



24 Conclusion

24.1 Overview

Melbourne Metro would deliver substantial transport, economic, social and environmental benefits for Melbourne and Victoria.

Through the EES process, MMRA has:

- Addressed the Scoping Requirements prepared by the Minister for Planning
- Undertaken an integrated assessment of the potential environmental effects of Melbourne Metro
- Evaluated the project's risks and potential impacts on a precinct and project-wide basis and recommended Environmental Performance Requirements and proposed measures to avoid, manage or mitigate these impacts.

The assessments undertaken for the EES demonstrate that the project would:

- Meet the draft evaluation objectives set out in the Scoping Requirements
- Meet the project objectives
- Align with the principles of the *Transport Integration Act 2010*
- Manage all potential impacts to achieve acceptable environmental, social and economic outcomes with the adoption of the recommended Environmental Performance Requirements.

24.2 Melbourne Metro Concept Design and Environmental Performance Requirements

A Concept Design for Melbourne Metro has been developed that demonstrates a technically feasible way for the project to be developed that meets the Victorian Government's objectives.

Melbourne Metro incorporates four key components, which are evaluated in this EES:

- The Concept Design and specific alternative design options
- Indicative construction methodology
- The environmental impact assessment (underpinned by a risk assessment)
- Recommended Environmental Performance Requirements.

The Concept Design, design options and indicative construction methodology provide the basis for assessing the potential environmental risks and impacts of Melbourne Metro and for demonstrating that the project's impacts can be managed. By achieving the recommended Environmental Performance Requirements developed through the impact assessments undertaken for this EES the potential impacts of the project would be minimised and the benefits realised.

The recommended Environmental Performance Requirements define the outcomes that must be achieved in project delivery and operation, rather than specifying how the outcomes would be achieved.

Contractors tendering to construct Melbourne Metro may offer alternatives to the Concept Design that deliver better value for money or that incorporate innovative approaches in design, technology, construction techniques or operations. Further refinement of the Concept Design may also be required as the detailed design is developed and stakeholder requirements are addressed. These alternatives or refinements would need to comply with the recommended Environmental Performance Requirements and be within the proposed project boundary.

If these alternatives cannot meet the recommended Environmental Performance Requirements or are outside the proposed project boundary, they could be subject to further impact assessment (subject to the decision of the Minister for Planning).

The recommended Environmental Performance Requirements are part of Melbourne Metro's Environmental Management Framework, which is discussed in detail in Chapter 23 of this EES. Compliance with the Environmental Management Framework and the recommended Environmental Performance Requirements would be a requirement of the contractual arrangements for delivery of the project.

24.3 Project Evaluation against the Scoping Requirements

As set out in the EES Scoping Requirements, Melbourne Metro has been assessed against specific draft evaluation objectives designed to assist the Minister for Planning to assess whether the environmental effects of the project would be acceptable. The draft evaluation objectives identify the desired outcome to be achieved by Melbourne Metro in terms of identifying and managing the potential impacts of delivering and operating the project.

The assessment of Melbourne Metro detailed in this EES and the supporting technical appendices has found that the project would meet the draft EES evaluation objectives.

A summary of the assessment of Melbourne Metro against the draft evaluation objectives is provided in the following sections.

24.3.1 Transport Connectivity

- *Transport Connectivity – To enable a significant increase in the capacity of the metropolitan rail network and provide multimodal connections, while adequately managing effects of the works on the broader transport network, both during and after the construction of the project.*

As the first major upgrade of the inner core of the Melbourne metropolitan rail network in 30 years, Melbourne Metro would facilitate a major reconfiguration of the network, which would allow for the independent operation of all lines and support the transformation of the rail network into a metro style service.

Melbourne Metro would deliver a significant increase in the capacity of the Melbourne rail network of 39,000 additional passengers in each of the morning and afternoon peak periods from Day One of operations.

The project would:

- Create a dedicated line from Sunshine in Melbourne's west to Dandenong in the east that would operate as a metro style end-to-end line using the latest generation of HCMTs
- Release capacity within the City Loop to increase services on other lines
- Release a rail track pair between South Yarra and Flinders Street for use by V/Line and freight services to operate independently of suburban trains.

Melbourne Metro would also provide the foundation for additional capacity increases across the metropolitan rail network. By the mid-2030s, after making further network enhancements to refine operations into a coordinated network of simple metro style lines, Melbourne Metro would have provided the foundation for moving around 80,000 additional passengers in each of the peak periods, as well as enabling higher levels of reliability across the network.

Melbourne Metro would provide opportunities for multimodal connections by:

- Providing five new stations, with connections to the existing City Loop at CBD North station (via Melbourne Central Station) and CBD South station (via Flinders Street Station)
- Providing DDA-compliant train/tram interchanges at Parkville and Domain
- Improving walking and cycling facilities and links.

Construction of a project of this scale and complexity within Melbourne's CBD and inner urban areas would result in some disruption to the broader metropolitan transport network during construction. However, the Concept Design has sought to minimise disruption (particularly in the CBD) and impacts on transport connectivity would largely be confined to local networks.

The Environmental Performance Requirements would mandate the preparation and implementation of detailed traffic management plans in consultation with relevant land managers, road authorities, PTV and the railway franchisee to minimise and manage potential impacts to the transport network, including:

- Potential impacts to the rail network of works within and adjacent to existing rail infrastructure, in particular at each portal (tunnel entrance) and the CBD stations
- Potential impacts to the bus and tram network of changed road conditions and increased local traffic
- Potential impacts to the road network, including temporary road closures, the interaction of construction and private traffic, and the impacts of additional construction traffic in local areas
- Potential impacts to pedestrian movements, particularly through the CBD.

Managing these impacts would be a critical component in the delivery of Melbourne Metro. Traffic management plans would include measures to direct traffic away from construction work sites to alternative routes and minimise truck movements during peak periods and through residential areas at night. The plans would also identify construction traffic routes for each precinct with the aim of moving this traffic away from local areas to the arterial road/motorway network as quickly as possible. As a result, any delays and travel time increases associated with construction works are not expected to be substantial.

MMRA is committed to ongoing communication with the public, businesses and regulators to minimise the potential effects of disruption to the transport network during construction, and would also consider measures to encourage people to consider changing their travel habits and patterns in response to temporary transport disruptions.

Post-construction, permanent changes to the road network in the Domain station precinct could result in increased travel times and delays along parts of the road network in the area; however, the overall network would continue to operate to acceptable standards. The Environmental Performance Requirements recommend further consultation with Councils and road management authorities in relation to the potential impacts of permanent changes to the road network, including Franklin Street in the CBD North precinct and around Domain station.

Overall, the future road network when Melbourne Metro is operational would be suitable, safe and appropriate to service the needs of all precincts.

24.3.2 Built Environment

Built environment – To protect and enhance the character, form and function of the public realm and buildings within and adjacent to the project alignment, and particularly in the vicinity of project surface structures, having regard to the existing and evolving urban context.

The Melbourne Metro stations would be located within the CBD and inner urban areas. The impact assessment and development of recommended Environmental Performance Requirements has given particular consideration to the contribution of existing buildings and structures within the CBD to the character and function of the city. The recommended Environmental Performance Requirements and Urban Design Strategy require that all surface structures are of a high quality design and finish, integrate with their location and settings, and have appropriate footprints. The design of Melbourne Metro must also take into account neighbourhood character and the local community's aspirations for each precinct as set out in the relevant planning policies and strategies and identified through consultation with Councils and other stakeholders.

The new Arden station would present a significant opportunity to stimulate urban renewal in the Arden-Macaulay precinct, supporting the area's potential for growth as a major employment destination built around a high capacity public transport connection.

Melbourne Metro would also provide an opportunity for over-site development at CBD South and CBD North stations. While any development proposed by the contractor would be subject to separate planning and approval processes, this would be an opportunity for a high quality built response that is designed and constructed in synergy with the expansion of the transport network.

24.3.3 Social, Community and Land Use

Social, community, land use and business – To manage the effects on the social fabric of the community in the area of the project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.

A project of the scale, nature and duration of Melbourne Metro would impact communities and businesses in the construction areas in a range of ways. Although these impacts would largely be temporary during the construction period, they would need to be managed and mitigated. The proposed measures to address these impacts are set out in the recommended Environmental Performance Requirements and include regular and ongoing communication with residents and businesses, and specific actions to assist businesses in close proximity to construction work sites.

The Concept Design has minimised property acquisition required for Melbourne Metro and there are minimal permanent changes to land use arising from the project. In addition to the main construction work site on publicly owned land at Arden, a number of smaller construction work sites would be located in each precinct. These include areas of public open space such as City Square and Edmund Herring Oval, which would be used for relatively long periods during construction. The recommended Environmental Performance Requirements set out a process for identifying alternative areas of public open space for community use during the construction period to mitigate these impacts, and require the areas used during construction of the project to be returned and upgraded as improved public open spaces following construction.

Continued access to services and facilities during the construction phase would be managed through the traffic management, business disruption and community and business involvement plans required by the recommended Environmental Performance Requirements. The need to maintain access to emergency and medical services in the Parkville precinct has been a key input to the development and design of Melbourne Metro.

24.3.4 Amenity

Amenity – To minimise adverse air quality, noise or vibration effects on the amenity of nearby residents and local communities, as far as practicable, especially during the construction phase.

The EES sets out the results of detailed modelling of the potential air quality, noise and vibration impacts of construction and operation based on the Concept Design. The modelling demonstrates that the project can be constructed and operated in compliance with applicable regulatory standards and best practice guidelines. The recommended Environmental Performance Requirements take into account the potential impacts on nearby residents, businesses and local communities and the special needs of health and education facilities in the Parkville station precinct. The technical appendices to the EES provide details of well-tested management actions and mitigation measures that could be used by the contractors to meet the air quality, noise and vibration targets set for the project.

The recommended Environmental Performance Requirements also require monitoring for air quality, noise and vibration during construction, and establish the processes to be followed to implement additional mitigation measures if amenity threshold triggers are reached during construction. A thorough community consultation and notification process would also be undertaken before and during construction. These management measures would enable Melbourne Metro to maintain the required intensity of works (to minimise the construction period required), while maintaining a close watch on amenity effects during construction.

Air quality and vibration during operation are not expected to create amenity issues. The potential increase in operational rail noise created from additional rail services would require permanent noise treatments to protect a small number of properties near the tunnel entrances. These treatments would be designed in accordance with Victoria's *Passenger Rail Infrastructure Noise Policy*.

24.3.5 Cultural Heritage

Cultural Heritage – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values.

A CHMP has been prepared alongside the EES to avoid and manage potential impacts to Aboriginal cultural heritage.

The Melbourne Metro Concept Design has been developed to avoid impacts on significant historic buildings and places where practicable. There would be no direct impacts on important heritage places such as the City Baths, the State Library of Victoria, St Paul's Cathedral, Princes Bridge, Young and Jackson Hotel, Melbourne Town Hall or the Shrine of Remembrance.

Potential physical impacts from ground movement, particularly during construction, would be the subject of ground movement modelling of the project's final detailed design. If heritage buildings are identified as potentially being affected, pre-construction condition assessments would be carried out, continual monitoring would be undertaken during construction and management and mitigation measures would be implemented should triggers be exceeded during construction.

Where items of historic importance would be impacted directly by construction works, such as the South African Soldiers' Memorial in South Melbourne, these items would be protected, relocated or stored and reinstated post construction. Necessary works to heritage places, such as Flinders Street Station, would be subject to detailed design requirements and require further statutory approvals.

Implementation of the Urban Design Strategy would minimise adverse visual impacts on heritage places and values from the project's permanent above ground structures.

Known potential archaeological sites that would be impacted by Melbourne Metro would be investigated and recorded prior to construction works, and the recommended Environmental Performance Requirements require the development and implementation of a protocol for managing any unknown archaeological sites encountered during construction.

Overall, the impacts of Melbourne Metro on heritage and historic values would not be significant. Opportunities to enhance heritage values would include repair and conservation works (where structures need to be protected or relocated) and the development of a heritage interpretation strategy for the project as a whole that would explore historical and Aboriginal cultural heritage themes and recognise heritage places in the design of the new stations.

24.3.6 Land Stability

Land stability – To avoid or minimise adverse effects on land stability that might arise directly or indirectly from project works.

The Concept Design for Melbourne Metro has been informed by a substantial amount of geotechnical investigation. The EES and its technical appendices set out the results of detailed modelling of potential impacts to land stability from construction and operation based on the Concept Design. This has taken into account the potential for ground movement due to groundwater drawdown impacts, vibration and excavation impacts, and slope instability. The modelling demonstrates that the project can be constructed and operated to ensure that ground movement is minimised with no undue effects to buildings (including heritage places) or the natural environment such as rivers and parkland.

The recommended Environmental Performance Requirements require the contractor to undertake further predictive modelling based on the project's final detailed design, taking into account proposed construction methodology and mitigation measures, to demonstrate that direct and indirect effects to land stability have been avoided or minimised to acceptable levels. The Environmental Performance Requirements also recommend monitoring and preparation of contingency plans to manage any issues that may arise during construction.

24.3.7 Landscape, Visual and Recreational Values

Landscape, visual and recreational values – To avoid or minimise adverse effects on landscape, visual amenity and recreational values as far as practicable.

While Melbourne Metro would have a substantial construction footprint, the potential landscape and visual impacts of the project would be ameliorated by a large proportion of construction activities being carried out underground. However, there would be some adverse effects on landscape and visual values during construction. These would be temporary, although of several years' duration at some locations. These impacts would be the result of tree removals, overlooking of construction work sites from elevated viewpoints or where views and sightlines would be obstructed by construction work sites and activities. The EES and supporting impact assessments have concluded that these impacts are manageable and acceptable for a project of this nature.

The design of the project's surface infrastructure, including potential over-site development in the CBD, presents an opportunity for high quality design that responds to its context and appropriately reflects the importance of Melbourne Metro as the foundation for the future development of Melbourne's rail network. The Environmental Performance Requirements recommend consultation with regulators and communities on the design of these structures, and promote high quality design outcomes in accordance with the Urban Design Strategy.

Recreational values would be affected by the temporary loss of open space and parkland for construction work sites. As noted above, the recommended Environmental Performance Requirements identify a process for identifying alternative areas of public open space for community use during the construction period to mitigate these impacts, and require public open space areas used during construction to be returned and upgraded as improved public open spaces following construction.

24.3.8 Hydrology, Water Quality and Waste Management

Hydrology, water quality and waste management – To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.

The EES sets out the results of detailed modelling of potential groundwater drawdown, groundwater and other water inflow into project structures requiring disposal, stormwater management and flooding potential during the construction and operation phases, based on the Concept Design. The modelling demonstrates that the project can be constructed and operated in compliance with applicable regulatory standards, policies and guidelines for hydrology, water quality and waste management.

Groundwater drawdown during construction would be managed by standard construction techniques and is not predicted to impact any beneficial uses. Preliminary discussions with water authorities indicate that the predicted volume and quality of water inflow into project structures over time during construction can be disposed to sewer under trade waste agreements. Groundwater inflow into project structures during operation would be minimal as the structures would be designed as ‘tanked’ (or sealed) structures to prevent water inflow.

The Environmental Performance Requirements recommend predictive modelling to confirm groundwater drawdown and potential impacts based on the final detailed design, taking into account the proposed construction techniques and mitigation measures. A groundwater management plan would also be required to ensure that appropriate groundwater disposal measures are adopted, to identify and manage any contaminated groundwater encountered during works (in consultation with the EPA) and to implement a groundwater monitoring regime and contingency plan to address any issues that arise during construction.

There would be no direct impacts on water quality or flows in the three major waterways traversed by the Melbourne Metro alignment (the Yarra River, the Maribymong River and Moonee Ponds Creek). The Environmental Performance Requirements recommend that stormwater treatment systems and floodwater management must be fully integrated into the design of Melbourne Metro to ensure that water entering a receiving waterway complies with environmental policies and standards and does not diminish water quality in the waterways.

Best practice measures that comply with EPA guidelines and other standards would be implemented to minimise the health and environmental risks associated with intercepting contaminated land or groundwater and to store, manage and dispose of waste groundwater and contaminated spoil.

As construction would take place in an urban environment, works may encounter contaminated soil, including potential acid sulfate soils and potential acid sulfate rock. The Environmental Performance Requirements recommend development and implementation of a Spoil Management Plan prior to construction. MMRA's draft Spoil Management Plan (provided in this EES) identifies the predicted volumes and categories of spoil from construction in each precinct and outlines potential measures to store, classify, treat and dispose of spoil. Movement of spoil has been taken into account in the air quality and transport impact assessments, as well as the requirement that construction sites comply with EPA guidelines in managing potential stormwater runoff.

The hydrological modelling of the Concept Design set out in this EES identifies that Melbourne Metro's permanent structures would achieve acceptable outcomes for floodplain management (particularly at the western portal and Arden station), including taking into account potential future impacts of climate change. The Environmental Performance Requirements recommend that the Melbourne Metro tunnels, portals and stations must be designed to withstand potential extreme flooding events and must maintain existing flood plain storage capacity.

A risk assessment based on modelling of the final detailed design must be carried out to confirm that flooding is appropriately addressed, and structures must be designed to minimise the potential for flood and stormwater flows to carry any contaminants from Melbourne Metro structures to surface water bodies.

24.3.9 Biodiversity

Biodiversity – To avoid or minimise adverse effects on native terrestrial and aquatic flora and fauna, in the context of the project's components and urban setting.

The highly developed urban landscape along Melbourne Metro's alignment means that many areas have a long history of disturbance and have been cleared of native vegetation. The Concept Design has been developed to avoid or minimise adverse effects on native terrestrial and aquatic flora and fauna; for example, by using TBMs for crossing beneath the Yarra River rather than more intrusive construction techniques. The impact assessments undertaken for the EES have identified that there are very few native terrestrial and aquatic flora and fauna values that may be impacted by the project, and that any residual potential impacts can be managed.

In particular, flora and fauna values would be protected by the recommended Environmental Performance Requirements that would ensure any water entering stormwater drains or surface water bodies is of acceptable quality, and that contingency measures are in place to address emergency situations.

The EES has also considered the project's impacts on trees. Trees that would be removed to allow for construction are of varying age, quality and predicted lifespan, and are situated within a range of landscape and heritage contexts. The Environmental Performance Requirements recommend the replanting of trees to replace loss of canopy cover and to restore amenity and landscape values in accordance with local Council policies and strategies. While action would be taken to re-establish canopy cover, restore the continuity of tree-lined streets and reinstate trees in public open spaces as quickly as possible, it would take time to fully re-establish these landscapes. The impact assessments undertaken for the EES have reported that the proposed measures for tree removal and replanting are appropriate given the limited lifespan of trees and the urban context in which the project would be located.

The recommended Environmental Performance Requirements also provide for the protection of other trees in the vicinity of project works through the reinstatement of disturbed soils (ensuring that sufficient soil volumes are provided to ensure long-term viable tree growth) and soft landscaping, groundwater monitoring to ensure sufficient water supply to trees and preparation and implementation of a detailed Tree Protection Plan for each precinct.

24.3.10 Environmental Management Framework

Environmental Management Framework – To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with construction and operation phases of the project, in order to achieve acceptable environmental outcomes.

The proposed Environmental Management Framework for the construction and operational phases of Melbourne Metro is included as Chapter 23 of this EES. The development of the Environmental Management Framework has been guided by the EES Scoping Requirements and relevant legislation, policy and guidelines, and informed by the environmental risk assessment and specialist impact assessment studies undertaken for the EES. It has also taken into account the comments received from regulators through the consultation process in preparing the EES.

The Environmental Management Framework includes recommended Environmental Performance Requirements that define the outcomes the project must achieve during its construction and operation. This approach clearly identifies the further work required when the detailed design of the project is completed by the contractors, creating opportunities for innovative, flexible and value for money solutions while ensuring that the potential impacts remain within the acceptable levels and comply with all relevant standards as set out in this EES.

If Melbourne Metro proceeds, delivery of the project would be required to comply with the final Environmental Performance Requirements approved for the project:

- The Environmental Management Framework, including the Environmental Performance Requirements, would have regulatory status as a condition of the Incorporated Document proposed under the planning scheme amendment for Melbourne Metro
- The Environmental Management Framework would inform all of MMRA's contractual arrangements for the delivery of Melbourne Metro. The relevant Environmental Performance Requirements would be contractual requirements for each contractor.

The Environmental Management Framework sets out the monitoring, reporting and auditing obligations on MMRA and each contractor during construction and operation of Melbourne Metro.

MMRA considers that the Environmental Management Framework is a robust framework for future management of the potential impacts of Melbourne Metro, so that the Minister for Planning can be satisfied that Melbourne Metro would be delivered to achieve its project objectives with acceptable environmental effects.

24.4 *Transport Integration Act 2010*

24.4.1 Purpose of the Act

The vision statement for the *Transport Integration Act 2010* is to provide an integrated and sustainable transport system in Victoria that contributes to an inclusive, prosperous and environmentally responsible State. To achieve this vision, transport and interface bodies must have regard to the transport system objectives and decision-making principles set out in the Act.

For Melbourne Metro, this means the Minister for Planning would need to have regard to these objectives and principles and determine the weight to be given to each them when assessing this EES and deciding whether to approve the planning scheme amendments for the project. The project authority for Melbourne Metro, when appointed, would also be required to have regard to these objectives and principles and determine the weight to be given to them when exercising its powers and performing its functions under relevant legislation.

The analysis presented below has been informed by the following guidelines published by the Victorian Government:

- Addressing the *Transport Integration Act 2010* in a planning scheme amendment, Advisory Note No. 34 (Department of Planning and Community Development, January 2011)
- Transport and the triple bottom line. Transport's role in driving the economic, social and environmental objectives of the *Transport Integration Act 2010* (Department of Transport, 2012).

24.4.2 Principle of Integrated Decision Making

This principle means seeking to achieve Government policy objectives through coordination between all levels of government and government agencies and with the private sector.

Melbourne Metro is consistent with this principle because:

- It is consistent with national and Victorian Government policy objectives, as described in Section 2.3 of Chapter 2, notably the *Australian Infrastructure Plan*, the *Plan Melbourne Refresh discussion paper* and the *Network Development Plan – Metropolitan Rail*
- The Concept Design for Melbourne Metro has been developed by MMRA in close collaboration with other government agencies including Heritage Victoria, the Metropolitan Planning Authority, Public Transport Victoria, Melbourne Water and VicRoads, as well as with a team of specialist advisors

- Melbourne Metro was referred to the Commonwealth Minister for the Environment in accordance with the *Environment Protection and Biodiversity Conservation Act 1999*. While the Minister decided the project did not require assessment and approval under that Act, he imposed certain requirements to prevent the heritage elements of the Victoria Barracks on St Kilda Road from being damaged by vibration caused by construction activities. This EES has assessed the effects of vibration on Victoria Barracks and concluded there would be no impacts on the heritage fabric of these buildings
- DELWP has convened an agency-based Technical Reference Group to advise on a range of matters, as described in Chapters 3 and 7. The TRG comprised representatives of DELWP, EPA, Melbourne Water, Heritage Victoria, the Office of Aboriginal Affairs Victoria and the Cities of Melbourne, Stonnington and Port Phillip. The advice from the TRG has been taken into account in assessing the environmental effects of Melbourne Metro and in preparing this EES
- Independently of the Technical Reference Group, MMRA is working collaboratively with other State and local government bodies in accordance with its Community and Stakeholder Engagement Plan, as described in Chapter 7
- MMRA would also coordinate the development and procurement of Melbourne Metro by the private sector, as described in Chapter 23.

24.4.3 Principle of Triple Bottom Line Assessment

This principle means assessing all of the economic, social and environmental costs and benefits taking into account externalities and value for money.

Despite the reference to 'costs' in this principle, a triple bottom line assessment does not require 'costs' and 'benefits' to be monetised. If that was the case, a risk-weighted assessment of benefits and impacts to establish whether the project would achieve a net community benefit would be unnecessary. When evaluating Melbourne Metro against the triple bottom line principle, 'costs' and 'benefits' are equated with the predicted impacts presented in this EES.

Melbourne Metro is consistent with the triple bottom line principle because:

- The 'costs' or potentially adverse impacts of Melbourne Metro described below have all been assessed in this EES and are generally confined to the construction phase of the project. While this is not a reason to downplay how the environment, people and communities could be impacted or inconvenienced by construction activities, forward-planning, good design, excellent and proactive communication and attentive management and monitoring of construction activities would contribute to ensuring that the costs are acceptable and that any ongoing negative effects are avoided or minimised

- The 'benefits' or potentially positive impacts of Melbourne Metro described below have also been assessed in this EES and are generally confined to the long-term legacy of the project in relation to the development of the public transport network and the broader Melbourne metropolitan area.

Environmental, Social and Economic Costs

The key *environmental* costs are associated with the construction of Melbourne Metro and include the potential for dust, noise and vibration emissions, and the extraction, transportation and disposal spoil and groundwater. There would be localised impacts on the landscape and views in the vicinity of construction work sites and in locations where parks would be temporarily occupied for construction purposes and mature street trees would need to be removed. Impacts to biodiversity values are very limited.

These costs have been minimised to a significant extent through the development of the Concept Design and proposed construction methodology. In addition, construction activities would be managed and regulated and work sites reinstated and landscaped (where relevant) through the Environmental Management Framework discussed in Chapter 23.

The key *social* costs of Melbourne Metro are associated with the disruption and fragmentation of communities during the construction of the project, particularly as a result of the acquisition of residential and commercial properties, the closure of Grattan and Franklin Streets and reducing the lanes on St Kilda Road, diverting public transport services around construction areas, and the occupation of public open space at Fawkner Park, Domain Parklands, University Square, City Square and Federation Square. Some people would also be disturbed for limited periods of time by ground-borne noise and vibration from tunnelling activities and the excavation of station caverns in the Tunnels precinct and in the Parkville, CBD North and CBD South station precincts.

Good planning and proactive, clear communication to affected people about these issues would inform them about their rights when properties are acquired and alternative road, public transport and walking and cycling options available to them. Measures would be taken to prepare people for the levels of ground borne noise and vibration they might experience (which are likely to be low) and for how long, and to identify people who may require special attention or respite.

The key *economic* costs of Melbourne Metro are associated with the displacement of businesses brought about by the acquisition of commercial properties for the project, disruption of access to businesses in the vicinity of construction areas and disruptions to health and education facilities at Parkville and CBD North. The Concept Design and construction methodologies for Melbourne Metro have been refined to meet the recommended Environmental Performance Requirements for access to these facilities and for noise and vibration impacts to sensitive medical and research institutions and equipment. Early and proactive engagement with businesses would be undertaken to plan for and implement measures to mitigate the effects on customers, suppliers and clients.

The construction of Melbourne Metro would also deploy methods to limit groundwater drawdown and ground settlement, minimising any consequential impact on existing buildings and structures in the vicinity of the project.

Environment, Social and Economic Benefits

The rationale and key benefits of Melbourne Metro are described in Chapter 2. Notable benefits are described below.

The key *environmental* benefit of Melbourne Metro is that it would greatly improve public transport accessibility to the CBD from metropolitan growth areas and give residents and workers alternatives to driving their cars. This mode shift would contribute to reducing traffic congestion as the city's population grows to beyond 8 million people and reduce the level of greenhouse gas emissions per passenger kilometre travelled across all transport modes.

The key *social* benefits of Melbourne Metro are that it would contribute to improving train reliability, reducing train crowding and – combined with HCMTs and the wider network enhancements – connect metropolitan Melbourne to work and economic opportunities in the expanding central Melbourne, enabling an extra 39,000 commuters to travel to and from the city from the first day of operations. The delivery of stations and other rail infrastructure in accordance with the Urban Design Strategy would ensure a lasting, positive legacy is left by the project and make a positive contribution to design excellence in the public realm.

The key *economic* benefit is that Melbourne Metro would link the rapidly expanding CBD, which would continue to grow in importance to the Victorian economy, to workers and businesses in the metropolitan area. The project would also create opportunities for mixed-use developments above the CBD North and South stations, provide an enhanced public transport link to national employment clusters at Parkville, Monash, Dandenong South and Sunshine, and catalyse urban renewal at Arden-Macaulay. By reshaping accessibility within Melbourne, the legacy project is forecast to generate additional gross value added of \$317 million across the metropolitan economy by 2031.

24.4.4 Principle of Equity

The principle of equity means:

- Equity between persons irrespective of their personal attributes, including age, physical ability, ethnicity, culture, gender and financial situation, or
- Location, including whether in a growth, urban, regional, rural or remote area, or
- Equity between generations by not compromising the ability of future generations to meet their needs.

Melbourne Metro is consistent with the equity principle because:

- All Melbourne Metro stations would comply with the Commonwealth *Disability Discrimination Act 1992*. The Urban Design Strategy developed for the project provides for stations and their precincts to be safe, easily accessed places that are welcoming and inclusive environments for social and cultural interaction
- Melbourne Metro would improve access to jobs, education and other opportunities for people living in Melbourne's growth areas – particularly in the north, west and south east. Not only would it improve access to the CBD, but also to Melbourne's national employment clusters at Parkville, Monash, Dandenong South and Sunshine. Overall, Melbourne Metro would increase capacity in each peak period by 39,000 passengers across the metropolitan rail network
- Tunnels and stations would be designed to have a lifespan of more than 100 years, which would provide a legacy for future generations. Melbourne Metro would also provide the foundation for future improvement of the public transport network, including expansion of the train network into growth areas, which would be required as Melbourne's population continues to grow
- To preserve intergenerational equity, MMRA has developed a sustainability policy that includes themes and associated targets that must be achieved across all components of the project. The themes and targets include a focus on environmental protection, resource efficiency, and reduction of waste and greenhouse gas emissions, climate resilience, and sustainable procurement and workforce strategies. MMRA has committed to achieving excellent sustainability ratings to ensure best practice across the construction and operation phases of Melbourne Metro
- Melbourne Metro aims to achieve a minimum 'Excellent' certified rating for 'Design' and 'As-built' ratings set out in the Infrastructure Sustainability Council of Australia IS rating system. Stations are to achieve a minimum 5 star Green Star standard as set by the Green Building Council of Australia.

24.4.5 Principle of the Transport System User Perspective

The transport system user perspective means:

- Understanding the requirements of transport system users, including their information needs
- Enhancing the useability of the transport system and the quality of experiences of the transport system.

Melbourne Metro is consistent with this principle because:

- Transport users want a reliable transport system that is safe, efficient, comfortable and accessible. Melbourne Metro would improve the reliability, efficiency and speed of trains on the Sunshine – Dandenong Line, and the Concept Design for Melbourne Metro enables passengers to enter and exit the new stations efficiently and to connect to Flinders Street and Melbourne Central Stations. Interchanges between train stations and between train stations and tram stops would improve the transport system's connectivity and enhance its useability
- Assessments undertaken for Melbourne Metro (prior to and as part of this EES) have considered the requirements of transport users to determine the optimal route alignment and station locations, and to increase its connectivity with the broader metropolitan rail, tram and bus networks. This process and its outcomes are described in Chapter 5. This would ensure that the transport system can be used by as many people as possible and improve their travel experience
- Melbourne Metro has been designed to accommodate the use of HCMTs on the Sunshine – Dandenong line. These trains, in combination with the use of high capacity signalling, are fast, able to transport larger numbers of passengers than the current train fleet and reduce the time passengers take to board and exit trains
- The Melbourne Metro Urban Design Strategy provides for spaces that promote safe behaviour and that give consideration to Crime Prevention through Environmental Design principles to ensure the safety and wellbeing of the users of trains, trams, stations and interchanges.

24.4.6 The Precautionary Principle

The precautionary principle means that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle includes:

- A careful evaluation to avoid serious or irreversible damage to the environment wherever practicable
- An assessment of the risk-weighted consequences of various options.

Melbourne Metro is consistent with the precautionary principle because:

- In accordance with the Minister for Planning's Order under the *Environment Effects Act 1978*, the Scoping Requirements and draft evaluation objectives, this EES describes the potential effects of Melbourne Metro on the environment. It describes the existing environment that may be affected by Melbourne Metro, identifies the potential environmental effects and recommends Environmental Performance Requirements to avoid, minimise or manage any adverse environmental effects. It also includes a proposed Environmental Management Framework for monitoring and managing the environmental effects of Melbourne Metro. In this way, this EES enables decision-makers (including relevant Ministers, local councils and statutory authorities) to make informed decisions about whether approvals and consents for Melbourne Metro should be issued and, if so, on what conditions
- Climate change is of particular relevance when applying the precautionary principle. The Concept Design for Melbourne Metro includes best practice greenhouse gas abatement initiatives for the construction and operational phases. These initiatives would be incorporated into the project's detailed design to achieve the MMRA sustainability themes and targets. When considering the movement of people across all transport modes, Melbourne Metro is expected to provide a net reduction of 1.2g CO₂-e per passenger kilometre travelled (PKT) after 20 years of operation (in 2046) compared to the 'without Melbourne Metro' scenario
- The Concept Design for Melbourne Metro has been developed and adapted for the potential long-term effects of climate change, including drier and warmer conditions, increased sea levels and less frequent but heavier rainfall events.

24.4.7 Principle of Stakeholder Engagement and Community Participation

The principle of stakeholder engagement and community participation means:

- Taking into account the interests of stakeholders, including transport system users and members of the local community
- Adopting appropriate processes for stakeholder engagement.

Melbourne Metro is consistent with this principle because:

- This EES is supported by a Community and Stakeholder Engagement Plan to inform the public and consult with individuals and groups likely to be affected by Melbourne Metro. The plan is discussed in Chapter 7 *Community and Stakeholder Engagement*
- The Concept Design has been developed with the interests of stakeholders in mind. For example, one of the key reasons for adopting a deeper vertical alignment along Swanston Street was to reduce impacts on businesses and residents in the CBD

- The Community and Stakeholder Engagement Plan seeks to draw on the expertise and opinions of the community and key stakeholders at critical stages throughout the development of the project to inform the design, construction and operation of Melbourne Metro as well as the specialist studies being undertaken as part of this EES. Implementation of the plan commenced in February 2015 and would continue during the public exhibition and hearings associated with this EES and throughout the detailed design, procurement and construction phases of Melbourne Metro.

24.4.8 Principle of Transparency

The principle of transparency means members of the public should have access to reliable and relevant information in appropriate forms to facilitate a good understanding of transport issues and the process by which decisions in relation to the transport system are made.

Melbourne Metro is consistent with the transparency principle because:

- MMRA has used a range of communication channels to ensure up-to-date information about Melbourne Metro is disseminated regularly to the public. These channels include the Melbourne Metro website (<http://melbournemetro.vic.gov.au/>), Melbourne Metro Your Say portal, social media (twitter @mmrailproject), e-bulletins, letter box and postcard drops and pop-up stands in public spaces such as City Square and Flinders Street Station forecourt.

In using these communication channels, MMRA has tailored messages and delivery to suit the communication and information needs of its intended audiences. For example, large-scale information dissemination techniques (such as mass mailouts) have been used to raise awareness of Melbourne Metro in the wider community, while direct communication methods (such as face-to-face engagement, phone calls and personalised letters) have been adopted when engaging with communities and stakeholders who have been – or are likely to be – directly affected by Melbourne Metro.

- Because Melbourne Metro is being assessed through the EES process, the public is provided with detailed information about the Concept Design and its potential environmental, social and economic effects, and has an opportunity to participate in and comment on the project's merits.
- Melbourne Metro would be designed, constructed and operated in accordance with the Environmental Management Framework documented in this EES. The Environmental Management Framework is a transparent framework that outlines the accountabilities and auditing and reporting requirements for managing the environmental aspects of the project.

24.5 Next Steps

The EES will be on public exhibition for 30 business days. During this time, members of the public can view the EES and make written submissions. At the end of this period, the Minister for Planning is expected to appoint a Joint Advisory Committee/Inquiry to evaluate the effects of the project, having regard to the EES, the proposed planning scheme amendment and public submissions.

The Inquiry may take one of three forms: a desktop review of written submissions, a conference of submitters and a review of submissions, or a formal hearing where the proponent and submitters can speak and present expert witnesses. Given the scale and complexity of the Melbourne Metro, the Inquiry would be expected to take the form of a formal hearing.

Following receipt of the Inquiry's report, the Minister for Planning would prepare an Assessment of the environmental effects of the project that considers the EES documents, public submissions, the proponent's response and the Inquiry report. This Assessment is usually provided within 25 days of the Inquiry's report being finalised. The Minister's Assessment may conclude that the project:

- Would have an acceptable level of environmental effects, or
- Would not have an acceptable level of environmental effects, or
- Would need major modifications and/or further investigations to establish that acceptable outcomes would be achieved.

Chapter 3 of this EES outlines the statutory approvals required for Melbourne Metro, if the Minister's Assessment concludes that the project would be acceptable.

24.6 Conclusion

The growth of Melbourne's population over the next 30 years is expected to be concentrated in the northern, western and south-eastern growth corridors. By 2021, patronage demand will be exceeded on the Craigieburn and Sunbury Lines, and Werribee trains will also be experiencing significant capacity constraints. By 2031, demand will exceed capacity by 20-30 per cent on these lines, and also exceed capacity on the Upfield, Cranbourne and Pakenham lines.

As Melbourne's population grows and the city's economy changes, the demand for personal and business travel is increasing, and there is an escalating demand for moving more goods to, from and around the city. This growing travel demand is leading to more cars, trucks and commercial vehicles on Melbourne's roads and more people using public transport, especially to commute to jobs in or near the central city.

Melbourne Metro would support the delivery of a substantial uplift in capacity across the rail network, allowing more people to travel by train in the morning and evening peak periods. It would also assist improving the connectivity and accessibility of Melbourne's key growth areas, catalyse urban renewal and open up opportunities for new housing, commercial development and jobs close to the city centre. Importantly, Melbourne Metro would facilitate the transition of Melbourne's rail network into an international-style metro system and provide the foundation for further improvements to the capacity and reliability of the rail network in the future, ensuring that the network keeps pace with a growing and changing Melbourne.

The EES for Melbourne Metro provides an integrated assessment of the potential environmental, social and business impacts associated with the construction and operation of Melbourne Metro. MMRA's assessment of the potential impacts of Melbourne Metro has been guided by the EES draft evaluation objectives contained in the Scoping Requirements prepared by the Minister for Planning.

The EES details the systems and risk-based approach adopted to assess the potential impacts of the project and develop recommended Environmental Performance Requirements.

MMRA considers that the recommended Environmental Performance Requirements are a suitable approach to manage the environmental, social and business outcomes of the construction and operation of the project – as part of a transparent and accountable overarching Environment Management Framework.

Meeting the recommended Environmental Performance Requirements would result in Melbourne Metro achieving acceptable environmental, social and economic outcomes. The Environmental Performance Requirements would also ensure that the ongoing design and development of project would avoid or reduce adverse impacts and achieve benefits for not only Melbourne, but for the whole of Victoria.