with signalling and infrastructure upgrades across the existing Sydney rail network, will increase the capacity of train services entering the Sydney CBD – from about 120 services an hour today, up to 200 services beyond 2024. This is an increase of up to 60 per cent across the network to meet demand. Sydney Metro, including the project, will have a long-term target capacity of about 40,000 customers per hour in each direction, similar to other metro systems worldwide.

Sydney Metro, Australia's largest public transport project, will transform Sydney, cutting travel times, reducing congestion, and delivering economic and social benefits for generations to come. It will boost economic activity by more than $5 billion a year, supporting major jobs and business

growth along its route with better connectivity and urban renewal opportunities, and greatly improving business logistics, especially for knowledge-based businesses.

With at least 15 trains an hour in the peak when services start in 2024, the conversion of the T3 Bankstown Line to metro operations would address one of Sydney's biggest rail bottlenecks, delivering benefits across Sydney's rail network. These benefits would further increase when the number of trains increases to 20 per hour as part of the ultimate operations.

The T3 Bankstown Line effectively slows down the Sydney Trains network because of the way it merges with other railway lines close to the city, including the T2 Airport, Inner West & South Line.

Parts of the T3 Bankstown Line are over 120 years old with existing infrastructure in varying conditions. A key challenge for this line is customer accessibility, with five of the stations not having lifts. In addition, a number of these stations have larger than desirable gaps between the platforms and trains, which makes access difficult for some customers, particularly the disabled, elderly, and those travelling with young children, prams or luggage.

Further information on the need for and benefits of the project is provided in Chapter 5 (Project need).

1.3.2 Customer experience

The design and delivery of Sydney Metro is centred on the customer and focussed on their needs, at each stage of their journey. Sydney Metro's commitment is to provide a reliable transport solution that will make it easy for all customers to get to where they need to go.

Sydney Metro is being designed to deliver a service that is on time, clean, safe, comfortable, efficient, convenient, accessible and easy for customers to use. It will also be seamlessly integrated with other transport modes, including interchanges with the existing Sydney Trains network, as well as buses, light rail and ferries.

Customer benefits of Sydney Metro include:

- no timetable – customers can just turn up and go, with services every four minutes in the peak
- opal ticketing – fares set and controlled by the NSW Government, the same as the rest of Sydney
- customer service assistants at every station and moving through the network during the day and night
- Australian-first platform screen doors (running the full length of all metro platforms and only opening at the same time as the train doors), which keep people and objects away from the edge, improving customer safety and allowing trains to get in and out of stations faster
- continuous mobile phone coverage throughout the metro network
- 98 per cent on time running
- clean platforms and trains
- two multi-purpose areas per train for prams, luggage, and bicycles
- wheelchair spaces, separate priority seating, and emergency intercoms inside trains
- safety benefits, including security cameras on trains, and the ability for customers to see inside the train from one end to the other
- video help points at platforms, connecting directly with train controllers – an Australian first
- level access between the platform and train, and three double doors per side per carriage, for faster loading and unloading

- heating and air-conditioning in all metro trains
- on-board real time travel information and live electronic route maps.

As Australia's first fully automated railway, customer safety is a priority of Sydney Metro. At all times, a team of expert train controllers will monitor the network, making sure everything runs smoothly.

1.4 Purpose and structure of the Environmental Impact Statement

This Environmental Impact Statement supports an application for approval of the project as critical State significant infrastructure under Part 5.1 of the EP&A Act. It addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the 'Secretary's environmental assessment requirements'), dated 23 March 2017 (refer to Appendix A).

The Environmental Impact Statement (volume 1) is structured in four parts as follows:

- **Part A Introduction and background**:
  - an introduction to the environmental impact assessment (**Chapter 1**)
  - a description of the project area and a concise description of its general biophysical and cultural environment (**Chapter 2**)
  - an overview of the project's statutory context, in terms of relevant assessment and approval requirements (**Chapter 3**)
  - a summary of previous and proposed community and stakeholder consultation (**Chapter 4**).
- **Part B The project**:
  - an overview of the strategic context and need for the project (**Chapter 5**)
  - a summary of the strategic alternatives to Sydney Metro as a whole and the options considered during design development (**Chapter 6**)
  - a description of how the project design was developed, including how urban design, place making, heritage, and other environmental considerations formed part of the design process (**Chapter 7**)
  - a description of the project features and operation (**Chapter 8**), including design features and infrastructure proposed, operations, acquisition requirements, and maintenance
  - an indicative description of the likely construction process and activities (**Chapter 9**).
- **Part C Environmental assessment**:
  - the results of the assessment of the key environmental issues identified by the Secretary's environmental assessment requirements, including information on the existing environment, potential construction and operation impacts, and proposed mitigation measures (**Chapters 10 to 27**).
- **Part D Conclusion**:
  - provides a synthesis of the findings of the Environmental Impact Statement, a description of the proposed approach to environmental management during construction and operation, and a consolidated list of mitigation measures (**Chapter 28**).

Other appendices in volume 1 provide supporting information.

The specialist technical reports prepared as an input to the Environmental Impact Statement are provided in volumes 2 to 6.

2. Location and setting

This chapter describes the project's location. It defines the project area for the purpose of the Environmental Impact Statement, and provides a summary of the key features of the environment of the project area, and the broader study area in which it is located. The Environmental Impact Statement assesses the potential impacts of the project on the project area and, where relevant, the broader study area. These terms are defined in the chapter.

The Secretary's environmental assessment requirements addressed in this chapter are listed in Table 2.1. A full copy of the assessment requirements and where they are addressed in the Environmental Impact Statement is provided in Appendix A.

Table 2.1 Secretary's environmental assessment requirements – location and setting

Ref	Secretary's environmental assessment requirements – location and setting	Where addressed
2.1(i)	A concise description of the general biophysical and socio-economic environment that is likely to be impacted by the project (including offsite impacts).	This chapter

2.1 Definitions used in this Environmental Impact Statement

The following are the key locational descriptor definitions used in this Environmental Impact Statement.

2.1.1 Project area

The term 'project area' is used in this Environmental Impact Statement to refer to the area where the project would be undertaken. The project area is the area that would be directly disturbed by construction of the project (for example, as a result of ground disturbance and the construction of foundations for structures). It includes the location of construction activities, compounds and work sites, areas that may be affected by alternative transport arrangements during construction, and the location of operational infrastructure. A description of the project area is provided in Section 2.2.2.

2.1.2 Study area

The study area is defined as the wider area including and surrounding the project area, with the potential to be directly or indirectly affected by the project (for example, by noise and vibration, visual, or traffic impacts). The actual size and extent of the study area varies according to the nature and requirements of each assessment and the relative potential for impacts. For example, the study area for the heritage assessment is generally restricted to the area with the potential for heritage impacts, extending for a distance of about 25 metres on either side of the project area. In comparison, the study area for the noise and vibration assessment is based on noise catchment areas, and extends for a distance of about 100 metres on either side of the majority of the project area, and 200 metres around construction compounds.

A concise description of the general biophysical, social, and cultural environment of the study area is provided in Sections 2.3 and 2.4.

2.1.3 Station area

The station area is the area surrounding the stations, within which works are required to provide facilities associated with the upgraded stations. Works are proposed in the station area to meet

statutory accessibility requirements, better integrate the station with other modes of transport, and improve travel paths. As noted in Section 1.2, this would include providing pedestrian, cyclist, and other transport interchange facilities, as well as works to the public domain, such as landscaping. The extent of the station area around each station is shown in Figure 2.1.

2.2 Location of the project and the project area

2.2.1 Location

The project is located in Sydney's inner to middle ring western/south-western suburbs, between about seven and 17 kilometres south-west of the Sydney CBD (extending from west of Sydenham Station to west of Bankstown Station respectively). At its closest point (at Bankstown Station), the project area is located about 11 kilometres south of the Parramatta CBD.

The location of the project is shown on Figure 1.3 and Figure 1.4.

2.2.2 The project area

The project area is shown in Figure 2.1. It extends for about 13 kilometres along the rail corridor, from west of Sydenham Station in Marrickville, to west of Bankstown Station in Bankstown.

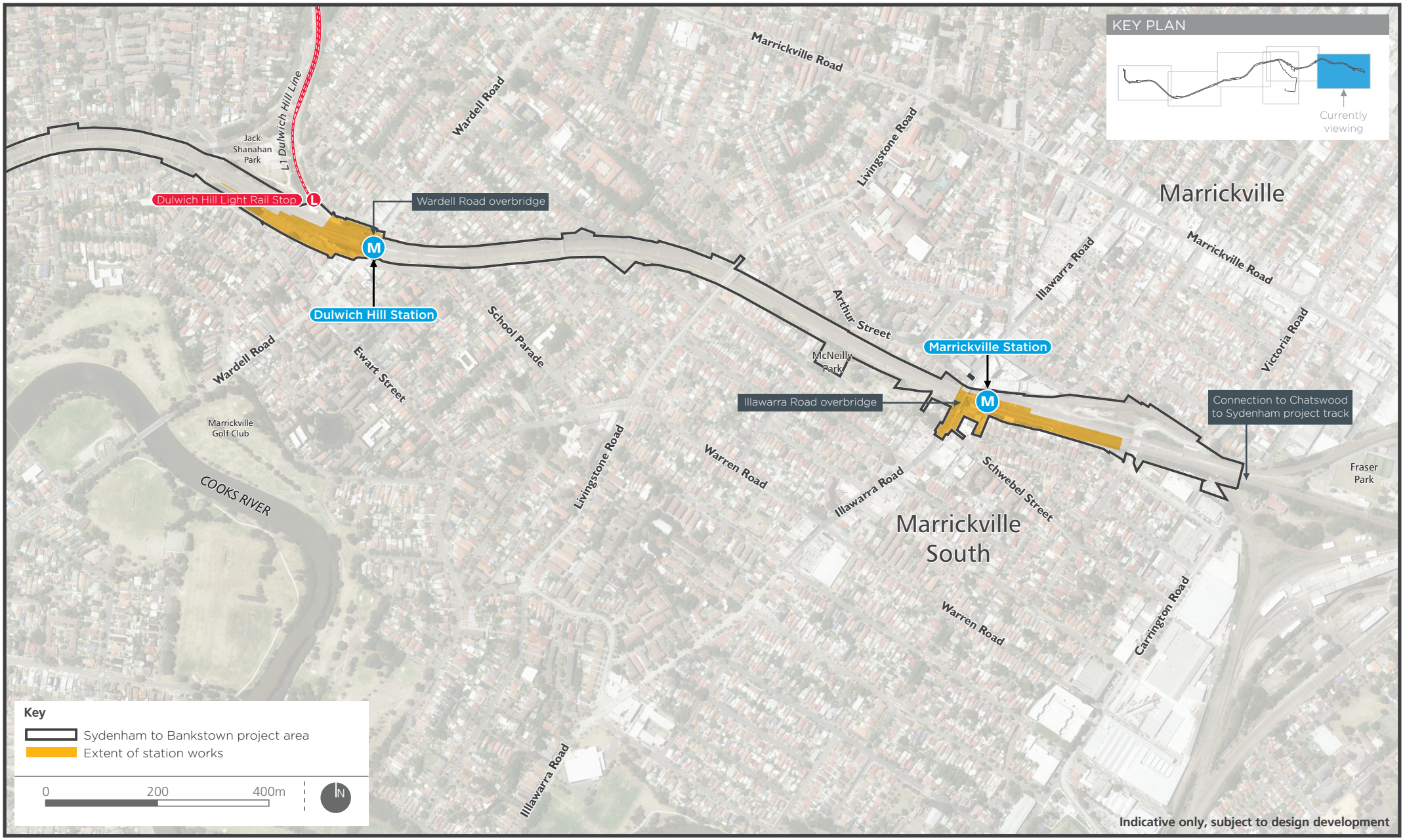
The eastern end of the project area is located within the rail corridor, about 800 metres west of Sydenham Station and about 500 metres east of Marrickville Station, to the west of Fraser Park (near Meeks Road). From this location, the project area extends west along the T3 Bankstown Line. In some locations, the project area extends beyond the rail corridor to provide for the location of construction compounds, construction worksites, station work areas, and ancillary infrastructure.

The western end of the project area is located within the rail corridor about one kilometre to the west of Bankstown Station, near Carmen Street, Bankstown.

The project is as described in this Environmental Impact Statement, and is generally located within the suburbs of Marrickville, Sydenham, Tempe, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl, and Bankstown, in accordance with the critical State significant infrastructure declaration. Further information on the permissibility of the project is provided in Section 3.1.1.

The project area generally includes:

- the existing rail corridor from west of Sydenham Station to west of Bankstown Station
- Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl, and Bankstown stations
- bridges crossing the rail corridor where works are proposed as part of the project (described in Section 8.1.3)
- the proposed locations of construction compounds and work sites (described in Section 9.8 and shown in Figure 9.1)
- the location of the proposed new 33 kilovolt electricity feeder cable between Campsie Station and Ausgrid's Canterbury Substation (described in Section 8.1.3 and shown in Figure 2.1)
- works required to prepare the road network and station surrounds for the implementation of temporary transport management plans (described in Sections 9.2.3 and 10.3.1).
- works required to prepare the road network for the movement of heavy vehicles during construction, including works at certain intersections (described in Section 10.3.3) to allow vehicles to make safe turns.



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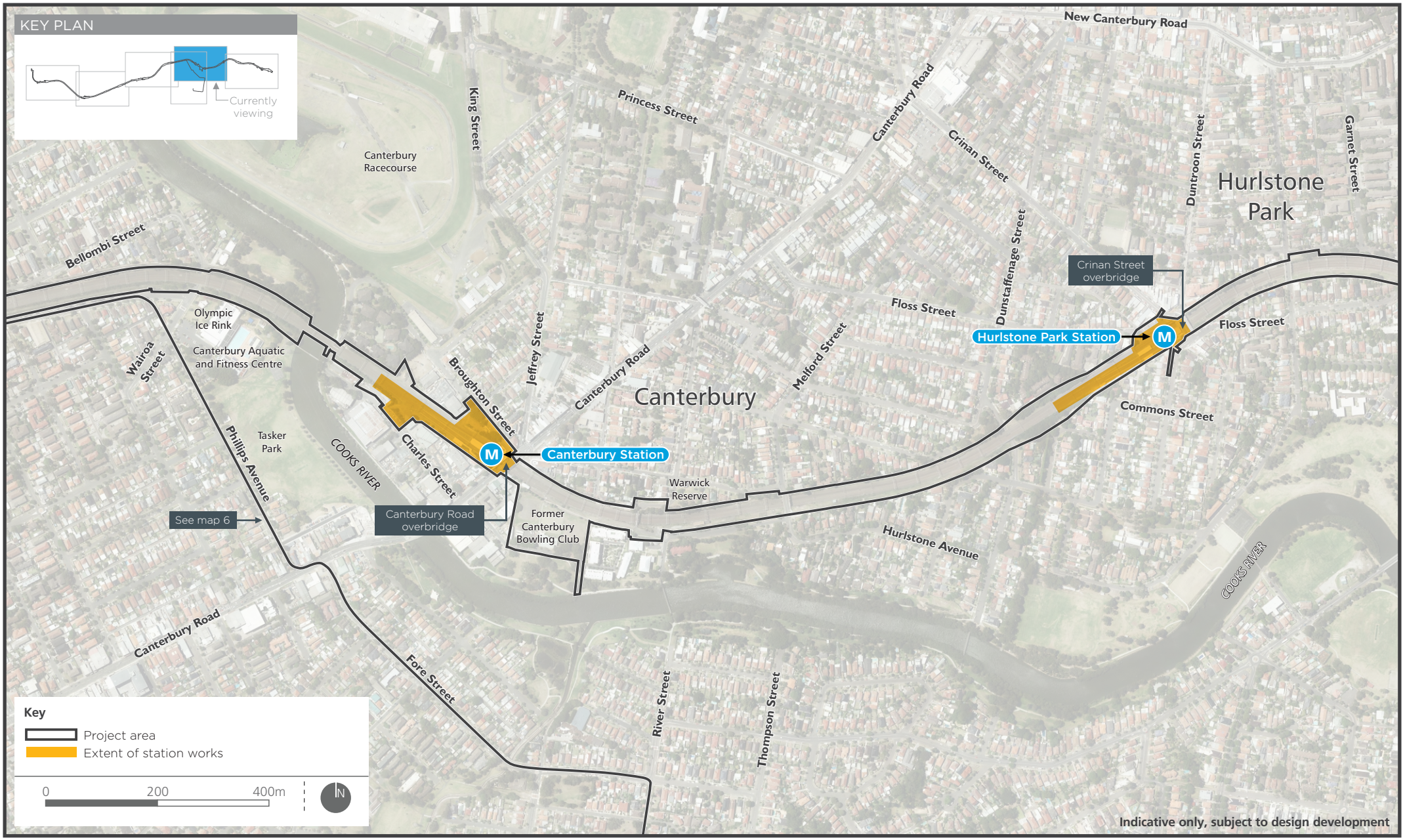
The project area - map 1

FIGURE 2.1



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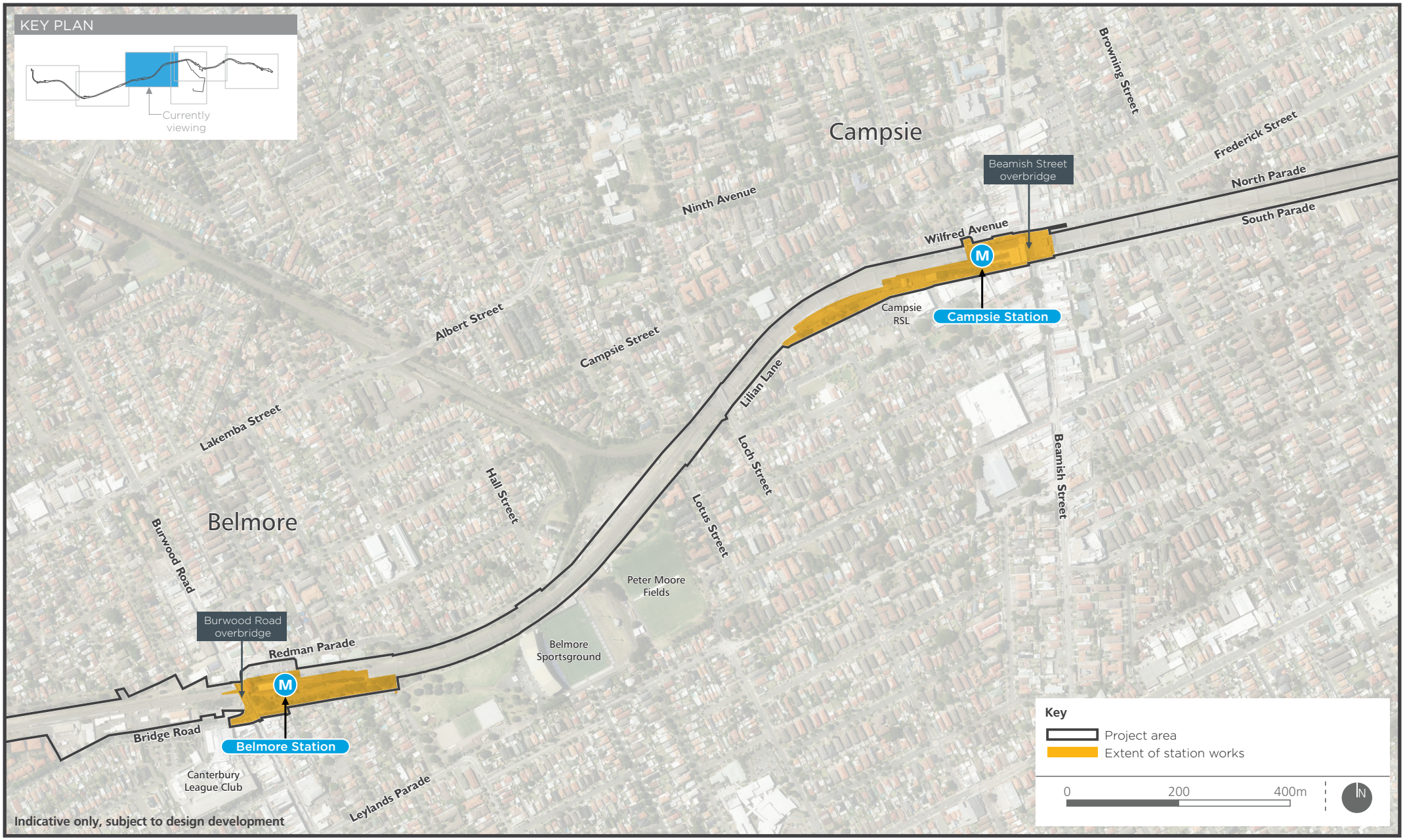
The project area - map 2

FIGURE 2.1



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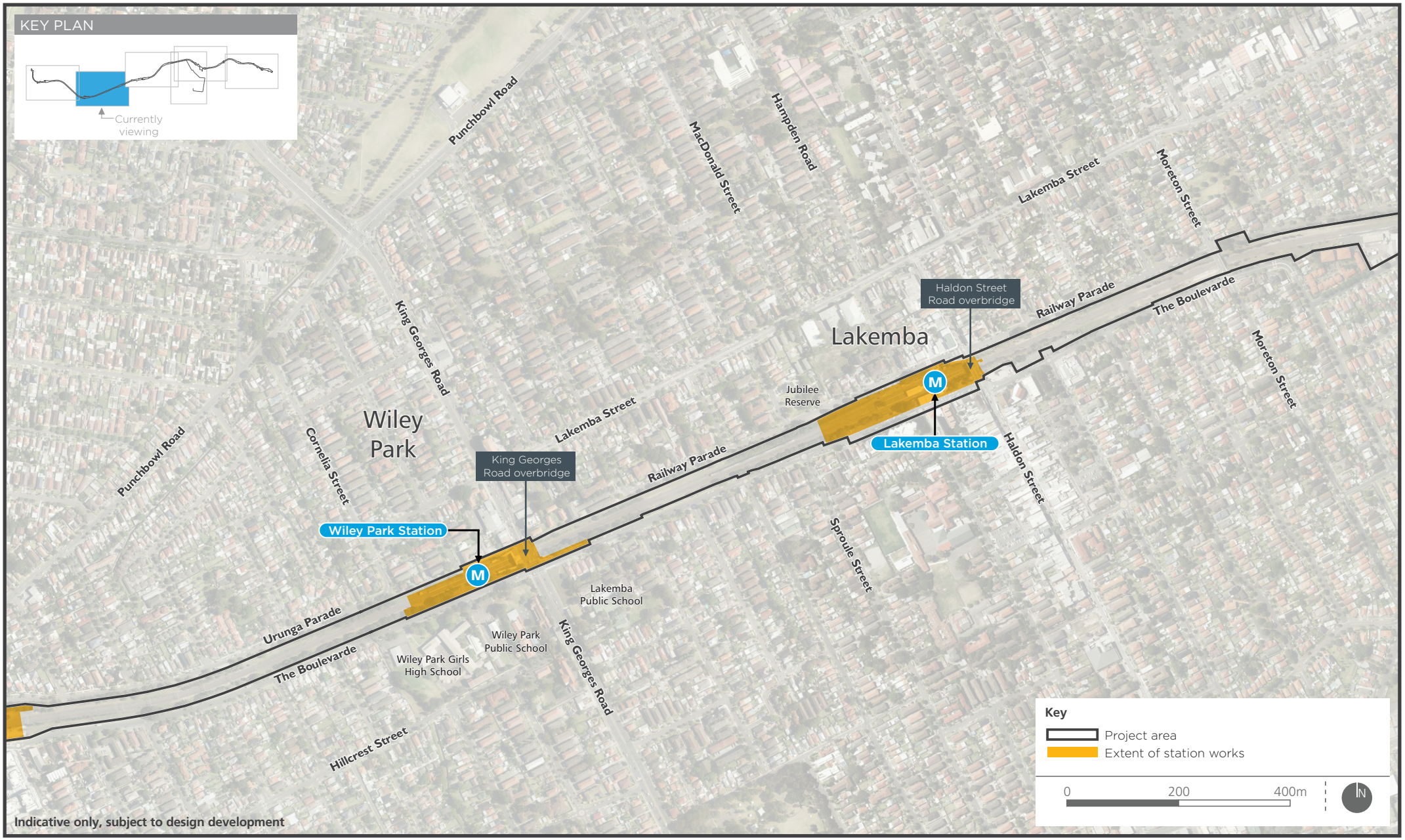
The project area - map 3

FIGURE 2.1



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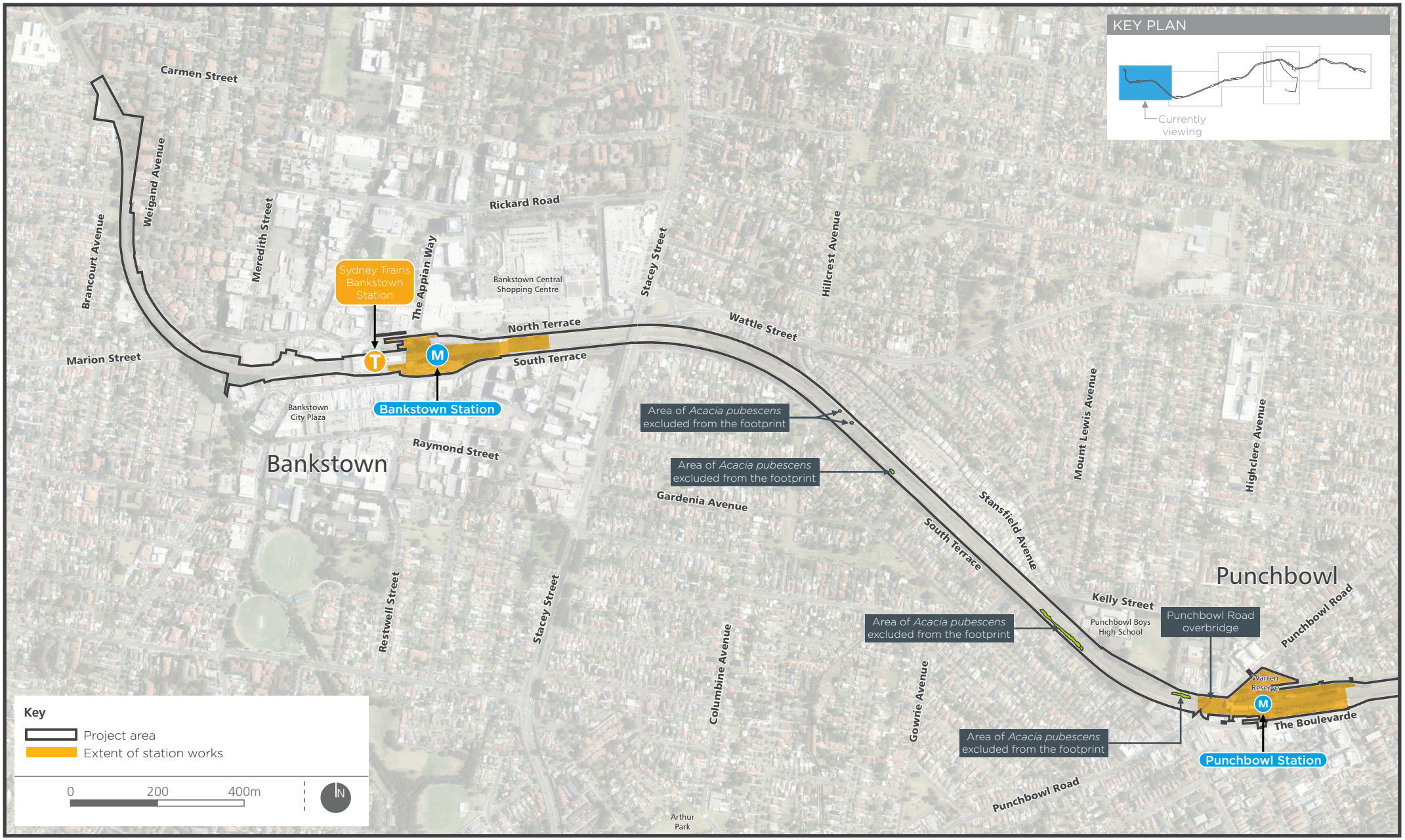
The project area - map 4

FIGURE 2.1



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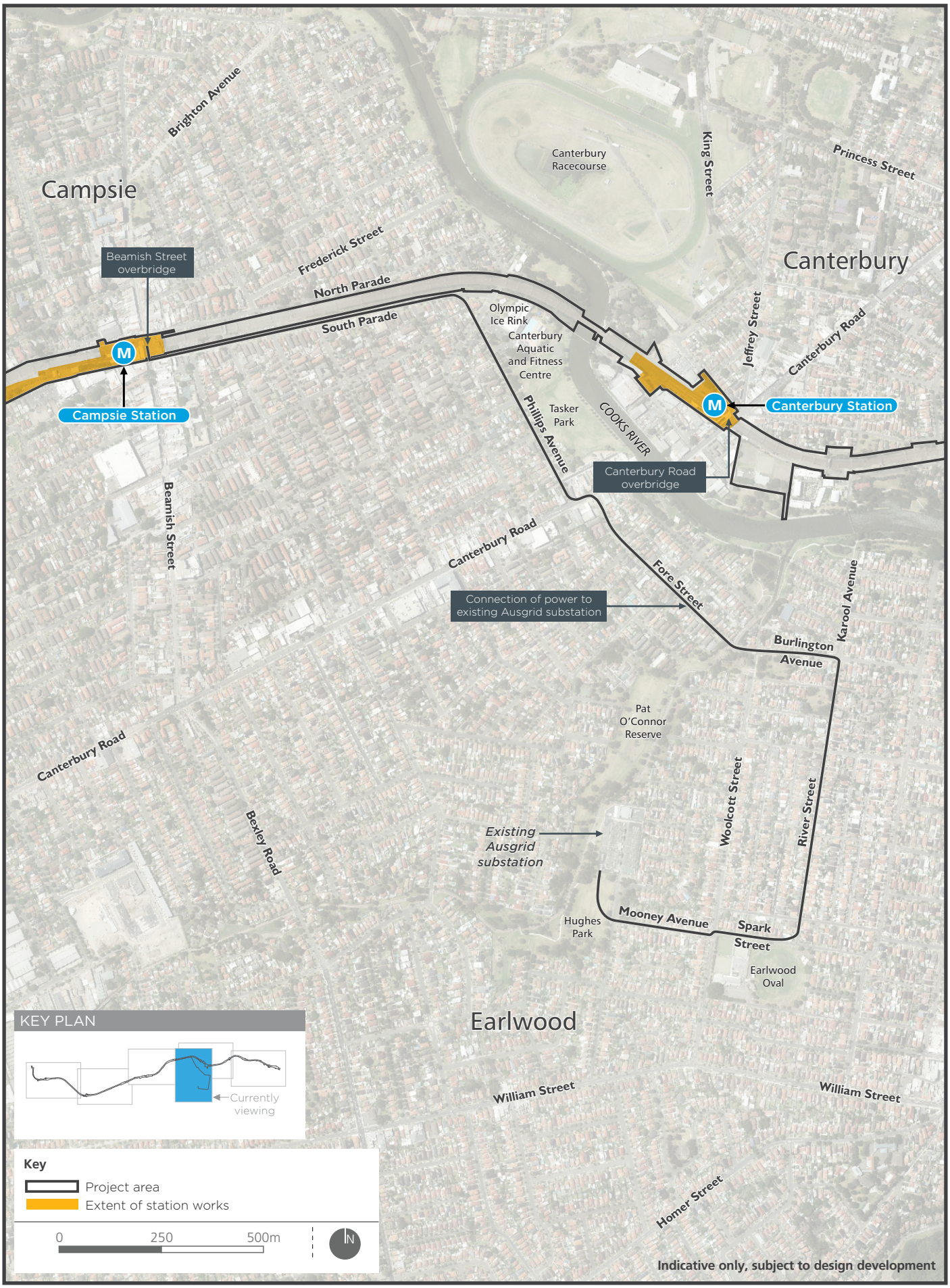
The project area - map 5

FIGURE 2.1



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The project area - map 6

FIGURE 2.1

2.3 General biophysical environment

A summary of the general biophysical characteristics of the study area is provided below.

2.3.1 Soils

Sandstone and shale geological units underlie the majority of the project area. There are some alluvium deposits and volcanic intrusions along the project area. The majority of the project area is located on the Blacktown soil landscape, which generally has low soil fertility and poor drainage. Between Canterbury and Marrickville stations, the project area is located on the Gymea soil landscape, which is highly erodible, highly permeable, and has low soil fertility. Isolated areas of the Birrong soil landscape are located along drainage lines that cross the project area, with this landscape subject to localised flooding.

Within the rail corridor, the majority of the project area consists of fill associated with railway embankments, or exposed bedrock associated with cuttings and overlain with rail ballast or fill. Saline soils are located west of Punchbowl Station, with some isolated areas of high salinity potential. Acid sulphate soils are located along the Cooks River.

A preliminary contamination assessment undertaken as part of the design process identified that there is a low to medium risk of contamination along the majority of the project area, with a medium to high risk in three areas (between Sydenham and Marrickville stations, between Campsie and Belmore stations, and between Punchbowl and Bankstown stations).

Further information on soils is provided in Chapter 20.

2.3.2 Water

Between Marrickville and Punchbowl stations, the project area is located within the Cooks River catchment. The project area crosses the Cooks River about 400 metres west of Canterbury Station. The proposed location of the electricity feeder cable from the Canterbury Substation crosses Cup and Saucer Creek, which is a tributary of the Cooks River. Between Punchbowl and Bankstown stations, the project area is located within the Salt Pan Creek catchment.

Within both catchments, water generally drains to nearby watercourses via stormwater drainage infrastructure.

Water quality within the two catchments is generally poor because of the influence of run-off from urban areas. However, water quality improves in downstream areas within both catchments.

Around Marrickville Station, the rail corridor and surrounding lands are subject to regular and extensive flooding. Other areas where flooding of the rail corridor may occur are located to the west of Campsie Station, between Campsie and Canterbury stations, and to the east of Canterbury Station, however the frequency and extent is less than at Marrickville. Flooding issues generally result from the limited capacity of existing drainage infrastructure, including infrastructure within and crossing the rail corridor.

Further information on hydrology, flooding, and water quality is provided in Chapter 21.

2.3.3 Biodiversity

The majority of the study area has been heavily modified by past and ongoing disturbances associated with urban development and the active rail corridor. Vegetation within the project area is dominated by grasses, small shrubs, and a variety of weeds, with some scattered trees. The majority of vegetation comprises exotic or planted native species on highly modified landforms. This includes vegetation in the form of street trees in the vicinity of stations and also along the corridor. There are small isolated patches of remnant or regrowth native vegetation in small portions of the study area associated with rail cuttings with less disturbed soil profiles.

Two threatened ecological communities, listed under the *Threatened Species Conservation Act 1995* (TSC Act), occur in the project area:

- Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion
- Shale Gravel Transition Forest.

There is limited riparian vegetation at the location where the Cooks River is crossed by the rail corridor.

One threatened fauna species, the Grey-headed Flying-fox, was recorded in the study area during site surveys. Four other species listed as vulnerable under the TSC Act are likely to occur at least on occasion: the Eastern Bentwing Bat, Large-footed Myotis, Eastern Freetail Bat and Yellow-bellied Sheath-tail Bat.

Potential habitat for the endangered Long-nosed Bandicoot population is present in parts of the study area. Despite a number of targeted searches and different methods being employed, no individuals were recorded.

The rail corridor also contains around 650 stems of the endangered Downy Wattle, which is listed as a vulnerable species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the TSC Act. These stems are located between Punchbowl and Bankstown stations.

Further information on biodiversity is provided in Chapter 22.

2.4 General social and cultural environment

A summary of the general social and cultural characteristics (including land use, heritage, and socio-economic) of the study area is provided below.

2.4.1 Land use and property

The study area consists of a varied and relatively dense mix of land uses, including residential, commercial, industrial, transport infrastructure, community, health, education, and recreation. The majority of the project area is located within an active rail corridor used for transport (rail) purposes. This includes suburban rail uses (the T3 Bankstown Line), and regional rail freight uses. Other land uses include commuter car parks at various stations along the corridor, and businesses operating within some stations.

Land uses surrounding the project area mainly include a mix of residential and commercial land uses, with other land uses scattered throughout the study area. Low to medium density residential areas are located in the vicinity of most stations and between stations. Higher density residential areas are concentrated around a number of stations, including Canterbury, Campsie, Lakemba, and Bankstown stations.

Commercial development is generally focused within local and neighbourhood centres, located in the vicinity of stations. Campsie and Bankstown stations are located within larger regional centres.

The vast majority of the project area is located on publicly owned land.

Further information on land use and property is provided in Chapter 16.

2.4.2 Heritage

Non-Aboriginal heritage

Urban development in the vicinity of the project area increased between 1892 and 1939 with the construction of the rail line between Sydenham and Bankstown. The line was opened in three stages, with the Sydenham to Belmore section opening in 1895, and extensions to Bankstown and

Regents Park in 1909 and 1939 respectively. Development of the line coincided with development of land adjacent to the line.

The project area contains substantial historical resources of significance. All 10 railway stations in the project area are heritage listed. Three stations (Marrickville, Canterbury and Belmore stations) are listed on the State Heritage Register, and the others are subject to listings on local environmental plans and/or a State agency Section 170 heritage register.

Two items listed on the State Heritage Register (Sewage Pumping Station 271 in Marrickville and the Old Sugarmill in Canterbury) are located adjacent to the project area. A number of other locally listed items are located adjacent to, or within 25 metres of the project area. In addition, the project area passes through or adjacent to two heritage conservation areas.

Further information on non-Aboriginal heritage is provided in Chapter 14.

Aboriginal heritage

The project area is located within an area thought to have been occupied by the Wangal clan, whose territory extended between the Parramatta River and the Cooks River, from Darling Harbour to Rosehill.

There are no listed Aboriginal heritage sites located within the project area.

The closest previously recorded Aboriginal heritage site is a potential archaeological deposit (PAD) (the Fraser Park PAD) located about 650 metres north-east of the project area boundary. Two areas of potential archaeological deposits were identified during field surveys near Belmore and Punchbowl stations (S2B PAD 01 and S2B PAD 02 respectively).

The archaeological significance of the project area located within the existing rail corridor is considered to be low as a result of the high levels of ground disturbance. S2B PAD 01, which is located outside the project area is considered to have low to moderate significance, while S2B PAD 02 is considered to have moderate significance, and low to moderate potential for intact archaeological deposits to be identified.

Further information on Aboriginal heritage is provided in Chapter 15.

2.4.3 Socio-economic

The project area extends through a highly urbanised, densely populated, and ethnically diverse area. It is located within 11 suburbs in the Inner West and the Canterbury-Bankstown local government areas. According to the 2011 census[1], the combined population of both local government areas was 542,514 people (ABS, 2011) with about 35 per cent of the population living in the Inner West LGA (comprising the former Ashfield, Leichhardt and Marrickville LGAs), and around 65 per cent in the Canterbury-Bankstown LGA (comprising the former Canterbury and Bankstown LGAs).

The Inner West local government area is characterised by densely populated, older, inner-city suburbs, with numerous significant heritage and cultural items. The local government area also contains substantial industrial and commercial areas, many of these being historic areas that are gradually converting to other uses. Since the 1970s, the area has experienced significant urban renewal and gentrification.

The former Canterbury local government area is densely populated and culturally diverse. Parks, historical sites, open space, and sport and recreational facilities contribute to the amenity of the area. These include Belmore Oval, Canterbury Racecourse, Canterbury Ice Rink, Canterbury

[1] At the time of the assessment, the 2016 Census data had not yet been released

Aquatic and Fitness Centre, and open space corridors surrounding the Cooks River, Wolli Creek, and Salt Pan Creek. A designated cycle path and walking track is located along the Cooks River.

The character of the former Bankstown local government area is largely residential. It has a commercial core (the Bankstown town centre) adjacent to Bankstown Station.

Further information on the existing socio-economic environment is provided in Chapter 17.

2.4.4 Businesses

Ten business precincts were identified within the study area. These precincts vary in size and the proportion of land used for business purposes, with distinct differences in business and industry profiles. According to the 2011 census, the Sydenham to Bankstown corridor provided about 19,700 jobs. About 45 per cent of the employment was attributed to three major industry sectors, being health care and social assistance (18 per cent), retail trade (16 per cent), and accommodation and food services (11 per cent).

Bankstown's status as a regional centre is reflected in its role as the largest retail employer in the study area, employing nearly 1,700 people. Bankstown is also the location of a major regional shopping centre, the Bankstown Central Shopping Centre, which is located about 150 metres north-east of Bankstown Station. Campsie is the second largest centre along the rail corridor. Other stations adjoin local centres.

Businesses of varying types are located close to each station. A small retail business is located at six stations (Dulwich Hill, Belmore, Lakemba, Wiley Park, Canterbury, and Punchbowl). Campsie Lakemba stations are also directly adjoined by a number of buildings (located on land owned by the NSW Government) that are used for a variety of retail/commercial purposes.

Further information on the existing business environment is provided in Chapter 18.

2.4.5 Transport infrastructure

Transport infrastructure in the study area includes rail infrastructure, other public transport infrastructure, numerous regional and local roads, and active transport facilities. A brief overview of the existing infrastructure is provided below. Further information on transport infrastructure within and near the project area, including local and regional infrastructure, and existing active and public transport networks, is provided in Chapter 10.

Rail

Rail infrastructure in the study area consists of Sydney Trains suburban rail lines and a freight rail line. The Sydney Trains T3 Bankstown Line is located within the project area. Other rail lines operated by Sydney Trains in the vicinity of the project area pass through Sydenham Station to the east of the project area. These include the T2 Airport, Inner West & South and the T4 Eastern Suburbs & Illawarra lines.

It is noted that the NSW Government is currently implementing the More Trains, More Services program, which involves delivering extra services and upgraded rail infrastructure to the Sydney Trains rail network. As part of the program, a refreshed rail network map has been developed. Changes to the network, including new line names and additional services, will be implemented in late 2017 and 2018. Line names used in this Environmental Impact Statement reflect the existing naming conventions.

A rail line forming part of the Sydney Metropolitan Freight Network (managed by ARTC) runs within the rail corridor in the project area, adjacent to the T3 Bankstown Line, between about 500 metres east of Marrickville Station, and about 700 metres west of Campsie Station.

Other public transport

A number of bus routes cross the project area and serve stations within the project area. Major concentrations of bus routes are focussed around Canterbury, Campsie, and Bankstown stations. This includes a major bus interchange at Bankstown Station.

The light rail line travelling to/from the inner west (the L1 Dulwich Hill Line) terminates near the project area at the Dulwich Hill light rail stop, located about 130 metres to the north-west of Dulwich Hill Station.

Roads

Classified main roads close to and/or crossing the project area via road overbridges include Illawarra Road, Canterbury Road, Beamish Street, King Georges Road, Punchbowl Road, and Stacey Street. A number of local roads also cross the project area via road overbridges, generally in a north–south direction.

Stacey Street (part of the A6) and King Georges Road (part of the A3) connect with Canterbury Road and the South Western Motorway (the M5) located to the south of the project area.

The M5 and the M5 East, which are located between around 1.5 and three kilometres to the south, run roughly parallel to the project area. Marrickville Station is located about 1.5 kilometres to the north-west of the Princes Highway (the A36). The Hume Highway (the A22) is located about one kilometre north of Bankstown Station.

Active transport

The pedestrian network consists of footpaths and dedicated road crossings. Both signalised and un-signalised pedestrian crossing facilities are located throughout the footpath/road network.

The majority of local cycling connections are on-road mixed environments or pathways through recreation areas/parks. Bike parking facilities are provided at a number of stations in the project area.

3. Planning and assessment process

This chapter provides a review of the statutory context and approval pathway for the project. It addresses the Secretary's environmental assessment requirements listed in Table 3.1.

Table 3.1 Secretary's environmental assessment requirements - planning and assessment

Ref	Secretary's environmental assessment requirements – planning and assessment	Where addressed
1. Environmental Assessment Process		
1.1	The Environmental Impact Statement must be prepared in accordance with Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (the Regulation).	Section 3.1.3
1.2	It is the Proponent's responsibility to determine whether the project needs to be referred to the Commonwealth Department of the Environment for an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).	No approval is required Requirements under the EPBC Act are considered in Section 0
2. Environmental Impact Statement		
2.1	(p) Statutory context of the project as a whole, including: • how the project meets the provisions of the EP&A Act and EP&A Regulation • a list of any approvals that must be obtained under any other Act or law before the project may lawfully be carried out	 Section 3.1 Section 3.2

3.1 NSW environmental planning approvals

The EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) are the primary pieces of legislation regulating land use planning and development assessment in NSW. A range of environmental planning instruments, including State environmental planning policies (SEPPs) and local environmental plans, support the legislation.

As described below, the project is critical State significant infrastructure that is permissible without development consent. It is subject to the assessment and approval provisions of Part 5.1 of the EP&A Act.

3.1.1 Permissibility of the project

Clause 79 of *State Environmental Planning Policy (Infrastructure) 2007* provides that development for the purpose of a railway or rail infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land. The project is characterised as development for the purpose of a railway or rail infrastructure facilities, and would be carried out by or on behalf of Transport for NSW, a public authority, accordingly, development consent under Part 4 of the EP&A Act is not required for the project.

Section 115U(4) of the EP&A Act provides that specified development on specified land is State significant infrastructure if it is specifically declared to be State significant infrastructure by a SEPP or by an order of the Minister that amends a SEPP for that purpose.

Section 115V of the EP&A Act provides that any State significant infrastructure may also be declared to be critical State significant infrastructure if it is of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons.

The *Environmental Planning and Assessment Amendment (Sydney Metro City and Southwest Project) Order 2015,* which was made on 10 December 2015, amended Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011*, by adding clause 5, which describes Sydney Metro City and Southwest. The effect of this was that:

- development for the purposes of Sydney Metro City & Southwest was specifically declared to be State significant infrastructure by an order of a Minister that amends a SEPP under section 115U(4) of the EP&A Act
- this State significant infrastructure was also declared to be critical State significant infrastructure, under section 115V of the EP&A Act.

The project is development for the purpose of Sydney Metro City & Southwest. Hence, the project is State significant infrastructure and critical State significant infrastructure. It does not require development consent under Part 4 of the EP&A Act, but it does require the approval of the Minister under Part 5.1 of the EP&A Act.

Transport for NSW will review the scope of the declaration to ensure consistency with the project area and all elements of the project.

3.1.2 Planning approval process under Part 5.1 of the EP&A Act

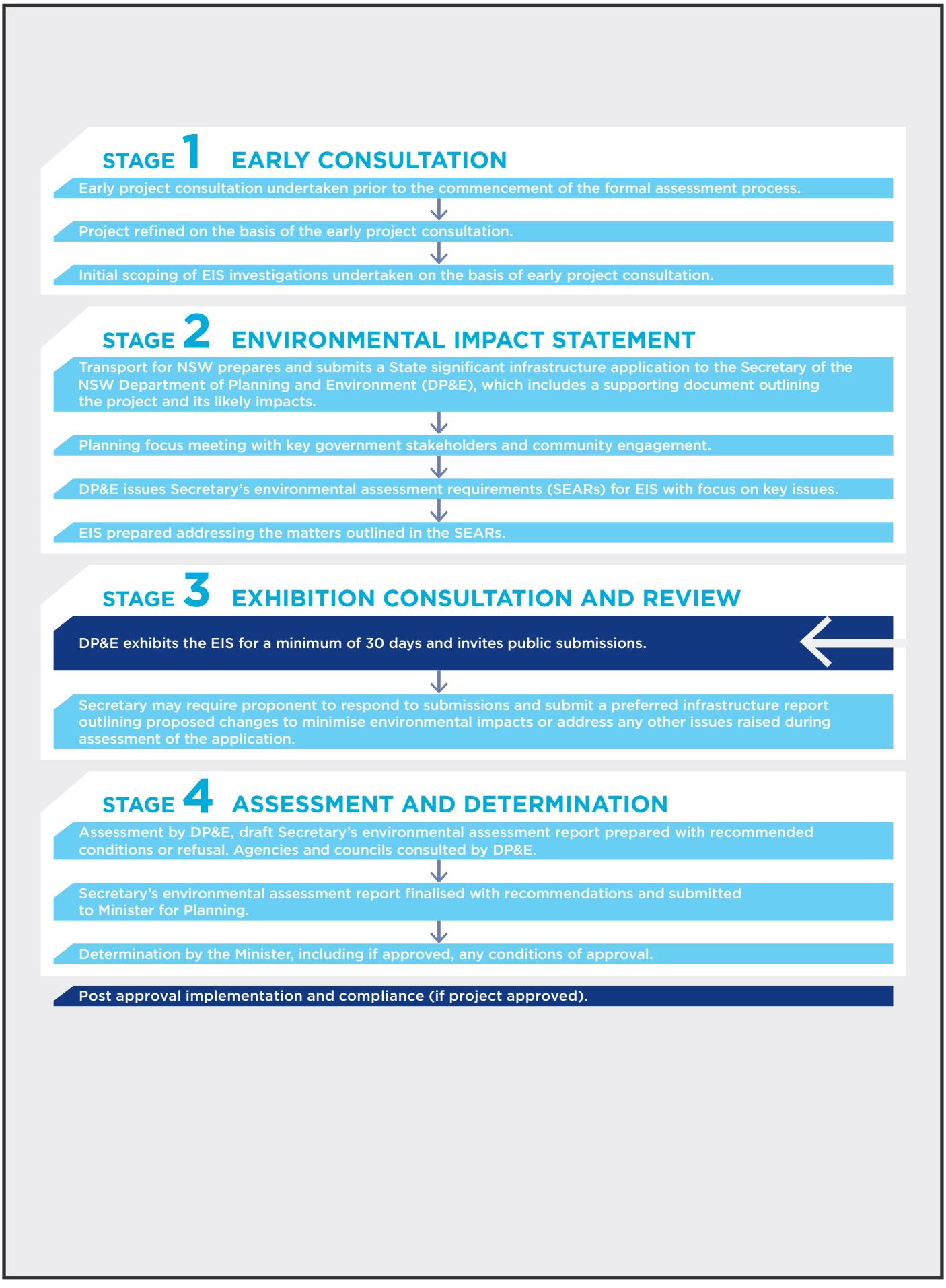
Part 5.1 of the EP&A Act regulates the assessment and approval process for critical State significant infrastructure. An overview of the process is shown in Figure 3.1.

As required by Section 115X of the EP&A Act, Transport for NSW submitted a State Significant Infrastructure application and supporting State Significant Infrastructure Application Report to the Secretary of the Department of Planning and Environment on 16 February 2017. The Secretary's environmental assessment requirements for the project were issued (as per Section 115Y of the EP&A Act) on 23 March 2017. The Secretary's environmental assessment requirements are provided in full in Appendix A.

The Department of Planning and Environment will place this Environmental Impact Statement on public exhibition for a minimum of 30 days (as per Section 115Z of the EP&A Act). During the exhibition period, interested parties can review the Environmental Impact Statement and make a written submission to the Department of Planning and Environment for consideration during the assessment process.

At the completion of the public exhibition period, the Department of Planning and Environment will collate and provide Transport for NSW a copy of all submissions received. After reviewing the submissions, Transport for NSW will prepare a submissions report that responds to the relevant issues raised. If changes are required to the project to respond to the issues raised or to minimise environmental impacts, a preferred infrastructure report may also be required. This report would be made available to the public.

Approval from the Minister for Planning is required before Transport for NSW can proceed with the project (as per section 115ZB of the EP&A Act).



sydney METRO | city & southwest

The assessment and approval process for critical State significant infrastructure

FIGURE 3.1

3.1.3 Environmental Planning and Assessment Regulation 2000

This Environmental Impact Statement has been prepared in accordance with the requirements of clauses 6 and 7 of Schedule 2 of the EP&A Regulation. These requirements, and where they are addressed in the Environmental Impact Statement, are provided in Appendix B.

Clause 193 of the EP&A Regulation includes the provisions for owner's consent and notification requirements for State significant infrastructure projects. As the application for the project is being made by a public authority and is for linear transport infrastructure, the consent of individual landowners will not be required to make the application. However, the proponent needs to give notice of the application in accordance with the requirements of clause 193(4).

3.1.4 NSW environmental planning instruments

Section 115ZF of the EP&A Act provides that environmental planning instruments do not apply to critical State significant infrastructure projects (with some exceptions, including how they apply to the declaration of critical State significant infrastructure). As described in Section 3.1.1, the project is declared critical State significant infrastructure, and is listed on Schedule 5 of the State and Regional Development SEPP. As critical State significant infrastructure, the project is permissible without consent under clause 16(a) of the State and Regional Development SEPP.

3.1.5 Approvals process for future rail corridor development

The project has identified future rail corridor development opportunities at Campsie where an existing commercial property is to be removed to allow the upgrading of Campsie Station.

Provision for future rail corridor development may include foundation work, retaining walls, concrete slabs, providing building services (such as water, sewer, power, etc.), and providing adequate space and access routes for pedestrian, cyclists, and vehicles.

All future rail corridor development would be subject to a separate planning and approvals process. Subject to the size, scale, and type of rail corridor development, this could include local or regional development (with the local council or a regional planning panel as the consent authority) or State significant development (with the Minister for Planning as consent authority).

3.2 Requirements under other legislation

3.2.1 NSW approval requirements

Approvals that would otherwise apply

In accordance with sections 115ZG and 115ZH of the EP&A Act, some environment and planning legislation does not apply to critical State significant infrastructure or must be applied consistently.

Section 115ZG of the EP&A Act specifies authorisations that are not required for approved State significant infrastructure. Approvals of potential relevance to the project include:

- permits under sections 201, 205 and 219 of the *Fisheries Management Act 1994* (FM Act)
- approvals under Part 4, excavation permits under section 139 and Division 8 of Part 6 of the *Heritage Act 1977*
- Aboriginal heritage impact permits under section 90 of the *National Parks and Wildlife Act 1974*
- various approvals under the *Water Management Act 2000*, including water use approvals under section 89, and activity approvals (other than aquifer interference approvals) under section 91.

Similarly, section 115ZG of the EP&A Act specifies directions, orders or notices that cannot be made or given so as to prevent or interfere with the carrying out of approved critical State significant infrastructure. These include:

- an interim protection order (within the meaning of *National Parks and Wildlife Act 1974* or the *Threatened Species Conservation Act 1995*)
- an order under Division 1 (Stop work orders) of Part 6A of the *National Parks and Wildlife Act 1974*, Division 1 (Stop work orders) of Part 7 of the *Threatened Species Conservation Act 1995* or Division 7 (Stop work orders) of Part 7A of the *Fisheries Management Act 1994*
- an environment protection notice under Chapter 4 of the *Protection of the Environment Operations Act 1997*
- an order under section 124 of the *Local Government Act 1993*.

Section 115ZH of the EP&A Act identifies approvals or authorisations that cannot be refused if they are necessary to carry out approved State significant infrastructure and are substantially consistent with the Part 5.1 approval. Those of potential relevance to the project include:

- an environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997*
- consent under section 138 of the *Roads Act 1993*.

Consideration of requirements under relevant NSW legislation

NSW environmental planning related legislation relevant to the project is identified in Table 3.2.

Table 3.2 Consideration of requirements under relevant NSW legislation

Legislation	Requirement	Relevance to the project
Contaminated Land Management Act 1997	Section 60 of the Act outlines the circumstances in which notification of the Environment Protection Authority (EPA) is required in relation to the contamination of land.	The EPA would be notified in writing of contamination identified within the project area, in accordance with the requirements of section 60 of the Act.
Fisheries Management Act 1994	Section 199 of the Act requires a public authority to notify the Minister prior to carrying out dredging or reclamation (defined by section 198A).	The project would require works adjacent to the Cooks River at Canterbury, which may trigger the notification requirements of the Act. Further information on the works required is provided in Chapters 8 and 9 (Project description – operation and construction). The potential impacts on the river are considered in Chapter 21 (Hydrology, flooding and water quality). The Minister for Primary Industries would be notified in writing if dredging or reclamation work is required, in accordance with the requirements of section 199.
Heritage Act 1977	Section 146 requires that the Heritage Council be notified if a relic is uncovered, where it is reasonable to believe that the Heritage Council is unaware of the location of the relic.	The Heritage Council would be notified in writing of relics uncovered during construction, in accordance with the requirements of section 146.
Land Acquisition (Just Terms Compensation) Act 1991	Specifies the procedures and requirements for the acquisition of land for a public purpose.	Chapter 16 (Land use and property) provides information on the acquisition of private property required for the project. Acquisition would be undertaken in accordance with this Act.

Legislation	Requirement	Relevance to the project
Noxious Weeds Act 1993	Under Part 3 Division 1 of the Act, public authorities are required to control noxious weeds on their land.	The approach to managing weeds during construction is provided in Chapter 22 (Biodiversity).
Protection of the Environment Operations Act 1997 (POEO Act)	An environment protection licence (EPL) is required for scheduled activities or development work listed by the POEO Act. Scheduled activities requiring a licence relevantly include: (1) railway systems activities (clause 33) meaning: (a) the installation, on site repair, on site maintenance or on site upgrading of track, including the construction or significant alteration of ancillary works, or (b) the operation of rolling stock on track.	A separate EPL would be required for construction and operation of the project.
Roads Act 1993	Section 138 requires approval from the relevant roads authority to impact, or carry out work on or over, a public road. Clause 5(1) of Schedule 2 to the Roads Act exempts public authorities from this requirement, except in relation to works on or over classified and Crown roads.	The project would impact on classified roads, including Illawarra Road, Canterbury Road, Beamish Street, King Georges Road, Punchbowl Road, and Stacey Street. Further information is provided in Chapter 10 (Construction traffic and transport). Approval would be required under section 138 for works to these roads.
Waste Avoidance and Resource Recovery Act 2001	Encourages the most efficient use of resources to reduce environmental harm.	As described in Chapter 26 (Waste management), waste resulting from the project would be managed in accordance with the requirements of this Act.
Water Management Act 2000 and the *Water Act 1912* (the Water Act)	Temporary dewatering and construction activities that interfere with aquifers are generally identified as aquifer interference activities in accordance with the Water Management Act and the *NSW Aquifer Interference Policy* (DPI, 2012). However, the aquifer interference approval provisions of the Water Management Act have not commenced, and licensing of these activities is carried out under Part 5 of the Water Act. A licence under Part 5 is required for dewatering activity that would require the extraction of more than three megalitres of groundwater per year.	Excavation would be undertaken to construct the project. Although groundwater may be intercepted, it is unlikely that dewatering would exceed three megalitres of groundwater per year. A licence would be obtained if required.

3.2.2 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

Under Part 3 of the EPBC Act, approval from the Australian Government Minister for the Environment and Energy would be required for an action that:

- has, will have, or is likely to have a significant impact on a matter of national environmental significance
- is undertaken on Commonwealth land and has, will have, or is likely to have a significant impact on the environment
- is undertaken outside Commonwealth land and has, will have or is likely to have a significant impact on the environment of Commonwealth land
- is undertaken by the Commonwealth and has, will have or is likely to have a significant impact on the environment.

Matters of national environmental significance comprise:

- world heritage properties
- national heritage places
- wetlands of international importance
- Commonwealth-listed threatened species and ecological communities
- Commonwealth-listed migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mines)
- a water resource, in relation to coal seam gas development and large coal mining development.

No world, national or Commonwealth heritage items have been identified within or adjacent to the project area.

The potential for impacts on ecological matters of national environmental significance are considered in Chapter 22 (Biodiversity). No potential significant impacts were identified.

The project would not impact on Commonwealth marine areas or the Great Barrier Reef Marine Park, and it does not involve a nuclear action or coal seam gas/coal mining.

As no significant impacts on matters of national environmental significance or Commonwealth land are predicted, and the project is not being undertaken by a Commonwealth agency, approval under the EPBC Act is not required.

Native Title Act 1993

The main objective of the *Native Title Act 1993* is to recognise and protect native title. Section 8 states that the Native Title Act is not intended to affect the operation of any law of a State or a Territory that is capable of operating concurrently with the Act. Searches of the register maintained by the National Native Title Tribunal indicated that there are no native title claims registered with respect to land within the project area. The project also would not directly affect Crown land that is currently the subject of a native title claim.

Disability Discrimination Act 1992

The *Disability Discrimination Act 1992* aims to eliminate as far as possible discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The project has been, and would continue to be, designed to be independently accessible and comply with the objectives and requirements of the Act. The design guidelines for the project (*Sydney Metro City & Southwest Sydenham to Bankstown Design Guidelines* – provided in Appendix C) are consistent with the objectives of this Act.

Disability Standards for Accessible Public Transport 2002

Section 33.1 of the *Disability Standards for Accessible Public Transport 2002* requires all new public transport premises, infrastructure, and conveyances to comply with the requirements of the standards, unless unjustifiable hardship is incurred by implementation. The project would continue to be designed to comply with these standards.

3.3 Summary of approval and notification requirements

In summary:

- The project is critical State significant infrastructure, requiring approval from the Minister for Planning under Part 5.1 of the EP&A Act.
- The project is permissible without consent.
- Environment protection licences under the POEO Act are required to construct and operate the project.
- Approval under section 138 of the Roads Act is required for works to classified roads.
- A licence would be sought under Part 5 of the Water Act if extraction of more than three megalitres of groundwater per year is required to construct the project.

4. Stakeholder and community consultation

This chapter describes the consultation undertaken to date, and that proposed during the detailed design and delivery of the project. The Secretary's environmental assessment requirements relevant to consultation, together with a reference to where they are addressed in this chapter and the Environmental Impact Statement, are provided in Table 4.1.

Table 4.1 Secretary's environmental assessment requirements – consultation

Ref	Secretary's environmental assessment requirements - consultation	Where addressed
4. Consultation		
4.1	The project and its assessment must be informed by consultation, including with relevant government agencies, (including the Department of Planning and Environment (Growth, Designs and Programs) and within the Transport for NSW cluster (such as Roads and Maritime Services and Sydney Trains), local councils, infrastructure and service providers, special interest groups, affected landowners, businesses and the community. The consultation process must be undertaken in a manner commensurate with expected levels of impact and stakeholder significance.	This chapter
4.2	The Proponent must document the consultation process, and demonstrate how the project has responded to the inputs received (inclusive of a strategy of engagement with key stakeholders on key design elements of the project).	Consultation undertaken to date is described in Sections 4.1 and 4.2 The key issues raised, and a summary of how the design has responded to the issues raised by key stakeholders, is provided in Section 4.3 and Chapter 7 (Design development and place making)
4.3	The Proponent must describe the timing and type of community consultation proposed during the design and delivery of the project, the mechanisms for community feedback, the mechanisms for keeping the community informed, and procedures for complaints handling and resolution.	Section 4.4

4.1 Consultation approach and objectives

4.1.1 Approach

Stakeholder and community consultation for Sydney Metro is an ongoing process that commenced with the release of *Sydney's Rail Future* in 2012. Consultation undertaken since June 2014 for the Sydney Metro City & Southwest project has played an important role in informing and scoping the design of the project and this Environmental Impact Statement.

Transport for NSW is implementing a comprehensive community and stakeholder consultation program for Sydney Metro, to engage proactively with local communities and key stakeholders.

Key stakeholders for the project include:

- NSW Government agencies and elected representatives
- Inner West and Canterbury-Bankstown councils
- directly affected communities, including residents and businesses
- business and industry groups
- community groups
- utility and service providers
- Sydney Trains customers
- the broader community.

4.1.2 Communication objectives

The communication objectives for Sydney Metro are to:

- communicate the rationale for Sydney Metro and the broader network benefits it will deliver, including how it fits with the NSW Government's plans to increase Sydney's rail capacity
- communicate the Sydney Metro concept and timing
- build community and stakeholder relationships and maintain goodwill
- provide information about the planning approvals process and encourage community participation
- clearly communicate the property acquisition process.

4.2 Consultation and engagement activities to date

Consultation for Sydney Metro City & Southwest, including the Sydenham to Bankstown upgrade, has included:

- early stakeholder consultation between June 2014 and June 2015
- project scope consultation following the announcement of Sydney Metro City & Southwest in June and July 2015 and design development for Sydney Metro City & Southwest (described below)
- consultation during preparation and exhibition of the Environmental Impact Statement for the Chatswood to Sydenham project, between June 2015 and June 2016 (which also captured feedback on the Sydenham to Bankstown upgrade - refer to Table 4.3 for relevant issues raised)
- consultation as part of lodgement of the State Significant Infrastructure Application Report for the Sydenham to Bankstown upgrade, between February and June 2017
- consultation during preparation of the design and Environmental Impact Statement for the Sydenham to Bankstown upgrade, between February 2016 and July 2017.

A summary of consultation undertaken for Sydney Metro City & Southwest (including the Sydenham to Bankstown upgrade) is provided in Section 4.2.1. Further information on consultation undertaken prior to exhibition of the Environmental Impact Statement for the Chatswood to Sydenham project is provided in the State Significant Infrastructure Application Report for that project.

4.2.1 Consultation during development of Sydney Metro City & Southwest

Community consultation

On 4 June 2015, the Premier of NSW announced that funding had been secured to progress the Sydney Metro City & Southwest project. The announcement also initiated a round of community consultation undertaken to:

- collect stakeholder and community feedback on the project
- inform the Environmental Impact Statement for the Chatswood to Sydenham project
- inform the planning and design process for the Sydenham to Bankstown upgrade.

During this period, consultation was undertaken along the project corridor between Chatswood and Bankstown, to proactively engage with the community prior to the commencement of the formal environmental impact assessment process for both components of Sydney Metro City & Southwest. Engagement activities have continued since then.

Consultation activities included:

- provision of contact details including an information line (toll free), email address, website and postal address
- establishment of a mobile community information centre
- appointing Place Managers
- community information sessions (June and July 2015)
- interactive online forums (June to August 2015)
- industry consultation and briefings (June 2015, September 2016, and April 2017)
- media releases
- advertisements in local newspapers including foreign language newspapers
- issue of various project collateral (eg newsletter and project updates)
- preparation of an animation/fly-through.

Stakeholder consultation

Consultation was undertaken with a wide range of stakeholders as an input to the design and environmental impact assessment process. Consultation included the interface between Sydney Metro City & Southwest and assets owned by relevant stakeholders, and general briefings. Stakeholders consulted included:

- Inner West and Canterbury-Bankstown councils
- Sydney Trains and NSW Trains
- Roads and Maritime Services and Sydney Co-Ordination Office
- Department of Planning and Environment
- Office of the Environment and Heritage
- Office of the Government Architect
- Australian Rail Track Corporation
- utility providers including Transgrid, Ausgrid, Qenos, and Sydney Water
- Sydney Motorway Corporation (in relation to WestConnex).

A summary of the key issues discussed with the various stakeholders and the design and assessment responses is provided in Section 7.4.

4.2.2 Consultation during preparation of this Environmental Impact Statement

The objective of consultation before public exhibition of the Environmental Impact Statement was to ensure stakeholders were aware of the project and the design and assessment process. The key engagement activities undertaken are described below.

Stakeholder identification and analysis mapping

A desktop search and site visit was undertaken to identify stakeholders within/close to the project area and those likely to have an interest in the construction and operation of the project.

Community contact and information tools

The community contact and information tools available during the preparation of the Environmental Impact Statement are listed in Table 4.2. These will remain in place for the duration of the project.

Table 4.2 Community contact and information points available during the planning and approval process

Activity	Detail
Community information line (toll free)	1800 171 386
Community email address	sydneymetro@transport.nsw.gov.au
Website	http://www.sydneymetro.info/
Postal address	Sydney Metro City & Southwest PO Box K659, Haymarket, NSW 1240
Place Managers	Contact details are provided at http://www.sydneymetro.info/

State Significant Infrastructure Application Report

On 16 February 2017, the State Significant Infrastructure Application Report was made available to the public on the Department of Planning and Environment's Major Projects website. The statutory advertisement was placed in three daily newspapers and three local papers. It was also translated and placed in six non-English news publications to ensure that the culturally and linguistically diverse communities in the vicinity of the project area were made aware of the project and its status.

Project update

After lodgement of the State Significant Infrastructure Application Report, the Sydney Metro City & Southwest project update was delivered to 70,000 properties located in the vicinity of the project area on 16 February 2017. The update provided information about the project, the next steps, consultation mechanisms and the State Significant Infrastructure Application Report. The project update was also made available on the Sydney Metro website.

Copies of the update were distributed to relevant ethnic community organisations. The update was also translated into Arabic, Vietnamese, Greek, Mandarin, Bengali, Hindi, and Korean.

Door knocks

Members of the project team visited properties potentially affected by acquisition and those located adjacent to the stations. Occupants were provided information on the release of the State Significant Infrastructure Application Report, what it means for them and the upcoming stages of the environmental assessment and acquisition process.

Community information display

Community information displays were held to provide up to date information on the project (and the Sydney Metro in general) and to provide the opportunity for community members to ask questions and provide feedback. The information displays were held at the following events and locations (total number of visitors is included in brackets):

- Sydney Festival at Barangaroo in January 2017 (31,000 visitors)
- Bankstown Central in March 2017 (1,452 visitors)
- Lakemba Markets in April 2017 (175 visitors)
- Sydney Royal Easter Show in April 2017 (88,882 visitors)
- Campsie Shopping Centre in May 2017 (806 visitors)
- Marrickville Metro in May 2017 (820 visitors).

A summary of the questions asked and issues raised is provided in Table 4.3.

Station information flyers

In May and June 2017, over 5,600 information flyers were handed out at the following stations during the morning and afternoon peak periods:

- Hurlstone Park Station
- Canterbury Station
- Dulwich Hill Station
- Wiley Park Station
- Belmore Station
- Punchbowl Station.

The aim of the flyers was to provide information about Sydney Metro, including future benefits, service frequency, and estimated travel times. Members of the community were also encouraged to engage with the Place Managers and share their comments and feedback.

Key issues raised during this activity are included in Table 4.3.

Community survey on the Sydney Metro website

A survey was developed and uploaded onto the Sydney Metro website seeking feedback from the community regarding existing travel habits, the use of rail replacement buses during Sydney Trains scheduled possessions, and potential alternative transport arrangements during the project construction period. The survey included the following questions:

- How often do you catch train services on the Bankstown Line on weekdays?
- How often do you catch train services on the Bankstown Line on weekends?
- Have you ever wanted to catch the train on the weekend, but found that rail replacement buses were operating?
- In the future, if rail replacement bus services are provided during temporary closures of the Bankstown Line on either weekdays or weekends, what will be most important to you?
- What else would make catching rail replacement buses more appealing?
- How would you like to be informed about the temporary closure of the rail line?

Between 14 May and 12 June 2017, a total of 35 responses to the survey were received.

Alternative transport arrangements would be implemented to convey rail customers to their destinations during periods where temporary station or track closures are required, including provision of temporary rail replacement buses and other services during rail possession periods. Information on alternative transport arrangements is provided in Section 9.11.

Planning focus meeting

A planning focus meeting was held with government agency stakeholders on 27 February 2017 to provide information on the project and the scope of the Environmental Impact Statement, and to assist agencies in their response to the Department of Planning and Environment in relation to issues relevant to the Secretary's Environmental Assessment Requirements. Representatives of the Inner West and Canterbury-Bankstown councils and a number of NSW State government agencies, attended the meeting.

A summary of issues formally raised by agencies as an input to the Secretary's Environmental Assessment Requirements is provided in Table A.3 of Appendix A.

Customer focus groups

Transport for NSW conducted research with customers in early 2017 to understand their perspectives and receive feedback on the preliminary station designs. Areas of focus for customer feedback included usability, safety, efficiency, interchange, the station role in the community, and the challenges faced by people with accessible transport needs. This early customer engagement provided key insights that have informed the ongoing design of the stations. There would be further customer research and testing during key stages of design development. Further information on how the design developed is provided in Chapter 7.

Government agency consultation

Ongoing consultation has been undertaken with specific groups, including regular meetings with:

- Heritage Working Group – this group was consulted on the station designs, including options and design drivers influencing heritage, potential project impacts on heritage items, and management strategies. The group includes heritage specialists and representatives from the Department of Planning and Environment, Transport for NSW, Sydney Trains and the Office of Environment and Heritage. Further information on heritage was considered during design development is provided in Chapter 7.
- Sydney Metro Roads Integration Working Group - this group was consulted on the traffic and transport assessment, the potential project impacts and management strategies. The group includes the Sydney Co-ordination Office and Roads and Maritime Services.

Transport for NSW's government agency consultation focussed on cross-agency integration and communication. Regular meetings were held with a variety of government stakeholders to ensure key issues were appropriately addressed in the Environmental Impact Statement, including (but not limited to):

- Department of Planning and Environment
- Environment Protection Authority
- Office of Environment and Heritage
- Department of Primary Industries
- Department of Premier and Cabinet

- UrbanGrowth NSW
- Sydney Motorway Corporation (WestConnex)
- Inner West Council
- Canterbury-Bankstown Council
- Sydney Water
- Ausgrid.

Major stakeholder consultation

Transport for NSW's stakeholder consultation team was responsible for ensuring local members of parliament, councils, peak bodies, and industry groups were proactively engaged and informed about the project. Regular briefings were held to keep stakeholders informed and to ensure key issues raised were addressed.

Community design workshops

The Hurlstone Park Association and the Save Dully Action Group raised a number of issues and concerns about the potential impact the proposed station upgrades on the character of Hurlstone Park and Dulwich Hill. In response, Transport for NSW held interactive design workshops to seek feedback from the groups on the following dates:

- Hurlstone Park Association – 24 May 2017
- Save Dully Action Group – 29 June 2017.

The workshops covered:

- current station designs
- explaining negotiable and non-negotiable elements of the design, and those aspects that could be influenced, such as accessibility and maintenance requirements
- opportunities, constraints, and challenges.

The participants were also encouraged to provide feedback on what they liked and disliked about the existing station, their concerns, priorities for the upgrade, ideas for the station precincts, materials to be used, and areas to be enhanced and preserved. Where possible, feedback provided has been incorporated into the design.

4.3 Results of consultation relevant to this Environmental Impact Statement

Key issues raised during consultation relevant to the Environmental Impact Statement, including the potential impacts to be considered and the information to be provided, are summarised in Table 4.3. A summary of the issues raised by agencies in response to the request by the Department of Planning and Environment for input to the Secretary's environmental assessment requirements is provided in Appendix A. It is noted that these lists present a summary of the key issues raised.

Table 4.3 Summary of key community issues raised relating to the Environmental Impact Statement

Issue category	Issues raised	Where addressed in the EIS
Project scope	• What does the project involve and where is it located?	Chapters 1, 2 and 8
	• Public domain improvements proposed	Section 8.1
	• What other transport facilities are included? Is the bus interchange at Bankstown included in the scope?	Section 8.1.1
	• What other facilities are required (eg external storage sites outside the corridor)?	Section 9.8
	• Will there be any acquisition or divestment of lands?	Section 8.2
	• Why is this section not underground like in the city?	Section 6.3.4
	• Infrastructure ownership and nature of private operating contract	Section 8.3
	• Project cost and who is paying for it	Section 1.2.1
	• Suitability of existing stations for Sydney Metro operations	Section 8.1
	• Will the project result in the permanent closure of any stations?	Section 8.1
Project design and features	• Station design (location, access, platform length etc)	Section 8.1
	• Train/carriage design (numbers of seats, heating/air conditioning etc)	Sections 8.3.4 and 8.3.5
	• Security on trains (if no driver) and at stations	Section 8.3.4
	• Emergency and mechanical failure response arrangements	Section 8.3
Project need/ justification	• Reason for/purpose of the project	Section 5.1
	• Journey to work benefits	Sections 5.3.4 and 5.3.5
	• The project is not needed - the cost should be allocated to other transport projects, as there is already rail services along the T3 Bankstown Line	Chapter 5
Operation of the project	• How the project would operate, including timing of operation and frequency of services	Section 8.3.2
	• Future travel times to the city	Section 5.3.5
	• Interface with the Sydney Trains network	Section 11.4.2
	• Cost of fares and use of Opal cards	Section 8.3.6
	• Routes and service patterns – including future travel routes and services; for example, impacts on direct access to stations, including City Circle stations (Museum/St James/Circular Quay/Wynyard/Town Hall), and St Peters and Erskineville stations, services beyond Bankstown	Section 11.4.2
Construction	• Construction timing and duration	Section 9.7.1
	• Service disruptions (timing and duration) during construction	Sections 9.7.2 and 9.7.3
	• Transport strategies and bus services that would be provided during construction to replace trains	Section 9.11 and Chapter 10
Traffic, transport and access	• Impacts on accessibility, including 'whole of journey'	Section 11.4.2
	• Impacts on/benefits for traffic during operation	Section 11.4

Issue category	Issues raised	Where addressed in the EIS
	• Access to pedestrian and cycling links	Chapters 10 and 11
	• Integration with other modes of transport, such as buses and light rail	Sections 8.1.1 and 11.4
Noise	• Construction noise and vibration	Chapter 12
	• Noise during operation	Chapter 13
Heritage	• Impacts of upgrading stations on heritage listed stations, and impacts on heritage overall	Section 7.3.7 Chapter 14
Socio-economic and business impacts	• Impacts on employment, including employment of rail staff/train drivers	Chapter 17
	• Impacts on businesses around stations	Chapter 18
	• Access for customers and staff	Chapter 18
Landscape and visual amenity	• How many trees would need to be removed, and would these be replaced	Sections 9.3.2 and 9.4.4
Hydrology and flooding	• Impacts on existing flooding situation – would the project make it worse?	Section 21.3
Land use and future planning	• Interface with the Sydenham to Bankstown urban renewal corridor strategy	Section 16.3
Air quality	• Air quality impacts of additional traffic during construction	Section 23.3.2

4.4 Future consultation and engagement

4.4.1 Public exhibition of the Environmental Impact Statement

The Department of Planning and Environment will place this Environmental Impact Statement on public exhibition for a minimum of 30 days. During the exhibition period, government agencies, project stakeholders and the community will be able to review the Environmental Impact Statement and make a written submission to the Department of Planning and Environment for consideration in its assessment of the project.

Advertisements will be placed in newspapers to advise of the public exhibition, where the Environmental Impact Statement can be viewed and details of community consultation activities and information sessions.

Consultation activities during public exhibition will include:

- environmental impact statement overview document
- media releases
- information sessions
- community event stalls
- door knocks
- newsletter letterbox drop
- project website updates
- newspaper advertising
- displays at local councils
- stakeholder meetings

- local business engagement
- translated materials
- government stakeholder engagement.

The activities to be implemented are listed in Table 4.4.

At the completion of the public exhibition period and after reviewing the submissions, Transport for NSW will prepare a submissions report and/or a preferred infrastructure report. This report would be made available to the public. Further information on the approvals process is provided in Section 3.1.

4.4.2 Ongoing consultation and engagement activities

Consultation activities

Transport for NSW will continue to work with stakeholders and the community to ensure they are informed about the project and have opportunities to provide feedback to the project team.

The existing community contact and information tools (listed in Table 4.2) would remain in place throughout the duration of the project. Translated materials and content will continue to be provided on the Sydney Metro website. All publications provide information on translation services available through TIS National and where appropriate, Sydney Metro will take translators to face-to-face meetings with stakeholders.

A list of the proposed activities and timing is provided in Table 4.4.

Consultation and complaints handling during construction

The Construction Environmental Management Framework (Appendix D) sets out the environmental, stakeholder and community management requirements for construction. It provides a linking document between the planning approval documentation and the construction environmental management plan to be developed by the construction contractor/s.

The Construction Environmental Management Framework requires the construction contractor/s to develop a Community Communications Strategy for construction and the framework sets out the main elements required to be included and implemented as part of the plan. These include a complaints handling procedure. The Sydney Metro Construction Complaints Management System will be used to record, manage and where required escalate and mediate complaints. Further information is provided in Appendix D.

Table 4.4 Ongoing consultation and engagement activities

Activity	Timing	EIS exhibition	Design	Construction	Operation
Awareness and marketing campaign to engage future customers	Ongoing	●	●	●	●
Community event stalls/community information displays	Ongoing	●	●	●	
Community information sessions	During exhibition of the EIS	●			
Community and business forums	As required			●	
Overarching Community Communication Strategy for Sydney Metro City & Southwest	Existing			●	

Activity	Timing	EIS exhibition	Design	Construction	Operation
Community Communication Strategy for project	Prior to construction			●	
Translated materials	Ongoing	●	●	●	●
Construction complaints management system	Existing			●	
Construction notifications	Seven days prior to construction starting			●	
Displays at council offices	During exhibition of the EIS	●			
Door knocks	As required	●	●	●	●
Email updates	At relevant milestones	●	●	●	●
Enquiries and complaints information line	Ongoing	●	●	●	●
Environmental Impact Statement overview document	During exhibition of the EIS	●			
Fact sheets	As required	●	●	●	●
Government stakeholder engagement	As required	●	●	●	●
Local business engagement	As required	●	●	●	●
Media releases	At relevant milestones	●	●	●	●
Newsletter	During exhibition of the EIS and other relevant milestones	●	●	●	●
Newspaper advertising	During exhibition of the EIS and other relevant milestones	●	●	●	●
Operation communications plan	Prior to operation				●
Place Managers	Ongoing	●	●	●	
Project briefings and presentations	Relevant milestones	●	●	●	
Project overview document	Relevant milestones	●	●	●	
Site signage	Prior to construction			●	
Social media updates	Ongoing	●	●	●	●
Stakeholder meetings	As required	●	●	●	●
Website, animations and online forums	Ongoing	●	●	●	