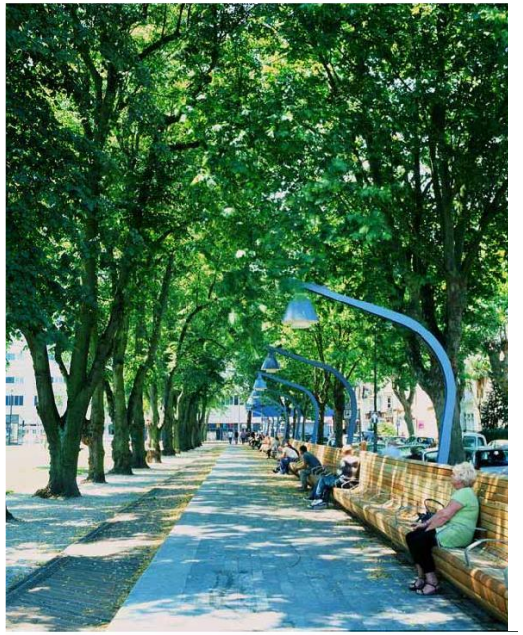
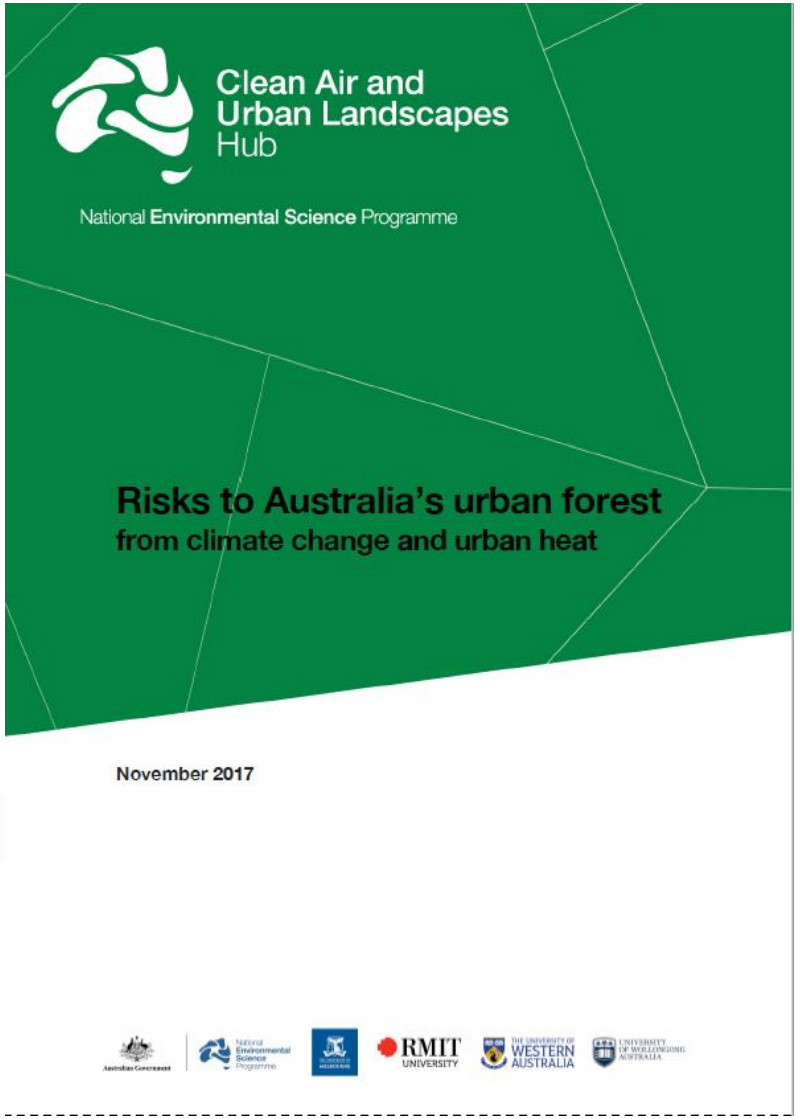
HEAT MITIGATION
a new approach to streets

Valuable green infrastructure & multiple benefits for our urban areas



- Streets are for people
- Walking & cycling
- Commerce & business
- Social interaction
- Vehicles

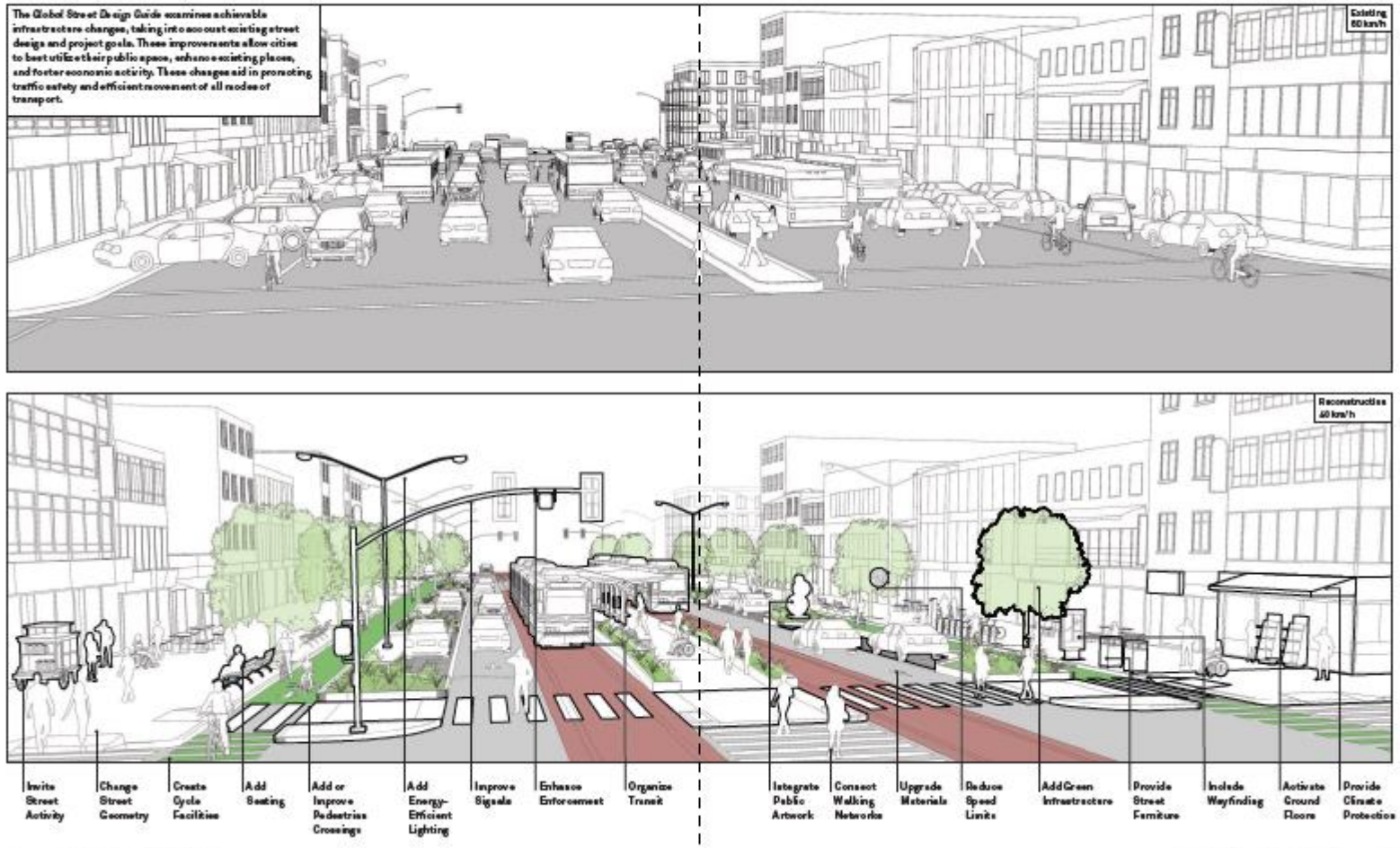
What makes a great street?



What is International & Local Research Telling Us?

1.8 | What is Possible

The Global Street Design Guide examines achievable infrastructure changes, taking into account existing street design and project goals. These improvements allow cities to best utilize their public space, enhance existing places, and foster economic activity. These changes aid in promoting traffic safety and efficient movement of all modes of transport.



Defining Streets
What is Possible

Time to rethink streets!

1.3 | The Economy of Streets

A safe, vibrant, efficient street network is essential to the economic health of a city or region. Street design also plays a major role in facilitating access to formal and informal commerce, jobs, or the wholesale movement of goods. The up-front costs of constructing a street should be considered with regard to the benefits its design will confer throughout its lifespan. Cost impacts of street design should be considered for individuals through value of travel time, public transportation access, fuel costs, and individual health, while the larger externalized cost to society can be examined through expenses such as those related to traffic crashes, hospital costs, negative environmental impacts, and congestion.

Health and Human Lives

The cost of lives lost and serious injuries caused by road crashes have a significant impact on the economy. Better-designed streets relieve mental and physical stress, lowering medical expenses and the need for social services.

Work and Productivity

Significant numbers of human working hours are lost as a result of time spent in congestion or injuries incurred in road crashes. These lost hours result in reduced productivity and, therefore, economic losses.

Business and Real Estate

Pedestrians, cyclists, and transit riders generally spend more money at local retail businesses than people who drive cars, underscoring the importance of offering attractive, safe spaces for transit riders, pedestrians, and cyclists. Great streets have also been shown to add value to neighborhoods.

Construction and Maintenance

Narrow streets cost less to build and maintain. Using good-quality, durable materials can significantly reduce maintenance costs. Green alleys or streets and tree planting are estimated to be 3–5 times more effective in managing stormwater and reduce hard infrastructure cost.[8]

1.4 | Streets for Environmental Sustainability

Designing streets that respond to their environment can help cities meet the challenges of a warming planet. Various international organizations and agendas, such as the UN Sustainable Development Goals, have increased the focus on environmental sustainability, greenhouse gas emissions, and global warming. It is the time to promote the environmental benefits of great streets. Investment in sustainable streets can be attracted by highlighting improved environmental impacts and increased contribution toward achieving a city's environmental goals.

Microclimate

Street trees and landscaping can assist in improving the local climate and reducing urban heat islands, thus minimizing the demand on energy-intensive air-conditioning in vehicles and adjacent buildings.

Noise

Urban trees can reduce noise pollution.

Air Quality

Streets prioritizing pedestrians, cyclists, and transit help to reduce the number of personal motor vehicles circulating, reducing emissions and air pollution.

Water Management

Incorporating green infrastructure strategies and local plant species within streets helps manage stormwater and reduces irrigation needs. See 7: *Utilities and Infrastructure.*

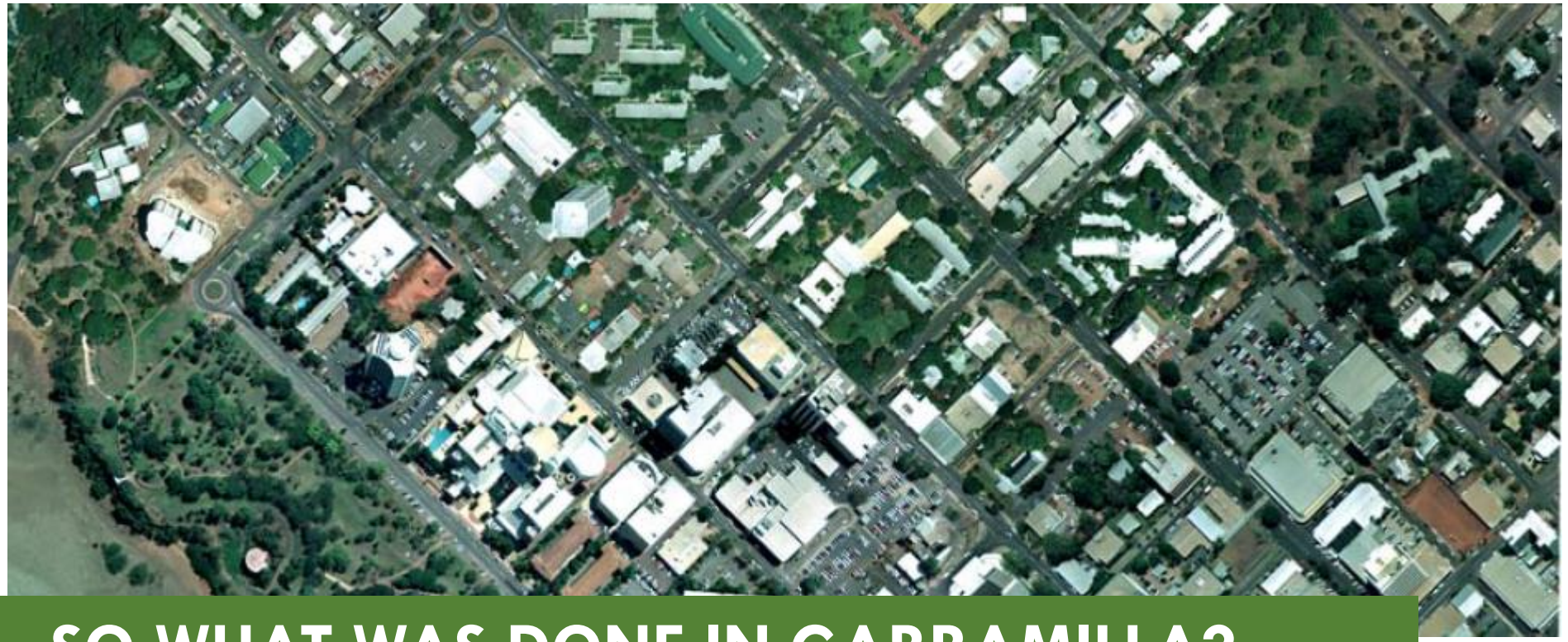
Health and Safety

Urban trees and vegetation help decrease stress and aggressive behavior in cities[16] and have been linked to crime reduction.[17]

Energy Efficiency

Street projects can contribute to improving a city's energy and resource efficiency by using recycled and low-impact materials and technologies as well as renewable energies.

The key drivers – economy & environment



SO WHAT WAS DONE IN GARRAMILLA?

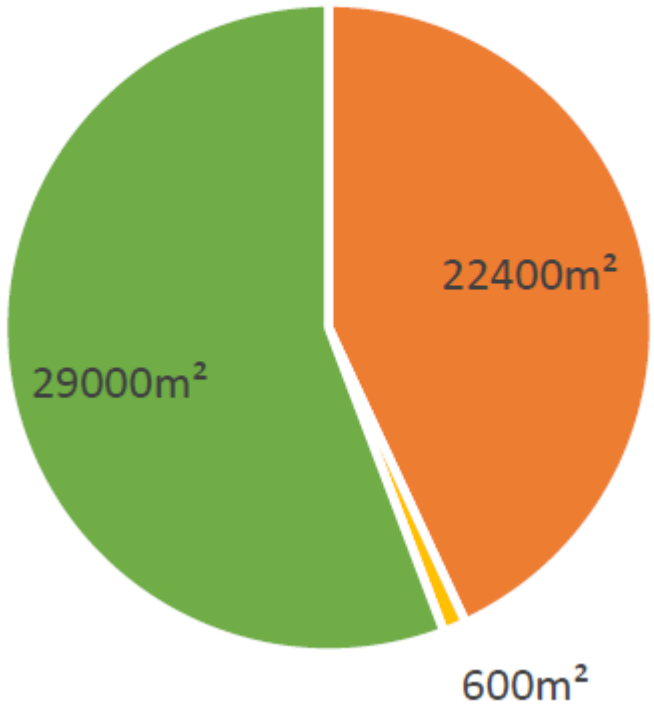
2015

2019

- Mixed transport
- Extensive landscape
- Shade & comfort
- Environmental services

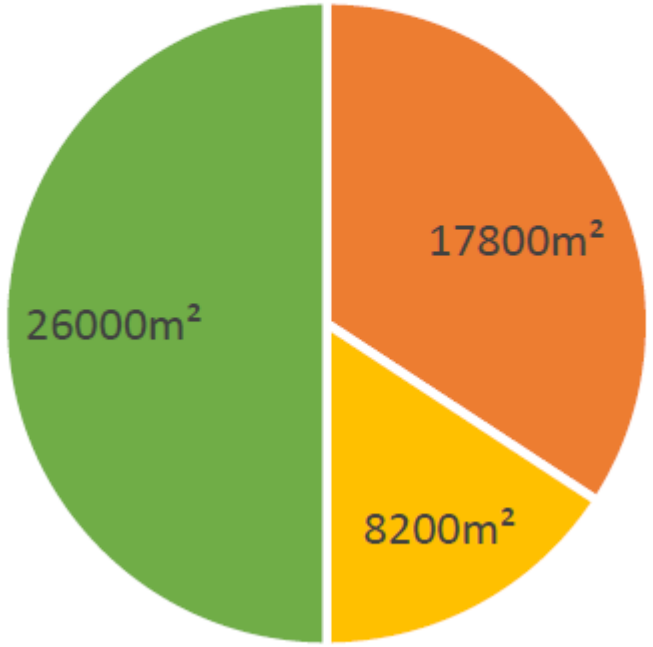
Garramilla - A Green Street

Before (2015)



- Road Pavements/ parking/ bare surfaces
- Provision for Pedestrians and Cyclists
- Landscape

After (2019)

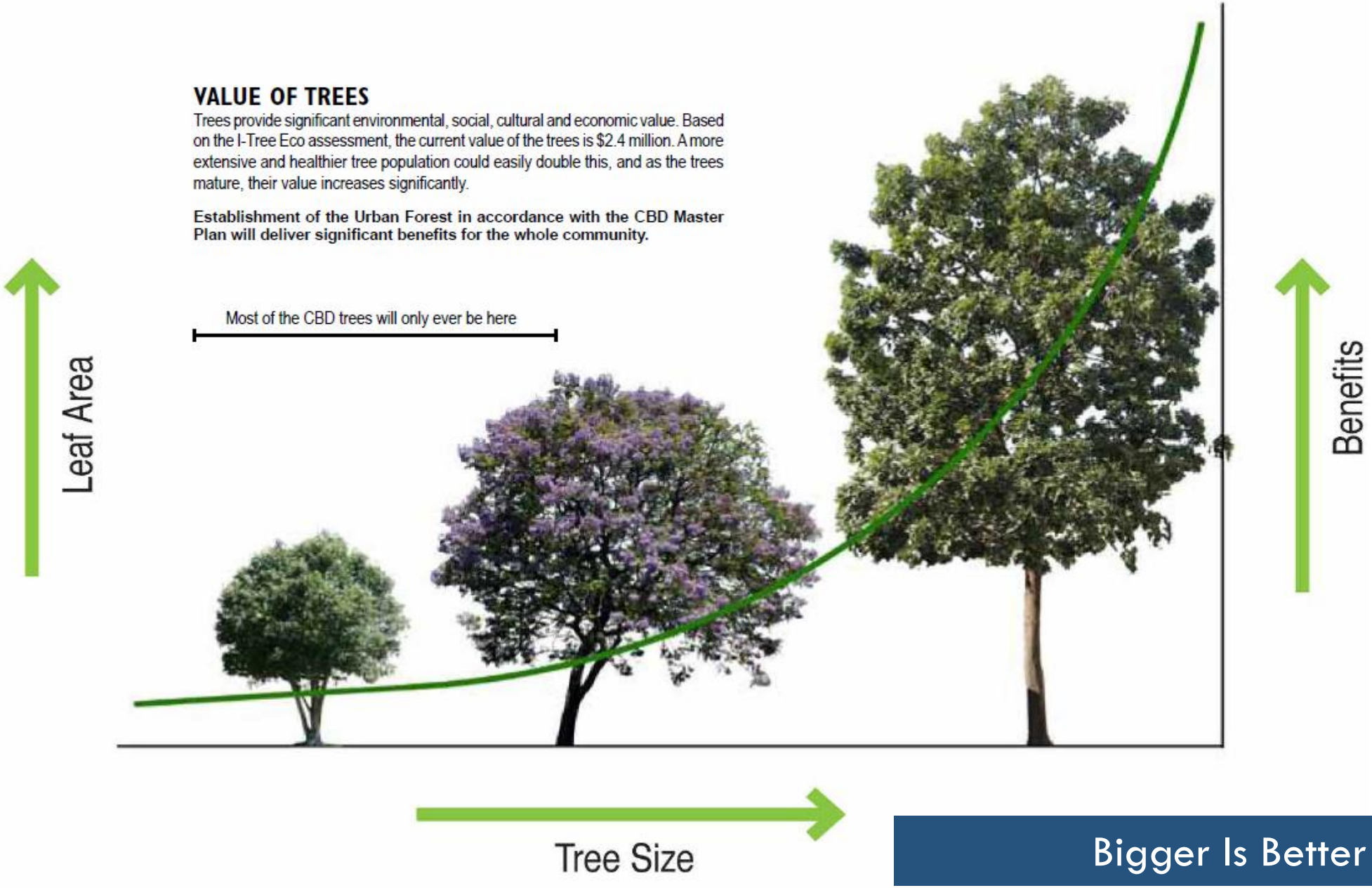


Garramilla – in figures

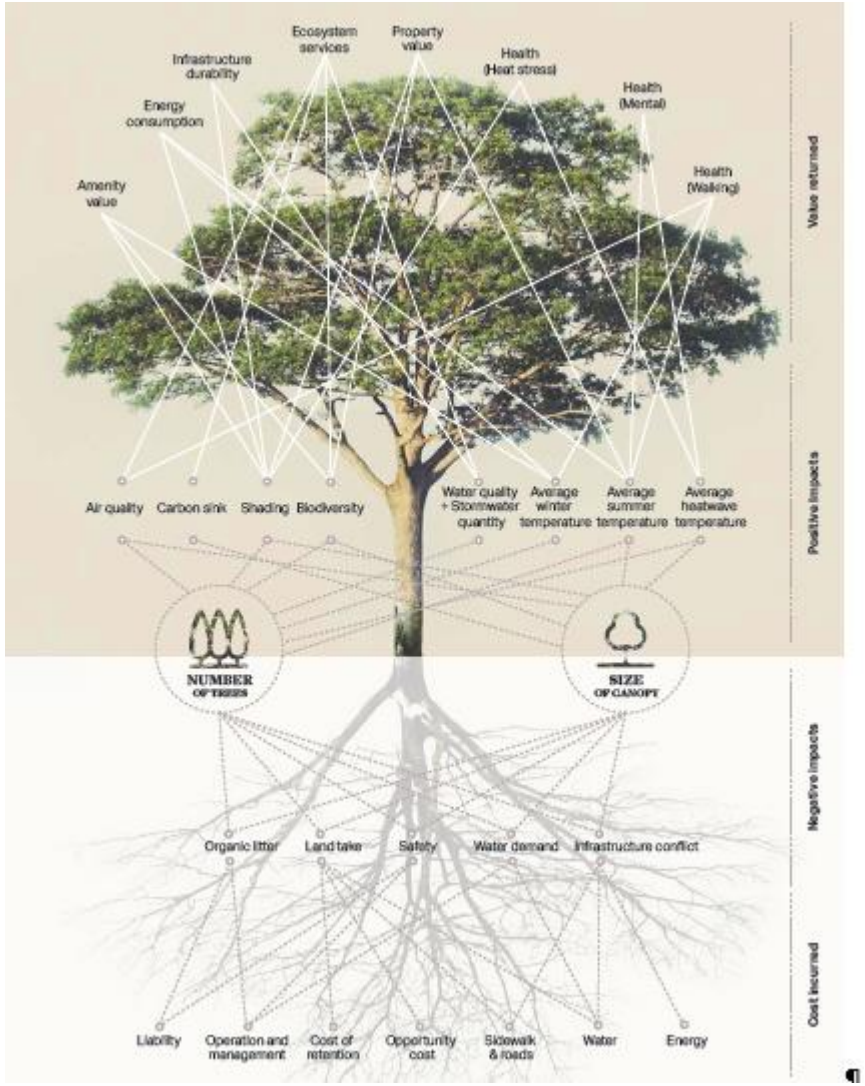
VALUE OF TREES

Trees provide significant environmental, social, cultural and economic value. Based on the I-Tree Eco assessment, the current value of the trees is $2.4 million. A more extensive and healthier tree population could easily double this, and as the trees mature, their value increases significantly.

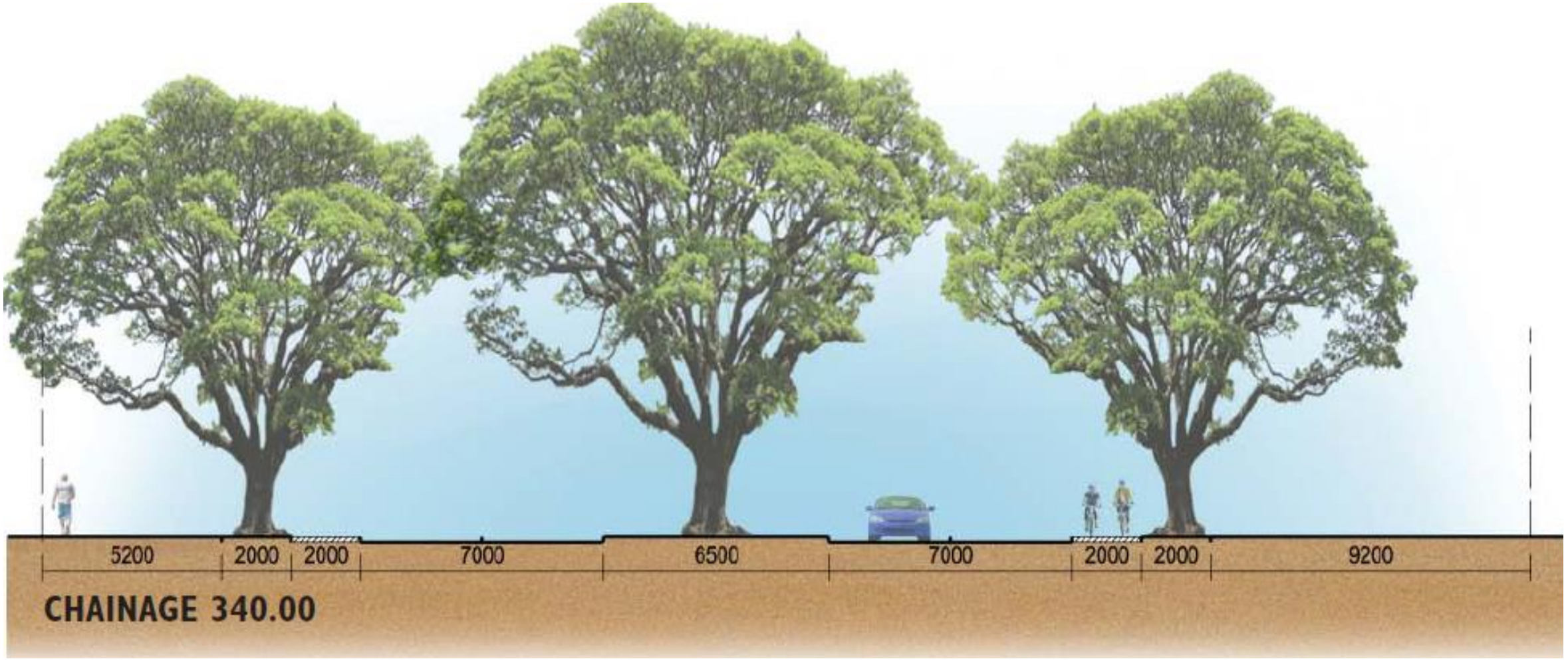
Establishment of the Urban Forest in accordance with the CBD Master Plan will deliver significant benefits for the whole community.



Bigger Is Better



Multiple benefits & value



- Space for other transport modes
- Space for landscape
- Volume for trees – above & below ground

Rethinking how we allocate space

Soil volume (m3)

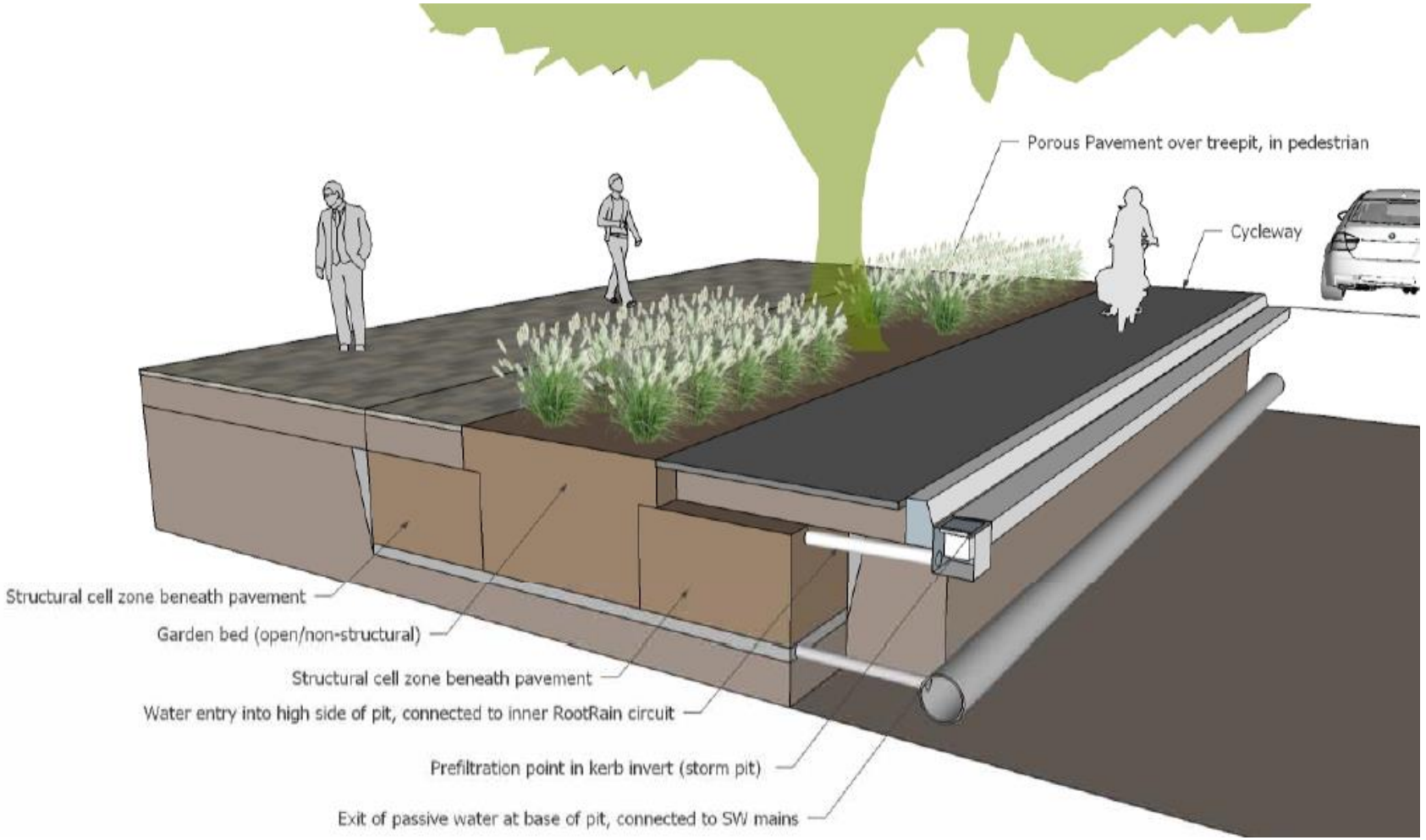
- Tree Height (m) x DBH (mm)/ 100
- Canopy spread (m2) x 0.6m
- Large tree 50 – 80m3
- Medium tree 20 – 40m3
- Small tree 5 -15m3

How much soil?

What trees need to thrive

- Soil volume & nutrients
- Air & water
- Drainage
- Protection of services

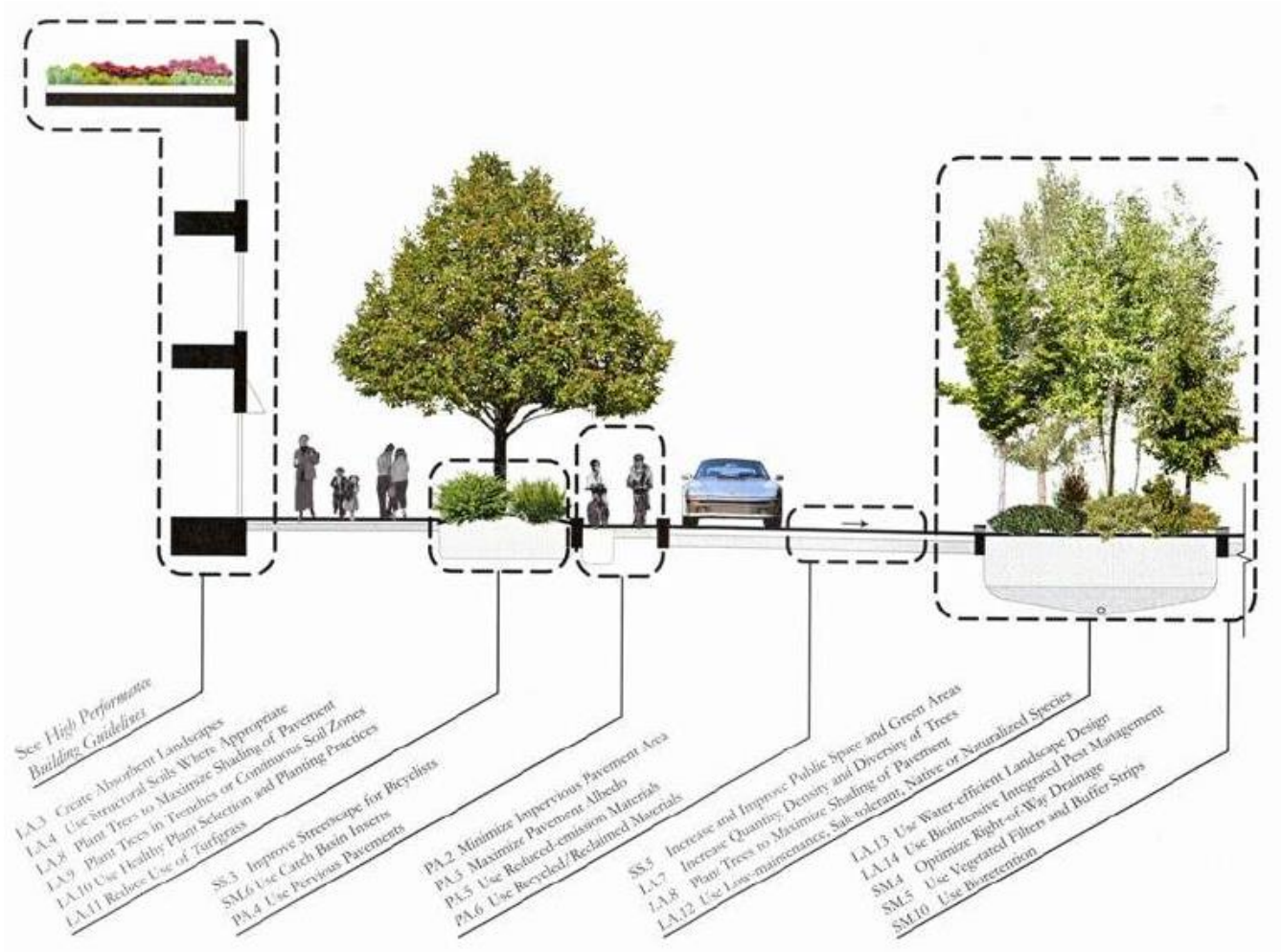
Innovation – new products



Water

- Absorbing – 50% of corridor
- Harvesting – 9% of corridor
- Conserving – unirrigated landscape 60%

Maximising & Valuing Water



Natural Systems Approach

- Integrated design
- Water, carbon, nutrient cycles
- Soil health
- Regenerative horticultural practice
- Drought hardy natives

Lessons Learnt & Further Innovation

Prioritizing People in Street Designs

The Global Street Design Guide has been designed to inspire leaders, inform practitioners, and empower communities to design streets that put people first.

Designing Streets for People

Use the icon tabs in chapter 6 to find the design guidance for specific users. Identify these users across the guide using these icons and their respective colors.

- Pedestrians
- Cyclists
- Transit Riders
- Motorists
- Freight Operators and Service Providers
- People doing Business

Safety Considerations
- Slower speeds
- Shift priorities

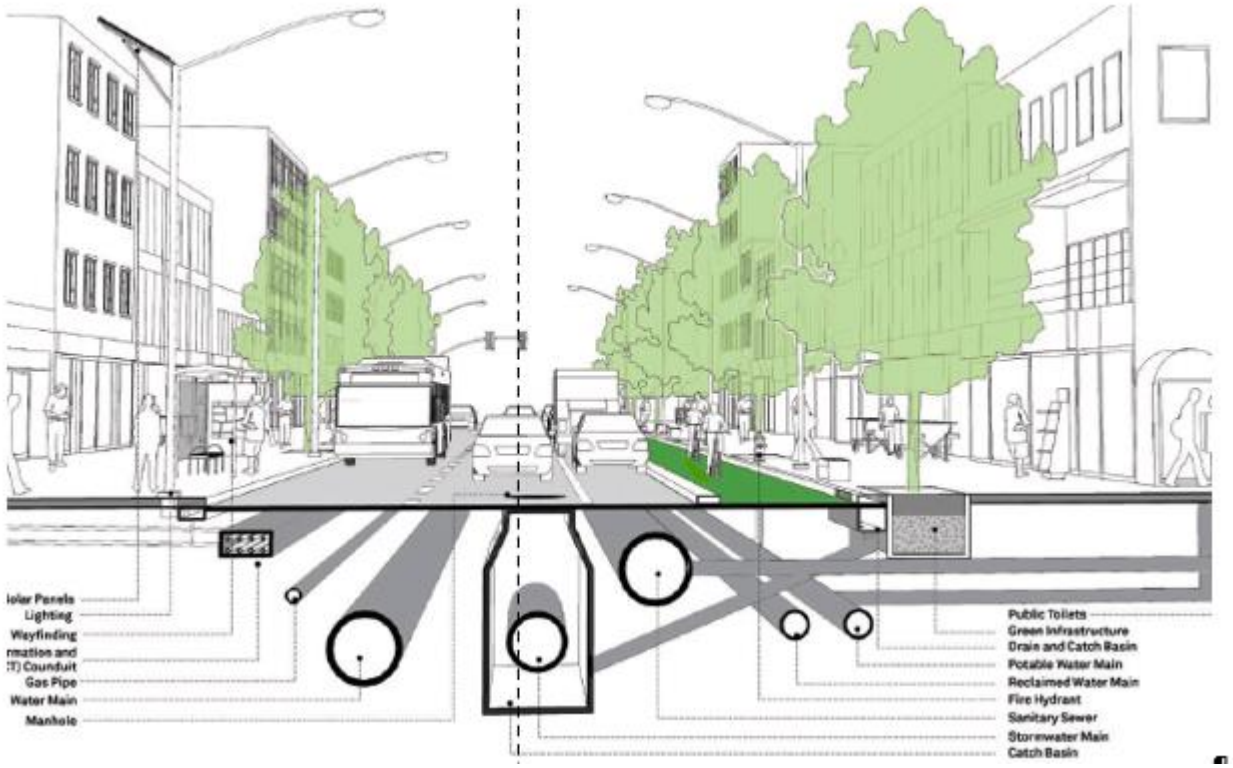
Space Considerations
- Narrow lanes
- Transit lanes

Material Considerations
- Recycled materials
- Cool pavements

Road Pavements & Transport

Retrofitting is more difficult

- Services
- Space
- Competing demands
- Established patterns



the challenges in our urban environment....

Cool Streets

- More space for trees & continuous canopy
- Engage with residents – value & importance
- Absorbent landscapes – a big sponge
- Reduced pavements & cool treatments

And what of our suburban streets?

GARRAMILLA BOULEVARD - IN NUMBERS				
	Before	%	After	%
Road Corridor Total Area	52,000m²	100	52,000m²	100
Road Pavements/ parking/ bare surfaces	22,400m²	43%	17,800m²	34%
Provision for Pedestrians and Cyclists	600m²	1.20%	8,200m²	16%
Length of Path	240m		2,700m	
Landscape - Total	29,000m²	56%	26,000m²	50%
Irrigated garden			4,000m²	15.40%
Unirrigated garden			7,600m²	29.20%
Irrigated grass			7,000m²	26.90%
Unirrigated grass			7,400m²	28.50%
Trees - Total Number			270	
Tree Canopy Cover	8,400m²	16.00%	22,000m²	42.30%
ROAD PAVEMENTS SHADED WHEN TREES REACH MATURITY (15 - 20 YEARS)				
Early morning			13,350m²	75%
Midday			9,800m²	55%
Late afternoon			13,350m²	75%
SHARED PATHS SHADED WHEN TREES REACH MATURITY (15 - 20 YEARS)				
Early morning			6,800m²	83%
Midday			7,500m²	91%
Late afternoon			7,100m²	87%

Garramilla – A Green Street

Continual improvement