LIVING INFRASTRUCTURE PLAN

AUSTRALASIAN NETWORK FOR ECOLOGY AND TRANSPORTATION

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RAIL AND SUSTAINABILITY

MAGGIE BARON
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MELBOURNE METRO RAIL AUTHORITY
POPULATION GROWTH

POPULATION GROWTH WILL BE CONCENTRATED IN THE NORTH, WEST AND SOUTH EAST

Figures indicate forecast population growth between 2011 and 2031.

Source: Plan Melbourne
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
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.

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.
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 as 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

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

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

Concrete kerb. Step-downs can be incorporated where the batter slope is deemed unsafe.

Provide appropriate edge treatment for footpaths, carparks, etc.

1000mm passively irrigate tree plot soil as specification.

Tree root ball should not be underlain by drainage layer. Soil mix can extend deeper than drainage layer.

150-300mm extended detention provided above finished surface level.

Planting must be undertaken with appropriate species for raingardens and biodiversity.

Optional overflow pit with grate at top of extended detention depth.

Kerb arrangement and edge treatment must suit surrounds adjacent usage.

500-700mm raingarden soil as specification. Hydraulic conductivity 100-200mm/hr.

150-200mm washed A3 filter sand (0/5mm) with 90% particles retained above 0.25mm.

150mm gravel pipe (no geovisit sack). Agg pipe sat into 200mm drainage layer. Compaction of 7mm minus aggregate.

Overflow to downstream stormwater system.

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)
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
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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