

22 Project justification

This chapter outlines the reasons justifying the project. Justification is based on the strategic need for the project, and in particular, how it would fulfil the project objectives as outlined in Chapter 4. The project justification also takes into account economic and social considerations, alternatives to the proposal, and the principles of ecological sustainable development.

The Director-General's requirements

Project justification – justify the project taking into consideration the objects of the Environmental Planning and Assessment Act 1979. This should include demonstration of how the preferred design meets the transport objectives for the project, particularly with respect to achieving additional public transport capacity to, from and within the Sydney CBD.

22.1 Strategic need for the project

The strategic need for the project is presented in Chapter 4. This section provides a summary given its key relevance to the justification of the project. In short, the metro network (of which CBD Metro would enable) is needed because:

- Sydney's complex network of rail, road and bus is already at capacity at key points of the network – points which are also experiencing and will continue to experience the highest rates of population and employment growth. To increase the capacity of our transport network, the NSW Government considers that it is now time for Sydney to develop a new product that will meet future urban transport demands, and help to realise the vision for Sydney as outlined in the *Metropolitan Strategy*.
- It would target the major corridors, such as Parramatta Road, Victoria Road, Anzac Parade and Military Road. In doing so, it would address significant areas of growing transport congestion around existing major road, bus and rail corridors. The planned *Metro Network Strategy* (as described in section 4.4) links land use and transport planning and delivers on the State's strategic objectives for improved urban environments with reliable transport access by establishing a strategy for delivery of a wider metro network for Sydney.
- It would provide fast and frequent rail services linking key population and employment centres, and support major destinations such as Parramatta and Macquarie Park, making them more attractive as employment locations. The metro system would also connect major health and education precincts like Westmead, Royal Prince Alfred, Sydney University, the University of Technology, Macquarie University and University of Western Sydney, as well as the Prince of Wales Hospital and the University of New South Wales. In so doing, it would assist in the planned population and employment growth around key transport centres and corridors.

Key strategic benefits of the CBD Metro would include:

- Relieving the greatest capacity constraint on the entire transport network – the CBD – while providing for future metros to the west and north-west.
- Providing an alternative means for commuters to move around the CBD, attracting passengers away from existing crowded rail and bus networks, particularly at key locations such as Central, Wynyard and Town Hall.
- Facilitating a wider range of timetable and investment choices for the commuter rail network.
- Relieving heavily congested bus services operating into and through the CBD, which currently compete with pedestrians, cyclists, delivery vehicles and cars.
- Supporting planned major development at Barangaroo and, in the future, the Bays Precinct and Blackwattle Bay area.

The CBD Metro would be built first and would form the central spine to which all other metros in the network would link or interchange. Accordingly, it is considered by Government to be the first logical and critical step in the transformation of Sydney's transport system.

22.2 Achieving the project objectives

This section presents the key performance indicators for the proposed CBD Metro.

22.2.1 Enabling a metro network for Sydney

Indicator

- Government's commitment to the broader metro network.

As indicated in Chapter 4, the NSW Government is committed to delivering Australia's first world-class metro rail system, as part of a major investment in Sydney's sustainable growth and prosperity. The CBD Metro will be the first step and a critical part of the government's targeted investment plan to make Sydney's transport network more efficient in its delivery of services to the community.

The government's public commitment to the broader metro network is reflected in:

- Its announcement in October 2008 of the CBD Metro.
- Its subsequent funding commitment (made in its November mini-budget and 2009-10 Budget) to lay the foundations of a broader metro network for Sydney.
- Its establishment of Sydney Metro on 27 January 2009 as the governing body responsible for developing and managing a metro railway system for Sydney, with the initial priority for the CBD Metro. While its immediate focus is on delivering and commissioning the CBD Metro by 2015, Sydney Metro is also undertaking further planning analysis for the potential expansion of the metro network, with the aim of completing the *Metro Network Strategy for Sydney*, by December 2009 (Sydney Metro 2009).
- The declaration by the Minister for Planning (6 February 2009) to the effect that development for the purpose of a metro rail line – as part of a metro rail network providing high speed, high frequency mass-transit capacity within the Greater Metropolitan Region – is a critical infrastructure project.

- Its commitment to the West Metro project (the proposed western extension to the CBD Metro) as reflected in the funding announced by the Commonwealth Government, the declaration of the West Metro as a project to which Part 3A of the *Environmental Planning and Assessment Act* would apply, and the recent lodgement of the Project Application and Preliminary Environmental Assessment for the West Metro project.

Indicator

Provision in the design to allow for:

- Future extensions from Central and Rozelle, without significantly affecting CBD Metro operations.
- High-frequency services and increased passenger flows at key locations, without affecting reliability or running times.

The CBD Metro would traverse the heart of the Sydney CBD through property that is arguably amongst the most dense, complex and expensive in the metropolitan area – if not the whole of Australia. Coupled with the complexities of construction in one of the busiest cities in Australia and providing high quality urban design outcomes, it would be a relatively expensive piece of infrastructure on a per-kilometre basis.

The true value of the CBD Metro, however, is that it would be an essential enabler for a future Sydney-wide metro network. Its location reflects the Sydney CBD's central place within the Global Economic Corridor and its continued significance as a generator of economic growth and jobs. Essentially, the CBD Metro is the beginning and centrepiece of a wider network that would allow benefits to be extended to more people across Sydney.

The metro network would have the potential capacity to carry from 29,000 up to 40,000 passengers per hour per direction at a given section of the line (depending on the frequency, train configuration and seating arrangement). Longer term patronage would be significantly influenced by the development of future extensions – including the West Metro corridor and a corridor towards the north-west – as well as future CityRail services as part of an integrated rail network.

A further extension of the CBD Metro to the north-west via Victoria Road and beyond, providing a direct link to major employment and education precincts could attract up to 75,000 passengers in the AM peak hour (2031).

Preliminary estimates indicate that a two to three minute frequency with the proposed five-car train sets with a high seating arrangement would provide enough capacity to meet the peak line load demand in 2031 for Metro Line 1. Should the demand be higher than anticipated, arrangements can be made to crease the capacity by increasing service frequency, reconfiguring seats to increase the train capacity, accepting higher loading levels, or changing to six-car train sets.

A number of specific features of the CBD Metro alignment make it critical as a network enabler:

- The metro station at Central is a strategic and essential location for a later extension to the west. The station is aligned to facilitate a future extension with the design providing for stub tunnels to the west of the station to allow extension without disrupting future operations.
- The metro station at Rozelle is positioned to facilitate a future extension to the north-west via the Victoria Road corridor.

A further metro rail line running north-south through the CBD, extending to the north-east and south-east is also possible, without precluding new heavy rail alignments through the CBD as part of a potential future expansion of the CityRail network. CBD Metro stations in the CBD are also being designed to accommodate potential future metro-to-metro interchange.

The CBD Metro (including the stations, signalling systems, ventilation systems, etc) is being designed to accommodate up to 30 rolling stock per hour (that is, a service every two minutes) without affecting reliability or running times. While the CBD Metro would initially operate every three minutes in the peak and every five minutes in the off-peak, network extensions are expected to fuel demand for greater frequency. For similar reasons, both the alignment and stations are being designed to accommodate, or be easily upgraded to accommodate, six-car service operation.

Indicator

- Capability to expand the Rozelle stabling and maintenance depot.

The CBD Metro stabling and maintenance depot at the former Rozelle Marshalling Yard has been designed to accommodate a potential expansion (subject to separate planning approval) of the rolling stock stabling required for future extensions of the metro network west to Parramatta / Westmead.

To operate 30 trains per hour on the full line from Westmead / Parramatta through to Epping would require 59 trains. The facility at Rozelle would potentially enable stabling of up to 30 six-car train sets, of which eight would be stabled in the maintenance areas.

At this stage, the Environmental Assessment and the approval being sought by Sydney Metro is only in relation to the stabling and maintenance of trains at Rozelle for the CBD Metro. A separate Environmental Assessment and approval process would be undertaken for any expansion.

Indicator

- Long-term planning to protect feasible metro corridors.

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) provides protection for the interim rail corridor proposed for the CBD Metro. Specifically, clauses 88A through 88C contain provisions to ensure that development on, or adjacent to, land within that corridor does not adversely affect the viability of the CBD Metro project or any proposed metro station. In addition, consent authorities are required to consider the impact on the viability of the project of any major development within interim rail corridors or station extents proposed for the CBD Metro.

In this context, corridor protection has been given statutory recognition by the Infrastructure SEPP, which defines the Interim Rail Pitt Corridor (including that for the CBD Metro) and includes referral provisions directed at ensuring development does not have an adverse impact on the viability of a metro project. Protection is also provided for the Interim Rail West corridor to safeguard any future heavy rail infrastructure.

It is also intended to protect the West Metro corridor and other future metro corridors as appropriate.

Finally, protection is also provided by the development of a single direction for transport services and a transport blueprint for Sydney, which is being coordinated by the NSW Transport and Infrastructure agency.

22.2.2 Delivering additional public transport capacity

Indicator

- Additional public transport capacity provided to and through Sydney CBD.

Relieving congestion on the existing transport networks is fundamental to the process of developing a transport network that better meets the needs of a complex, growing city.

The CBD Metro would result in a number of public transport improvements, as detailed in Chapter 14. As outlined in Chapter 4, the CBD Metro would deliver the following key improvements in terms of reduced congestion and increased capacity:



- The CBD Metro would provide additional intra-CBD services and an additional north-south route through the CBD, with a capacity of 29,000 up to 40,000 passengers per hour, depending on the metro train configuration, frequency and seating arrangement. This would relieve congestion on both the bus and rail network and represent a major injection of service quality and capacity into a currently constrained network.
- The CBD Metro would provide an alternative means for moving people around the CBD, thereby substantially reducing congestion on CityRail suburban services between Central and Town Hall/Wynyard. This is because many people arrive at Central from terminating InterCity services, and then need to transfer onto already overcrowded services on platforms 16 and 17 to gain access to the heart of the CBD. The CBD Metro would provide extra choice for access within the city for the 145,000 CityRail customers who exit the CityRail system daily in the CBD in the AM peak.
- Many of the passengers arriving at Central require access to the heart of the CBD. Without the CBD Metro these passengers would continue to join already crowded suburban services, increasing the already lengthy dwell times at Central, Town Hall and Wynyard and undermining the reliability of the maximum 20 suburban trains per hour able to be operated on the existing CityRail lines through the CBD.
- The CBD Metro would provide the opportunity to divert passenger loads to new stations, relieving peak hour congestion at Town Hall and Wynyard stations.
- The CBD Metro would help to relieve heavily congested bus services into and through the CBD, in particular in the Victoria Road corridor, by providing additional transport choice between Rozelle and the CBD.
- The CBD Metro would relieve bus congestion within the CBD. With a station at Rozelle, more than 10,000 residents live within walking distance of the new metro line. This would provide a strong customer base to support services from the north-western end of the metro and would substantially reduce the number of bus services required to operate from Victoria Road through to the northern part of the Sydney CBD. The scope to reduce bus services would come from a combination of customers being able to walk directly to Rozelle Station (for a faster trip to the CBD); and the substantial proportion (expected to be around 50 per cent) of existing Victoria Road bus commuters choosing to change from buses at Rozelle and join the metro to travel the remainder of the distance to the City. Those most likely to interchange would have destinations either at the northern (Martin Place, Barangaroo-Wynyard) or at the southern (Central) end of the CBD where metro would provide the greatest time advantage. By providing the opportunity to reconfigure the Victoria Road bus services to operate to the Domain via Park Street or elsewhere in the CBD, CBD Metro would provide relief to the very congested bus corridor in the northern part of George Street.
- In conjunction with the reconfiguration of Victoria Road bus services (see bullet point above), the CBD Metro would also:
 - Potentially reduce by 30 per cent the number of buses in the AM peak hour (8am-9am) using Anzac Bridge to access Sydney CBD. This would improve the reliability of the remaining bus services.
 - Potentially reduce by 45 per cent the number of buses in the AM peak (8am-9am) on George Street north of Druiitt Street. This would result in: more reliable bus services for remaining buses on George Street from Broadway to Wynyard/Circular Quay; the potential to provide additional stops for the remaining bus services operating on George Street that currently operate under a complex split-stop arrangement with gaps of up to one kilometre between stops for services travelling from Circular Quay; lower dwell times at Queen Victoria Building and Wynyard bus stops; and better operation and safety of the Circular Quay interchange due to a reduction in services.

In summary, the CBD Metro would provide an alternative to buses in a corridor where it can offer a faster, more frequent and reliable services than buses. It would start to allow bus services to be reconfigured to service more cross-regional journeys, connecting centres and giving people who work in dispersed, smaller centres across the metropolitan region (the majority of employment) a more direct public transport alternative to driving.

With extensions to the west and north-west, the metro network would further address congestion on specific parts of the CityRail network, and provide direct capacity relief to heavily congested bus corridors, including Victoria Road beyond Rozelle and Parramatta Road/Broadway.

Indicator

- Reduction in vehicle kilometres travelled.

Patronage modelling shows that the CBD Metro project would reduce vehicle kilometres travelled (VKT) over the Sydney region by about 0.5 per cent in 2031. However, it should be noted that the primary task of the CBD Metro is to provide additional capacity to relieve the existing crowded rail network and provide an alternative to the congested bus network. The CBD Metro's role in attracting passenger trips from private transport to public transport is an ancillary benefit that would increase as the metro network increases.

Indicator

- Reduced travel time to and through Sydney CBD.

The CBD Metro would provide a significantly faster option for travel to and through Sydney CBD compared with existing modes. For example:

- The CBD Metro would take about half the time of the bus service to travel between Central and Rozelle.
- The CBD Metro would take about two-thirds of the time of the train between Central and Martin Place.
- The CBD Metro would provide significantly greater reliability in terms of travel times, particularly compared with buses, which are often subject to delays due to traffic congestion, even outside peak periods.

A comparison of travel times using the CBD Metro and other public transport modes is given in Table 22.1.



Table 22.1 Comparison of public transport in vehicle travel times from Central (mins)

Mode of travel	CBD Metro (turn up and go service)	CityRail ¹ (timetabled)	Light Rail ² (timetabled)	Bus ¹ (timetabled)
Origin	Central Metro Station	CityRail Central Station	Central LRT stop	Railway Square
Destination				
Town Hall	1:25 (to Town Hall Square Metro Station)	3:00 (to Town Hall CityRail Station)	n/a	4:00 (to George St near Bathurst St bus stop)
Martin Place	3:20 (to Martin Place Metro Station)	5:00 (to Martin Place CityRail Station)	n/a	11:00 (to Elizabeth St near Martin Place bus stop)
Wynyard	5:20 (to Barangaroo-Wynyard Metro Station)	6:00 (to Wynyard CityRail Station)	n/a	11:00 (to George St at Wynyard bus stop)
Pymont	7:20 (to Pymont Metro Station)	n/a	10:00 (to Star City Light Rail stop)	11:00 – 14:00 (to Miller St opposite Jones St bus stop)
Rozelle	9:55 (to Rozelle Metro Station)	n/a	n/a	16:00 – 19:00 (Victoria Rd near Darling St bus stop)

1 Source: www.131500.com timetable information for AM Peak weekday journey.

2 Source: Metro Light Rail customer enquiries

Indicator

- Improvements to pedestrian accessibility and safety, and reduced pedestrian walking times.

At each station, the project would create new pedestrian links and contribute to the overall pedestrian permeability in each locality. For example:

- At Central – significant new links to Eddy Avenue (including the existing coach parking area), Henry Deane Plaza (connecting to Railway Square bus interchange), Chalmers Street (long term) and under Pitt Street/George Street to Quay Street.
- At Town Hall Square – footpath widening in the vicinity of the station and an accessible pedestrian link to CityRail's Town Hall Station.
- At Martin Place – footpath widening on Castlereagh Street and Pitt Street near the station and possibly extended (on Castlereagh Street) to between Hunter Street and King Street.
- At Pymont – improved accessibility at Mount Street, footpath widening on both sides of Union Street and potentially on Miller and Mount streets.
- At Rozelle – footpath upgrades along Victoria Road near the station and important links below Victoria Road and Darling Street.
- At Lilyfield – access across the depot site to directly link Lilyfield with Blackwattle Bay.
- At Barangaroo – the Barangaroo Pedestrian Link would also provide major benefits to pedestrians. It would bypass four sets of traffic lights as well as significant grade changes at street level.

- Various other safety/mobility improvements within the primary walking catchment of each station.

Sydney Metro would also work closely with other NSW transport agencies to assess the feasibility of introducing measures to reduce existing delays to pedestrians at intersections within the wider catchment area of each station. This would help to maximise the customer base, improve safety and foster positive attitudes, and a behavioural change towards public transport.

Promotional initiatives and preparation of materials to encourage walking to the metro, including clear pedestrian accessibility maps (downloadable from the Sydney Metro website – www.sydneymetro.nsw.gov.au) would also be undertaken.

Further details on the pedestrian strategy and the benefits associated with the CBD Metro are provided in Technical Paper 1 *Transport and Traffic*.

Indicator

- Improvements to cyclist accessibility and integration.

Cycling is expected to be a minor mode of access to metro stations within the CBD, reflecting the character and purpose of inner city stations.

Nevertheless, the following initiatives would be implemented to improve cyclist accessibility and integration:

- Bicycle facilities (such as parking) would be provided at all stations, including CBD Metro stations. This would expand the catchment of the stations by attracting passengers from farther afield to their nearest metro station, thereby increasing the station patronage potential.
- Cycling promotional and educational initiatives would be introduced to increase the visibility and attractiveness of cycling, and support and encourage a wider behavioural change to cycling.
- CBD Metro branding would be enhanced through association with the City of Sydney's proposed Cycle Centre at Town Hall Square and proposed bicycle-hire scheme docking stations located within CBD station precincts.

A cycling strategy has been developed for the CBD Metro (refer Chapter 14 of this document and Chapter 6 of Technical Paper 1 *Transport and Traffic*).

22.2.3 Facilitate optimisation of CityRail network

Indicator

- Creation of opportunities to reconfigure the heavy rail network, provided by the CBD Metro and a wider metro network, resulting in increased capacity on heavy rail corridors into the CBD.

Following the October 2009 timetable change, all rail routes into the Sydney CBD area are operating close to capacity (with 20 trains per hour operating on most corridors).

The CBD Metro would enable improvements to and enhancement of the heavy rail network. This would be achieved by:

- Relieving pressure off the CityRail Main West corridor and potentially unlock capacity, enabling additional services from the Western, South or Northern Lines. It could also provide the opportunity to offer a greater number of express services from the Parramatta/Blacktown corridor, which would improve travel times from that area and improve service frequencies from the Liverpool and Inner West lines.



This reconfiguration reflects the opportunities available for the CityRail network as a result of the CBD Metro. Further analysis is being undertaken with RailCorp to determine if there are further benefits to the rail network, particularly if a West Metro is also constructed.

The introduction of metros to Sydney can help encourage the transition of the heavy rail network from a CBD-focused, largely peak-hour market, to a more versatile mode of choice for all trip types, which would help to ensure the development of a comprehensive and fully integrated transport network.

The development of a single direction for transport services and a transport blueprint for Sydney is being coordinated by the new superagency, NSW Transport and Infrastructure, announced in June 2009. The new department takes control of all transport and roads coordinated policy and planning functions to ensure coordinated transport services and infrastructure.

In recognition of the importance of the CBD Metro, the Chief Executives of both RailCorp and Sydney Metro made a partnership commitment in May 2009 for the delivery of public transport services. It was agreed that the two organisations would work together with the Ministry of Transport and other transport operators in developing transport strategies to best meet the needs of the community. In particular, it was agreed to meet the Government's commitment to deliver the CBD Metro, including a cooperation agreement relating to construction and infrastructure interfaces, corridor protection, station precinct management, delivery timeframes and other matters.

22.2.4 Linking land use and transport planning

At a broad level, the CBD Metro supports the future growth and development of Sydney by enabling the provision of a wider metro network. More specifically, the CBD Metro would service the planned development at Barangaroo and any future redevelopment of the Bays Precinct.

Indicator

- Support the planned major new development at Barangaroo.

Barangaroo is a government-owned 22-hectare redevelopment site located on the western edge of the CBD. The plan is for a mixed-use site, with a capacity for 22,000 office workers, 1,500 residents, a foreshore promontory, retail and a headland park. The CBD Metro includes a station on the alignment of Margaret Street and adjacent to the southern section of Barangaroo, which would be its most densely developed area.

Around 10 to 15 percent of the passengers boarding the CBD Metro during the AM peak hour (2031 forecast) are expected to access the proposed Barangaroo-Wynyard station. An entrance on the Barangaroo site would facilitate direct access to the metro station. In addition, pedestrian flows from the city and CityRail's Wynyard Station would benefit from an improved underground pedestrian link – the proposed Barangaroo Pedestrian link forms part of the CBD Metro project.

Indicator

- Support the potential future development at the Bays Precinct.

NSW Government land holdings at White Bay, including the former Rozelle Marshalling Yard and port lands, are collectively known as the Bays Precinct. The Bays Precinct as a whole includes 80 hectares of NSW Government land, with five kilometres of harbour foreshore, located just two kilometres from the CBD.

The Government is committed to transform the Bays precinct over the next five, 10 and 20 years. It will change from a wholly industrial area into one that is a key part of the modern, vibrant city of Sydney.

The CBD Metro provides for the possible future development of a station at White Bay as a catalyst for potential redevelopment at the Bays Precinct.

22.2.5 Contribute to the environmental and social sustainability and strong economic global position of the city

Indicator

- Opportunity for sustainable land use and lifestyle options along the CBD Metro corridor.

The CBD Metro, together with future extensions, would support more sustainable land use and lifestyle options along the metro corridors. It would do this by creating capacity for infill development around higher quality public transport to accommodate increases in population and employment.

Indicator

- Improved safety.

The CBD Metro would provide world-class safety and security for customers, staff, contractors, neighbours and other stakeholders. Metro systems operate in tunnels throughout the world with a proven record of safety. The safety targets for the CBD Metro would be based on the safety record of reputable metro operators. In addition, because of the design, metro can incorporate features that significantly reduce the risk of incidents, including:

- Platform screen doors. These provide protection to passengers waiting on the platform, reduce fire risk by preventing rubbish building up within the tunnel, and maintain a comfortable environment for passengers waiting at the station.
- Automated train control systems. These eliminate the possibility of signals passed at danger and reduce the risk to train staff.
- Open modular rolling stock (without internal end doors) - these increase passenger security.

The Integrated Metro Operator (IMO) would have the ability to choose how it manages the metro, consistent with its contract, with respect to safety. The IMO would be required to obtain and maintain safety accreditation through the government's Independent Transport Safety and Reliability Regulator (ITSRR)

In addition, Barangaroo-Wynyard Station would be designed to support pedestrian movement as a primary mode of access, and pedestrian safety would be a primary consideration. The station would include direct access to the proposed Barangaroo Pedestrian Link, which serves to separate vehicle and pedestrian movements.

Indicator

- Improved environmental outcomes.

The CBD Metro would be a fast, frequent, high-capacity rail service into and through the CBD, providing a cleaner transport choice to support sustainable growth. Improved environmental outcomes would stem from:

- The service level and land use aspects of metro systems, which can lead to substantial reductions in car use and car dependency.
- The way the metro network would help to shape Sydney's growth. When extended into a wider metro network, metro would shape Sydney's planned growth, contributing positively to its environment (and economy). The best model to ensure sustainable growth and improve environmental outcomes is to encourage a significant proportion of the population and employment growth into corridors and centres supported by new, high-quality transport. Without metro, development will be scattered and create continued dependency on cars, resulting in less favourable environmental outcomes

Indicator

- Application of best-practice sustainability principles in the metro design.

Best-practice sustainability principles are built into the metro design to facilitate sustainable outcomes during construction, operation and end-of-life phase of the project. Details are provided in Chapter 8.

Indicator

- Positive economic agglomeration of benefits to Sydney CBD.

The CBD Metro would contribute to the economic position of Sydney as a global city. It would do this by:

- Supporting the Global Economic Corridor and its continued significance as a generator of economic growth and jobs. The CBD Metro, together with future extensions, would support the strength of the Global Economic Corridor and increase accessibility to its dense population and employment areas.
- Increasing access to the financial core precinct within the CBD around Martin Place; to the retail heart of the CBD along Pitt Street, with a station at Town Hall Square; and to Darling Harbour and its conference facilities through the proposed metro station at Pyrmont.

Indicator

- Value for money from the delivery model.

Through Sydney Metro, the NSW Government would procure the finance, design, construction, operation and maintenance of the CBD Metro by the private sector. Sydney Metro is separately procuring the main components of the CBD Metro:

- The design and construction of tunnels, tunnel structures, station excavations and caverns, and associated civil works, undertaken by the PRI contractor.
- The design, construction, delivery and commissioning of (and potentially funding of certain aspects of) all of the track, rolling stock, equipment, systems, utilities, services, facilities (including an operations control centre and a stabling and maintenance depot), station structures and fitout necessary for the long-term safe, reliable, effective and efficient operation and maintenance of the CBD Metro. The long-term operation and maintenance of the CBD Metro for the duration of a concession period, undertaken by the IMO contractor.

The state has committed to fully fund the CBD Metro and the PRI component. However, given the nature of the IMO, there is a case for delivery of that component as a privately financed project. Sydney Metro is working closely with the NSW Treasury and will continue to consult with industry prior to finalising the most appropriate financing and contracting model for the IMO, to ensure value for money and key customer outcomes, including improved service delivery, reduced whole-of-life costs, innovation and improved risk management.

22.3 Economic benefits

The anticipated economic benefits of the CBD Metro would be:

- Improved travel times for public transport users to and through Sydney CBD compared to both existing bus and train travel times.
- Reduced operating costs for existing public transport services. For example, the CBD Metro would substantially reduce congestion on CityRail suburban services between Central and Town Hall/Wynyard, and improve bus service reliability and operations on George Street from Broadway to Wynyard/Circular Quay.
- Relief for heavily congested bus services into and through the CBD, in particular in the Victoria Road corridor and within the CBD itself.
- Reduced vehicle kilometres travelled (VKT). Patronage modelling shows a reduction of about 0.5 per cent in VKT in 2031 over the Sydney region.
- Reduced road congestion costs, and reduced vehicle operation costs.
- Reduced delays for pedestrians.
- Reduced 'externality' costs, which would stem from improvements to air quality, reduced greenhouse gas emissions, and reduced noise pollution.

Wider economic benefits of the CBD Metro would include:

- Agglomeration (that is, the grouping of commercial activities). The CBD Metro would create enhanced opportunities for businesses to cluster together and benefit from increased productivity and innovation.
- Concentration of employment markets and the transition to more productive/higher value employment activities.
- Behavioural adaptations by organisations and households to changes in transport costs and improvements in accessibility.
- The deferral of significant expenditure associated with the need to provide additional heavy rail capacity through the CBD and across the harbour by between 10 and 25 years.
- Employment creation. It is anticipated that the project would directly generate some 12,467 'job years'⁷ over the construction period and 275 jobs per annum upon operation. The capital investment and construction of a major infrastructure project such as the CBD Metro would also have a strong multiplier effect for other industries and the wider economy.

The CBD Metro would also have a number of adverse economic impacts including business acquisitions prior to construction, and impacts on remaining businesses during construction and operation. A number of specific commitments have been identified to address any residual impacts. These are provided in detail in Chapter 21.

⁷ One job year represents one job for one year

22.4 Alternatives

The justification of the project is also based on the absence of feasible alternatives that could address the project objectives as effectively and efficiently as the CBD Metro. Alternatives considered included 'do-nothing', demand management, road network improvements, cycleway and walking improvements, heavy rail, bus augmentation/enhancement, and light rail.

The assessment found that only a rail-based alternative could potentially satisfy the project objectives, particularly those relating the need to relieve existing and future network congestion for CBD bus or rail services that would be achieved by the CBD Metro.

While heavy rail could potentially seek to embrace a metro system's operating characteristics, requiring new single deck rolling stock, significant retrofitting of platforms and full sectorisation from other lines, it would, without a new CBD line, only partially meet the future demand afforded by CBD Metro. Provision of heavy rail in the Rozelle-Central corridor could be achieved, but likely at a greater cost than CBD Metro, and would not address the network and platform congestion in the City nor enable the wider transport issues to be addressed as would a CBD Metro, as part of a wider metro network.

With CBD Metro, heavy rail would continue to operate as a complementary service, reflecting the relative strengths of each mode and differentiating between the target markets of outer urban express (rail) and inner urban local services (metro).

Further details on the assessment of alternatives are provided in Chapter 5 and in Technical Paper 1 *Transport and traffic*.

22.5 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the metro project.

The EP&A Act recognises that ESD requires the effective integration of economic and environmental considerations in decision-making processes. There are four main principles supporting the achievement of ESD:

- Precautionary principle.
- Inter-and intra-generational equity.
- Conservation of biological diversity and ecological integrity.
- Improved valuation and pricing of environmental resources.

These are discussed below.

22.5.1 Precautionary principle

The precautionary principle deals with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

The environmental risk analysis documented in Chapter 20 covers the potential impacts of the project. That analysis and the environmental assessment as a whole identify no threat of serious or irreversible environmental damage.

The threat of serious or irreversible environmental damage is one of the essential preconditions to the engagement of the precautionary principle. As the environmental assessment did not identify a threat of serious or irreversible environmental damage the precautionary principle does not operate.

22.5.2 Inter- and intra-generational equity

Inter-generational equity is the concept of fairness between people of different generations. In this context, it refers to the need to minimise the passing on of economic, social and environmental costs to future generations.

Intra-generational equity is the concept of fairness between people of the same generation. It is also called social equity, and refers to the need for fairness in the distribution of economic, social and environmental costs and benefits.

Once it begins operating, the CBD Metro would deliver inter-and intra-generational equity by:

- Enhancing access and cohesion between various areas in the Sydney and Leichhardt LGAs for different social groups. The provision of an accessible, reliable and affordable CBD Metro would cater to the broad range of socio-economic groups that live in the serviced locations.
- Enhancing social equity by improving access for the disabled, elderly, and for parents with young children.
- As an enabler to the wider metro network, begin the task of addressing significant areas of growing transport congestion around existing major road, bus and rail corridors, including Parramatta Road, Victoria Road, Anzac Parade and Military Road.
- Providing a positive public transport legacy for future generations. Most significantly, with the improvements to public transport, it would provide the key enabler for the wider metro network across the Sydney metropolitan area – providing long-term benefits in terms of the environment and urban living. It would link land use and transport planning and deliver on the state's strategic objectives for improved urban environments with reliable transport access. It would also meet future generations' transport needs which would be critical in allowing those generations the same, if not better, transport opportunities than current generations

22.5.3 Conservation of biological diversity and ecological integrity

The twin principles of biodiversity conservation and ecological integrity have been a consideration during the course of the design and assessment process with a view to identifying, avoiding, minimising and mitigating impacts.

Potential impacts on the Grey-headed Flying-fox and insectivorous bats have been addressed as the only threatened flora or fauna species considered to potentially utilise affected areas. A 'significant impact' on local populations of these threatened species is not expected.



22.5.4 Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by a project, including air, water, land and living things.

Placing a reliable monetary value on the residual, environmental and social effects of the project presents a number of challenges. Nonetheless, a range of environmental impacts and associated costs have been considered in the economic appraisal including:

- Air pollution.
- Greenhouse gases.
- Noise pollution.
- Water pollution.
- Nature and landscape degradation.
- Urban separation.

In addition, the value placed on the environment is evident in the development of project design features and also in the extent of environmental investigations, planning and design of impact mitigation measures to minimise adverse environmental impacts. Ongoing and detailed design of the project together with specific issue-based management plans would represent further commitment to the recognition of the value of reducing environmental impacts.

22.6 Meeting the objects of the EP&A Act

The objects of the EP&A Act provide a policy framework within which the justification of the CBD Metro can be considered. Table 22.2 outlines those objects and provides comment on their relevance to the project.

Table 22.2 Relevance of the EP&A Act objects to the project

EP&A Act objects	Comment
Encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment	The CBD Metro would improve the transport network and promote the use of sustainable modes of transport.
Encourage the promotion and coordination of the orderly and economic use and development of land.	The CBD Metro would provide transport infrastructure that addresses an immediate transport need, as well as enabling a broader metro network for Sydney. Its benefits would have a positive economic value. The integration of the project with surrounding land uses has been addressed through a concurrent master planning process.
Encourage the protection, provision and coordination of communication and utility services.	The project has been designed to minimise impacts on communications and utility services.

EP&A Act objects	Comment
Encourage the provision of land for public purposes.	The project would create or improve a number of areas of public land, including public transport station complexes. The project would also support major public domain initiatives such as the proposed Town Hall Square. New pedestrian links would be created as part of the project and there is potential to incorporate community facilities within the station precincts.
Encourage the provision of coordinated community services and facilities.	The project represents the first stage in a new metro network for Sydney. Interchange between the CBD Metro and existing transport networks has been fundamental to the project development process.
Protect and conserve native animals and plants, including threatened species, populations and ecological communities, and their habitats.	The project would have minimal impact on native animals and plants.
Ecologically sustainable development.	The project would positively address the principles of ESD.
Provide and maintain affordable housing.	The project does not involve the provision of affordable housing. Notwithstanding, it would have positive intra-generational effects by providing a high standard service for a broad range of socio-economic groups.
Share the responsibility for environmental planning between the different levels of government in the state.	The responsibility for environmental planning and approval in relation to the project rests with the NSW Government. Consultation has, however, occurred across all levels of government.
Provide increased opportunity for public involvement and participation in environmental planning and assessment.	The project development process has involved extensive consultation with relevant parties.

23 Conclusions

This chapter provides an overall conclusion to the Environment Assessment and outlines the next steps in the consideration of the project.

23.1 Overall conclusions

The Environmental Assessment has been prepared in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979*. In particular, it addresses the requirements of the Director-General of the NSW Department of Planning and incorporates the issues raised by the key state government agencies. The Environmental Assessment also includes consideration of the issues raised by the community and stakeholder during the development of the project.

The NSW Government is committed to delivering Australia's first world-class metro rail system, as part of a major investment in Sydney's sustainable growth and prosperity. The project would be the first step and a critical part of the NSW Government's targeted investment plan to make Sydney's transport network more efficient in its delivery of services to the community.

A CBD Metro would not only add new capacity to the CBD's transport network, it would also release extra capacity on the existing rail and bus network. Overall the CBD Metro would be an essential addition to Sydney's transport system. The CBD Metro would also have strategic benefits with respect to assisting the planned population and employment growth around key transport centres and corridors including the Barangaroo development and possible future development around White Bay.

Whilst the CBD Metro would provide significant benefits on its own it would also be of strategic importance as an enabler of the entire metro network. That is, the CBD Metro would form the central spine to which all other metros would link or interchange.

It is inevitable with a project of this scale that there would be adverse temporary impacts in the CBD environment, particularly ones during construction. These impacts need to be considered within the context of the overall objectives of the project and the transportation and other benefits it would produce.

Key environmental issues have been examined throughout the project development and construction planning processes. Consultation with affected stakeholders has been undertaken by the project to ensure that key potential impacts were identified and discussed at an early stage, and, where possible, appropriate mitigation agreed in principle. This has resulted in a number of changes that have mitigated many of the potential significant impacts. Nevertheless, despite these efforts a number of significant negative impacts, mainly temporary, would remain. The key issues identified include:

- Construction traffic impacts.
- Construction noise and vibration effects.
- Non-indigenous heritage impacts.
- Social and economic effects.

In addition, the cumulative effects of the project combined with other projects constructed over the same period of CBD Metro, has the potential to be a significant issue.

These negative residual impacts need to be balanced against the many positive impacts of the project both in transport terms and as a catalyst for redevelopment and regeneration. A draft Statement of Commitments has been included in the Environmental Assessment incorporating a comprehensive suite of mitigation measures and management strategies to reduce the severity of any residual impacts arising from the project. Further investigations would be undertaken as the project progresses into the detailed design and construction stage including preparation of detailed environmental management plans. These plans would assist in further mitigating any residual adverse impacts.

23.2 The next steps

Sydney Metro is seeking approval from the Minister for Planning for the construction and operation of the CBD Metro. The next steps in the process are:

- **Exhibition of the Environmental Assessment** for a minimum of 30 days and invitation for the community and stakeholders to make submissions.
- **Consideration of submissions.** Submissions received by the Director-General would be provided to Sydney Metro and any relevant public authorities. Sydney Metro may then be required to prepare and submit:
 - A submissions report, responding to issues raised in the submissions.
 - A preferred project report, outlining any proposed changes to the project to minimise its environmental impacts.
 - A revised Statement of Commitments.
- **Determination of the Environmental Assessment.** The Director-General of the Department of Planning provides an assessment report on the Environmental Assessment to the Minister for Planning, who then makes a decision on the project and, if approved, sets Conditions of Approval.

Consultation with the community and stakeholders would continue throughout the detailed design and construction phases. The station precinct plans have been placed on public exhibition concurrently with the Environmental Assessment.

You can comment on the Environmental Assessment or the project by making a submission online at the Department of Planning's website (<http://www.planning.nsw.gov.au/>) or by sending a written submission to:

Director, Major Infrastructure Assessments NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Submissions must be received by 12 October 2009.

All submissions and information obtained during the public exhibition period will be used in accordance with the *Privacy Act 1988*. All submissions received are regarded as public documents and any information contained in them can be published in subsequent assessment documents. Copies of the submissions received on the project may be issued to interested parties. If the author of a submission does not wish the information to be distributed, this needs to be clearly stated in the submission.