

# MELBOURNE METRO RAIL AUTHORITY SUSTAINABILITY PRINCIPLES AND APPROACH

20 April 2016



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# 1 Introduction

This document presents the Sustainability Principles and Approach that has been developed for Melbourne Metro. The Sustainability Principles and Approach document provides information pertaining to:

- Planning for delivering sustainability on Melbourne Metro; including how sustainability will be incorporated throughout the design, construction and operation phases
- MMRA sustainability governance framework to manage sustainability performance
- The use of Sustainability Rating Tools to assess sustainability outcomes
- Delivering climate resilient infrastructure and encouraging innovation to deliver better sustainability outcomes.

## 1.1 Project Description

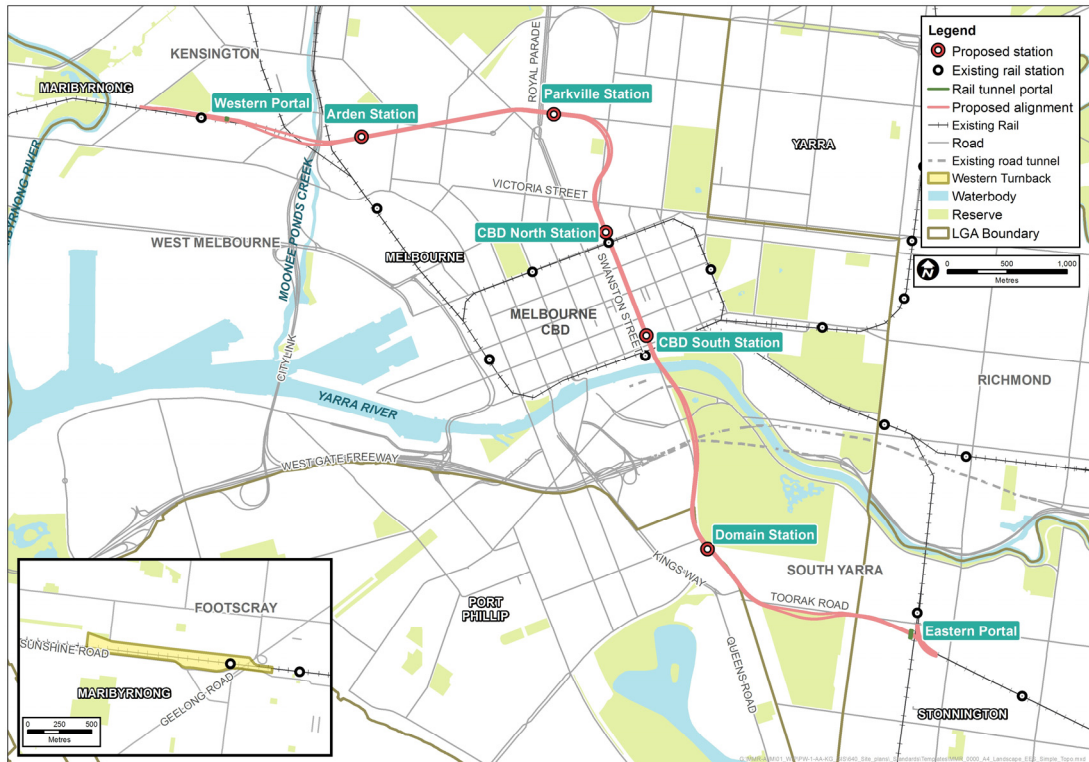
The infrastructure proposed to be constructed as part of Melbourne Metro broadly comprises:

- Twin nine-kilometre rail tunnels from Kensington to South Yarra connecting the Sunbury and Cranbourne/ Pakenham railway lines form the new Sunshine-Dandenong Line (with the tunnels to be used by electric trains)
- Rail tunnel portals (entrances) at South Kensington and South Yarra
- New underground stations at Arden, Parkville, CBD North, CBD South and Domain with longer platforms to accommodate longer High Capacity Metro Trains (HCMTs). The stations at CBD North and CBD South will feature direct interchange with the existing Melbourne Central and Flinders Street Stations respectively
- Train/tram interchange at Domain station.

The project would also require track work (a turnback) at West Footscray to enable trains using the Sunbury Line to turn around before reaching Sunbury and head back through the Melbourne Metro tunnels.

The project includes operation of the five new stations and tunnel however it does not include the operation of the whole rail network. Figure 1 shows a broad schematic plan for the principal inner Melbourne components of Melbourne Metro.

Figure 1: Map of Melbourne Metro alignment and five proposed underground stations



## 1.2 Melbourne Metro Rail Authority

MMRA is delivering the Melbourne Metro and is committed to ensuring excellent environmental, social and economic outcomes are achieved across all phases of the project. MMRA aspires to deliver best practice initiatives and aims to deliver an integrated piece of sustainable infrastructure in a holistic manner, providing an asset that connects the community in an environmentally sustainable manner.

## 2 Sustainability Definition and Benefits

### 2.1 Defining Sustainability on Melbourne Metro

There are many social, scientific and engineering definitions for sustainability or sustainable development<sup>1</sup>. One of the first internationally recognised and most frequently cited definition of the concept to date is:

*‘Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’*

*- World Commission on Environment and Development 1987,  
(Our Common Future) The Report of the Brundtland Commission*

The Report of the Brundtland Commission definition is based around the broad principles of environmental protection, social equality and economic growth (IISD, 2015)<sup>2</sup>. This aligns with the triple bottom line approach to bring together economic development, social development and environmental protection to provide an overall positive outcome.

A first step toward implementing sustainability across Melbourne Metro was to clearly define MMRA’s sustainability approach:

*‘Sustainability on Melbourne Metro means taking an integrated approach and embedding sustainable principles within the design, construction and operation phases of the Project to facilitate a long-lasting legacy for surrounding communities.’*

This integrated approach to sustainability translates into better building and infrastructure performance; economic growth; ecologically sustainable development; improved operational efficiency and minimised maintenance requirements; whole-of-life cost savings and healthy and safe environments for customers.

### 2.2 Benefits of Sustainability

The implementation of sustainable design and construction practises not only decreases negative impacts on the environment, they also provide economic benefits, productivity benefits and enhance public relations. Sustainability improves the economic bottom line by reducing operating costs and optimising life- cycle economic performance<sup>3</sup>.

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<sup>1</sup> Kunz, J. Levitt, R. Fischer, M. (2003) *Management and Leadership Education for Civil Engineers: Teaching Virtual Design and Construction for Sustainability*. California: Center for Integrated Facility Engineering Stanford University.

<sup>2</sup> IISD. (2015, August). What is Sustainable Development? International Institute for Sustainable Development: <https://www.iisd.org/sd/>

<sup>3</sup> Castillo, R. Chi Chung, R (2004) *The Value of Sustainability*. California: Center for Integrated Facility Engineering Stanford University.

Other benefits for the inclusion of sustainable design and sustainability practices include:

- Environmental protection
- Public perception
- Longevity in design and resilient systems
- Social inclusion

Other large infrastructure projects have identified significant cost benefits over the infrastructure lifecycle. These have been found in areas such as reduced energy use, increased passenger comfort (leading to an increase in passenger numbers), greater local employment opportunities and other benefits<sup>4</sup>.

## 2.2.1 Strategic Benefits

The *Transport Integration Act 2010* requires that the development of the transport system has regard to sustainability and sustainable design. The Act has provisions relevant to MMRA's sustainability approach, including:

- Promoting forms of transport and the use of forms of energy and transport technologies which have the least impact on the natural environment and reduce overall contribution of transport related greenhouse gas emissions
- Improving the environmental performance of all forms of transport and the forms of energy used in transport
- Preparing for and adapting to the challenges presented by climate change.

The *Climate Change Act 2010* requires that a climate change adaptation plan and climate action framework be developed for Victoria. Melbourne Metro, in developing a climate change risk assessment and adaptation plan, ensures that the 100 year design of the project shall be resilient to predicted changes to climate in Victoria and Melbourne.

*Plan Melbourne 2014* acknowledges the need for a transport system that supports a more productive central city to improve access to job-rich areas from across metropolitan Melbourne and strengthen transport networks in existing suburbs, the delivery of the Melbourne Metro supports these aims by facilitating orderly and sustainable growth of the central city with improved public transport access.

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<sup>4</sup> Stapledon et al (2015) *Understanding the business case for infrastructure sustainability*. In Lee, Woo Bang, Choi, Byeong-Keun, Ma, Lin, Mathew, Joseph (Eds.) *Lecture Notes in Mechanical Engineering [Proceedings of the 7th World Congress on Engineering Asset Management (WCEAM 2012)]*, Springer International Publishing, Daejeon City, South Korea, pp. 535-543.

## 2.2.2 Long Term Benefits

Many aspects of the project have a lifespan of over 100 years and as such even the smallest savings related to energy efficiency, water use or resource use from an operational perspective would have substantial impacts throughout the life of Melbourne Metro. The use of more efficient systems, plant and facilities is paramount in reducing long term costs and impacts of Melbourne Metro.

# 3 Sustainability Approach

MMRA recognises that the ability to influence long-term sustainability outcomes is greatest at the start of the project and then steadily reduces over time as design and delivery progress.

A Sustainability Policy (refer to Appendix A of this report) has been developed for Melbourne Metro. It acknowledges that the project has the potential for both positive and negative sustainability related impacts and aims to maximise the potential sustainability benefits while minimising negative impacts.

## 3.1 Melbourne Metro Sustainability Vision and Principles

MMRA's Sustainability Policy (the Policy) aims to achieve positive environmental, economic and social outcomes to be realised across the project lifecycle.

The vision of the Policy states:

*“Our Sustainability Vision is to achieve excellent environmental, social and economic outcomes across all phases of the Melbourne Metro Rail Project in order to deliver an integrated Project that connects the community in an environmentally sustainable manner.”*

The MMRA Sustainability Policy (the Policy) requires MMRA and its delivery partners to take meaningful actions across all areas of the project to achieve the environmental, social and economic objectives.

To achieve this Vision MMRA has committed to:

### Melbourne Metro 5 Key Sustainability Policy Commitments

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Optimising the Project's design to ensure it is delivered to operate sustainably

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Managing resources efficiently through embedding energy, water and material saving initiatives into the design, construction and operation of the Project

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Avoiding, minimising and offsetting harm to the environment and the loss of biodiversity

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Protecting and conserving the natural environment

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Preparing for the changes presented by climate change

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These commitments provide an overarching framework for the development of more specific Sustainability Themes and Targets, developed as part of MMRA’s Sustainability Strategy, to guide the integration of sustainability into project governance, design, construction and operation.

## 3.2 Melbourne Metro Sustainability Strategy

The MMRA Sustainability Strategy incorporates the Sustainability Policy and sets out specific Themes and initiatives/targets to be integrated into the project planning and design, procurement, construction and operations stages of Melbourne Metro.




## 3.3 Melbourne Metro Sustainability Themes and Targets

To guide the implementation of the Policy, MMRA has developed a comprehensive set of Sustainability Targets (the Targets) to be achieved by Melbourne Metro. The Policy and Targets were developed in accordance with the adopted Sustainability Rating Tools, achievements of similar projects nationally and internationally and pushing for best practice and innovation where possible.



### 3.3.1 Themes

The Themes identified in Table 1 are the key focus areas for performance measurements. The Targets are grouped into Themes covering key aspects of Melbourne Metro.

Table 1 Melbourne Metro Sustainability Themes

Sustainability Themes	Sustainability Objectives
<b>Excellence</b>	 Demonstrate leadership in the commitment to a prosperous and integrated economic, social and environmental sustainable future.
<b>Urban Ecology and Vegetation</b>	 Protect and enhance vegetation, functioning of ecosystems and maintain biological diversity.
<b>Climate Resilience</b>	 Respond to the challenges of climate change impacts through adaptation and resilience planning and design.
<b>Supply Chain</b>	 Demonstrate commitment to sustainable procurement.
<b>Communities</b>	 Support and enhances social, cultural and community wellbeing.
<b>Workforce</b>	 Facilitate economic prosperity and development and providing a resilient local workforce.
<b>Energy</b>	 Promote energy efficiency throughout design and delivery and implement innovative uses of renewable energy on site.



Sustainability Themes	Sustainability Objectives	
<b>Materials and Waste</b>		Reduce the impact of materials over the lifecycle, and provide healthy environments through the reduction of emissions, pollution and waste.
<b>Water</b>		Reduce water through an energy efficient design and identify and use non-potable water from local sources.

### 3.3.2 Targets

The Targets align with the Themes and are designed to provide achievable and measurable sustainability outcomes for the Project.

Many of the Targets have been developed to align with the Sustainability Rating Tools adopted by the project. These include the Infrastructure Sustainability Council Australia (ISCA) IS Rating Scheme Tool and the Green Building Council Australia (GBCA) Green Star Rating Scheme Tool (see 3.4.2 for more discussion about the rating tools).

## 3.4 Implementation and Monitoring

### 3.4.1 Sustainability Management System

To guide and monitor the ongoing compliance with the Targets, MMRA would maintain a Sustainability Management System (SMS) that is integrated into all project deliverables and activities. The SMS would ensure that effective assurance processes are implemented to monitor performance against the Sustainability Policy, Themes and Targets.

The MMRA SMS will require that the Contractors develop and implement an SMS addressing outcomes in the MMRA Policy, Sustainability Strategy, Themes and Targets. The purpose of the SMS is to ensure that works are planned and performed so that the key commitments outlined in the MMRA Sustainability Policy and Sustainability Targets are carried out through design, construction and operation.

Contractors would be required to clearly identify how they would ensure that specific Sustainability Targets and initiatives/targets are met. The MMRA Sustainability Strategy also includes the implementation of two Sustainability Rating Tools to drive and monitor sustainability performance. This approach would encourage industry to develop innovative value for money sustainability solutions.

Implementation of the Sustainability Targets would be monitored and audited in line with the requirements of the project's Sustainability Strategy. The result of this process would be reported and subject to independent verification as part of an overall sustainability assurance process.

## 3.4.2 Sustainability Rating Tools

To benchmark and monitor performance against the Sustainability Policy and Targets, MMRA will use the following industry-recognised rating tools:

### **Infrastructure Sustainability Council Australia (ISCA) IS Rating Scheme Tool:**

ISCA's Infrastructure sustainability (IS) Rating Tool is an industry recognised assessment tool developed for large-scale infrastructure projects across various sectors including the transport, water, communication and energy sectors. It represents a common methodology which is used to drive sustainable outcomes across a broad range of infrastructure projects. Using the tool, sustainability performance on a project can be recognised through a third party certification system.

The ISCA IS Rating Tool evaluates sustainability initiatives and potential environmental, social and economic impacts of major infrastructure projects. The tool helps improve project performance and aligns the mindsets of designers, project managers and decision makers to transform the way infrastructure is planned, designed, built and operated.

The project has registered with ISCA to use the IS Rating Tool on major contract packages to achieve Design and As Built ratings.

### **Green Buildings Council of Australia (GBCA) – Green Star Accreditation**

The GBCA suite of Green Star Rating Tools is a comprehensive rating system that evaluates the environmental design and construction of buildings at all stages of the built environment lifecycle. The use of Green Star is now commonplace in the design and construction of new buildings. For Melbourne Metro, this would involve using a bespoke Design & As Built tool for underground stations.

The Green Star rating certification provides a wide array of benefits to any buildings project. These can include lower operating costs, higher return on investment, a higher ability to attract and retain tenants, enhanced marketability, productivity benefits, reduced liability and risk, healthier places to live and work demonstration of corporate social responsibility, future-proofed assets and associated competitive advantage.

Much of the process is aimed at the long term environmental benefits which largely translate into reduced operating costs and greater comfort for end users. The tool would be used by the project team to identify the most appropriate environmental initiatives to be undertaken that provide the best value for money on investments in comparison to the long term savings and environmental benefits.

## 4 Climate Change

The project responds to climate change in two distinct ways through:

- Climate Change mitigation
  - Reducing the amount of GHG emissions to the atmosphere
- Climate Change adaptation
  - Adapting to the physical impacts of climate change (for example more frequent and longer heatwaves)

The MMRA Sustainability Policy outlines a commitment that Melbourne Metro will be delivered to 'prepare for the challenges presented by climate change'. The commitment is implemented through the Sustainability Target for Climate Resilience which requires the preparation of a climate risk assessment, adaptation plan and implementation measures.

This approach is consistent with the objectives of the current Victorian Climate Change Adaptation Plan<sup>5</sup>.

In addition to the MMRA Sustainability Targets, the ISCA and Green Star rating tools include specific credits to address climate change through various mechanisms.

## 5 Sustainability Innovation

The MMRA has a strong commitment to innovation throughout the planning, design, delivery and operation of the project as demonstrated by the Sustainability Targets and using industry-recognised rating tools to monitor and benchmark performance. Both the ISCA and Green Star rating tools include credits relating to innovation. Innovation will be encouraged throughout the design and delivery of the project to ensure it provides a lasting legacy for surrounding communities.

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<sup>5</sup> Government of Victoria 2012. Victorian Climate Change Adaptation Plan. Government of Victoria.

# Appendix A MMRA Sustainability Policy



## MELBOURNE METRO RAIL SUSTAINABILITY POLICY



Our Sustainability Vision is to achieve excellent environmental, social and economic outcomes across all phases of the Melbourne Metro Rail Project (**Project**) in order to deliver an integrated Project that connects the community in an environmentally sustainable manner.

### To achieve this Sustainability Vision, Melbourne Metro Rail Authority is committed to:

- Optimising the Project's design to ensure it is delivered to operate sustainably;
- Managing resources efficiently through embedding energy, water and material saving initiatives into the design, construction and operation of the Project;
- Avoiding, minimising and offsetting harm to the environment and the loss of biodiversity;
- Protecting and conserving the natural environment; and
- Preparing for the challenges presented by climate change.

### To give effect to this Policy, our people will:

- Demonstrate leadership in the commitment to a prosperous and integrated economic, social and environmental sustainable future;
- Demonstrate commitment to sustainable procurement;
- Protect and maintain vegetation, the functioning of ecosystems and biological diversity;
- Facilitate economic prosperity and development and provide a resilient local workforce;
- Support and enhance social, cultural and community wellbeing;
- Encourage the pioneering of innovation in sustainable design, process or advocacy that seeks continuous improvement to promote new ideas and thinking;
- Embed environmental and sustainability outcomes by establishing robust sustainability objectives and targets; and
- Report on sustainability performance and be accountable for meeting environmental and social responsibilities.

Evan Tattersall  
Chief Executive Officer  
Melbourne Metro Rail Authority

August 2015

