

Blue/Green Integration

Using living green to improve water management

AIPH MEETING

Professor Tony Wong, CEO



CRC for
Water Sensitive Cities

20-23 March 2018

The Hotel Windsor,
Melbourne, Australia



AIPH



Nursery & Garden Industry
Australia

**Hort
Innovation**



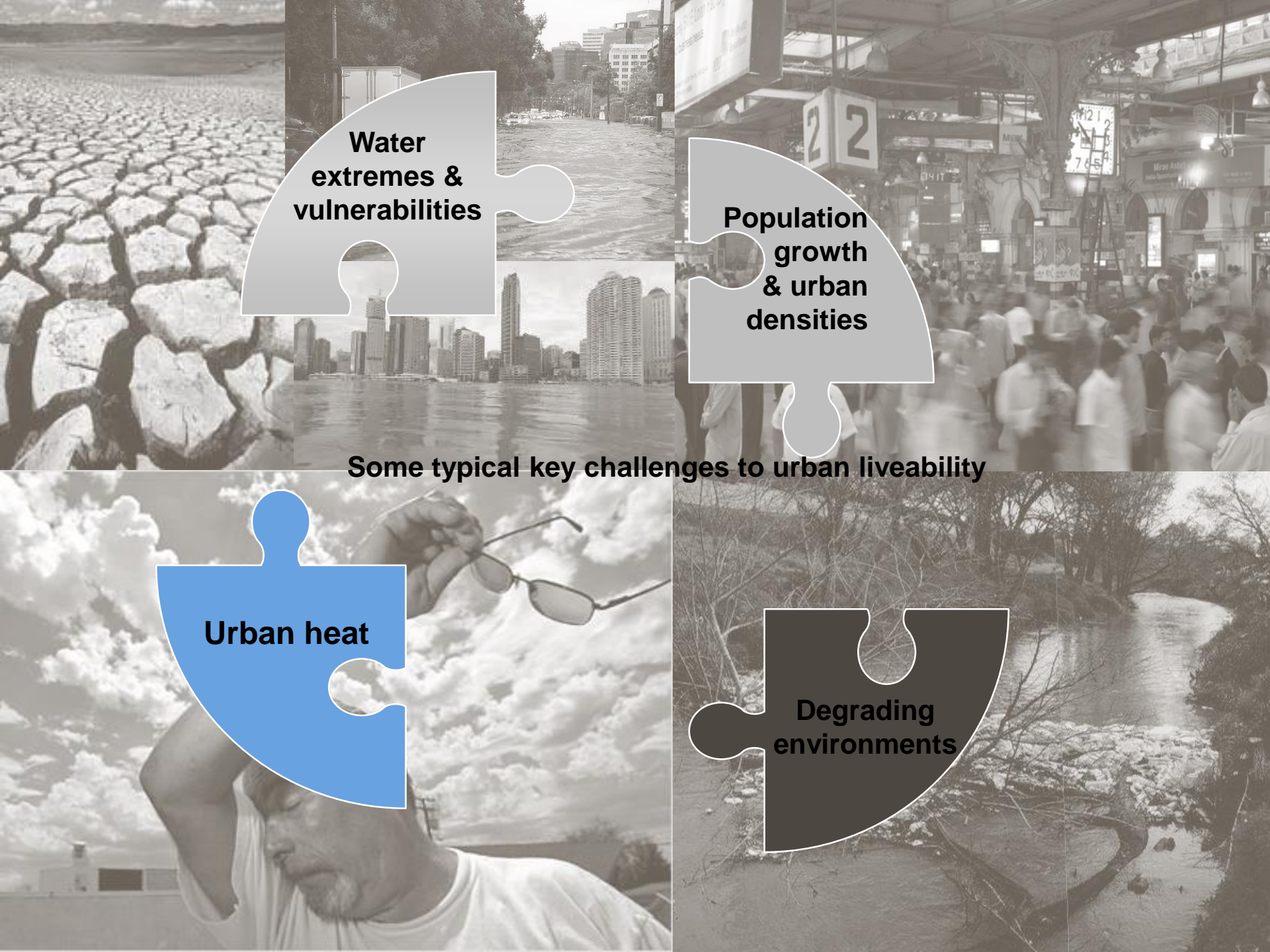
**Water
extremes &
vulnerabilities**

**Population
growth
& urban
densities**

Some typical key challenges to urban liveability

Urban heat

**Degrading
environments**



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THE WATER SENSITIVE CITY: PRINCIPLES FOR PRACTICE

Cities as Water Supply Catchments meaning access to water through a diversity of sources at a diversity of supply scales;

Cities Providing Ecosystem Services meaning the built environment functions to supplement and support the function of the natural environment;

Cities Comprising Water Sensitive Communities meaning socio-political capital for sustainability exists and citizens' decision-making and behaviour are water sensitive.

Cities Providing Ecosystem

Services: meaning the built environment functions to supplement and support the function of the natural environment;

- ❑ water quality improvement
- ❑ management of stormwater as a resource
- ❑ buffering aquatic ecosystems from the effects of catchment urbanisation and climate change



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- ❑ flood mitigation – Infiltration; Detention; Harvesting & safe passage of flood water
- ❑ influencing urban micro-climates
- ❑ enhancing urban ecology and biodiversity

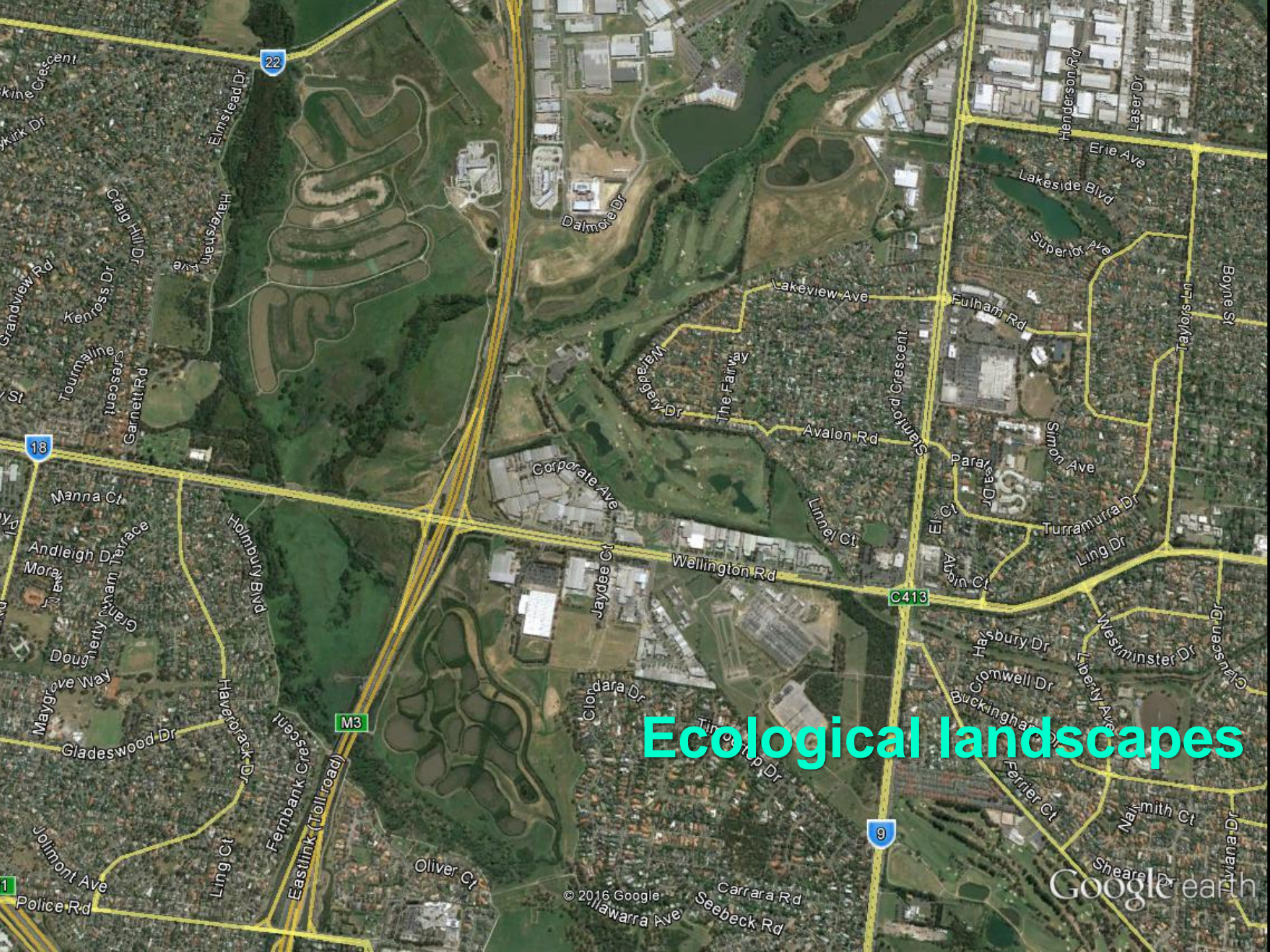


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Spaces in the public domain are essential features of public amenities. However, these urban landscapes must be functional beyond providing spatial amenities.

*Our knowledge of the traditional 'values' of open spaces and landscape features needs to be **bolstered with an understanding of the 'ecological functioning' of the urban landscapes** that capture the essences of sustainable water management, micro-climate influences, facilitation of carbon sinks and use for food production.*





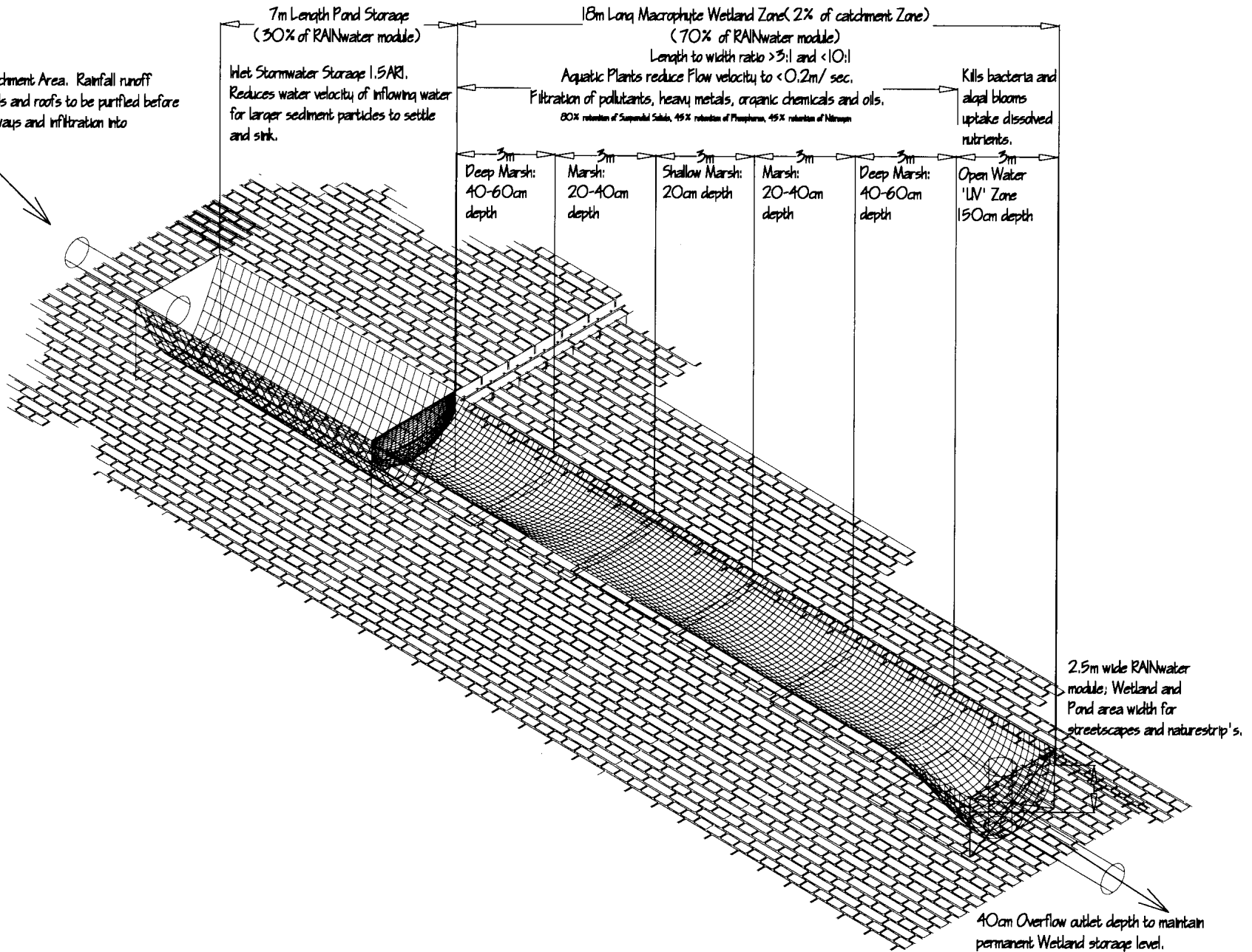
Ecological landscapes



Hallam Wetland Experiments



2.25 hectare Catchment Area. Rainfall runoff collected from roads and roofs to be purified before release into waterways and infiltration into watertable.









What is stormwater biofiltration?

Compared with undeveloped or natural catchments, stormwater runoff from urban areas tends to have substantially larger peak flows, volumes and pollutant loads. The poor water quality and altered hydrology are both highly detrimental to the health of receiving waters (e.g. streams, estuaries, bays).

Water biofiltration is the process of improving water quality by filtering water through biologically influenced media (Figure 1). Stormwater biofiltration systems (also known as biofilters, bioretention systems and raingardens) are just one facet of a range of accepted Water Sensitive Urban Design (WSUD) elements. They are a low energy treatment technology with the potential to provide both water quality and quantity benefits.

A typical biofilter consists of a vegetated swale or basin overlaying layers of porous media. Stormwater is diverted from a kerb or pipe into the biofilter, where it flows through dense vegetation and temporarily ponds on the surface, before slowly filtering down through the filter media (Figure 1). Depending on design, treated flows are either infiltrated to underlying soils, or collected in the underdrain system for conveyance to downstream waterways or storages for subsequent re-use.

The technology can be applied to various catchment sizes and landscape settings (Figure 2), from street trees and private backyards to street-scale applications and car parks, up to larger regional stormwater treatment systems, including those in public parks and forested reserves. Further, biofilter design can be tailored to optimise performance for local conditions and specific treatment objectives.

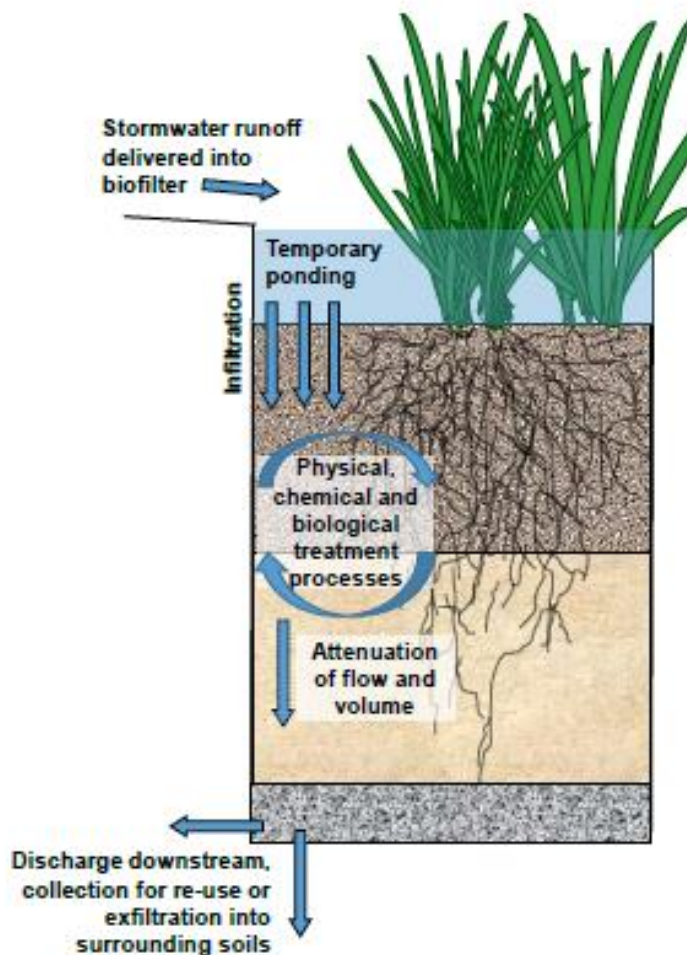


Figure 1. Key principles of stormwater biofiltration











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2012

**Linking ecological
landscapes:** for safe
detention and passage of
flood waters





Street tree bioretention system

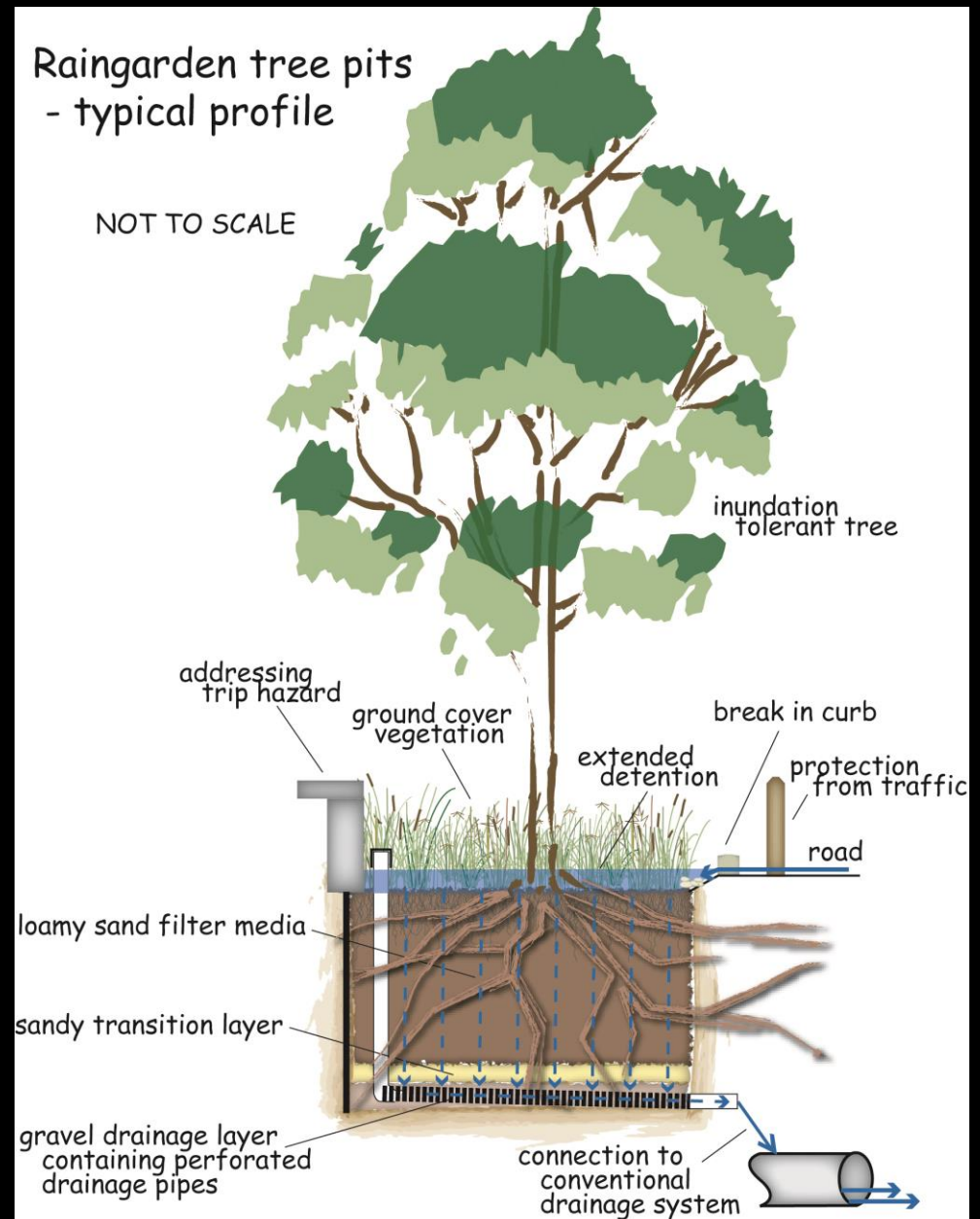


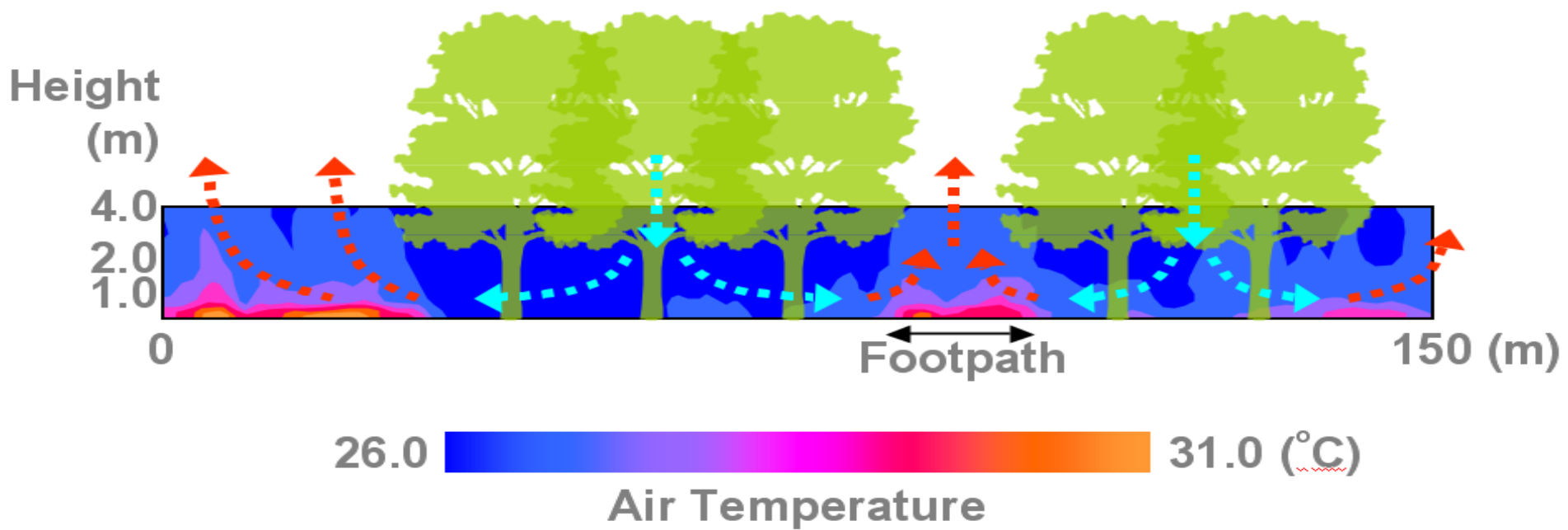
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Raingarden tree pits - typical profile

NOT TO SCALE





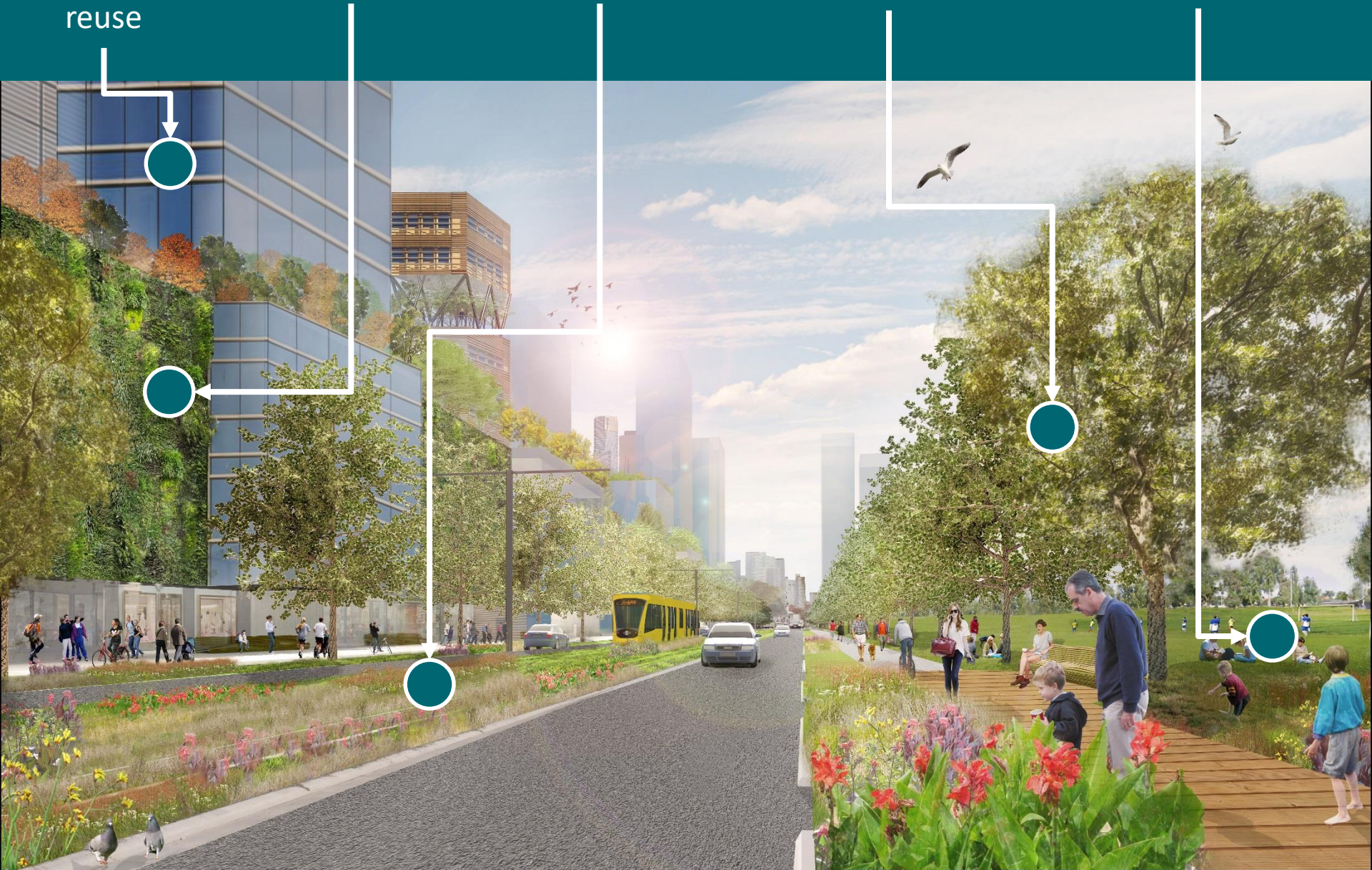
Potable
greywater
reuse

Green walls

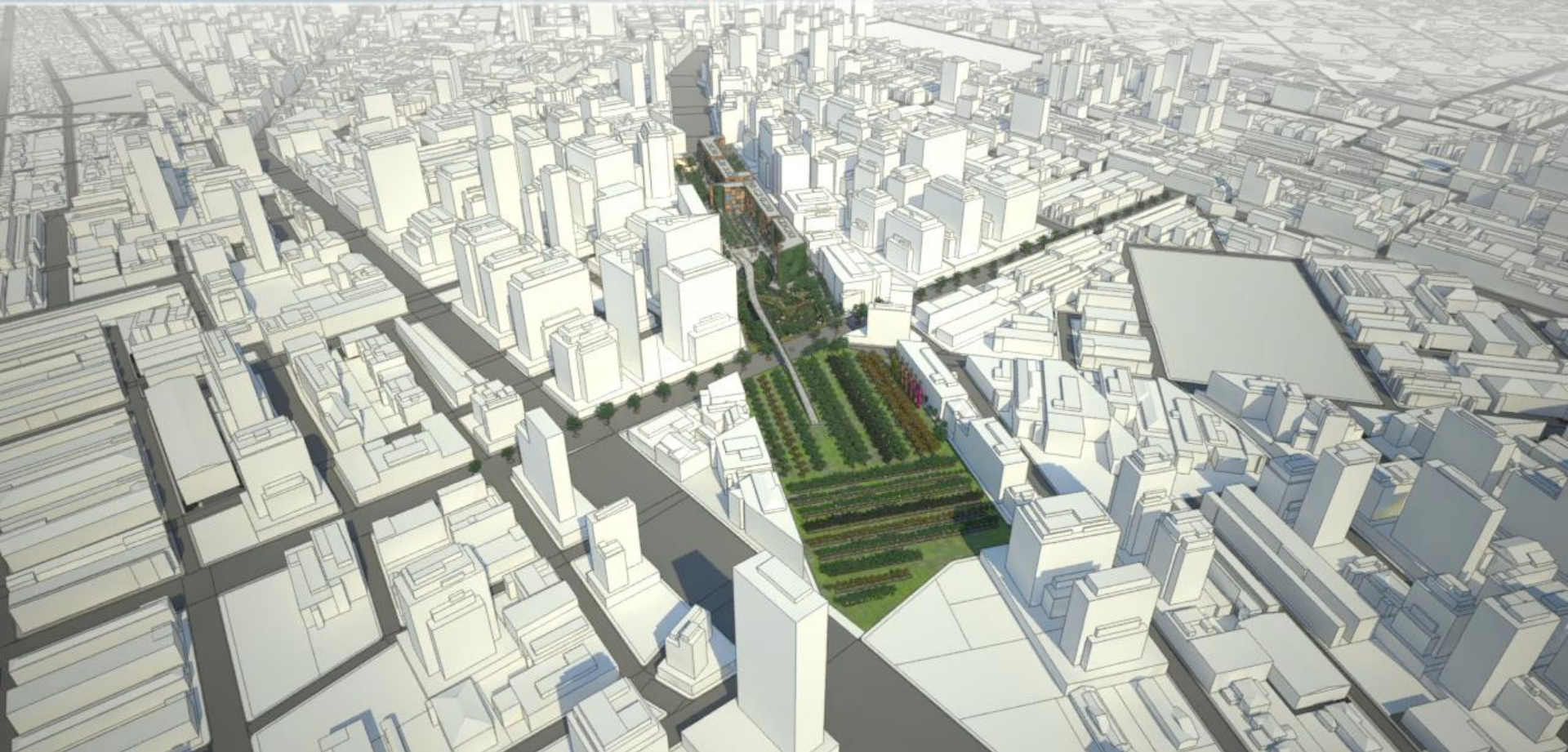
Green spine

Microclimate

Blue corridors



Envisioning a water sensitive city



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Thank You for Listening



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