

# **STRATEGIC NEED AND JUSTIFICATION**

CHAPTER THREE

# 3 Strategic need and justification

This chapter outlines the strategic need and justification for the project taking into account the transport challenges that Sydney faces now and into the future, and NSW strategic planning and transport policy.

## 3.1 Secretary’s environmental assessment requirements

The Secretary’s environmental assessment requirements relating to strategic justification and project need, and where these requirements are addressed in this Environmental Impact Statement, are outlined in Table 3-1.

**Table 3-1 Secretary’s environmental assessment requirements – strategic need and justification**

Ref.	Secretary’s environmental assessment requirements	Where addressed
<b>2. Environmental Assessment Process</b>		
2.1	The EIS must include, but not necessarily be limited to, the following:	
2.1(c)	a statement of the objective(s) of the project	The objectives of the project are provided in Section 3.9.
2.1(d)	a summary of the strategic need for the project with regard to its critical State significance and relevant State Government policy	<p>The strategic need for the project is discussed in Section 3.3.</p> <p>The key benefits of the Sydney Metro network are discussed in Section 3.4 and the key benefits of the project are discussed in Section 3.5.</p> <p>Consistency of the project with the NSW strategic planning and policy framework and NSW strategic transport infrastructure policy is discussed in Section 3.6 and Section 3.7 respectively.</p> <p>A summary of the strategic need for the project is provided in Section 3.8.</p>

## 3.2 Sydney’s challenges

### 3.2.1 Population and economic growth

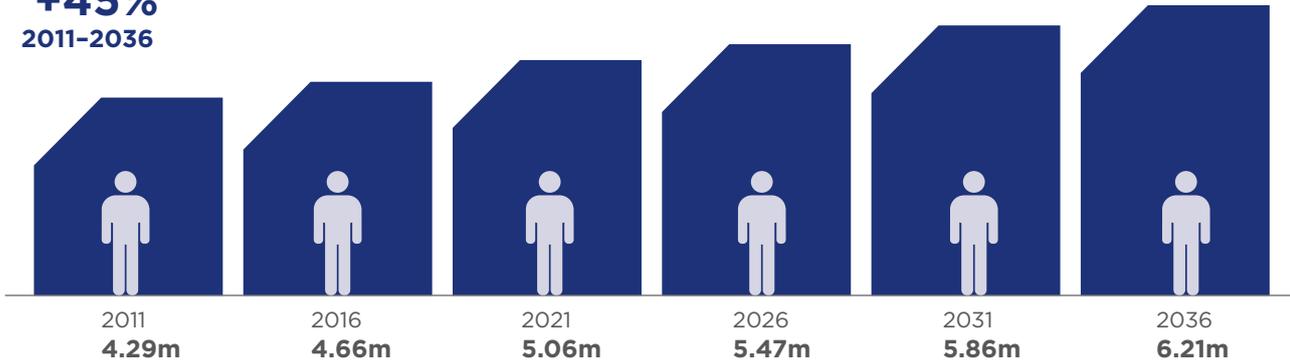
Sydney is Australia’s financial and economic capital with half of Australia’s globally competitive service sector jobs. Its economy accounts for about 70 per cent of total NSW economic output and 20 per cent of Australia’s gross domestic product (SGS Economics, 2014).

The city is home to over four million people and is Australia’s economic capital and a ‘global city’ (NSW Government, 2014) – a status that reflects its importance in terms of its economic and cultural influences, engagement with international trade and finance, and attractiveness to globally-mobile workers and visitors. Businesses and workers are attracted to Sydney for the city’s way of life and amenity, which help it score highly in international quality of life surveys.

A sign of Sydney’s attractiveness for business is that its economic output and population are growing. Close to 200,000 jobs have been added to the NSW economy over the past five years (NSW Government and Rebuilding NSW, 2014). By 2031 Sydney’s economic output will almost double to \$565 billion a year and there will be 689,000 new jobs. In the next 20 years Sydney’s population will grow by 1.6 million people (Department of Planning and Environment, 2015) (refer to Figure 3-1).

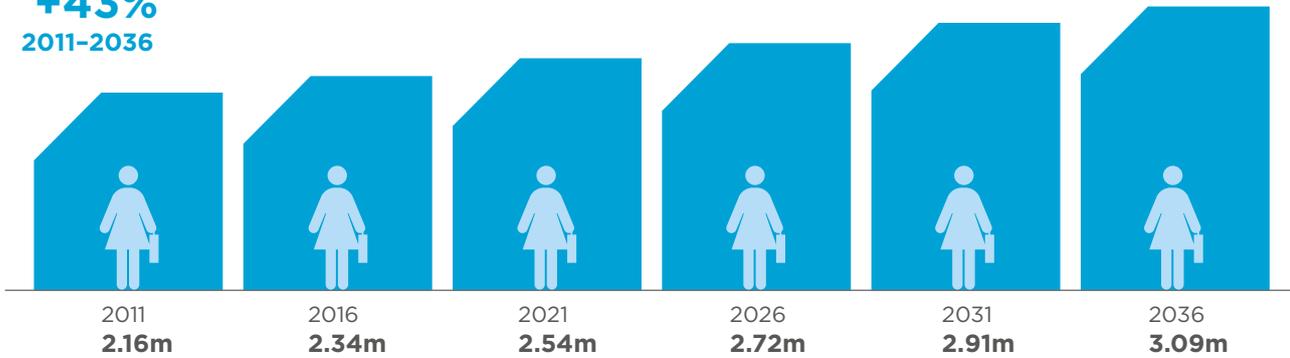
### Population growth

**+45%**  
2011-2036



### Employment growth

**+43%**  
2011-2036



### Household growth

**+54%**  
2011-2036

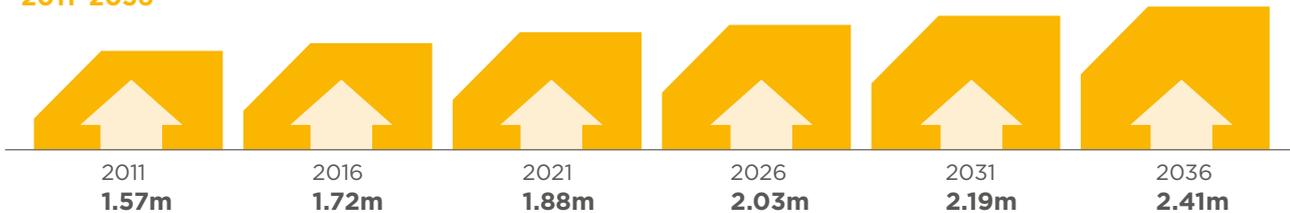


Figure 3-1 Population, employment and dwellings growth (Department of Planning and Environment, 2015)

Sydney's key employment and economic areas are clustered along a corridor that runs from Port Botany and Sydney Airport to Macquarie Park; this is known as the Global Economic Corridor (refer to Figure 3-2). In the last decade, demand for office space has seen overflow activity in Sydney's central business district (CBD) and the Global Economic Corridor extend the corridor towards Parramatta and Norwest Business Park, Sydney Olympic Park and Rhodes. The Global Economic Corridor now accounts for over 41 per cent of the NSW gross State product and provides jobs in a range of knowledge-based sectors including education, financial and other business services, communications, high-tech manufacturing and biotechnology (NSW Government, 2014).

It is important that the Sydney CBD continues to be one of Australia's premier commercial districts. The Sydney CBD has 10 times the number of jobs than any other centre in Sydney, and generates 28 per cent of the city's gross domestic product (Department of Planning and Environment, 2015). Barangaroo is Sydney's newest precinct. It will provide a hub for Sydney's financial and professional services and will further enhance the city's appeal for international investment and skilled workers (Department of Planning and Environment, 2015).

The finance and insurance industry is expected to maintain its position as the largest industry in NSW, with an expected average annual growth rate of 2.9 per cent. Other service based industries, including professional, scientific and technical services, health care, social assistance and education, are also expected to experience growth slightly above the level seen in the economy overall in this period (Deloitte Access Economics, 2014). Many of these jobs are located in the Sydney CBD and the Global Economic Corridor.

Sydney will continue to be NSW's primary employment centre, with employment in the city expected to increase from its current level of 2.1 million workers to 3 million workers by 2031, with about two-thirds working within the Global Economic Corridor (Transport for NSW, 2012a).

To continue to grow and develop, the Global Economic Corridor, including Sydney CBD and Barangaroo, will require high quality transit amenity to remain an attractive place to do business and to work.

Attracted by this economic prosperity, the city's population is growing much faster than during the previous 20 years. To support this growth, the rate of development of new dwellings will also need to increase with up to 664,000 new homes needed by 2036 to house this population. To maintain liveability and support continued growth in productivity, these homes will need to be serviced by transport infrastructure connected to employment areas, thereby enabling residents to actively participate in Sydney's growing economy.

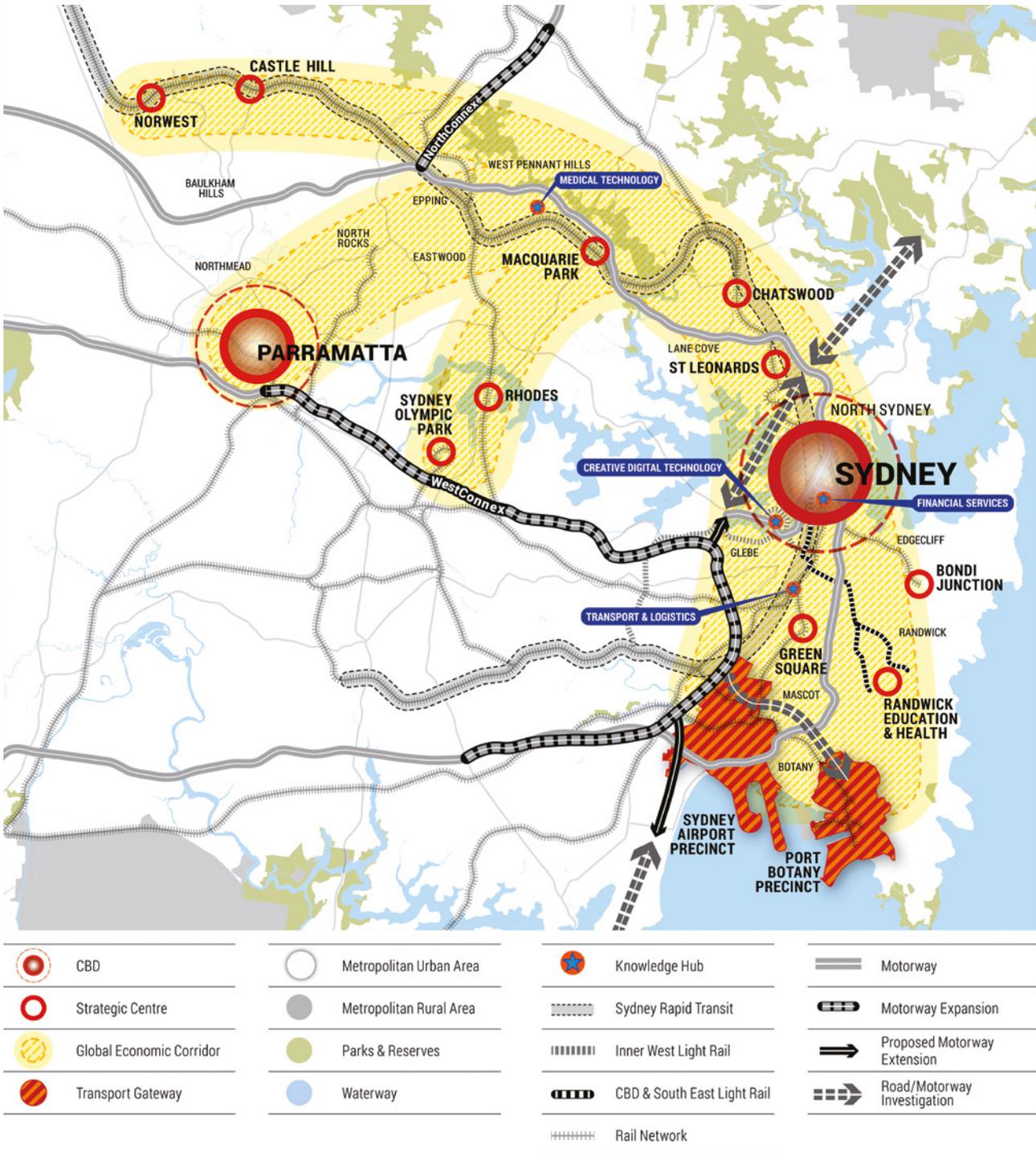


Figure 3-2 Sydney's global economic corridor

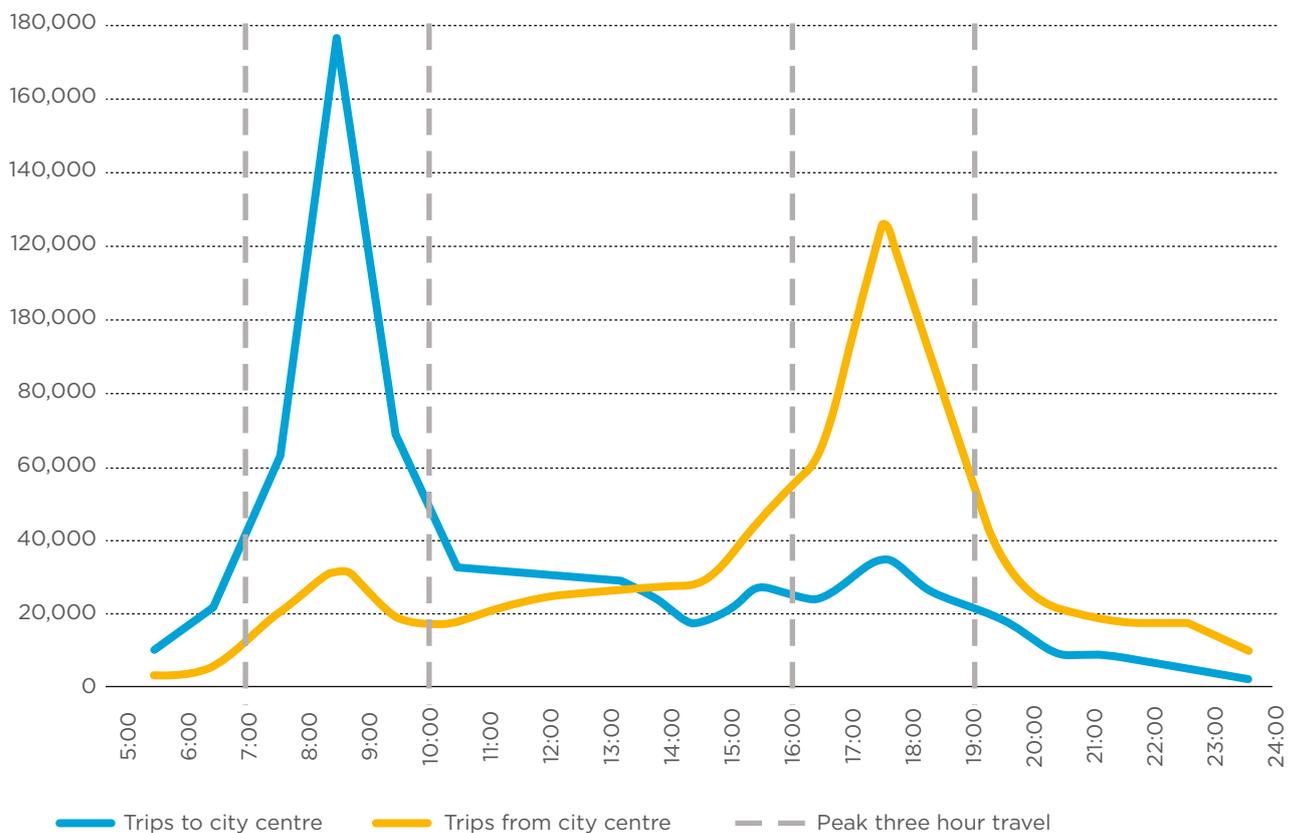
Note: Graphic taken from *A Plan for Growing Sydney* (Department of Environment and Planning and Environment 2015).  
References to Sydney Rapid Transit in the above figure are references to Sydney Metro.

### 3.2.2 Transport capacity and reliability

#### Importance of the rail network

Sydney’s suburban rail network is the backbone of the city’s public transport system, which connects the city’s skilled workforce with high value employment land located throughout the Global Economic Corridor. On a typical workday, commuters make about one million journeys on the rail network, with one third occurring in the morning peak (between 6 am and 9.30 am) (Transport for NSW, 2012b).

The most critical period for the transport system is the morning peak, when people are travelling to work, dropping children to school, transporting freight and making deliveries to businesses. This is particularly pronounced for key economic centres such as the Sydney CBD. Figure 3-3 provides a daily travel demand profile for the Sydney CBD.



**Figure 3-3 Passenger trips (all modes) to and from the Sydney CBD - average weekday by time of day 2010-11 (Transport for NSW, 2013a)**

Rail is the dominant mode of public transport for commuters travelling to and from the Sydney CBD and North Sydney, and a significant mode for commuters travelling to and from Chatswood, St Leonards and Macquarie Park.

Figure 3-4 shows the extent of the transport task required to service the Sydney CBD in the one hour AM peak.

Sydney will require increased transportation capability to support employment and population growth. Of the three primary transportation modes, it is projected that travel by rail will experience the highest growth in demand, more than double that of buses and over a third more than that of car trips.

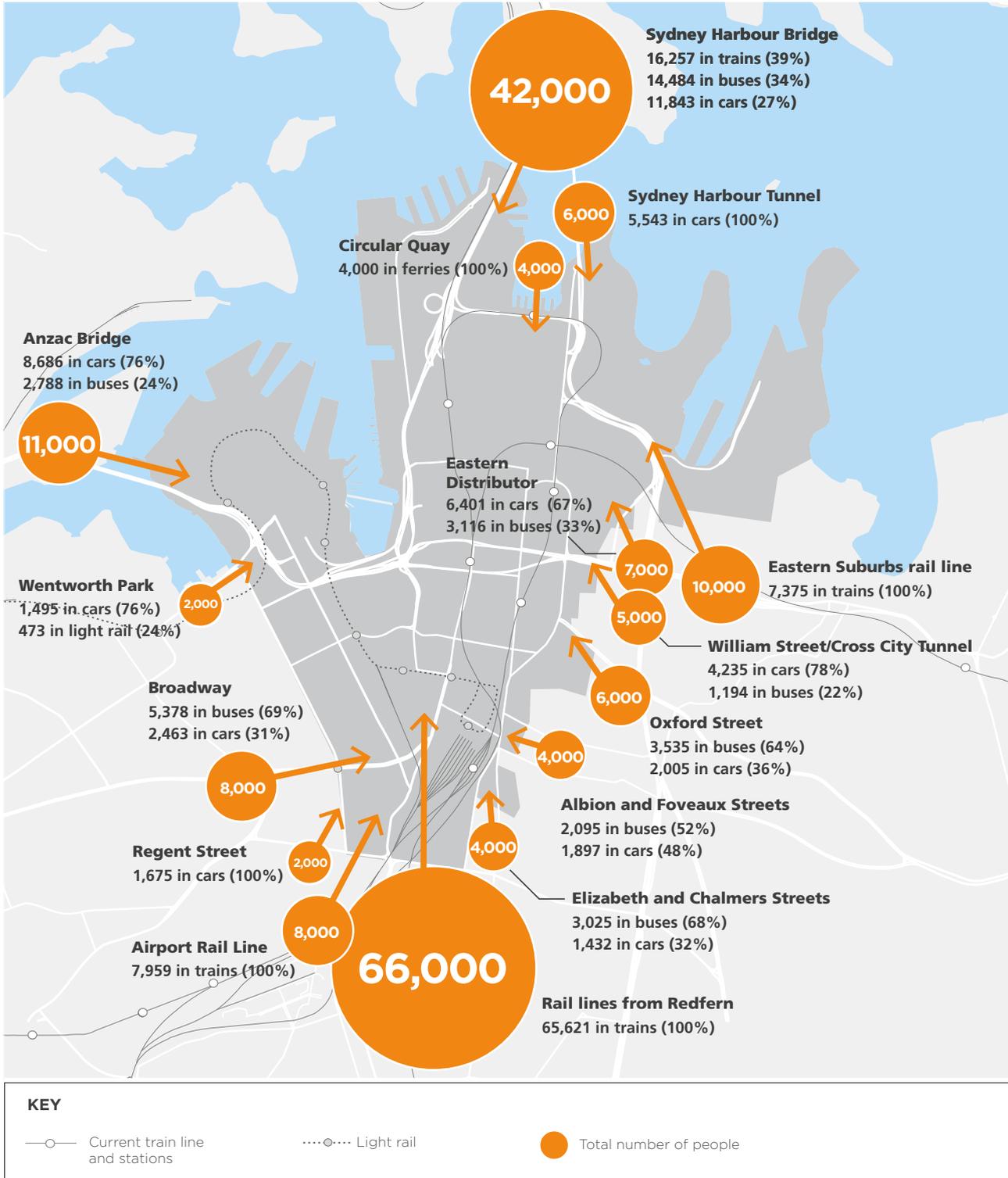


Figure 3-4 2011 Sydney CBD weekday entries in the one-hour AM peak (number of persons) (Transport for NSW, 2013a)

### Constraints on the rail network

The rail network is heavily congested, with customers on most train lines often experiencing significant crowding on trains and station platforms during the morning and evening peaks. The reliability and capacity of Sydney's rail network is currently constrained by a number of factors, which include:

- Large numbers of 'junctions' on the rail network (ie points where two train tracks converge, requiring trains to cross paths)
- A large number of tracks that enter Sydney's CBD
- Capacity constraints including limitation in the number of services able to be provided, generally limited to 20 trains per hour per line, with each train having a reliable capacity of 1,200 passengers
- Complex train timetables that demand trains with different service patterns share the same track, which can result in slower trains delaying fast and express trains
- Crowded trains with internal stairs and 3 + 2 seating arrangements, which are slow to load and unload, resulting in long 'dwell times' (the time a train needs to stop in a station for passengers to board and alight)
- Crowded station and narrow platforms in busy Sydney CBD stations, which hinder passenger flow between trains and stairs and make it difficult for customers on the platform to make way for passengers alighting from trains
- Traditional signalling technology, which impedes optimised train running and maximum utilisation of line capacity.

### Consequences of forecast passenger growth

As population and employment grow, transport network demand will also grow. By 2031, about 21 million trips will be made in Sydney every day, with all transport modes experiencing growth in demand, as shown in Figure 3-5 (Transport for NSW, 2012b).

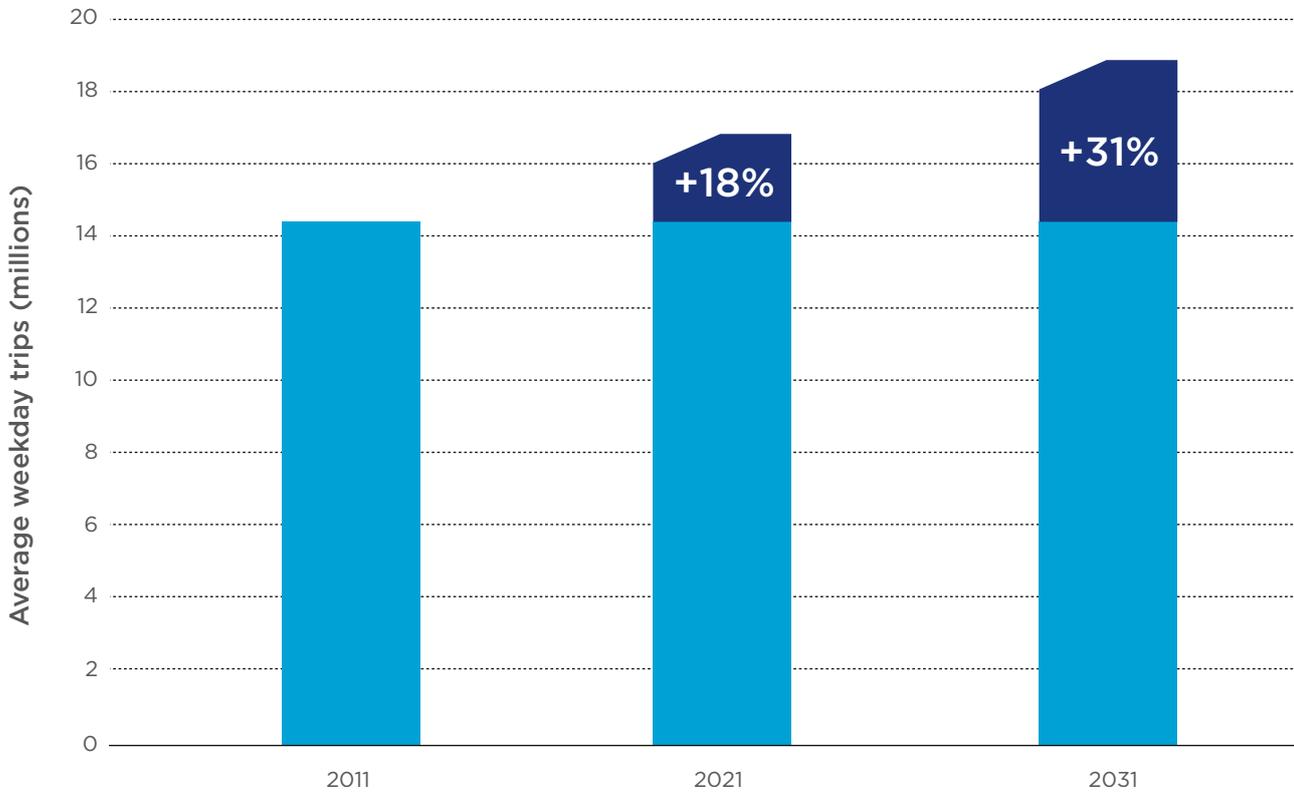


Figure 3-5 Growth in average weekday trips in Sydney (Transport for NSW, 2012b)

Rail is forecast to experience the highest growth in travel demand, with about an additional 100,000 trips expected on Sydney’s rail network during the morning peak by 2036 as shown in Table 3-2. This will place additional pressure on the rail network.

Table 3-2 Forecast network rail demand

Year	Demand	Change from 2014	
		Per cent growth	Per cent growth per annum
2014	168,400	N/A	N/A
2026	237,000	41	2.9
2036	271,700	61	2.2

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). This means most rail lines on the network will be overcrowded in the morning peak. The closer the rail network gets to capacity, the less reliable it will become and the more likely it will fail to meet the needs and expectations of rail customers.

As population and employment continue to grow, key stations in the Sydney CBD will not be able to cater for increased passenger movements. Increased platform crowding at Sydney CBD stations will contribute to increased dwell times, decreased network reliability and reduced network capacity. Without addressing platform crowding at Sydney CBD stations, investment to improve the suburban line capacity will not deliver capacity improvements, and reliability will continue to decline.

Increased platform crowding at Sydney CBD stations will also impact on the level of customer comfort and journey times. Given that timeliness and comfort are key drivers of customer satisfaction, poor customer outcomes have the potential to cause a shift away from rail.

### **Constraints on alternative transport modes**

Alternative transport modes have limited capacity to absorb Sydney's forecast long-term travel demand growth.

Sydney's roads are already some of the most congested in Australia. As transport demand grows there is limited ability to augment the existing road network to increase capacity and reduce congestion, particularly within Sydney's CBD and the Global Economic Corridor. Accessing the Sydney CBD by car is further constrained by a lack of available on-street car parking.

Sydney's bus network is complex, consisting of over 600 bus routes with many different types of bus services that provide more than 220 million bus trips each year (Transport for NSW, 2012a).

With buses competing for road space with cars, the bus network is affected by the growing congestion on Sydney's roads, especially along arterial connections and routes to the Sydney CBD. Road congestion will increasingly slow down bus services, resulting in longer and more uncertain travel times across the network during peak periods. In the morning peak, around 1000 buses converge on the Sydney CBD. Figure 3-6 shows bus volumes entering the Sydney CBD during the two-hour morning peak in 2012, with the highest volume of buses entering the Sydney CBD across the Harbour Bridge.

Previous attempts to meet extra demand have involved adding new services to Sydney's already complex bus network. While extra buses can carry more people, these services are not necessarily faster or more reliable. Without measures to improve journey times, adding more buses simply adds to congestion and each bus becomes less effective in meeting customer needs. Services continue to experience significant delays in peak times, even with bus lanes and traffic light prioritisation.

Recent implementation of changes to bus services in the Sydney CBD as part of the Sydney CBD Bus Plan and the closure of George Street associated with construction of the Sydney CBD and South East Light Rail project has reduced bus numbers in the core of the Sydney CBD by around 45 percent, and altered bus routes around the Sydney CBD to alleviate traffic and bus congestion while maintaining access to important Sydney CBD destinations.

Demand for bus travel across Sydney is forecast to grow by 30 percent by 2031. Whilst the Sydney CBD and South East Light Rail project (when it opens in 2019) will replace bus services in the Sydney CBD from the south, the lack of road and pedestrian space in and around the Sydney CBD means there is limited ability to increase the number of bus services on the Harbour Bridge and the York Street corridor.

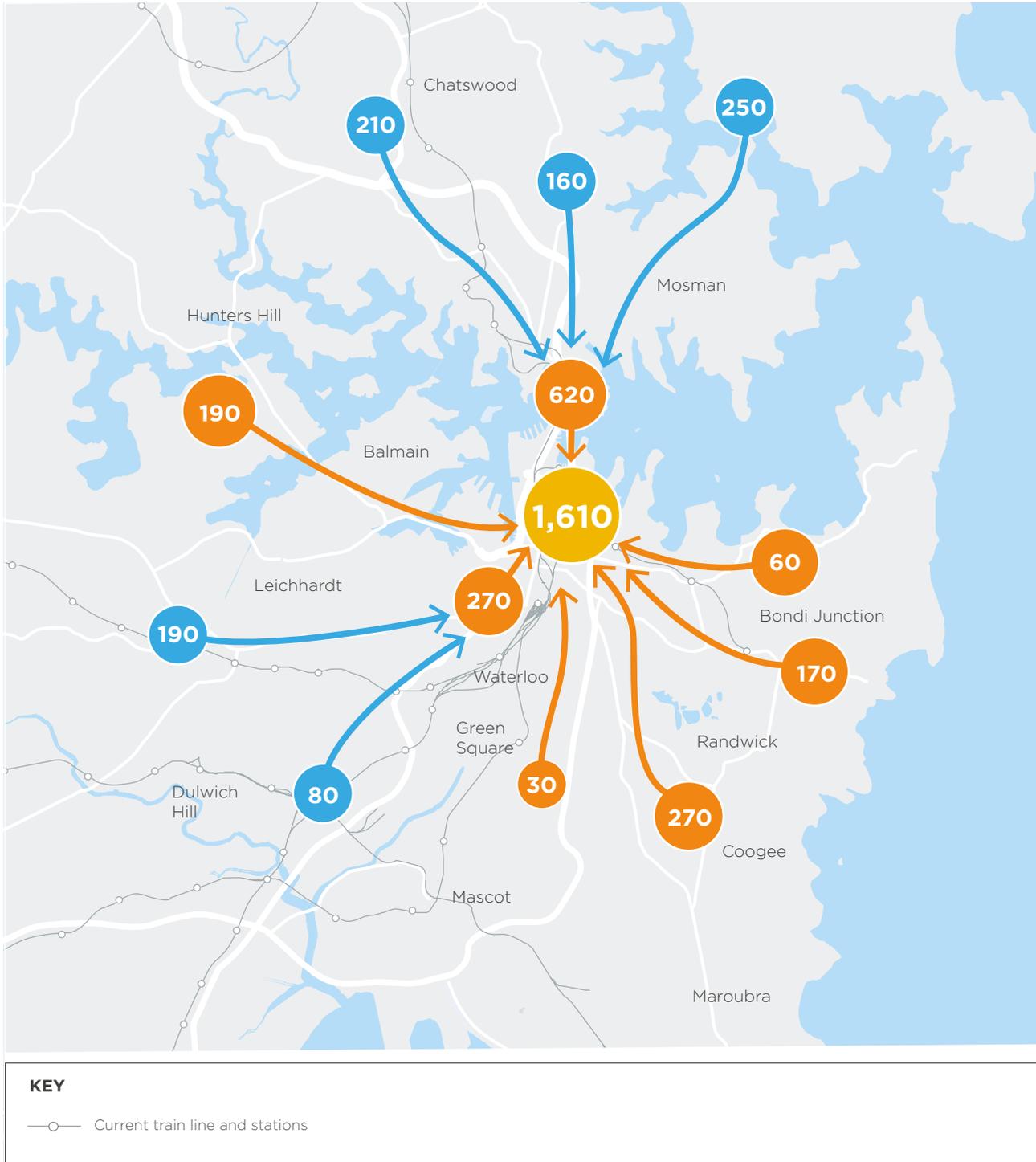


Figure 3-6 Bus volumes entering the Sydney CBD during the two-hour morning peak 2012

### 3.3 Why Sydney Metro?

Given the current and forecast travel demand for rail services within Sydney, and the limited capacity of other modes of transport to absorb forecast population and employment growth, improvements in rail capacity, through initiatives like the Sydney Metro network, are critical.

The proposed Sydney Metro network, comprising Sydney Metro Northwest and Sydney Metro City & Southwest, would deliver a seamless metro service for more than 65 kilometres between Rouse Hill and Bankstown, with investigations started for an extension of the network to Liverpool. The proposed Sydney Metro network is shown in Figure 1-1 and described in Chapter 1 (Introduction).

At ultimate capacity, the Sydney Metro network would be able to run 30 trains per hour in each direction through Sydney's CBD, providing the foundation for a 60 per cent increase in the number of trains that could operate in the peak periods and catering for an extra 100,000 customers per hour across the Sydney CBD rail lines. At ultimate capacity, the Chatswood to Sydenham component would provide additional capacity for more than 40,000 customers per hour through the Sydney CBD in each direction.

Sydney Metro would improve reliability across the rail network by addressing current and emerging constraints such as train crowding, platform and station crowding, and network complexity. The metro rail network would be capable of carrying more people, more quickly, than any other form of public transport ever seen in Sydney.

Sydney Metro would therefore deliver a new tier for Sydney's rail network, supporting high demand with a high-capacity, turn-up-and-go service. It is also being developed with an emphasis on supporting the needs of customers for 'door-to-door' journeys from origin to destination as shown by Figure 3-7. Sydney Metro would also be Australia's first fully automated rail network. The benefits of the project are expanded in Section 3.4.

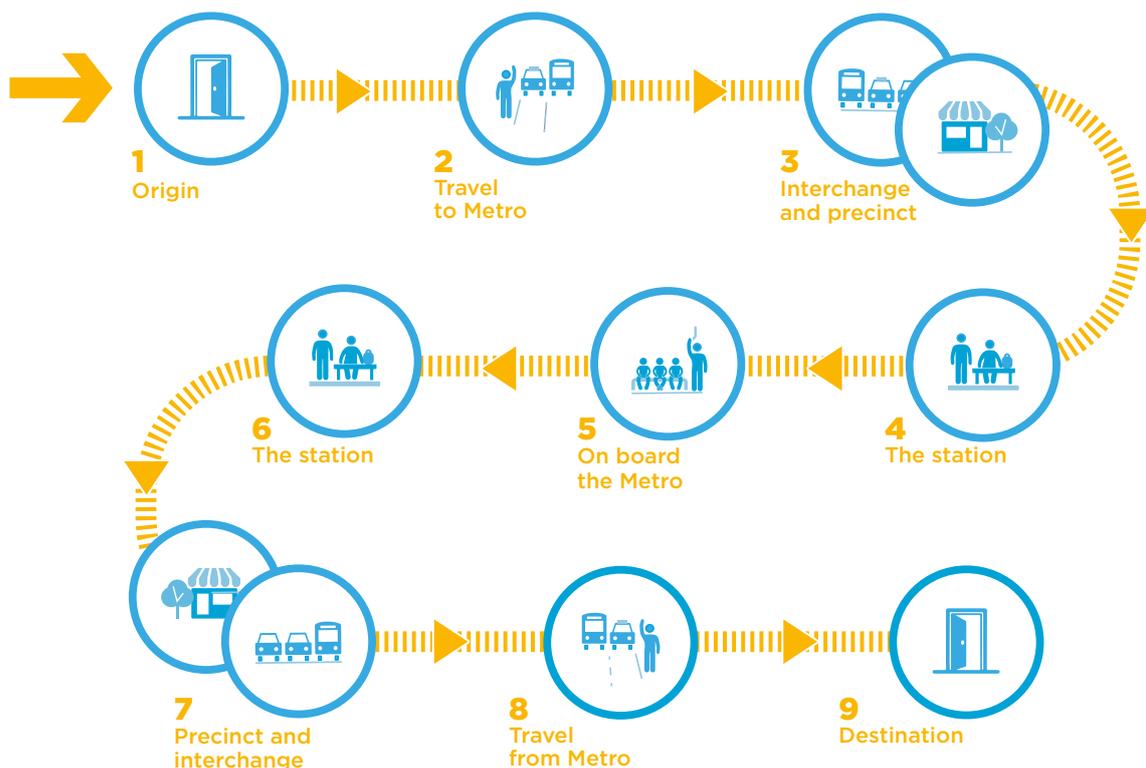


Figure 3-7 Customer journey

## 3.4 Key benefits of the Sydney Metro network

As indicated in Chapter 1 (Introduction), the Sydney Metro network comprises Sydney Metro Northwest and Sydney Metro City & Southwest. Sydney Metro Northwest is currently under construction and opens in the first half of 2019. Sydney Metro City & Southwest comprises two project components: Chatswood to Sydenham (this project) and the Sydenham to Bankstown upgrade (subject to a separate environmental assessment and approvals process). Sydney Metro City & Southwest would extend the currently approved metro network from Chatswood through the Sydney CBD to Bankstown.

This section outlines the benefits of the proposed extension to the metro network – incorporating both project components of Sydney Metro City & Southwest. It is recognised that this project could operate without the Sydenham to Bankstown upgrade. In this case, the project would still have broader network benefits including its connection to Sydney Metro Northwest, though there would be some changes to benefits without connecting through to Bankstown. Accordingly, benefits of the project in isolation of its connection to the Sydenham to Bankstown upgrade project have been specifically identified and are discussed in Section 3.5. Further discussion on the inter-relationship between the project and the Sydenham to Bankstown upgrade project, including implications for impacts are provided in Chapter 26 (Cumulative impacts).

### 3.4.1 Key transport benefits of the Sydney Metro Network

Sydney Metro City & Southwest would provide significant additional transit capability to the broader Sydney transport network by:

- Extending Sydney Metro from Chatswood, under Sydney Harbour through the Sydney CBD to Sydenham
- Increasing the number of primary Sydney CBD stations by building new Sydney Metro stations at Barangaroo, Martin Place and Pitt Street
- Providing extra connectivity and interchange capacity at Central Station, Martin Place and Sydenham
- Upgrading the Bankstown Line between Sydenham and Bankstown to be part of the high-capacity, high-frequency Sydney Metro system.

The key transport benefits of the Sydney Metro City & Southwest project are addressed in the following sections.

### Catering for growth in demand

As detailed in Section 3.2.2, demand for rail services is projected to grow by about 100,000 trips in the AM peak hour by 2036. Without intervention this growth will be constrained by network capacity limitations. The development of Sydney Metro City & Southwest would support this increase by providing the capacity to accommodate an extra 100,000 customers per hour across the Sydney CBD rail lines.

### Increased accessibility and trip diversity

Sydney Metro City & Southwest would increase the network rail catchment through the provision of:

- New stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, and Waterloo as well as new underground platforms at Central Station
- More direct connections to high-capacity Sydney CBD stations at Martin Place and Pitt Street
- Additional interchange capability at Central, Martin Place, Sydenham and Bankstown, enabling increased network connectivity and demand for rail services.

By increasing the reach of the rail network, frequency of services, interchange with other modes and connections to key destinations, Sydney Metro City & Southwest is expected to increase accessibility, trip diversity and utilisation of the network during both peak and non-peak periods. This would facilitate a greater mode shift to rail from car, particularly during non-peak periods where travel service consumers have greater choice.

Sydney Metro City & Southwest would facilitate a diverse range of trips, providing not only a fast journey to work but also encouraging trips for other purposes such as access within the Sydney CBD, local or business trips, access to universities and educational institutions, service and recreational uses.

Figure 3-8 provides an overview of destination land uses and facilities along the alignment, interchanges to increase accessibility, and trip choices that are available to metro customers.

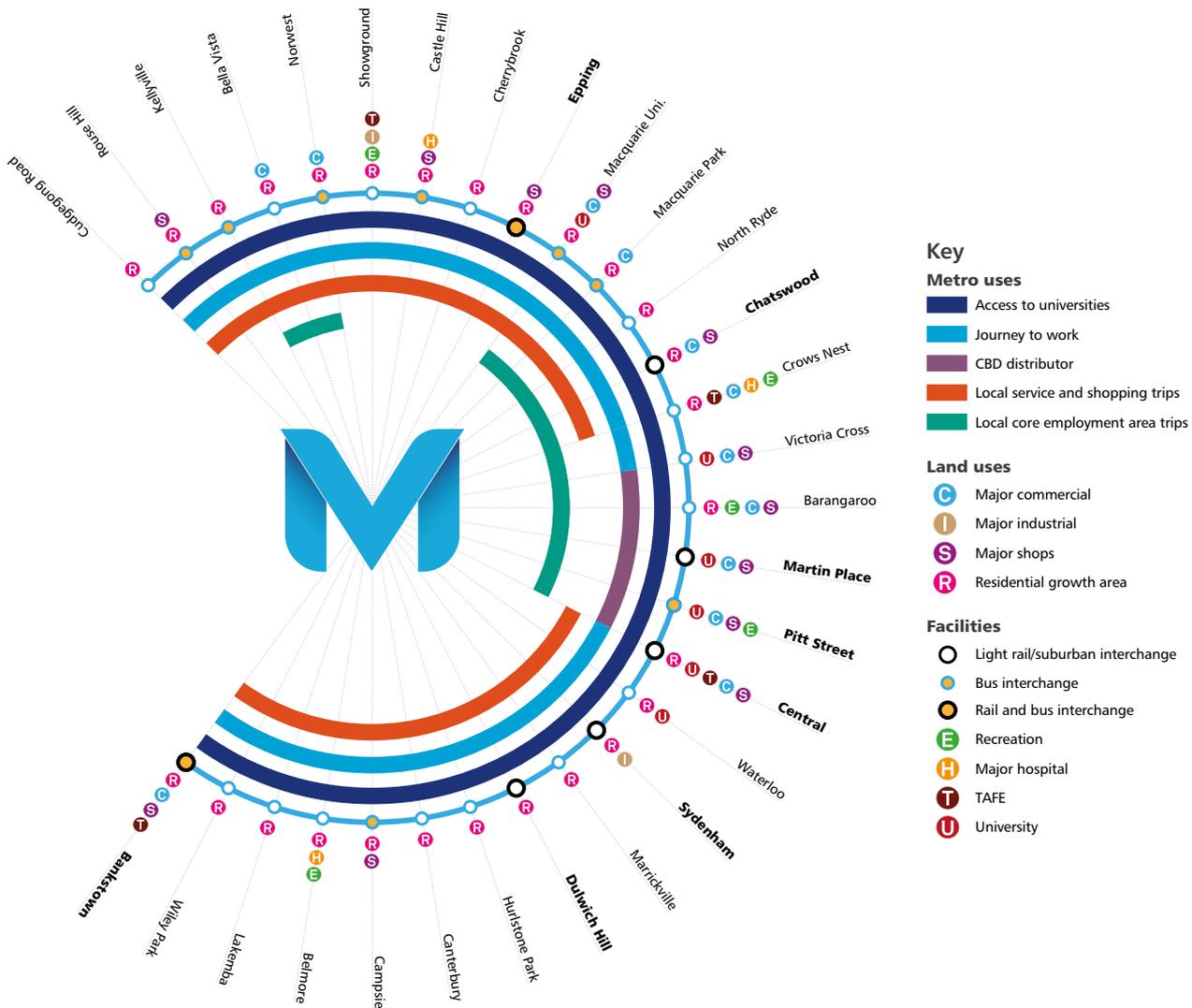


Figure 3-8 Overview of metro uses, land uses and facilities

### Increased rail network capacity

The Sydney Metro network would considerably increase rail network capacity by introducing new high-capacity rail connections from the Sydney CBD to other key economic centres in the broader Sydney area. Network capacity is a function of the number of reliable train paths able to be achieved and the carrying capacity of a train.

The reliable capacity of an existing Sydney Trains double deck train is about 1,200 passengers. Upon opening, Sydney Metro would operate with six car trains, with an ultimate capacity to operate eight car trains in the future. These new, high-capacity metro style trains would have a carrying capacity of about 1,500 passengers at the ultimate eight car configuration.

In addition, the Sydney Rail network is generally limited to 20 trains per hour per line. Sydney Metro would provide dedicated track, train control, rolling stock and platform configurations to support up to 30 trains per hour. Figure 3-9 provides an overview of the line capacity between the Sydney Trains and Sydney Metro networks.



**Figure 3-9** Line capacity comparison between Sydney Trains and Sydney Metro networks

Sydney Metro City & Southwest would provide a considerable increase in network capacity through the introduction of a new metro line through the Sydney CBD serviced by high-capacity trains. Sydney Metro, together with signalling and infrastructure upgrades across the existing network, would increase the capacity of the rail network through the Sydney CBD from about 120 per hour during peak periods today, to up to 200 services per hour beyond 2024, including capacity for up to 60 metro trains per hour during peak periods (or 30 trains per hour in each direction). This would equate to an increase of up to 60 per cent capacity across the network.

The two additional tracks from Chatswood to the City would more than double the number of train paths available from the north; and the conversion of the Bankstown Line would remove the need for Bankstown services to use the City Circle, providing for additional train paths for other lines using the City Circle. Increasing rail line capacity through Sydney's CBD and removing T3 Bankstown Line services from the City Circle would enable a fundamental change in the suburban network service plan, diverting passengers from the T1 North Shore Line and T1 Western Line; and allowing additional capacity on the T2 Airport, Inner West & South Line.

The extension of Sydney Metro from Chatswood to Bankstown would increase total train paths available to the Sydney CBD, and given that metro trains are of a higher reliable capacity than double deck trains, total passenger carrying capacity would be increased by about 60 per cent.

The increase in network capacity and ability to make a significant change to how the network operates provides other benefits as discussed in the following sections.

The Sydney Metro City & Southwest project would improve travel times by:

- Providing more direct routes to key destinations
- Providing more direct routes on suburban and intercity services, enabling additional capacity
- Reducing crowding on trains and at stations, which would improve the reliability of services.

The largest travel time savings would be experienced in areas where new stations are provided (such as Crows Nest), where more direct routes are provided (such as Martin Place to Chatswood), or where customers are required to transfer between services and new stations added or where there are connections to Sydney Metro Northwest (such as Norwest Business Park to Central).

Travel time savings would be experienced by existing rail customers (who would directly benefit from shorter travel times), new rail customers (who would transfer from road-based transport to rail) and road users (who would experience less congestion).

With the completion of Sydney Metro City & Southwest, customers on the Sydney Metro Northwest, T1 North Shore Line and T3 Bankstown Line, would have access to Sydney Metro services that would provide more direct connection with key destinations in the Global Economic Corridor.

The project would result in travel time savings through:

- More direct access for North Shore and North Sydney customers to key destinations in the Global Economic Corridor such as Martin Place and Norwest Business Park
- More direct access for Eastern Suburbs customers to key destinations in the Global Economic Corridor, interchanging to direct services at Martin Place Station instead of the crowded Town Hall Station.

Table 3-3 also provides examples of the estimated travel time savings to and from certain destinations associated with the introduction of the Sydney Metro City & Southwest to the network. These travel time savings have been forecast based on the time savings a customer would realise on their journey compared with existing rail network travel times, including interchange time and walking time from new metro station locations (such as Crows Nest) to the closest existing train station.

**Table 3-3 Examples of estimated trip travel time savings for Sydney Metro City & Southwest**

Origin	Destination		Travel time savings (approx.) <sup>1</sup>
Martin Place	Chatswood	<p><b>Without project:</b>                      10 minute walk Martin Place to Wynyard Station                      20 minute train Wynyard to Chatswood                      TOTAL: 30 minutes</p> <p><b>With project:</b>                      11 minute metro Martin Place to Chatswood</p>	19 minutes
Norwest Business Park	Central	<p><b>Without project:</b>                      28 minute metro Norwest to Chatswood                      3 minute interchange                      26 minute train Chatswood to Central                      TOTAL: 57 minutes</p> <p><b>With project:</b>                      42 minute metro Norwest to Central</p>	15 minutes

Origin	Destination		Travel time savings (approx.) <sup>1</sup>
Martin Place	North Sydney (corner Miller Street and Pacific Highway)	<p><b>Without project:</b>            10 minute walk Martin Place to Wynyard Station            7 minute train Wynyard to North Sydney Station            6 minute walk to Miller Street            TOTAL: 23 minutes</p> <p><b>With project:</b>            5 minute metro Martin Place to Victoria Cross            3 minute walk to Miller Street            TOTAL: 8 minutes</p>	15 minutes
Macquarie Park	North Sydney (corner Miller Street and Pacific Highway)	<p><b>Without project:</b>            9 minute metro Macquarie Park to Chatswood            3 minute interchange            13 minute train Chatswood to North Sydney Station            6 minute walk to Miller Street            TOTAL: 31 minutes</p> <p><b>With project:</b>            15 minute metro Macquarie Park to Victoria Cross            3 minute walk to Miller Street            TOTAL: 18 minutes</p>	13 minutes
Crows Nest (Hume Street)	Central	<p><b>Without project:</b>            9 minute walk Hume Street to St Leonards Station            23 minute train St Leonards to Central            TOTAL: 32 minutes</p> <p><b>With project:</b>            11 minute metro Crows Nest to Central</p>	21 minutes
Bondi Junction	North Sydney (corner Miller Street and Pacific Highway)	<p><b>Without project:</b>            11 minute train Bondi Junction to Town Hall            3 minute interchange            10 minute train Town Hall to North Sydney Station            6 minute walk to Miller Street            TOTAL: 30 minutes</p> <p><b>With project:</b>            8 minute train Bondi Junction to Martin Place            3 minute interchange            5 minute metro Martin Place to Victoria Cross            3 minute walk to Miller Street            TOTAL: 19 minutes</p>	11 minutes

Origin	Destination		Travel time savings (approx.) <sup>1</sup>
Bankstown	Central	<p><b>Without project:</b> 30 minute to 36 minute train Bankstown to Central</p> <p><b>With project:</b> 26 minute metro Bankstown to Central</p>	Up to 10 minutes

<sup>1</sup> The above estimates are based on analysis carried out in 2015, compared with train journeys at that time

### Reduced train crowding

During periods of heavy train congestion the following impacts can arise:

- Services begin to become unreliable as passengers crowd on to trains and dwell times at stations are more difficult to manage
- Passengers need to board a following train
- Passengers may seek to use another form of transport, travel at a different time or will not travel.

By enabling additional train services on the rest of the suburban rail network and diverting passengers from existing services, Sydney Metro would significantly reduce train crowding on the T1 North Shore Line; T1 Western Line; and the T2 Airport, Inner West and South Line.

### Decreased station crowding

Currently there is station crowding at key Sydney CBD stations during peak periods.

With passenger travel demand to the Sydney CBD forecast to increase, additional constraints will be placed on Sydney CBD and other key interchange stations, particularly crowding on platforms and vertical transport. This is likely to result in excessive delays to platform and station clearance times.

A key benefit of Sydney Metro City & Southwest is relief to platform crowding at existing Sydney CBD stations and a reduction in the amount of passenger time spent under heavily crowded platform conditions. Sydney Metro City & Southwest would achieve this by providing an alternative route through the Sydney CBD and increasing the number of high-capacity inner city stations from two to four by:

- Increasing the functionality of Martin Place Station, by providing two new underground platforms with interchange capability
- Providing a new station at Pitt Street.

The project would also provide a new station at Barangaroo and two new underground platforms at Central Station with high interchange capability. This would further reduce congestion at Wynyard Station and support improved dispersal of customers arriving on services that need to interchange at Central Station, such as customers on intercity services which terminate at Central.

The new stations and platforms at Martin Place, Pitt Street, Central and Barangaroo would spread the load of station utilisation and reduce Town Hall and Wynyard expected crowding. The project would also provide relief to the existing North Sydney Station with a new station at nearby Victoria Cross.

Overall passenger movements at the key Sydney CBD stations platforms of Wynyard and Town Hall in 2036 would be reduced by around 30 per cent during the one hour morning peak and by around 40 per cent at North Sydney and St Leonards stations. The anticipated change in passenger demand at key stations is shown in Figure 3-10.

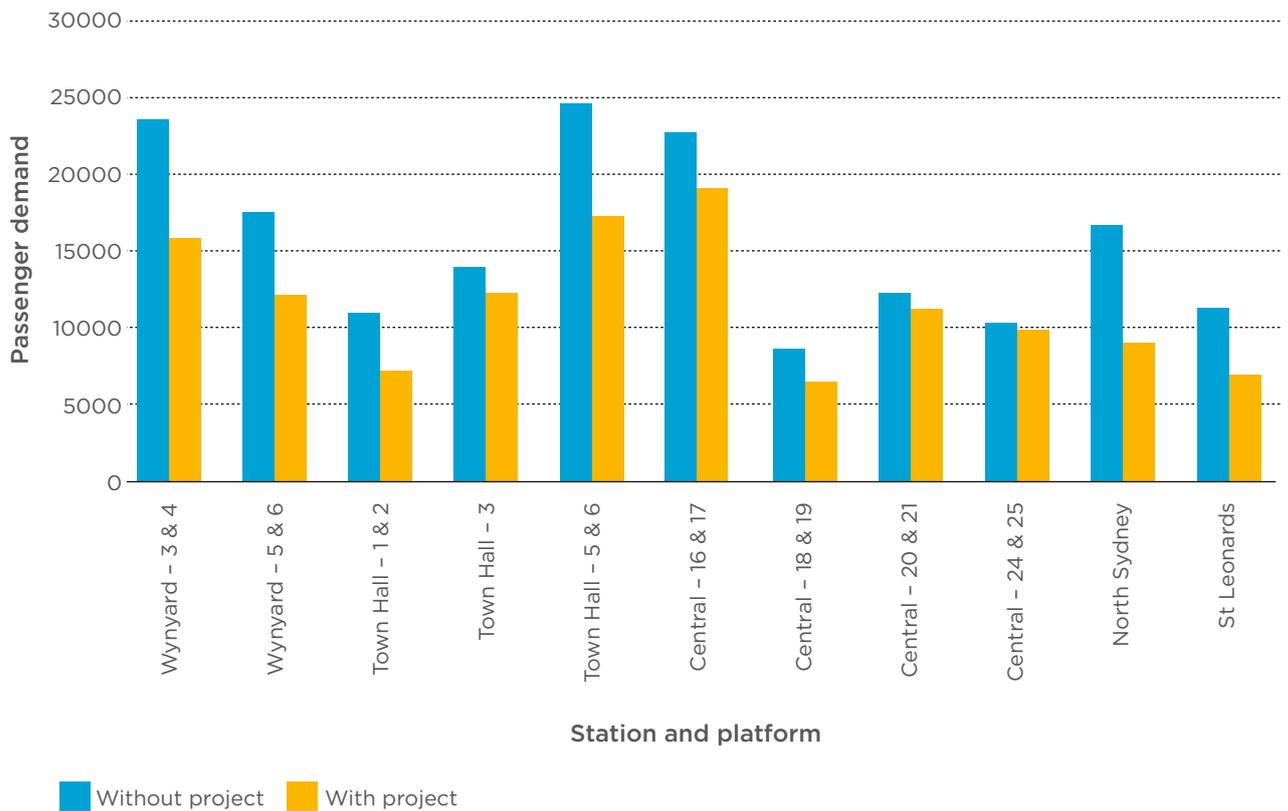


Figure 3-10 Anticipated change in passenger demand at key stations (one hour morning peak)

### Improved network resilience

Suburban rail access through the Sydney CBD and across the harbour is limited to the T1 North Shore, Northern and Western Line.

Forced shutdowns during unplanned and planned events impacts on customer service provision. Closures of the Harbour Bridge for example can cease the provision of public transport services linking the Sydney CBD to key destinations on the lower North Shore and Northern Sydney. The T1 North Shore Line is also subject to periodic maintenance which reduces access for passengers to key stations such as North Sydney, St Leonards and Chatswood.

The Sydney Metro City & Southwest project would provide an additional, high-capacity public transport link through the Sydney CBD and across the harbour, enabling rail network redundancy for this critical link. During planned and unplanned events patrons would continue to have access to direct high-capacity transport services.

### Improved conditions for bus customers

Sydney Metro City & Southwest would be part of an integrated public transport network with high-quality bus connections to the stations and easy transfers for customers travelling to and from locations beyond walking distance. The existing and future planned bus networks would continue to be reviewed by Transport for NSW to enhance the bus network and its connectivity with Sydney Metro stations.

By connecting with Sydney Metro Northwest at Chatswood, the project would provide a direct connection from Sydney's northwest, potentially allowing for a reduction in the number of bus services from the northwest to the Sydney CBD during the morning peak. The project would contribute to:

- Improving the reliability of journey times for the remaining bus passengers
- Reducing the number of buses in the Sydney CBD
- Reducing the number of buses accessing the Sydney CBD via the Harbour Bridge
- Reducing the number of bus services using the already congested Wynyard Bus Interchange, freeing it for use by other services
- Reducing journey times for existing bus passengers who switch to using Sydney Metro for all or part of their journey.

People around Waterloo have traditionally relied on buses and walking as a transport solution. The introduction of a metro station at Waterloo would therefore benefit existing bus customers by providing a high quality metro / bus connection and by reducing reliance on the bus network.

### Improved conditions for road users

By encouraging people to use the metro network, Sydney Metro City & Southwest would reduce the number of trips that would otherwise be made on the road network. This is particularly the case for sections of the road network that are constrained, such as the Harbour Bridge and the Sydney CBD, where the project would provide a high-quality transport alternative. Reduced congestion would mean that those road users who do not shift modes would gain from travel time and reliability benefits.

Public transport already provides for the majority of the AM peak commuter movements in Sydney. As a result of the project in 2026 there could be about 20 million fewer car trips annually. By 2036 the corresponding reductions could be as much 30 million fewer car trips annually.

### 3.4.2 Key city building benefits

Sydney Metro City & Southwest would provide a significant increase in transit amenity throughout Sydney, which would facilitate increased economic productivity and land use efficiency. Sydney is the most urbanised area within Australia with the density of population and economic activity in its centres being major drivers of national productivity. Sydney Metro City & Southwest would facilitate:

- Higher productivity by enabling businesses to become effectively closer together through reduced travel times between major economic centres, and between economic centres and potential employees
- Opportunities for a higher intensity of land use around new and converted stations, including employment opportunities and potential for higher density residential areas which could offer more affordable housing options with better access to services and employment, and support more liveable, vibrant communities.

Planning being carried out by the Department of Planning and Environment along the Sydney Metro corridor supports the following:

- Global Economic Corridor – about 650,000 jobs within 800 metre station catchments by 2036
- Urban renewal corridor along the full length of the Sydney metro line – about 514,000 people within 800 metre station catchments of the Sydney metro line by 2036
- Future priority precincts emerging from the current investigation between Bankstown and Sydenham
- 460,000 jobs and 67,000 residents at Barangaroo, Martin Place, Pitt Street and Central
- Potential future priority precinct at St Leonards.

### 3.5 Key benefits specific to the Chatswood to Sydenham project

Section 3.4.1 has detailed the expected benefits of the full Sydney Metro including both Sydney Metro City & Southwest projects. The full realisation of the benefits to the overall Sydney rail network in terms of catering for growth in demand and increasing rail network capacity would ultimately be dependent on delivering both these projects. However, this project would provide specific benefits, particularly given the additional Sydney Harbour rail crossing and the additional stations provided in the Sydney CBD. A summary of the key benefits enabled specifically by the project are provided in Table 3-4.

**Table 3-4 Key transport benefits enabled by the project**

Benefit category	How the benefits are enabled
Enables longer term development of Sydney rail network	<ul style="list-style-type: none"> <li>○ Facilitates development of the rail network, including continued development of Sydney Metro, and continued development and enhancement of the Sydney Trains network.</li> </ul>
Catering for growth in demand	<ul style="list-style-type: none"> <li>○ Increased rail accessibility, number of services, reliability and rail catchment; reduced train and station crowding, particularly at Wynyard, Town Hall and North Sydney stations; travel time savings, would enable rail system to cater for growth in demand.</li> </ul>
Increasing the reach of the rail network	<ul style="list-style-type: none"> <li>○ New stations at Barangaroo, Crows Nest, Victoria Cross and Waterloo would directly increase rail catchment areas</li> <li>○ More direct connections to high-capacity Sydney CBD stations at Barangaroo, Martin Place and Pitt Street would increase Sydney CBD rail catchment areas</li> <li>○ Additional interchange capability at Central, Martin Place and Pitt Street stations.</li> </ul>

Benefit category	How the benefits are enabled
Increased accessibility and trip diversity	<ul style="list-style-type: none"> <li>○ Improved frequency of services and interchange with other modes and connections to key destinations would increase accessibility (eg to major commercial, industrial, retail and residential areas) and trip diversity (eg journey to work, education, Sydney CBD distributor, local service trips and work related trips)</li> <li>○ <b>Crows Nest Station</b> would provide improved connections to the key employment centre of St Leonards, and the restaurants and specialist shops in the Crows Nest village. The station would provide a new transport focus to the south of the St Leonards strategic centre and be an opportunity to respond to North Sydney Council’s planning precinct studies for the area</li> <li>○ <b>Victoria Cross Station</b> would be located in the North Sydney CBD and would provide improved connections to the commercial, retail users, restaurants and cafes of the centre. The station would also improve connections to schools and educational facilities in the locality, including the Australian Catholic University (North Sydney) campus. The station would provide another focal point to North Sydney CBD, relieving pressure on the existing North Sydney Station and extending the rail catchment to the north. The station would improve mid-block connections between Miller Street and the eastern areas of the North Sydney CBD</li> <li>○ <b>Barangaroo Station</b> would provide customers with easy access to Barangaroo Reserve and the Walsh Bay arts precinct including the Sydney Theatre Company, Sydney Dance Company, and many cafes and restaurants. The station would also provide much needed east-west connectivity across the Sydney CBD. Once Central Barangaroo is constructed and open to the public, customers would be connected to office and retail centres, and a new casino and hotel complex</li> <li>○ <b>Martin Place Station</b> would serve the high-end commercial and financial precinct within the Sydney CBD. It would provide an opportunity to respond to City of Sydney Council’s Martin Place Urban Design Study. It would also provide customers with a new connection to the civic spaces including the State Library, Sydney Hospital, Domain and a short walk to the Royal Botanic Gardens. Customers would be able to easily access events held in or near Martin Place during the off peak period, such as families going to the City of Sydney’s Christmas tree lights, Vivid Sydney and the Sydney Festival</li> <li>○ <b>Pitt Street Station</b> would connect customers to the retail heart of the CBD. It would provide customers with access, by a short walk, to the Queen Victoria Building, Pitt Street Mall and Galleries Victoria. Customers would also have easy access to the entertainment precinct along George Street and to Town Hall and other civic buildings to attend events like Vivid Sydney</li> <li>○ <b>Central Station</b> would provide customers with connections to a range of attractors including the University of Technology Sydney, University of Notre Dame Australia, the shopping and market districts around Haymarket, and Central Park, Chinatown and Surry Hills for a wide variety of restaurants and bars. Many customers would alight at Central and transfer to another mode to access the Sydney Football Stadium and Sydney Cricket Ground for a variety of concerts and sporting events</li> <li>○ <b>Waterloo Station</b>, through the provision of new infrastructure and substantial improvements in accessibility for the area, would indirectly contribute to the renewal of the area’s social housing, which would in turn contribute to an increase in the supply of new homes close to the Sydney CBD.</li> </ul>
Increased rail network capacity	<ul style="list-style-type: none"> <li>○ Additional tracks through the Sydney CBD – two additional tracks enabling up to 30 high-capacity metro services (AM Peak hour) through the Sydney CBD in each direction</li> <li>○ Additional tracks from Chatswood to Sydney CBD – two additional tracks providing additional capacity from the north.</li> </ul>

Benefit category	How the benefits are enabled
Travel time savings	<ul style="list-style-type: none"> <li>○ Sydney Metro Northwest and T1 North Shore Line customers would have access to more direct Sydney Metro services to key activity areas in the Global Economic Corridor</li> <li>○ Central Coast customers travelling to North Shore and Sydney CBD stations would have significant travel time savings, with these services being able to take advantage of the more direct routes made possible by the introduction of Sydney Metro City &amp; Southwest</li> <li>○ North Shore and North Sydney customers would have direct rail access to key destinations in the Global Economic Corridor such as Martin Place and Norwest Business Park</li> <li>○ Eastern suburbs customers would have more direct access to key destinations in the Global Economic Corridor, interchanging to direct services at Martin Place Station instead of the crowded Town Hall Station.</li> </ul>
Decreased train crowding	<ul style="list-style-type: none"> <li>○ Sydney Metro services – at opening of the project 20 new high frequency metro services would reduce crowding on the T1 North Shore Line. For example between Milsons Point and Wynyard, loadings would reduce from around 122 per cent of capacity to around 70 per cent of capacity in the AM peak.</li> </ul>
Decreased station crowding	<ul style="list-style-type: none"> <li>○ New Sydney CBD stations and platforms provided at Barangaroo, Martin Place, Pitt Street and Central spreads station loading and decreases crowding at Wynyard and Town Hall stations</li> <li>○ New station at Victoria Cross would decrease crowding at North Sydney Station.</li> </ul>
Increased reliability	<ul style="list-style-type: none"> <li>○ Reduced train and station crowding would increase reliability of T1 North Shore, Northern and Western Line.</li> </ul>
Improved network resilience	<ul style="list-style-type: none"> <li>○ Public transport access through the Sydney CBD and across the harbour is limited to a few key pieces of infrastructure</li> <li>○ The project would provide an additional, high-capacity public transport link through the Sydney CBD and across Sydney Harbour. The project provides an alternative option for customers during unplanned and planned events which may force closure of other Sydney CBD and harbour links.</li> </ul>
Improved transport integration	<ul style="list-style-type: none"> <li>○ Improved interchange with bus, light rail, pedestrian and cycling networks, and provision of taxi and kiss and ride key stations.</li> </ul>
Rail safety benefits	<ul style="list-style-type: none"> <li>○ Improved rail safety through the introduction of new technologies and design, such as communication based train protection system, platform screen doors, modern ventilation systems and emergency arrangements in the tunnelling environment, intrusion detection technologies along the corridor, and extensive CCTV coverage on board and at stations.</li> </ul>
Bus network benefits	<ul style="list-style-type: none"> <li>○ Freeing of bus services by bus customers transferring to rail, enabling the opportunity to redeploy bus services from the north and north west</li> <li>○ Less demand for Sydney Harbour Bridge bus services, freeing capacity over the Harbour Bridge.</li> </ul>
Road network benefits	<ul style="list-style-type: none"> <li>○ Reduced road congestion by road users transferring to rail</li> <li>○ Less congestion on key road corridors including Sydney Harbour Bridge, Sydney Harbour Tunnel and Eastern Distributor.</li> </ul>

## 3.6 Consistency with NSW strategic planning and policy framework

The project is consistent with key NSW Government planning strategies, as outlined in this section.

### 3.6.1 State and Premier priorities

In September 2015 the NSW Premier released 30 'State priorities', including 12 'Premier priorities' to grow the economy, deliver infrastructure, and improve health, education and other services across NSW. Key priorities relevant to the Sydney Metro Chatswood to Sydenham project include 'building infrastructure' and 'creating jobs'.

The project would contribute to economic growth by providing direct benefits to customers in terms of reduced travel time and better reliability. It would also deliver wider economic benefits by facilitating increased connectivity, land development and business logistics improvements, particularly for knowledge based businesses.

There are a number of health benefits associated with the project that relate to increased density and increased active transport (walking and cycling) opportunities around metro stations.

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 (NSW Government, 2015). Sydney Metro City & Southwest is identified as a key infrastructure project as part of the NSW government's infrastructure investment program.

The NSW Government is committed to the creation of 150,000 new jobs over the next four years. Through investment in infrastructure such as the Chatswood to Sydenham project, new jobs and apprenticeships are being created for the construction sector.

### 3.6.2 Sydney metropolitan planning strategy

*A Plan for Growing Sydney* (NSW Government, 2014) sets out the NSW Government's strategy for accommodating Sydney's future population growth over the next 20 years. The plan consists of goals, directions and actions that provide a framework for strengthening the global competitiveness of Sydney and delivering strong investment and jobs growth in Western Sydney. The project's expected contribution to achieving these goals, directions and actions is outlined in Table 3-5.

Table 3-5 Expected contribution to achieving the goals of A Plan for Growing Sydney

Directions of the plan	Corresponding actions of the plan	Project contribution to achieving the plan's directions and actions
<b>Goal 1: A competitive economy with world-class services and transport</b>		
<b>Direction 1.6: Expand the Global Economic Corridor</b>	<b>Action 1.6.2:</b> Invest to improve infrastructure and remove bottlenecks to grow economic activity	The project would support the Global Economic Corridor by providing faster and more reliable access and by fostering clusters of activities that support more economic growth.
<b>Direction 1.7: Grow strategic centres – providing more jobs closer to home</b>	<b>Action 1.7.1:</b> Invest in strategic centres across Sydney to grow jobs and housing and create vibrant hubs of activity	The project would improve capacity and reliability of links along the Global Economic Corridor to the Sydney CBD. Together with Sydney Metro Northwest, the project would also improve links to the strategic centres of Chatswood, Macquarie Park, Castle Hill, Norwest and Rouse Hill.
<b>Direction 1.11: Deliver infrastructure</b>	<b>Action 1.11.1:</b> Preserve future transport and road corridors to support future growth	<i>A Plan for Growing Sydney</i> specifically identifies preserving a future corridor for Sydney Metro. The project is consistent with this action.
<b>Goal 2: Sydney's housing choices</b>		
<b>Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs</b>	<b>Action 2.2.2:</b> Undertake urban renewal in transport corridors which are being transformed by investment, and around strategic centres	Together with Sydney Metro Northwest, the project would provide significant opportunities for new housing development, giving new communities shorter and more reliable commutes to major job centres.

## 3.7 Consistency with NSW strategic transport infrastructure policy

### 3.7.1 Rebuilding NSW: State Infrastructure Strategy 2014

*Rebuilding NSW: State Infrastructure Strategy 2014* (NSW Government and Rebuilding NSW, 2014) outlines the NSW Government's plan to invest \$20 billion in new infrastructure to sustain productivity growth in NSW's major centres and regional communities, and to support a forecast population of almost six million people in Sydney and more than nine million in NSW. Projects identified in Rebuilding NSW were based on investment recommendations made by Infrastructure NSW.

Rebuilding NSW states that \$7 billion has been reserved to fully fund a second rail crossing of Sydney Harbour as part of Sydney Metro. The project is therefore consistent with this strategy.

### 3.7.2 NSW Long Term Transport Master Plan

The *NSW Long Term Transport Master Plan* (Transport for NSW, 2012b) is the NSW Government's 20 year plan to improve the NSW transport system by delivering an integrated, modern transport system that puts the customer first. The plan identifies the transport challenges that will need to be addressed to support NSW's economic and social performance over the next 20 years and establishes a number of short, medium and long-term actions to address those challenges. These actions provide the overall framework for how the NSW transport system develops, in terms of services and infrastructure.

A key element of the *NSW Long Term Transport Master Plan* is the need to increase the capacity of Sydney's rail network to meet existing customer needs and accommodate the additional travel demand created by Sydney's forecast population and economic growth over the next few decades. The plan notes that over the next 20 years, the number of trips made by rail is expected to increase by 26 per cent (Transport for NSW, 2012b). This growth cannot be accommodated on Sydney's existing rail network, which is already approaching its capacity and is subject to significant crowding on most lines at the height of the morning and evening peak periods (Transport for NSW, 2012b).

Without the creation of additional rail capacity, crowding levels on the network will continue to increase, with many parts of the rail network forecast to be near capacity in 2031, even with service improvements that are possible within the constraints of the current network configuration (Transport for NSW, 2012b).

The *NSW Long Term Transport Master Plan* identifies a 'three-tiered network' approach to expand the capacity of Sydney's transport system. This approach involves the implementation of high-capacity metro into the current two-tier arrangement of suburban and intercity services to untangle the current system and ensure fast, efficient and reliable services throughout the network. The plan identifies a second Sydney Harbour rail crossing and Sydney CBD rail line, which connects Chatswood to the Sydney CBD, as the centrepiece of Sydney's modernised rail system.

The project is therefore a key long-term action in the *NSW Long Term Transport Master Plan*, which would improve access and connectivity for the T1 North Shore Line and Sydney Metro Northwest, and improve travel times and capacity through the city from the north and south. The project would provide the largest increase in capacity to the Sydney rail network for 80 years, while proposed new stations within the Sydney CBD would relieve pressure on Central, Wynyard and Town Hall stations.

The *NSW Long Term Transport Master Plan* is accompanied by *Sydney's Rail Future* (Transport for NSW, 2012a), which details how the NSW Government will deliver the core elements needed to give Sydney a world-class rail network that can support the city's growth, which is discussed in Section 3.7.3.

### 3.7.3 Sydney's Rail Future

*Sydney's Rail Future: Modernising Sydney's Trains* (Transport for NSW, 2012a) is the NSW Government's long-term plan to increase the capacity of Sydney's rail network by investing in new services and upgrading existing infrastructure. It aims to improve the customer's experience, improve reliability and increase services across the rail network. *Sydney's Rail Future* forms an integral part of the *NSW Long Term Transport Master Plan* (discussed in Section 3.7.2) and once implemented will enable Sydney's rail network to carry another 90,000 to 100,000 people per hour in the peak period across the Sydney CBD rail lines.

*Sydney's Rail Future* recognises key challenges for Sydney's rail system, including increased demand for rail transport driven by employment and population growth, the limited capability of the current network, capacity constraints, Sydney CBD congestion, the need to support the on-going development of the Sydney CBD, and suburban bottlenecks.

*Sydney's Rail Future* is based on the NSW Government's strategy to meet customer needs, which include:

- Create a more reliable service
- Get 'Sydneyiders' to work on time
- Maintain a safe, clean and comfortable commuting environment
- Run more services
- Reduce travel times.

*Sydney's Rail Future* describes the plan to transform and modernise Sydney's rail network based on a three-tiered system, comprising:

- Tier 1 – Metro: 'turn-up-and-go' services with single-deck metro trains
- Tier 2 – Suburban: timetabled services with double-deck trains
- Tier 3 – Intercity: timetabled services with double-deck trains and on-board amenities for long-distance commutes.

### 3.7.4 Sydney City Centre Access Strategy

The *Sydney City Centre Access Strategy* (Transport for NSW, 2013a) is the NSW Government's plan to deliver a fully integrated transport network in Sydney's city centre that puts the customer first and meets the city's growing transport task. The strategy outlines how people will enter, exit and move in and around the Sydney CBD over the next 20 years and demonstrates how light rail, buses, trains, ferries, cars, taxis, pedestrians and cyclists will interact in the heart of Sydney. The strategy also provides a clear direction for how all the different transport modes will work together in the city centre to:

- Reduce congestion
- Provide for future growth
- Improve the customer experience.

Under the *Sydney City Centre Access Strategy*, rail will remain the dominant mode for getting to the city centre. Key features of the integrated network identified in the *Sydney City Centre Access Strategy* are:

- Light rail on George Street between Central and Circular Quay
- Pedestrianisation of George Street between Bathurst Street and Hunter Street
- Improved pedestrian connections throughout the city centre including Wynyard Walk
- Redesigned bus services with priority routes on Elizabeth Street / Castlereagh Street, Park Street / Druitt Street, Clarence Street / York Street and Hickson Road
- New interchange precincts at Town Hall, Wynyard, Central and Circular Quay, and also at Martin Place and Museum stations
- An integrated cycleway network
- A new ferry hub at Barangaroo
- A new railway line and train stations for the city centre (this project)
- New designated traffic routes through and around the city centre.

The project is a key action in the Sydney City Centre Access Strategy, which identifies the following benefits to the Sydney CBD:

- Unlock the Sydney CBD rail bottleneck and enable more rail services from the west, southwest, Illawarra, Bankstown, North Shore and northwest
- Provide up to an extra 60 train services per hour (30 in each direction) across the harbour and through the city centre
- Create new train stations to relieve pressure on existing crowded platforms in the city centre
- Enable better connections to employment opportunities across Sydney
- Help reduce the number of buses travelling into the city centre from north of the Sydney Harbour Bridge.

## 3.8 Summary of strategic need and justification

The project has been assessed against key relevant State government policies. This includes:

- The NSW Premier's 30 'State priorities', including 12 'Premier priorities' to grow the economy, deliver infrastructure, and improve health, education and other services across NSW
- *Draft Metropolitan Strategy for Sydney 2031*
- *A Plan for Growing Sydney*
- *Rebuilding NSW: State Infrastructure Strategy 2014*
- *NSW Long Term Transport Master Plan*
- *Sydney's Rail Future: Modernising Sydney's Trains (Sydney's Rail Future)*
- *Sydney City Centre Access Strategy*.

To fulfil the objectives of those policies the assessment indicates that there is a need to:

- Significantly increase transport capacity in key parts of the network, especially to the Sydney CBD and the Global Economic Corridor
- Drive productivity through integrated transport and land use planning to realise 'agglomeration benefits' (agglomeration benefits refer to the productivity benefits firms derive from being located in close proximity to each other, enabling increased interaction between firms with resulting improved productivity through knowledge sharing and collaboration)
- Effectively develop infrastructure to cement Sydney's position among the world's most liveable cities.

The project as part of the broader Sydney Metro network would deliver a step-change in the capacity of Sydney's rail network by providing a fully automated rail system, supporting high demand with a high capacity, turn-up-and-go service. It would provide the largest increase in capacity to the Sydney rail network for 80 years. In particular, the proposed new stations within the Sydney CBD would relieve current significant pressure on Central, Wynyard and Town Hall stations. The proposed new station at Victoria Cross would relieve current pressure and crowding at North Sydney Station.

Working together with major upgrades to the T1 Western Line, the Sydney Metro network would deliver the capacity to increase the number of trains entering the Sydney CBD across the entire Sydney railway system from 120 to about 200 in the busiest hour of the day. This means that the rail network across greater Sydney would have room for an extra 100,000 train customers per hour. The fully automated state-of-the-art Sydney Metro network would have the capacity to operate 30 trains an hour through the Sydney CBD in each direction – a train every two minutes each way.

The Sydney Metro network would significantly improve reliability across the rail network by addressing current and emerging constraints such as train crowding, platform and station crowding, and network complexity. It would be capable of carrying more people, more quickly, than any other form of public transport in Sydney. It would improve travel times for customers by providing more direct connections to higher capacity Sydney CBD stations (such as Martin Place and Pitt Street) and improved interchange capability at key locations such as Central Station, including reduced train and station crowding on the existing rail network. It would also result in benefits for customers using the existing bus network as there would be fewer buses accessing the Sydney CBD.

In addition to the broader Sydney transport operational benefits, the customer experience provided by the project would result in health benefits and an improved customer experience with the creation of safer and more appealing conditions for pedestrians, cyclists and other transit users.

The project would also provide important urban renewal and development opportunities through the application of transit oriented development principles that support government objectives to achieve a more sustainable and efficient use of land to meet Sydney's growth. In particular, Waterloo Station would provide the opportunity for renewal of the areas social housing and increase the supply of new homes close to the Sydney CBD. It would help bring new jobs to the area as well as providing a direct public transport link from Waterloo to employment hubs at Barangaroo and Martin Place.

The project also has the potential to reduce network wide greenhouse gas emissions by providing a lower greenhouse gas alternative for transport compared to private car travel.

### 3.9 Project objectives

A set of objectives has been developed for the project having regard to the key challenges and the strategic land use and transport policies outlined above. The objectives for the project are:

- Improve the quality of the transport experience for customers
- Provide a transport system that is able to satisfy long-term demand
- Grow public transport patronage and mode share
- Support the productivity of the Global Economic Corridor
- Serve and stimulate urban development
- Improve the resilience of the transport network
- Improve the efficiency and cost effectiveness of the public transport system
- Implement a feasible solution recognising impacts, constraints and delivery risk.

These project objectives are referenced in Chapter 4 (Project development and alternatives) and have been used to guide decision-making during design development. They will also be used to guide decision-making on future design development. Chapter 29 (Justification and conclusions) further justifies the project with respect to its delivery against the above project objectives.