



## LIVING INFRASTRUCTURE PLAN

AUSTRALASIAN NETWORK FOR ECOLOGY AND TRANSPORTATION

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30 APRIL 2018

**Maggie Baron**, Melbourne Metro Rail Authority  
**Sheridan Blunt**, Loci Environment & Place Inc.



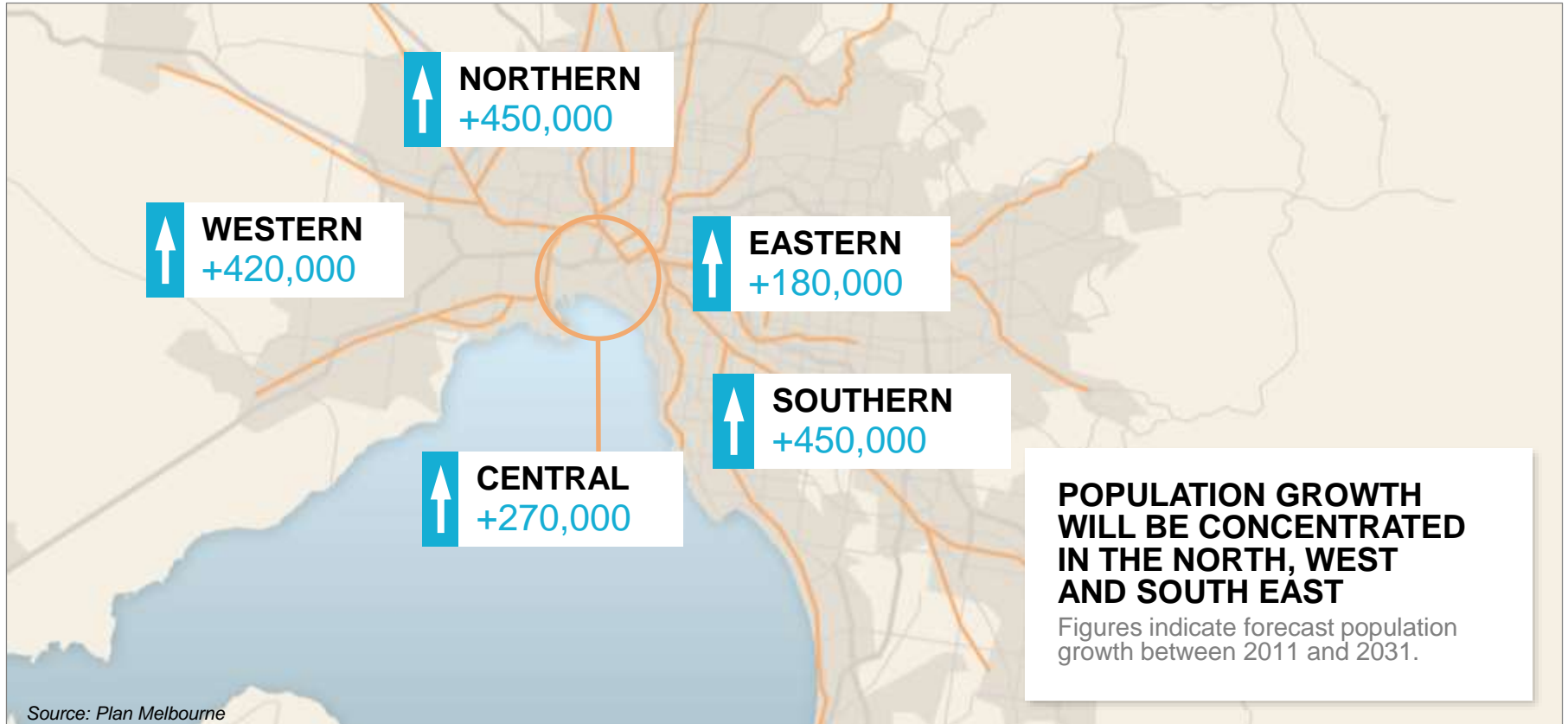
# RAIL AND SUSTAINABILITY

MAGGIE BARON

URBAN ECOLOGY MANAGER

MELBOURNE METRO RAIL AUTHORITY

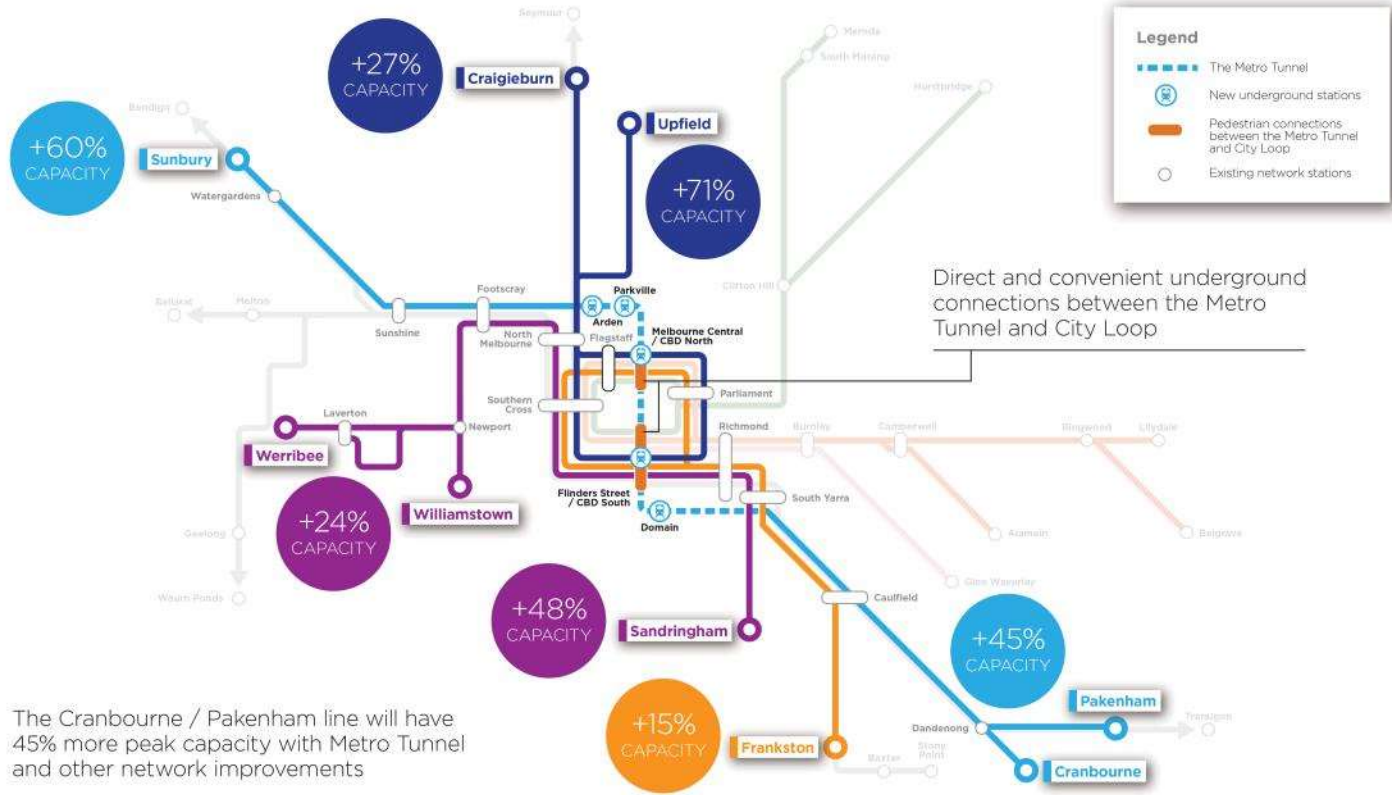
# POPULATION GROWTH



# PROJECT ALIGNMENT



# CAPACITY BENEFITS



The Cranbourne / Pakenham line will have 45% more peak capacity with Metro Tunnel and other network improvements

# ENVIRONMENT EFFECTS STATEMENT



## Metro Tunnel EES

- Beyond compliance via Environmental Performance Requirements (EPRs) including:
  - Reduction in tree impacts
  - Canopy enhancement commitments
  - Embeds tree asset managers' (Councils and University of Melbourne) urban ecology strategies
  - Responds to community valuing of trees, especially not addressed in native vegetation management frameworks



# THE ‘PROBLEM WE NEEDED TO ADDRESS’

Metro Tunnel was committed to leading urban ecology outcomes.

Now it needed a suite of tools, guidelines and specifications to support canopy and vegetation outcomes for the project.

Given this was an emerging field, the tools were not easy to find.

# PARTNERSHIP WITH LOCI ENVIRONMENT & PLACE INC.

Collaboration - Case Study

## Loci Environment and Place

Loci Environment and Place (Loci) is a not-for-profit organisation that's changing how cities are planned and built. It develops, trials, partners and teaches city-making solutions to reduce natural resource and pollution impacts.

The Metro Tunnel team is working with Loci to develop best-practice approaches to the design and construction of 'living infrastructure'.



### Key benefits

With Loci, we've developed:

- Best-practice initiatives in the emerging field of living infrastructure to help the project achieve its environmental and social commitments
- A targeted Living Infrastructure Plan to expand the project's sustainability legacy through the creation of healthy, resilient and biodiverse green, urban landscapes to help underpin Melbourne's future liveability.

In effect, this means:

- + Creating greener landscapes in inner Melbourne to support environmental outcomes for public health and wellbeing
- + Expanding the knowledge of urban planning and development practitioners to support greater sustainable development and climate resilience in the Melbourne municipality.



And from this the Melbourne Metro Rail Authority and Loci Environment & Place Inc. (Loci) partnership formed





# COLLABORATIVE CITY SHAPING

SHERIDAN BLUNT

EXECUTIVE MANAGER

LOCI ENVIRONMENT & PLACE INC.

# KNOWLEDGE SHARING

## Strategic Framework

LocI Environment & Place Inc.



### Problems facing our Cities



### Solutions for our Cities. LocI focuses on the 'city-shaping' practitioners.

#### 'Better Best Practice' Program

Better best-practice assess best possibilities for multiple sustainability benefit.

Where 'best practice' does not yet exist, LocI creates 'Better Best Practice' Notes for use by practitioners in projects, policy, training and advocacy. These Notes contain the latest evidence and practice knowledge and are supported by information sessions and training.

#### Knowledge Sharing Program

Practitioners to continue growing knowledge to apply multi-disciplinary solutions for healthy people and environments. The knowledge exchange program will help practitioners avoid 'reinventing the wheel' as they will can draw on shared new knowledge.

Practitioners have a responsibility to communities to keep learning about emerging city planning approaches.

#### Knowledge Creation Program

Co-production of knowledge to enable 'better best practice' to keep improving. Help, collaborate, learn, share & reinvent our, profits in multidisciplinary disciplines, new knowledge, emerging trends, market opportunities and applied research.



URBAN  
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IN ACTION



E2DESIGNLAB



G & M Connellan Consultants

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LOCI MELBOURNE

## The Urban Well

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The Urban Well

[Project proposals](#)

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We're Empowering Cities With New Ways of Planning  
LocI Environment & Place Inc. is a not-for-profit organisation supporting practitioners involved in shaping our cities for healthy environments and people.

**LocI partnering with Government**

LocI is currently partnering with the Victorian Government on the collaborative Living Infrastructure program.

We are partnering with industry for green friendly transportation design.

LocI, COOLTH and partners will continue to work together to create a more sustainable, resilient and vibrant Melbourne.

Contact us for a quote or to find out how we work with the specialists that best suit your project.

LocI facilitates The Urban Well and draws upon a well of subcontractors in its Provider Register to deliver specialist, progressive urban sustainability solutions.

Client Information

- [Open Space](#)
- [Urban Planning](#)
- [Urban Ecology](#)
- [Urban Form](#)
- [Urban Agriculture](#)
- [Resilience](#)
- [Climate Change](#)
- [Urban Connectivity](#)
- [Quality](#)
- [Sustainable Transport](#)
- [Air Pollution](#)
- [Sharing Cities](#)
- [Partnership Models](#)
- [Sustainable Design](#)
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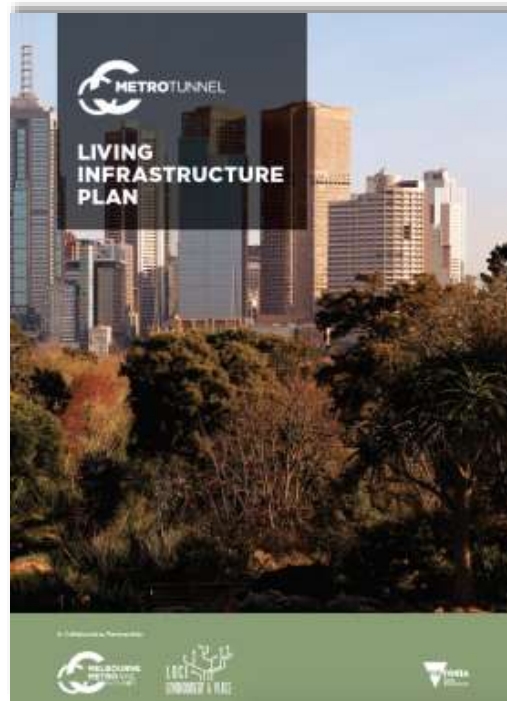
Find out more [»»](#)

# LINKING LIVING INFRASTRUCTURE AND BUILT INFRASTRUCTURE

METRO TUNNEL  
LIVING INFRASTRUCTURE PLAN

# NEW POLICY APPROACH

- Linked to Targets
- Multi Disciplinary
- Linked to Research
- Legacy Opportunities



# SUPPORTS SUSTAINABILITY TARGETS



## Urban Ecology

**Double tree canopy** cover by **2040** compared to the base case through the reinstatement of lost trees, planting of new trees and the creation of improved growing conditions.

Total amount of vegetated surface permanently gained post construction must be **greater than** total amount of **vegetated surface area** permanently **lost**

At least 25% of new and reinstated planting areas must consist of diverse, multi-storey **plantings for biodiversity**



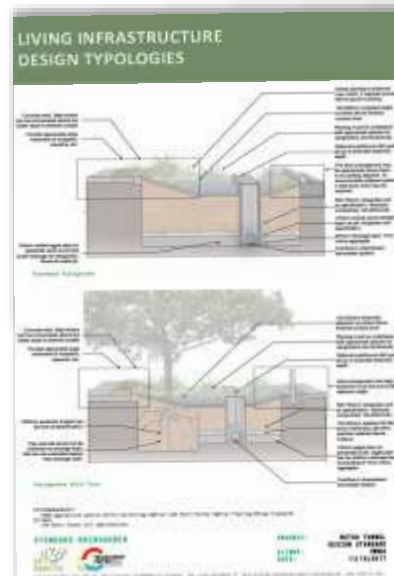
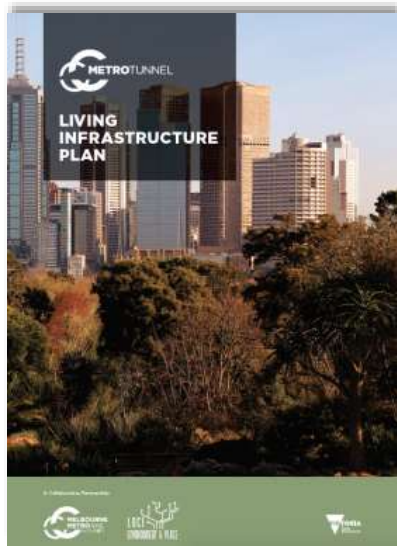
## Water

Manage stormwater runoff from new or reinstated ground surfaces and roof areas to achieve the best practice water quality performance objectives a set out in the Urban Stormwater Best Practice Environmental Management Guidelines (Victoria)

Use rainwater and/or stormwater to provide passive irrigation to all tree plots and vegetated areas to support soil moisture needs

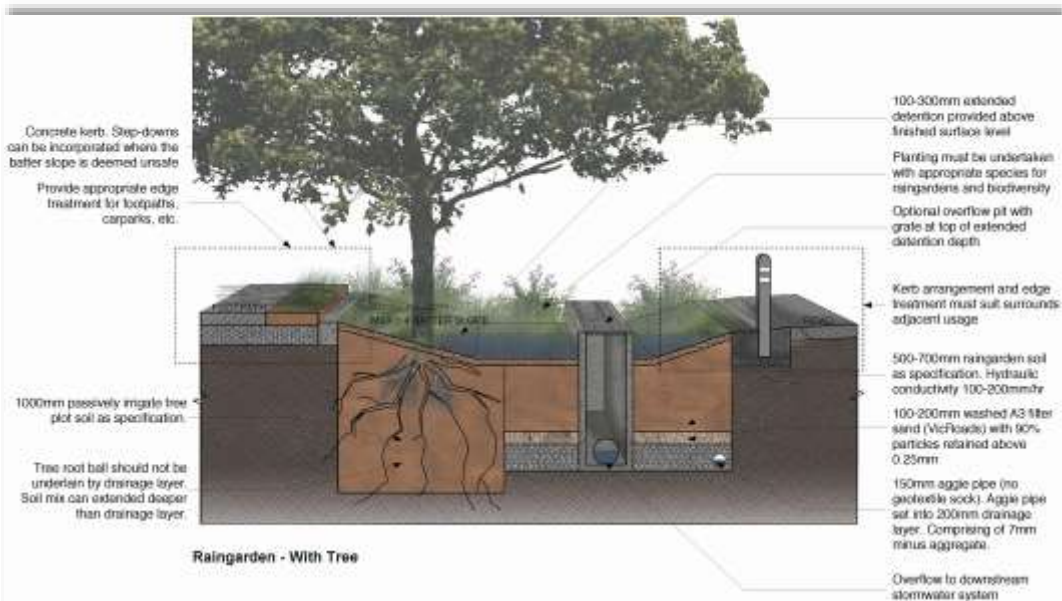


# TO SUPPORT DELIVERY OF LIVING INFRASTRUCTURE TARGETS





# NEW DESIGN TYPOLOGIES & SCENARIOS



Raingarden - With Tree

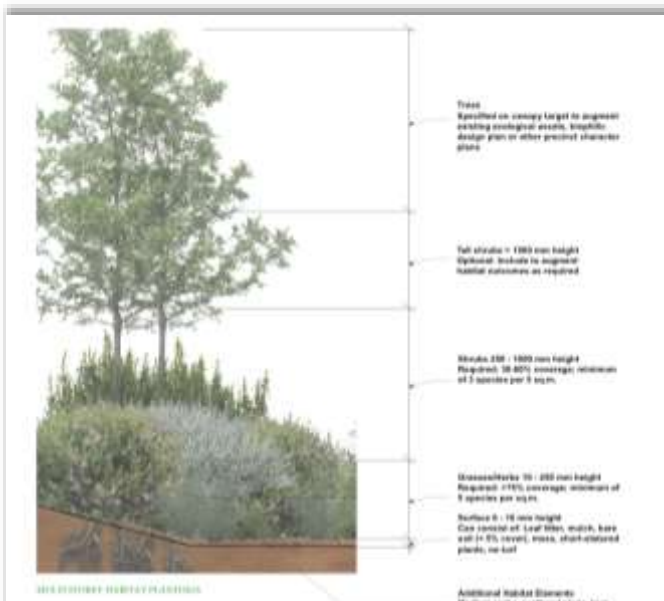
- BIODIVERSITY** WSUD appropriate species whilst maximising habitat (see Multi-Storey Habitat Planting Design Standard)
- SOIL** Apply soil specifications that maximise drainage and soil health (see Better Best Practice Note: Soils for Urban Landscapes)

## RAINGARDEN

LOCI WELCOMES THE USE OF THIS DESIGN STANDARD BY OTHERS.  
THE LEAD AUTHORS OF THIS DESIGN STANDARD WERE EZDESIGNLAB, SESL AUSTRALIA & COOLTH INC.



PROJECT: LIVING INFRASTRUCTURE DESIGN TYPOLOGIES  
DATE: 29/11/2017



MULTI-STOREY HABITAT PLANTING

- WATER** - Passive irrigation needs to be supported by subsurface drip irrigation
- BIODIVERSITY** - See Best Practice Note: Biodiversity Sensitive Urban Design.
- SOIL** - See Best Practice Note: Soils for Urban Landscapes. See associated Soil Specifications.

## MULTI-STOREY HABITAT PLANTINGS

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THE LEAD AUTHORS OF THIS DESIGN STANDARD WERE EZDESIGNLAB, SESL AUSTRALIA & COOLTH INC.



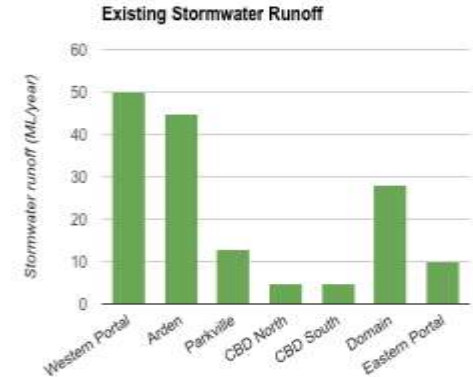
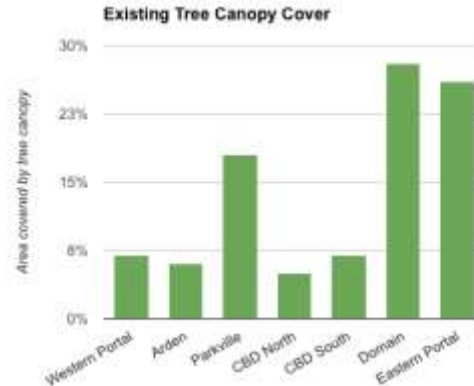
PROJECT: LIVING INFRASTRUCTURE DESIGN STANDARD  
DATE: 29/11/2017

# DOUBLE CANOPY: LOCATING TREES FOR LIVING INFRASTRUCTURE BENEFITS

Additional trees

1. Located as close as possible to the Metro Tunnel Project area
2. Located on land that maximises the public benefit of the tree for the long term
3. Located where the tree can best address the local community and environment benefits.  
The order of consideration includes opportunities to:

- reduce the impact of thermal hotspots with a priority for improving pedestrian and cycling comfort
- increase the canopy cover in the precincts with lower than average tree canopy coverage
- optimise opportunities to capture, treat and slow the flow of stormwater
- benefit biodiversity by helping fill a habitat gap for fauna, birds and other pollinators.





# WILDLIFE TRANSITION IN CONSTRUCTION AREAS

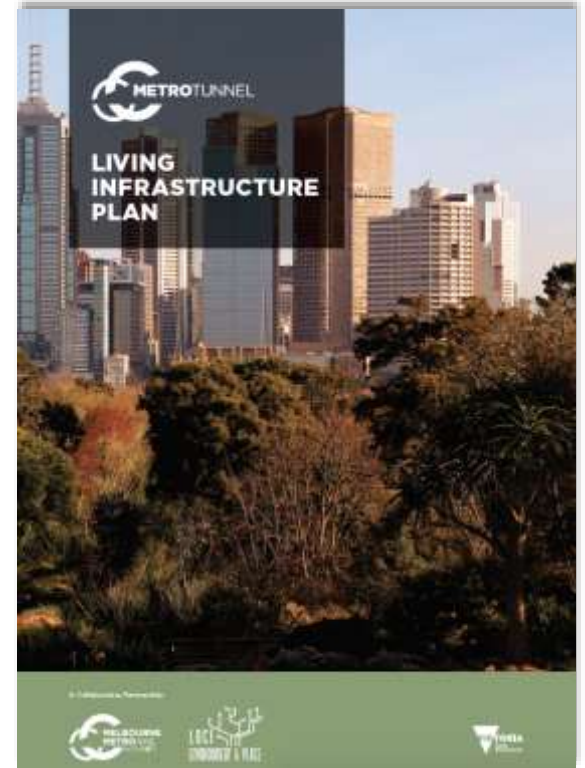
- Highly urbanised environment
- Strategic assessment to understand extent of animals present (possums and birds)
- Fauna assessments as part of tree removal process for all trees, as well as on-the-day wildlife handlers
- Establishment of nest boxes – possum, birds and microbats – in advance
- Staged removal



Image: [fauNature.com.au](http://fauNature.com.au)

# NEXT STEPS

- Ensure and enjoy delivery of the very environmentally progressive design
- Landscape design to maximise planting of trees within, and beyond our project area, to meet target to double tree canopy by 2040
- Share our experiences with the industry so that future major projects are as green, or dare we say it, even greener than ours.



**Further information on the  
Metro Tunnel Living Infrastructure Plan:**

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