

# HOW TO GROW AN URBAN FOREST

*A ten-step guide to help councils save money, time and share practical knowledge.*



# CONTRIBUTORS & ACKNOWLEDGEMENTS

Like the 2020 Vision, this resource is made possible by generosity of time and the spirit of collaboration.

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# CONTENTS

|                                | <i>Page</i> |
|--------------------------------|-------------|
| <b>INTRODUCTION</b> .....      | <b>04</b>   |
| <b>STEP 1</b> .....            | <b>13</b>   |
| <b>STEP 2</b> .....            | <b>21</b>   |
| <b>STEP 3</b> .....            | <b>27</b>   |
| <b>STEP 4</b> .....            | <b>33</b>   |
| <b>STEP 5</b> .....            | <b>37</b>   |
| <b>STEP 6</b> .....            | <b>51</b>   |
| <b>STEP 7</b> .....            | <b>57</b>   |
| <b>STEP 8</b> .....            | <b>63</b>   |
| <b>STEP 9</b> .....            | <b>71</b>   |
| <b>STEP 10</b> .....           | <b>75</b>   |
| <b>INTERVIEWS</b> .....        | <b>81</b>   |
| <b>BENEFITS OF TREES</b> ..... | <b>94</b>   |



# THE 202020 VISION

*The 202020 Vision is a mass collaboration of organisations working together to create 20% more green space in our urban areas by 2020.*

To achieve this we bring industry, business, NGOs, government, academia and individuals together and provide them with the tools, resources and networks necessary to achieve a shared goal.

The 202020 Vision was created in 2013 by Nursery & Garden Industry Australia and Horticulture Innovation Australia Ltd. It has since grown into Australia's biggest network of green space experts, creators and supporters.

The network has grown to include more than 250 organisational partners, 1,000 individual supporters and 29 strategic experts all working towards one common goal.

## PART OF A BIGGER PLAN



*In 2014 we ran the Growing the Seeds Tour. Its aim was to ask you to help us define the projects that need to happen to make our goal of 20% more and better green space in our urban areas by 2020.*

Through the tour, we connected with more than 500 green space experts and collated in excess of 3,000 ideas and solutions that you told us could create more green space.

We then distilled these draft solutions into *The 202020 Plan*. The plan outlines the 28 most replicable, measurable and scalable solutions that, when realised, will create 20% more and better green space.

Of these solutions, the book in your hands is possibly the most powerful. Simply put, if every urban LGA in Australia were to create an urban forest, then surely 20% more urban green space becomes an achievable reality.

With this in mind, we hope this resource – along with accompanying workshops – will help overcome some of the most common barriers to the creation of more and better green space in urban LGAs, namely:

1. Lack of buy-in from Council
2. Lack of skills and knowledge to make it happen
3. The means by which to access the time and money to make it happen

## IN NUMBERS

**500+**  
green space  
media stories

**250+**  
network partners

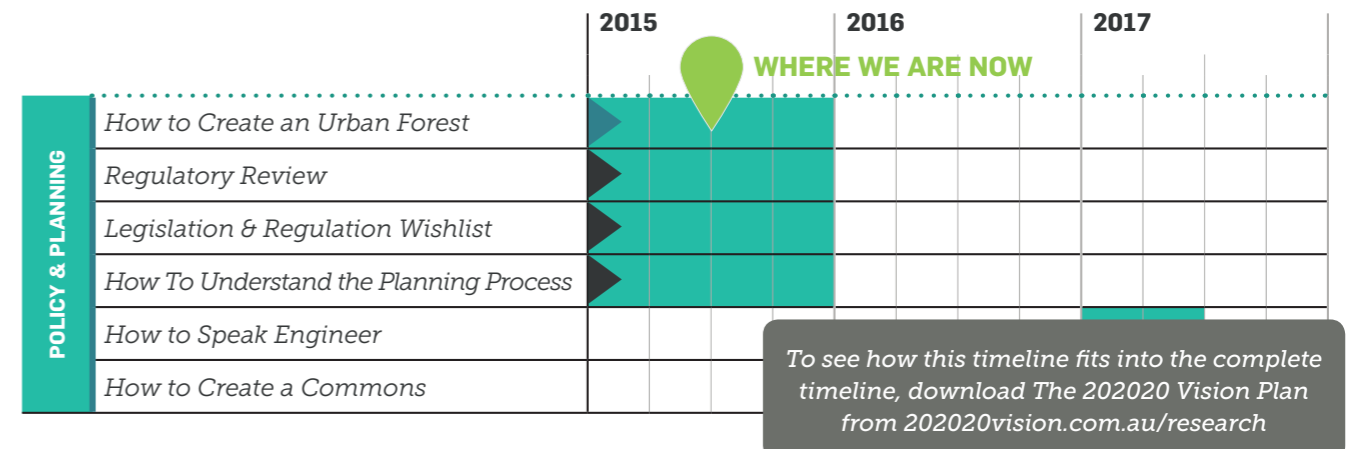
**150+**  
pioneering green space  
projects listed

**29**  
strategic experts

**28M+**  
total media circulation

**1,000+**  
individuals

*\*All figures current at May 2015, and counting!*





# OUR APPROACH

*The City of Melbourne's Urban Forest Strategy is widely considered to be a seminal piece of work in the space. Hence, it has guided this document.*

Nonetheless, it is also important to acknowledge that, when it comes to political context, resource structure and availability, or stage in the process, every council is different.

With this in mind, we have designed this workbook in a way that we hope is accessible at a range of stages – from not knowing where to begin, to dealing with an endorsed strategy that has been stalled or shelved for some reason, to understanding types of measurement tools. We have made sure that there is something in here for everyone.

A council starting from zero may wish to approach it chapter by chapter, while other councils may wish to cut, paste and rearrange as they see fit.

It is also worth noting that this workbook is designed to be part of a bigger conversation.

The 2020 Vision's Living Network is an enormous brain trust. Chances are, if you have a question, our members and the broader green space community have the answer.

So, if you reach a roadblock, please keep in mind we are happy to put you in touch with other Living Network partners who may have experienced some of the challenges you are having and can help you find a way through.

After all, working together is the only way to make great things happen, and indeed, the only way that great things have ever happened.

*Sign up to join the network at [202020vision.com.au](https://202020vision.com.au) or join our LinkedIn group to be part of the conversation.*

## STEPS WE TOOK TO CREATE THIS DOCUMENT:

- 1. Understand.** We worked with City of Melbourne to understand and document the process and methodology that they used to make the city's Urban Forest Strategy a success. We then worked with other councils to understand the different challenges they face and where flexibility is required.
- 2. Condense.** We worked to simplify what is a very detailed piece of work into a process and methodology that can be applied and adapted to most urban councils in Australia, to suit where they are located, their political context and the resources they have available.
- 3. Scale & Replicate.** By providing this information as a free activity-based workbook – and accompanying it with practical face-to-face workshops – we hope to provide the insights, expertise, resources, support and thinking to help you create your own approach to urban forestry that is not only endorsed by your council, but is also able to be implemented in a way that helps achieve more and better green space in your local council area.



# WHAT IS AN URBAN FOREST?

## Definition

Urban forestry, as distinct from arboriculture and horticulture, considers the cumulative benefits of an entire tree population, as well as other urban greenery across a town or city.

An urban forest comprises all trees and other vegetation within the municipality and the soil and water that supports it. It incorporates vegetation in streets, parks, gardens, plazas, campuses, river and creek embankments, wetlands, railway corridors, community gardens, balconies and roofs.<sup>1</sup>

We also encourage councils to consider vegetation on roofs, walls and facades as an important component of an urban forest, and incorporate these elements into thinking when it comes to designing an urban forest strategy to avoid the need for this to be a stand-alone document.

The practice of urban forestry can be described as the science and art of managing trees, forests and natural ecosystems in and around urban communities to maximise the physiological, sociological, economic and aesthetic benefits that trees provide society,<sup>2</sup> as well as habitat and biodiversity provisions.

*"In the 1960s and 70s, Dutch elm disease decimated urban forests in the eastern and midwestern U.S., changing the look of urban and suburban communities forever. From this crisis, the profession of urban forestry was born and has evolved, as researchers and practitioners learn more about the structure and function of trees and their unique role in providing environmental, economic and social benefits in urban areas."*

Planning the Urban Forest, American Planning Association, edited by James C. Schwab.

## What can it achieve?

Urban forests provide critical ecosystem services such as air and water filtration, shade, habitat, oxygen, carbon sequestration and nutrient cycling. The urban forest also provides opportunities for experiencing a connection to nature, something that is often perceived to be missing in the urban areas.

Looking holistically at the urban forest and its associated ecosystem services allows for consideration of the broader issues of climate change, the urban heat island effect and population growth that affect and can be influenced by an urban forest.

*The benefits of urban forests span environmental, economic, cultural and political domains.*

Urban forests have been around for generations, often valued chiefly for their aesthetic and recreational values. It is only more recently that many of their other ecosystem services, functions and provisions have been identified and quantified.

Many cities around the world are now coming to regard trees and other vegetation as critical components of urban infrastructure. Urban green space can be considered as important to how a city functions as roads or public transport, and particularly vital to the health and wellbeing of communities.

The benefits of urban forests span **environmental, economic, cultural** and **political domains**. These benefits are interrelated, with each cumulatively feeding into the creation of more resilient and sustainable urban communities. Details of some of these benefits can be found on pages 22 and 94.

Given the pressure on governments to plan for greater populations, increased urban density and climate change adaptation, there is a clear opportunity to communicate the importance of urban forests in creating resilient, sustainable cities that improve community health and provide enjoyable places for people to live and work. Some of the major benefits that support essential services are explored in this section.

## The benefits of urban forests

The urban forest is essentially the 'engine room' for urban ecosystems. The urban forest takes in water, nutrients and carbon dioxide and processes them through photosynthesis and transpiration, transforming them into the valuable environmental outputs of clean air, oxygen, shade and habitat. Broad calculations suggest that larger mature trees provide 75 per cent more environmental benefits than smaller trees. In the 2014 **Growing Green Guide**, significant work has also been done to explore the extent to which vegetation on green roofs, walls and facades play in reducing the heat and thereby energy consumption of buildings.<sup>1</sup>

## Why do you need one?

While there are many overarching benefits that can be derived from Urban Forests, what really matters is being able to clearly link these benefits with your own specific context and the types of challenges councils face. This is the stage where you could review your council's strategies, vision, mission and values, as well as your biophysical and socio-economic context, to identify what's important for your specific context.

Many of these benefits are referred to as 'Ecosystem Services', where an environmental output of green infrastructure (for example, air filtration, or cooling streets) is given a monetary value based on how much it would cost to create and operate a mechanical equivalent.<sup>2</sup> Please refer to the appendix for a helpful list of some of the many benefits of plants and trees.

<sup>1</sup> Department of Environment & Primary Industries, Growing Green Guide: A guide to green roofs, walls and facades in Melbourne & Victoria, February 2014.

<sup>2</sup> Costanza R, d'Arge R, De Groot R, Farber S, Grasso M, Hannon B, Limburg K, Naeem S, O'Neill RV, Paruelo J, Raskin RG, Sutton P and Vandenbelt M (1997). 'The value of the world's ecosystem services and natural capital', Nature 387:253-260.



# THE TEN STEPS

START AT THE START

PRESENT YOUR 'WHY?'

KNOW YOUR DATA

DEFINE YOUR VISIONS, GOALS & OBJECTIVES

THE FINAL CHECKLIST

1

3

5

7

9

2

4

6

8

10

IDENTIFY YOUR DRIVERS, BENEFITS AND BARRIERS

ASSESS YOUR ASSETS

TRANSLATE YOUR DATA

ENGAGE YOUR COMMUNITY

PRIORITISE AND CREATE YOUR IMPLEMENTATION PLAN







## STEP ONE

# START AT THE START

*Context is everything, so it's important to understand your own.*

What kind of council are you – inner, middle, outer urban or regional? Is your development context established or emerging? Is development occurring at a slow or rapid pace? What are the dominant characteristics of your neighbourhoods, built form and street typologies? What factors comprise the dominant perception of your municipality – history, heritage, greenfields, traffic congestions, families, commuters, climate, soil type, water availability etc?

What is the socioeconomic profile of your residential population? Where does your council sit on the political spectrum? Is your council risk averse or innovation led? What are the key risks and issues that influence decisions for your leaders? What are your community priorities and concerns? Does your organisation have any partners, champions or scope for collaboration?

These are all very important questions and this step is all about focus and preparation.



## 1. Gather your documents

**To get the most from this workbook we recommend you begin by gathering the following:**

- Your council's vision, mission & values statement
- Your council's strategic plan or Municipal Strategic Statement
- Most recent annual report & budget
- Open space plans – these are likely to be referenced in your Annual Report
- Infrastructure Strategies & Reports
- Infrastructure maintenance plans
- Any existing street tree management plans

*By collecting some of your council's plans and documents, you should start to gather a sense of the strategic priorities they have, what they consider to be challenges and what they aspire to. As you continue throughout this process, keep coming back to these words and documents to ensure your urban forest objectives support and align with council aspirations.*

## 2. Talk to the right people

Throughout this workbook we include tips to help identify and prioritise key stakeholders, as well as how the 2020 Vision team can assist you and your council.

Sometimes the biggest roadblocks presented are from within council, at other times resistance can be felt from community or business or developers. Whichever the case may be for you, it's important to anticipate and engage with these potential forces as early in the process as possible.

**Some good people to begin talking to within council are:**

ARBORISTS AND HORTICULTURALISTS

PARKS AND RECREATION PLANNERS

PARKS SERVICES & MAINTENANCE TEAMS

THE COMMUNICATIONS TEAM

SUSTAINABILITY/ENVIRONMENT TEAM

**You might also find some potential allies among:**

- Your local government association
- State Government departments
- Local indigenous groups
- Landcare, 'friends of' and other bushland conservation groups
- Carbon abatement or revegetation groups like Greenfleet
- Emergency services
- Road services
- Community gardeners
- Schools
- Bushwalking/outdoor recreation groups
- Significant tree registries
- Your neighbouring council colleagues
- Other council departments such as community development, health and social welfare, and the risk management team.

*It's good to start thinking about who are your allies and potential road blockers from the beginning so that you can best anticipate how to bring them all along with you.*





## WHERE ARE YOU ON THE JOURNEY?

*Thinking about where you are and what you're dealing with from the outset will help avoid a lot of unnecessary pain down the track.*



### LAGGARD:

You're a bit behind, right? It's likely that there is little interest in increasing plants and tree numbers in your council. In fact, it may even be the case that your residents don't like trees or are afraid of them.

You probably have little idea about your tree population and are unaware of the benefits they can provide.

At this stage, it's probably a good idea to focus on what the potential benefits of plants and trees are and begin to identify some potential drivers – luckily, you've come to the right place!

#### *How we can help:*

We can help you to promote the benefits of green space among the community and councils and help make the business case for more plants and trees.

### LEANER:

Generally there is a feeling among your council that plants and trees are good, although you probably aren't at the point of being able to clearly identify a specific driver as to why you need to invest in your tree population and its future planning.

It's likely that your resources are almost non-existent, access to the right kind of information is limited and you're looking for somewhere to start.

#### *How we can help:*

We can help you get started (from the beginning) and help make the case for why you should get some budget.

### LEARNER:

You know the drivers for more trees and better green space and have a strategic management position for your municipality. You've done some research and found out what other councils are doing and you may have consulted with other councils.

Your challenges are likely to revolve around harnessing available information, making the business case and creating an authorising environment to allow you to develop a strategy and seek council endorsement.

#### *How we can help:*

Help you avoid wasting time and money, help clarify targets and put you on a simple and tried-and-tested path.

### LEADER:

You are onto it! Your council understands the value and benefits of the urban forest. You have begun the process of developing your Urban Forest Strategy, you have support from management, budget has been allocated and you are ready to go.

#### *How can we help?*

Provide support to guide you on your way to engaging with your community, help streamline processes, save you money, help broaden your networks and ultimately help you achieve a firm commitment from council to support the implementation of the strategy once endorsed.







3. Circle where your council is on the urban forest spectrum



4. Now mark with an 'x' where you hope to be in five years time.

## STEP TWO

# IDENTIFY YOUR DRIVERS, BENEFITS AND BARRIERS

*On page nine we talked briefly about the benefits of urban forests. While the broad benefits of plants and trees such as cooling, air filtration, biodiversity and amenity may seem self-evident, it's important to specify exactly what they are and tie these to specific council priorities, drivers and barriers.*

Rather than trying to 'sell' an urban forest strategy or plan as something that delivers purely environmental outcomes, it can make more strategic sense to think broadly and creatively about all of the problems that plants and trees could help solve. The end game is to present more and better green spaces as a very cost-effective, efficient and smart way of solving multiple problems – not creating new ones.

We have listed below just a few of the many benefits that green space provides and encourage you to match some of these to your council's priorities and drivers.



## Economic benefits

Urban forest benefits that can be quantified in dollar terms span a range of industries and disciplines including health, engineering, planning, sustainability, geology, and real estate. Bringing these together to form a solid economic business case for urban forests is a powerful tool for decision makers, as most infrastructure and design decisions are based on economic cost benefit analysis. Some of the economic benefits of an urban forest include:

|  |  |
|--|--|
| <b>REDUCING ENERGY COSTS</b>                               | Restoring our natural systems is often more cost-effective than technological substitutes or building new infrastructure. Major economic benefits come through shading buildings in summer, reducing the need for air conditioning and, in turn, cutting energy costs.   |
| <b>INCREASING PROPERTY VALUES</b>                          | Trees in streets enhance neighbourhood aesthetics and consequently are proven to increase property values. It is estimated that properties in tree-lined streets are valued around 30% higher than those in streets without trees. <sup>1</sup>  |
| <b>AVOIDING COSTS OF INFRASTRUCTURE DAMAGE AND RENEWAL</b> | Urban forests that provide significant canopy coverage improve the lifespan of certain assets, such as asphalt, by shading them from harmful rays – potentially by 30%. <sup>2</sup>   |
| <b>DECREASING HEALTH COSTS</b>                             | Research suggests that a healthy green city helps alleviate the burden on national health systems. While it is difficult to create a direct link and quantify dollar savings, it is likely that urban forests reduce health costs associated with sedentary behaviour, obesity, and mental illness.  |
| <b>MARKETING THE CITY</b>                                  | Green spaces play a role in defining the culture and image of a city. A better image makes a city more competitive, thus expanding its political and economic influence.   |
| <b>NATURE BOOSTS BUSINESS</b>                              | Research has shown that nature can boost the viability of businesses by drawing shoppers into business districts and encouraging them to spend more: US research found that customers prefer shopping in well-tended streets with large trees. The study also found they would pay 9-12% more for goods sold in central business districts with high quality tree canopy, and would travel further to, visit more often, pay more for parking, and stay longer in a shopping district with plenty of trees. <sup>3</sup> |

<sup>1</sup> Sander H., Polansky S., Haight R.G., 2010. The value of urban tree cover: a hedonic property price model in Ramsey and Dakota, Minnesota, USA. *Ecological Economics* 69(8), 1646-4656.

<sup>2</sup> 'Urban Forest Impacts on Carbon, Water and Urban Heat Islands', G McPherson, Centre for Urban Forest Research, USDA Forest Service, 2009.

<sup>3</sup> (Wolf, K.L. (2005). Business district streetscapes, trees and consumer response. *Journal of Forestry*, 103(8): 396-400).

## Environmental benefits

If your council has environmental targets around climate, biodiversity, heat, water or pollution, an urban forest can assist in reaching such goals. Key environmental benefits include:

|  |  |
|--|--|
| <b>PROVIDING SHADE AND COOLING OUR CITIES</b>            | Established research and ongoing studies by the City of Melbourne confirm that the addition of trees and vegetation in the built environment is one of the most effective ways for mitigating the Urban Heat Island effect. Through the natural process of transpiration, trees help reduce day and night time temperatures in cities, especially during summer. Trees provide shade for streets and footpaths and their leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day.   |
| <b>REDUCING STORMWATER FLOWS AND NUTRIENT LOADS</b>      | Tree canopies and root systems reduce stormwater flows and nutrient loads that end up in our waterways. Broad tree canopies intercept and mitigate the impact of heavy rainfalls and healthy tree roots help reduce the nitrogen, phosphorus and heavy metal content in stormwater. Green roofs, facades and rain gardens also play an important role in purifying water and slowing rain flow.  |
| <b>REDUCING AIR POLLUTION AND AIR-BORNE PARTICULATES</b> | <p>The role of urban vegetation is equally vital in ameliorating air pollution and greenhouse gases. Through the process of photosynthesis, trees take up carbon dioxide, nitrous oxides, sulphur dioxide, carbon monoxide and ozone from the atmosphere. They also provide habitat and enhance levels of biodiversity.</p> <p>Although few cities have preserved large areas of natural habitat, a healthy urban forest contributes to biodiversity and provides habitat for a variety of wildlife. Urban forests around the world have been shown to support a wide range of species, even endangered animals and other biological species of high conservation value. By planting and managing different age strata, biodiversity and a wider range of habitats can be enhanced.</p> <p>Through achieving these benefits, the capacity of healthy and well-designed urban forests to contribute to mitigation and adaptation to climate change is broad and well-documented – for more references and research please see the appendix.</p> |
| <b>STORING AND SEQUESTERING CARBON</b>                   | During photosynthesis, trees convert carbon dioxide and water into sugar and oxygen and store carbon within their biomass. Urban trees therefore make an impact in absorbing carbon from the atmosphere.   |

Research has shown that a 20% increase in a city's urban forest canopy can reduce ambient temperatures by 3-4 degrees Celsius.<sup>1</sup>

A study in New York found that its urban forest removed 1,821 metric tonnes of air pollution at an estimated value to society of \$9.3 million annually.<sup>2</sup>

<sup>1</sup> McPherson, 1993.

<sup>2</sup> Nowak, 2002.



## Community benefits

*Urban forests have a large range of positive impacts on the community by forming shared points of orientation within the urban environment and allowing daily interaction with nature. Specific benefits are as follows:*

### PROVIDING A SENSE OF PLACE AND CREATION OF LOCAL IDENTITY

A city's landscape helps define its character in much the same way as architecture or urban design because trees and other vegetation physically define a place. Landscapes are the setting for many everyday recreational opportunities such as organised sport, walking the dog or having a picnic and therefore help forge a sense of connection to place.

### IMPROVING COMMUNITY COHESION

Urban forests and green open space provide the place for major events, festivals and celebrations throughout the city. Events and spaces can bring diverse groups of people together through the provision of a public realm that is available for everyone to enjoy. Green spaces especially play an important role in the integration of minority groups and can assist in the adaptation process of immigrants into their host country.<sup>1</sup>

### ENCOURAGING OUTDOOR ACTIVITY

Well-treed parks, gardens and streets encourage the use of open spaces, which have multiple flow-on health benefits such as reduction in obesity and improvement in general physical and mental wellbeing. In an era where lifestyle-related illnesses are prevalent and 61% of Australian adults are overweight or obese, (obesity costs Australia's healthcare industry \$58 billion in 2008) prevention methods are usually more effective than cures.

### RECONNECTING CHILDREN WITH NATURE

Studies have shown that green spaces provide therapy to children, allow creativity of mind, encourage exploration and adventure, promote physical activity, build resilience and enhance experiential learnings.<sup>2</sup>

### REDUCING PEOPLE'S EXPOSURE TO SUN

Skin cancer and other sun exposure illnesses highlight the importance of protection from sunlight's UV rays. Shade alone can reduce overall exposure to UV radiation by up to 75%.<sup>3</sup> Our urban forest provides the best form of natural shade, with broad canopied street and park trees the most effective.

### REDUCING HEAT-RELATED ILLNESSES

From a public health perspective, the shade provided by large canopied trees during hot summer days helps reduce localised daytime temperatures by up to two degrees Celsius. In Melbourne, on days over 30 degrees Celsius, the risk of heat-related morbidity and mortality for people over 64 years of age and other vulnerable people (the young, and those with pre-existing illnesses) increases significantly. Evidence suggests that buildings with little or no surrounding vegetation are at higher risk of heat-related morbidity.<sup>4</sup>

### IMPROVING MENTAL WELLBEING

The availability of, access to and even the ability to view green spaces and trees has positive effects on people's wellbeing. Many studies have explored the relationships between the amount of green in the landscape and associated levels of wellbeing or depression. In the Netherlands, disease rates, including mental disease, were shown to be of a lower prevalence in areas with higher percentages of green spaces within a 1km radius than those with lower percentages.<sup>5</sup>

<sup>1</sup> Jey et al, 2009.

<sup>4</sup> Department of Health, 2010.

<sup>2</sup> Louv, 2005.

<sup>5</sup> Maas et al, 2009.

<sup>3</sup> (Parsons et al, 1998).

## EXERCISE 2

# DEFINE YOUR DRIVERS, BENEFITS AND BARRIERS

1. First, read your council documents that you collected in Step One.

Now, based on these, tick which you think are your council's top three strategic priorities that can be assisted by creation of an urban forest.

|   |   |   |   |
|---|---|---|---|
| <input type="checkbox"/> CLIMATE CHANGE ADAPTATION & RESILIENCE             | <input type="checkbox"/> POLLUTION            | <input type="checkbox"/> URBAN DEVELOPMENT            | <input type="checkbox"/> COMMUNITY HEALTH |
| <input type="checkbox"/> EXTREME HEAT EVENTS & THE URBAN HEAT ISLAND EFFECT | <input type="checkbox"/> BIODIVERSITY         | <input type="checkbox"/> LIVEABILITY & SENSE OF PLACE | <input type="checkbox"/> ECONOMY & JOBS   |
| <input type="checkbox"/> FLOOD  | <input type="checkbox"/> HERITAGE & HISTORY   | <input type="checkbox"/> TREE REPLACEMENT             | <input type="checkbox"/> _____            |
| <input type="checkbox"/> DROUGHT MANAGEMENT                                 | <input type="checkbox"/> CARBON SEQUESTRATION | <input type="checkbox"/> WATER MANAGEMENT             | <input type="checkbox"/> _____            |
| <input type="checkbox"/> POPULATION GROWTH & DENSIFICATION                  | <input type="checkbox"/> AMENITY & RECREATION | <input type="checkbox"/> PERMEABILITY                 | <input type="checkbox"/> _____            |

2. Now that you know your council's drivers, what do you think are the benefits that will resonate with your council and support these drivers?

|   |  |  |  |
|---|--|--|--|
| <input type="checkbox"/> SHADE & COOLING            | <input type="checkbox"/> IMPROVED COMMUNITY COHESION       | <input type="checkbox"/> LOWER ENERGY COSTS        | <input type="checkbox"/> RECONNECTING CHILDREN WITH NATURE                   |
| <input type="checkbox"/> STORMWATER REDUCTION       | <input type="checkbox"/> ENCOURAGED OUTDOOR ACTIVITY       | <input type="checkbox"/> INCREASED PROPERTY VALUES | <input type="checkbox"/> INCREASING PROPERTY VALUES                          |
| <input type="checkbox"/> FLOOD MITIGATION           | <input type="checkbox"/> REDUCED SUN EXPOSURE/ CANCER RISK | <input type="checkbox"/> INCREASED ASSET LIFESPAN  | <input type="checkbox"/> AVOIDING COSTS OF INFRASTRUCTURE DAMAGE AND RENEWAL |
| <input type="checkbox"/> REDUCTION IN AIR POLLUTION | <input type="checkbox"/> LESS HEAT-RELATED ILLNESS         | <input type="checkbox"/> DECREASED HEALTH COSTS    | <input type="checkbox"/> DECREASING HEALTH COSTS                             |
| <input type="checkbox"/> BETTER SENSE OF PLACE      | <input type="checkbox"/> IMPROVED MENTAL WELLBEING         | <input type="checkbox"/> IMPROVED CITY MARKETING   | <input type="checkbox"/> _____   |
| <input type="checkbox"/> REDUCING ENERGY COSTS      | <input type="checkbox"/> MARKETING THE CITY                | <input type="checkbox"/> NATURE BOOSTS BUSINESS    | <input type="checkbox"/> _____   |



# POTENTIAL BARRIERS

1. Based on the reading of your council's key strategic documents and insights, write down the three primary barriers that could or do prevent the development, endorsement and/or implementation of an urban forest in your local council.

For example, you may have a disinterested and disengaged community, a lack of awareness among senior management, lack of financial resources or other competing high priority issues that your council is tackling.

**MY TOP THREE BARRIERS:**

1.

2.

3.

2. Finally, summarise all the above in the below table. Try to attach benefits to drivers. These start to form a story.

For example, "The benefits of an urban forest would include shade provision and decreased heat. These would help deliver on the council's priority to improve liveability in our LGA. However, to make this happen we need to overcome the barrier caused by a lack of capability in this space."

| DRIVERS  | 1. | 2. | 3. |
|----------|----|----|----|
| BENEFITS |    |    |    |
|          |    |    |    |
|          |    |    |    |
|          |    |    |    |
|          |    |    |    |
| BARRIERS |    |    |    |

STEP THREE

# PRESENT YOUR WHY

In this section we will take the benefits that will resonate most with your council and turn them into a short, sharp narrative. It's as simple as taking the work you did in the previous section and turning it into a story.



## TO CREATE A NARRATIVE

1. **Look back to go forward:** Find historical facts that can develop a compelling narrative about the role of plants and trees in your area. Places to look are your local historical trust, indigenous knowledge, universities, Wikipedia or commission a university history student or senior high school class to do some research on your behalf. It's a lot easier to sell the idea that you are re-establishing the urban forest that existed in the past than creating a new idea.
2. **Speak the language they already know:** Pull out your council's vision and values documents, annual report, strategic plans etc. Highlight the key statements with particular attention to the wording they use and the sentiment that underlies it. Use the same language and turn of phrase in your writing.
3. **Don't call it an urban forest strategy:** In some scenarios it's more appropriate to integrate urban forest principles and actions into other council plans, such as climate adaptation plans, or community wellbeing plans. It may even be the case that you do not call it an 'urban forest strategy' – you may call it a tree management plan, Urban Heat Island strategy, biodiversity strategy or a vegetation management strategy, as some councils have done (for example Tauranga City in New Zealand).
4. **Attach it to your vision:** Make the story a common thread that, at its conclusion, results in the realisation of your vision for your council area.
5. **Speak to the benefits:** In exercise 2 we asked you to write down all of the benefits of plants and trees. Go back and look at these and make sure that these benefits play a large part in the vision.
6. **Make it about people and places:** Assume the people who read your vision don't like trees and plants – so don't talk about them explicitly, instead talk about the ways in which they add to your suburb.

**TIP:** Framing urban forestry as a process of 'regeneration' or 'rehabilitation' by which you're returning what has been lost may appeal to more conservative attitudes. For example...

*"During the 1900s and especially in the lead-up to WWII, Somerville was known primarily for its orchards. Each year, people would travel from Flinders Street in Melbourne to partake in the annual harvest festival where, according to reports, 'Young and old would languish in the shade of the peach and apricot trees, sampling the finest of jams and ciders until the sun went down.'*

*In 1842, Charles La Trobe put forward the vision for Melbourne as a 'Garden City', citing that, 'It is of vital importance to the health of the inhabitants that there should be parks within a distance of the town where they could conveniently take recreation therein after their daily labour.'*

City of Melbourne, Victoria, Urban Forest Strategy

## Some other council's 'why' statements to help you with yours.

### CITY OF MELBOURNE (VIC):

**The first line in the Executive Summary of the City of Melbourne's Urban Forest Strategy is:**

*"At the core of this strategy is a vision to create a resilient, healthy, and diverse forest for the future."*

**It goes on...**

*"The challenges of climate change, resource shortages and rising fuel costs mean that simply investing in new services and facilities will not solve all the emerging issues. We need to be creative, we need to be innovative and we need to lead the charge on making sustainability an innate part of city life."*

### CITY OF PORT PHILLIP (VIC):

**City of Port Phillip's 'Greening Port Phillip' strategy fits quite well with their council vision. Their council vision is based on the following four principles:**

Engaged – A Well-Governed City

Healthy – A Healthy, Creative and Inclusive City

Resilient – A Strong, Innovative and Adaptive City

Vibrant – A Liveable and Connected City

**Their vision for the urban forest reads:**

*"The City of Port Phillip will have a healthy and diverse urban forest that uses innovative greening solutions to enhance the community's daily experience, ensuring environmental, economic, cultural and social sustainability for future generations."*



**CITY OF ADELAIDE (SA):**

*"The Green Infrastructure Project at the Botanic Gardens of South Australia is working together with government, industry and community towards the achievement of our vision: South Australians living in healthy, resilient and beautiful landscapes that sustain and connect people with plants and places."*

**CITY OF BELMONT (WA):**

*"The City of Belmont is home to a diverse and harmonious community, thriving from the opportunities of our unique, riverside city."*

*"The City's Urban Forest Strategy will secure the urban forest as a sustainable asset, which further contributes to the city becoming one of Western Australia's most liveable and desirable inner-city municipalities for current and future generations."*

*"A thriving Urban Forest should be seen as a desirable quality that supports sustainable growth in population, property and industry and therefore the livelihoods, lifestyles and health of the city's diverse communities."*

*"The protection and enhancement of green infrastructure will not only add to the urban liveability of current generations, but sets the precursor for healthy communities for decades to come."*

**CITY OF ARMADALE (WA):**

*"The vision for the City of Armadale Urban Forest Strategy is to strengthen a diverse landscape character through allocating suitable tree diversity, to be proactive in appropriate landscape planning while showcasing the city's botanic heritage and to distinguish an expanding 'tree change' destination from the existing Perth vernacular."*

**CHRISTCHURCH CITY COUNCIL (NEW ZEALAND):**

*"Christchurch has been known as New Zealand's Garden City since 1914. It is a term that is promoted as a fundamental part of Christchurch's image both nationally and internationally."*

*The Garden City identity is enshrined in the Community Outcomes and the Christchurch District Plan.*

*The Christchurch District Plan is a regulatory document and is concerned with the sustainable management of the resources of the City."*

EXERCISE 3

**WRITE YOUR WHY**

*Your 'why' is a nice piece of prose that captures the drivers from Exercise Two.*

*In the box below, write 100-200 words that express the benefits of an urban forest in a way that your council will listen to, remembering to speak about key council drivers and put the most important benefits first.*

A large rectangular box with a light blue border, containing horizontal lines for writing.







# ASSESS YOUR ASSETS

## 1. Tick below which assets are available to you

- A pre-existing strategy that promotes urban forestry – be aware that this may take the form of an open space planning document, liveability document, bushland conservation policies, precinct plans, street tree management plans etc.*

---

- Tree inventory – has your council already documented key characteristics of your trees, including species, location and health?*

---

- Canopy baseline measurement – what's the existing canopy cover in your municipality? This will give you an indication of where to start and will assist you when it comes time to set achievable targets to help preserve or promote more canopy.*

---

- Who is responsible for which parts of land? – Often State Government controls vast tracts, particularly surrounding water bodies, and are on Committees of Management for some reserves.*

---

- Permeability – do your maintenance or engineering teams, or your local Catchment Management Authority have any maps that gauge stormwater surges or drainage issues that arise during weather events?*

---

- The health status of residents – is heart disease, diabetes, obesity or respiratory illness an issue in your area? There may be documentation of this by State health departments or organisations like the Heart Foundation.*

---

- Community attitudes – are there any local conservation, Landcare or community greening groups that are on your side? What about any potential 'blockers', for example developers or people who just really don't like plants and trees?*

---



2. Now tick which council resources are available to you:

- Knowledge** – what type of knowledge and expertise do you have in-house, what consultants may be available to you?

---

- Time** – are there any key dates, timeframes or political cycles you need to bear in mind?

---

- Money** – where are the ‘resources’ in your council, or are any available to you through State Government funding? Instead of thinking of how much it costs, look at where plants and trees can save money, i.e. permeability can reduce flood impacts, more shade means less damage to infrastructure, healthier people mean less stress on the healthcare system, better parks mean more active spaces, and green roofs and facades save building owners money on heating and cooling.

---

- Resources** – what do you need to make this happen within your council? Who are the people you need on your team?

---

*Having undertaken this exercise you will have a good sense of what you have and you’ll be able to begin prioritising what you need.*

## STEP FIVE

# KNOW YOUR DATA

*Data is critically important as it not only helps establish the business case for an urban forest, but can also help predict benefits, orientate your strategy within your organisation and inform benchmarking, ongoing measurement and evaluation.*

Data drives decisions, so it's important to do it well. Data can be quantitative or qualitative and usually both are necessary to paint a full picture of what is happening in your areas – so talking to people and getting quality anecdotes can be just as useful as getting the right numbers.



Beyond simply collecting data, you will also need to think about how you will present it to develop understanding and further your case.

For example, if you have identified that a primary driver for more plants and trees in your municipality is to improve soil quality and prevent erosion, and the main thing preventing this is the prioritisation of parks and lawns maintenance, the data that you present will need to clearly demonstrate how much money can be saved on maintenance, and over what period of time the payback will be.

If your driver is preserving and replacing existing canopy that significantly contributes to the character and charm of a precinct, but the community is resistant to heavy pruning or the removal of unhealthy trees, the data that you collect may need to illustrate future scenarios if no action is taken.

**There are three key things you need data for:**

1. Understanding your context, challenges and opportunities.
2. Communicating an appropriate and relevant business case for your council.
3. Creating a foundation to set goals and benchmark against and then being able to monitor and evaluate the progress of your implementation.

**It also suggests ways in which you can use data to inform:**

- The overarching vision.
- Prioritisation of actions within the implementation phase.
- The mission and milestones – realistic targets and timing for achieving them.
- Ongoing measurement and progress indicators.



Source: City of Ballarat



## THE WHAT'S AVAILABLE TABLE

There's more out there than you think and a lot of it is free.  
This handy table will help you find it.

| WHAT                               | Tree inventory<br>condition, age, species,<br>location, life expectancy  | Canopy mapping   |
|------------------------------------|--|--|
| HOW TO GET IT AND WHO CAN HELP YOU | In-house arborist or a qualified consulting arborist   | <ul style="list-style-type: none"> <li>Consult the i-Tree or the "Where are all the Trees?" report for a free general estimate.</li> <li>Download and use i-Tree Canopy.</li> <li>Hire an arboriculture or GIS consultant to undertake an i-Tree Canopy analysis.</li> <li>If you are looking for precision, then hire a GIS consultant to undertake canopy mapping based on LiDAR data combined with an ortho-rectified aerial photograph.</li> </ul>   |
| WHEN AND WHY                       | This is the most important thing to do, before you do anything else, because it will help you understand the current status of your urban forest.                                    | <p>You can use the free 20V canopy figures if they are available for your area to establish your business case. However note that this figure includes total figures for the private and public realm only.</p> <p>You will need to commission your own canopy mapping if you want to set canopy targets for your strategy and benchmark your progress over the years.</p> <p>You can do this at the outset of your project or mid-way through the development of your strategy.</p> <p>Canopy mapping is very useful for urban forest management and evaluation, so you will almost definitely need to do this at some stage.</p> |
| INPUTS INTO                        | Asset management plans and everything.   | Baseline targets, informs drivers, establishes what your challenges are and helps you prioritise.  |
| COST                               | <b>\$2-\$5 per tree</b> , look at maintenance budgets as it's likely it would be covered here anyway.  | <b>Free-\$50k</b>  |
| LINKS                              | Best Management Practices – Tree Inventories 2013: <a href="http://www.isa-arbor.com/store/product.aspx?ProductID=137">http://www.isa-arbor.com/store/product.aspx?ProductID=137</a> | <a href="http://www.itreetools.org/canopy/">http://www.itreetools.org/canopy/</a>  |

| Social data<br>culture, age, income  | Health and vulnerability   |
|--|--|
| <p>Census data</p> <p>Your research team can help you or contact your State Government.</p>  | DIY for your municipality, obesity data, Monash Report, community indicators etc.  |
| <p>Use this data to better define your context and identify opportunities for creating shared value.</p> <p>This data is nice to have but not 'necessary'. Best time to acquire this information is at the outset of your project.</p> | <p>Use this data to better define your context and identify opportunities for creating shared value.</p> <p>This data is nice to have but not 'necessary'. Best time to acquire this information is at the outset of your project.</p>   |
| Business case – it can also help demonstrate the correlation between lower socio-economic areas and low tree canopy and highlight the best opportunities for improvement.  | Business case.   |
| <b>Free</b>  | <b>Free</b>  |
| <a href="http://www.abs.gov.au/websitedbs/censushome.nsf/home/data">http://www.abs.gov.au/websitedbs/censushome.nsf/home/data</a><br>Council profile ID data via your own council website.   | <a href="http://www.nccarf.edu.au/business/sites/www.nccarf.edu.au/business/files/attached_files_publications/Loughnan-ExtremeHeatEventsinAustralianCapitalCities-HighRes.pdf">http://www.nccarf.edu.au/business/sites/www.nccarf.edu.au/business/files/attached_files_publications/Loughnan-ExtremeHeatEventsinAustralianCapitalCities-HighRes.pdf</a><br><a href="http://www.nccarf.edu.au/publications/spatial-vulnerability-urban-extreme-heat-events">http://www.nccarf.edu.au/publications/spatial-vulnerability-urban-extreme-heat-events</a> |

| WHAT                               | <i>Additional environmental data<br/>soil quality, air quality,<br/>stormwater quality, temperature,<br/>climate change</i>           | <i>Risk</i>  |
|------------------------------------|---|--|
| HOW TO GET IT AND WHO CAN HELP YOU | NDVI, EPA, Internal Quality Reports, BOM, CSIRO or reach out to a local academic, conservationist group or council maintenance teams. | Complaints report, SES and insurance claims forms<br><br>Biodiversity and habitat values.<br><br>Your risk management team can help you. |
| WHEN AND WHY                       | This data will be very beneficial. Acquire it any time.   | This data will be very beneficial. Acquire it at the outset.   |
| INPUTS INTO                        | Business case.  | Business case.   |
| COST                               | Free  | Free   |
| LINKS                              |   | Waterwatch.<br><a href="http://www.environment.nsw.gov.au/waterwatch/">http://www.environment.nsw.gov.au/waterwatch/</a>                 |

| <i>Heat mapping</i>  | <i>Tree selection</i>   |
|--|---|
| <ul style="list-style-type: none"> <li>• Access to satellite images available through Landsat and MODIS for remote thermal sensing you can create heat maps with your GIS person.</li> <li>• Or you can pay for an aerial fly over and thermal image.</li> </ul>   | Seek out local knowledge within council tree maintenance groups, neighbouring councils, landscape architects and the 2020 Vision. |
| <p>Only acquire this data if heat is your driver. It is beneficial to have data that will help you build a business case and define priority areas for tree planting.</p> <p>You can acquire this at any time during your project.</p>   |   |
| <p>You need to make sure that you need this data – it should complement your driver etc.</p> <p>Goals and implementation.</p>  | Implementation plan.  |
| <b>Free - \$70k</b>  |   |
| <a href="http://www.vcccar.org.au/sites/default/files/publications/VCCCAR%20Urban%20Heat%20Island%20Technical%20Report%20-%20WEB.pdf">http://www.vcccar.org.au/sites/default/files/publications/VCCCAR%20Urban%20Heat%20Island%20Technical%20Report%20-%20WEB.pdf</a><br><a href="http://www.vcccar.org.au/sites/default/files/publications/Multiscale%20assessment%20Urban%20heating%20Technical%20Report.pdf">http://www.vcccar.org.au/sites/default/files/publications/Multiscale%20assessment%20Urban%20heating%20Technical%20Report.pdf</a><br><a href="http://landsat.gsfc.nasa.gov/">http://landsat.gsfc.nasa.gov/</a><br><a href="http://modis.gsfc.nasa.gov/">http://modis.gsfc.nasa.gov/</a> |   |



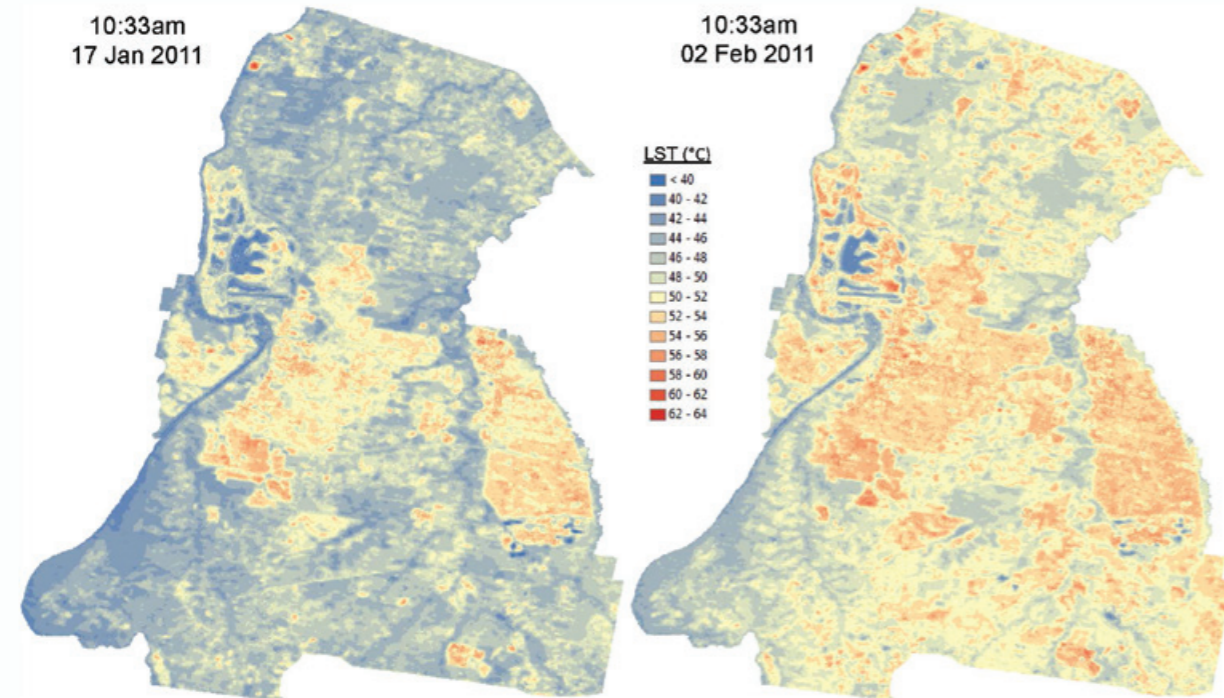
## WHAT ABOUT HEAT MAPPING?

Jen Guice, Senior Sustainability Planner at Penrith City Council.

*Airborne thermal remote sensing is one option for identifying hotspots in your town or city, and it can enable you to identify priority areas for urban forest implementation. Airborne thermal remote sensing provides high-quality and high-resolution (1-5 mb) images of surface temperatures, allowing the identification and analysis of individual landscape elements. But it is an expensive exercise that costs tens of thousands of dollars.*

An alternative is to acquire satellite data for thermal mapping. Current satellite products provide coarser resolution images, but still provide the ability to broadly identify hotspots across your municipality. Landsat is commonly used to map hotspots in cities and provides the highest spatial resolution mapping from space. Landsat ETM+ thermal data is free from the USGS website. GIS officers within council should have the necessary skills to acquire and process Landsat ETM+ data, or could do so with some additional training. This is likely to be simpler than what is required for the acquiring, processing and analysis of the high-resolution, airborne thermal remote sensing.

### Land Surface Temperature



Source: Processed by CSIRO using Landsat 5 TM data derived from Geoscience Australia with pixel resolution of ~25m



- TIP:**
1. In the absence of both thermal data mapping and Landsat, VCCCAR have freely available research that identifies types of areas likely to be urban hotspots; areas that lack vegetation and other shade areas with sealed surfaces and dark-coloured materials like, for example, car parks.
  2. Think about accessing maps of your council's open space network and other land features as a proxy if you can't access thermal mapping.

Judy Bush, University of Melbourne

Source: City of Melbourne



## WHAT ABOUT I-TREE?

Dr Jenni Garden, 2020 Vision Living Network Member, SA.



### What is i-Tree?

*i-Tree is a peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools. These tools are based on the premise that 'urban forest' is equivalent to trees comprising green infrastructure.*

**The i-Tree suite is comprised of six analysis tools and three complimentary utility tools for management, the two categories of tools are:**

1. The Analysis tools: i-Tree Eco; i-Tree Canopy; i-Tree Design; i-Tree Streets; i-Tree Vue; i-Tree Hydro.
2. The Utility tools: i-Tree Storm; i-Tree Species; i-Tree Pest.

**i-Tree tools have varying functionality, some of which overlap, however the key benefits of the tools are that they:**

- Can quantify the structure, environmental services, valuations and support the strategic management of services.
- They are constantly being improved and technical support is offered.
- Using i-Tree does not require specialist GIS skills, but the i-Tree data works well with existing GIS applications like, for example, ArcGIS.

### What does i-Tree do?

i-Tree can complement urban forestry efforts by giving trees a dollar value and helping to benchmark urban forest canopy cover.

### How much does i-Tree cost?

You can access most i-Tree tools for free, however costs are associated with specific data collection.

### Things to be aware of

- i-Tree was developed for use in the U.S. – therefore the models underpinning most tools are based on American data (e.g. tree species, weather, pollution). That said, many of the tools can be applied to an Australian context.
- i-Tree Canopy (used in the National Canopy Benchmarking report) is particularly useful to benchmark canopy cover, however you do need to be aware that the outputs are based on U.S. metrics.
- i-Tree Eco has been adapted specifically for use in Australian cities and offers more detailed analysis and quantification of urban forest structure and cost-benefit.



*"We don't yet have i-Tree in New Zealand, so the way we can measure canopy cover at the moment is to use the physical measurements of the trees. We are currently 90% through an asset validation and condition rating exercise for our urban street trees. We estimate that we have around 62,000. Park trees are validated either while the maintenance contractor is on site or by specific programs which are budget-dependent. We estimate that there around 45,000 park trees (excluding Regional Parks)."*

Shane Moohan, City of Christchurch



## WHERE TO GET DATA FREE CHECKLIST

1. Before spending a cent on consultants, research, tools or subscriptions have you:

- Looked at the 2020 Vision "Where are all the Trees?" i-Tree report?

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- Read other councils' existing strategies and plans?

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- Asked your planning department for any GIS data?

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- Liaised with State Government for any health indicators?

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- Gathered your council's profile.id data?

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- Asked whether your State Government has access to LIDAR data?

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- Been in touch with your local research institution or university? (Often they have an abundance of research papers and/or potential raw data – anything produced in the past three to five years is fine to use.)

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- Been in touch with the Australian Research Infrastructure Network (AURIN)?

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- Taken a look at the 2020 Vision website (research and resources page)?

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- Accessed any census data via the Australian Bureau of Statistics?

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## USING DATA TO CREATE A PICTURE

It's important to think about a much broader audience when conveying all-important numbers and statistics. So when a dataset comes back, it is worthwhile taking the time to explain it and have it interpreted by your design team, turning it into something that is accessible.

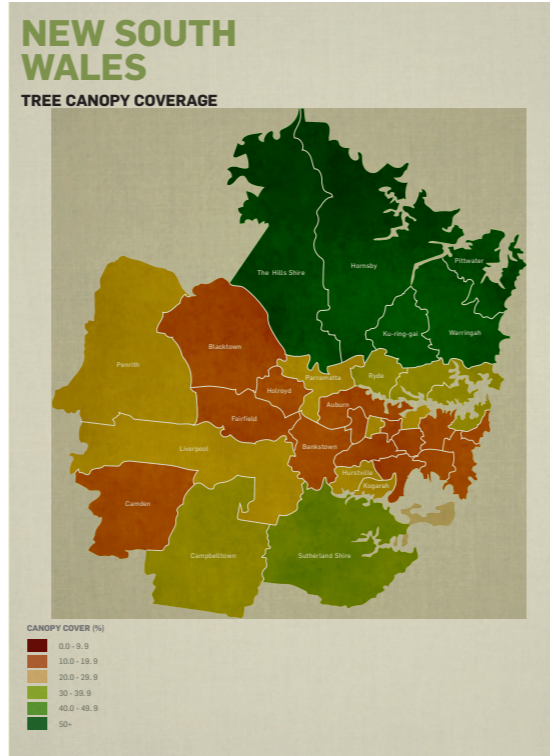
INSTITUTE FOR SUSTAINABLE FUTURES

MAY 2014

Table 4: New South Wales - tabulated i-Tree results sorted by canopy cover (%)

| LGA                            | Percent Cover (%) |      |      |      | Land Cover (km <sup>2</sup> ) |       |      |       |
|--------------------------------|-------------------|------|------|------|-------------------------------|-------|------|-------|
|                                | HS                | T    | S    | G/BG | HS                            | T     | S    | G/BG  |
| Botany Bay, City of            | 55.4              | 12.1 | 2.8  | 29.7 | 12                            | 2.63  | 0.61 | 6.46  |
| Rockdale, City of              | 58.1              | 12.4 | 4.5  | 25   | 16.4                          | 3.51  | 1.27 | 7.07  |
| Randwick, City of              | 45.8              | 14.2 | 9.2  | 30.8 | 16.7                          | 5.17  | 3.35 | 11.2  |
| Sydney, City of                | 69.1              | 15.2 | 2.5  | 13.2 | 18.5                          | 4.07  | 0.67 | 3.54  |
| Auburn City                    | 50.4              | 15.4 | 3.1  | 31.1 | 16.4                          | 5.01  | 1.01 | 10.1  |
| Fairfield, City of             | 35.8              | 16.0 | 4.6  | 43.6 | 36.4                          | 16.3  | 4.69 | 44.4  |
| Marrickville Council           | 63.4              | 16.3 | 4.9  | 15.4 | 10.5                          | 2.7   | 0.81 | 2.55  |
| Camden Council                 | 9.7               | 17.0 | 3.4  | 69.9 | 19.6                          | 34.3  | 6.86 | 141   |
| Holroyd, City of               | 49.4              | 17.0 | 4.7  | 28.9 | 19.9                          | 6.85  | 1.89 | 11.6  |
| Bankstown, City of             | 50.3              | 17.1 | 3.7  | 28.9 | 38.7                          | 13.2  | 2.85 | 22.3  |
| Waverley Council               | 59.1              | 17.1 | 7.0  | 16.8 | 5.48                          | 1.58  | 0.65 | 1.56  |
| Canterbury, City of            | 54.5              | 17.5 | 5.2  | 22.8 | 18.3                          | 5.89  | 1.75 | 7.67  |
| Strathfield, Municipality of   | 52.8              | 18.4 | 3.5  | 25.3 | 7.36                          | 2.56  | 0.49 | 3.53  |
| Blacktown, City of             | 28.3              | 19.2 | 4.9  | 47.6 | 26.3                          | 17.8  | 4.55 | 44.2  |
| Ashfield, Municipality of      | 57.4              | 19.8 | 4.6  | 18.2 | 4.77                          | 1.64  | 0.38 | 1.51  |
| Canada Bay, City of            | 51.6              | 20   | 5.2  | 23.2 | 10.3                          | 3.99  | 1.04 | 4.63  |
| Leichhardt, Municipality of    | 59.8              | 20.3 | 4.7  | 15.2 | 6.32                          | 2.15  | 0.5  | 1.61  |
| Kogarah, City of               | 52.2              | 21   | 6.1  | 20.7 | 8.14                          | 3.27  | 0.95 | 3.23  |
| Burwood Council                | 56.7              | 21.5 | 4.6  | 17.2 | 4.05                          | 1.54  | 0.33 | 1.23  |
| Parramatta, City of            | 43.4              | 23   | 5.9  | 27.7 | 26.7                          | 14.1  | 3.63 | 17    |
| Liverpool, City of             | 16.3              | 23.2 | 9.4  | 51.1 | 49.9                          | 71    | 28.8 | 156.5 |
| Newcastle, City of             | 24.3              | 23.4 | 5.1  | 47.2 | 45.5                          | 43.8  | 9.55 | 88.4  |
| Penrith, City of               | 15.3              | 25   | 5.7  | 54   | 62.1                          | 101.4 | 23.1 | 219.1 |
| Hurstville, City of            | 45.0              | 25.2 | 5.9  | 23.9 | 10.3                          | 5.74  | 1.34 | 5.44  |
| North Sydney Council           | 53.8              | 28.6 | 7.01 | 10.6 | 5.65                          | 3.0   | 0.74 | 1.12  |
| Woolahra, Municipality of      | 48.0              | 30   | 6.7  | 15.3 | 5.91                          | 3.89  | 0.82 | 1.88  |
| Manly Council                  | 39.9              | 31.1 | 11.3 | 17.7 | 5.74                          | 4.48  | 1.63 | 2.55  |
| Mosman, Municipality of        | 47.8              | 32.5 | 9.7  | 10   | 4.15                          | 2.82  | 0.84 | 0.87  |
| Ryde, City of                  | 38.6              | 32.7 | 7.1  | 21.6 | 15.7                          | 13.3  | 2.88 | 8.76  |
| Campbelltown, City of          | 12.0              | 34.2 | 15.3 | 38.5 | 37.6                          | 107   | 47.9 | 120.5 |
| Hunter's Hill, Municipality of | 35.9              | 36.0 | 7.3  | 20.8 | 2.06                          | 2.06  | 0.42 | 1.19  |
| Willoughby, City of            | 42.6              | 37.0 | 7.0  | 13.4 | 3.7                           | 3.21  | 0.61 | 1.16  |
| Lane Cove, Municipality of     | 40.5              | 37.8 | 6.4  | 15.3 | 4.26                          | 3.97  | 0.67 | 1.61  |
| Sutherland Shire               | 13.3              | 42.1 | 21.5 | 23.1 | 44.5                          | 140.8 | 71.9 | 77.3  |
| Ku-ring-gai Council            | 21.5              | 52.1 | 9.2  | 17.2 | 18.4                          | 44.6  | 7.88 | 14.7  |
| The Hills Shire                | 11.6              | 53.7 | 10.8 | 23.8 | 46.7                          | 215.6 | 43.4 | 95.7  |
| Warringah Council              | 19.1              | 56.0 | 9.2  | 13.7 | 11                            | 33.5  | 5.32 | 7.92  |
| Hornsby Shire                  | 8.4               | 59.0 | 12.6 | 20.0 | 38.9                          | 273.4 | 58.4 | 92.7  |
| Pittwater Council              | 14.5              | 59.3 | 11.1 | 15.1 | 13.1                          | 53.7  | 10.1 | 13.7  |

Source: UTS, Institute for Sustainable Futures

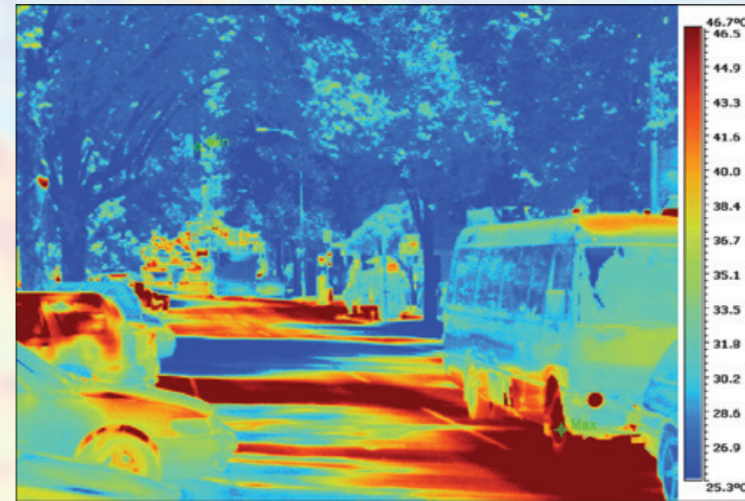


This dataset makes sense to researchers, but what about everyone else?

Here we have turned raw data into an easy to follow map of LGAs. This is much more effective in supporting your case.

**THIS DATASET COMES FROM "WHERE ARE ALL THE TREES":**  
*Australia's first benchmark of canopy cover in Australia's urban and peri-urban LGAs. Download it from [2020vision.com.au](http://2020vision.com.au)*

## Thermal imaging



Most people intuitively know that it is hot in summer, but seeing how hot it becomes on the road outside your house or on top of your own roof is more compelling.

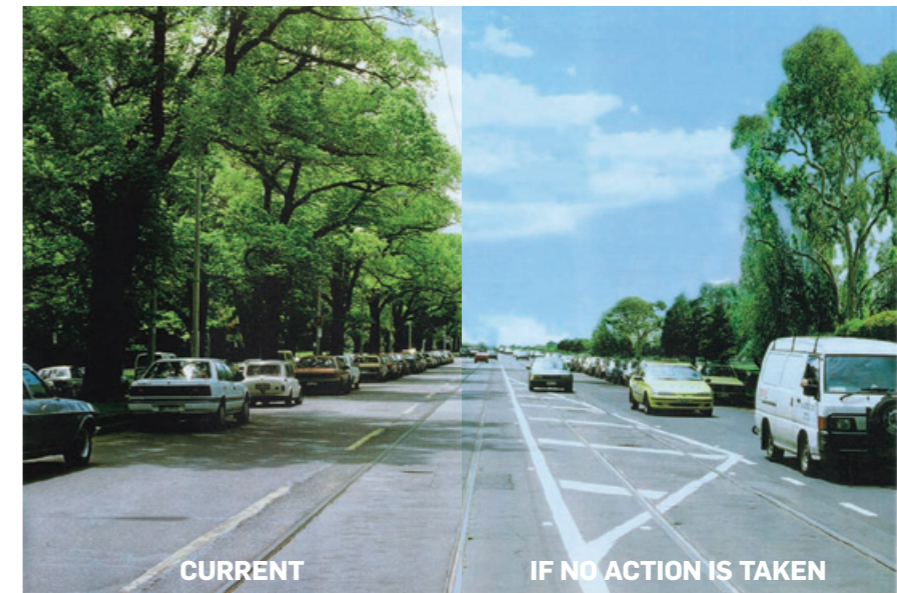
Presenting thermal imaging in a way that overlays the heat affects over time, and onto streets that people are familiar with, is much more convincing than talking about increases in degrees Celsius.

Source: City of Melbourne

## Useful Life Expectancy (ULE) images

Unless people can visualise a future where they can barely recognise an iconic street, they might not understand the need to plant more, and even remove and replace, some trees.

The City of Melbourne used Useful Life Expectancy (ULE) images modelled from an aerial position to show the existing condition of a parkland versus the potential effect if elms were lost. Placing these images side-by-side, more clearly demonstrates what's at risk if (even unpopular) action is not taken to replace or, in some cases, remove trees.



Source: City of Melbourne











## Defining your vision

**The process of defining a shared vision offers an incredible opportunity to engage with stakeholders and the community in a meaningful way.**

1. Write a draft vision. Collaboration is important, but having an idea of where you hope it will land is a good place to start.
2. Get the right people in the room. Those who can help you make your vision happen – or stand in the way if they are not included.
3. Run a co-creation session. See what they come up with. Present yours as an option for improvement and feedback.
4. Tie the vision to the Municipal Strategy or align with other visioning documents so that it is consistent with the big picture for your council and connects to a historical or cultural narrative for your local government area
5. Begin the process of agreeing and formalising how the vision can be enacted as a series of milestones and tangible plans

What does a good vision look like? Here's one that we think does it well.

*"The vision for the City of Armadale's Urban Forest Strategy is to strengthen a diverse landscape character through allocating suitable tree diversity, to be proactive in appropriate landscape planning while showcasing the city's botanic heritage and to distinguish an expanding 'tree change' destination from the existing Perth vernacular."*

City of Armadale, Western Australia, Urban Forestry Strategy, June 2014.

## Creating your objectives and goals

**Different people define goals, targets and objectives slightly differently. For us, objectives are proposed outcomes of realising the vision, while goals are the steps along the way that need to happen to make the vision a reality.**

For example, your objectives might include growing an understanding of green space benefits in your council, while your associated goals might include setting up a cross-discipline working group in the council to write the vision, and oversee the project.

It can be a good idea to cross-reference or adopt objectives and goals from elsewhere in your documents. If investing in an urban forest can help deliver objectives and goals set by other parts of the council, it is more likely to be adopted.

Once you've agreed upon the overarching vision, refer back to your data to decide upon some specific objectives and goals that can be agreed upon by your internal stakeholders.

### To do this you might consider these steps:

1. A follow-up 'how-do-we-do-it?' session to the vision workshop, where a range of possible targets based on your data, drivers and benefits are proposed and agreed upon.
2. Formalising achievable goals and outcomes into precinct plans or embedding these into other council documents.
3. Define your goals as 'achievable', 'ambitious', and 'challenging' to give you a sense of what to tackle when and manage expectations.
4. Build a timeline based on which goals you think can be achieved and when.
5. Agree on accountability measures to ensure that key stakeholders are kept up-to-date on the process.
6. Seek approval for your plan.

### HUME CITY COUNCIL

*Hume City Council has a Street and Tree Reserve Strategy that serves as a plan to implement a vision articulated in the Hume City Plan 2030. The Street and Tree Reserve Strategy quotes the overarching documents and builds upon its vision statement '...welcoming, leafy, picturesque and distinctive rural and urban living environments...'*

*Hume City Council's document is detail-oriented and tactical in its approach.*

*The Hume City Council has utilised the vision from the overarching City Plan document. Their objectives are threefold:*

1. *The community values and respects the city's trees*
2. *The city will have a leafier environment*
3. *Hume is recognised as a leader in urban forest management in local government.*

*For each of these objectives they have identified sub-objectives, and developed a strategy, action and target date for each.*



## Creating your targets and timeline

*Targets are simply about adding numbers to your goals, e.g. when will it happen by? how many people do you want in your steering group? and so on.*

Your timeline is your targets on, well, a timeline – a visual device that can help map out the way forward in simple terms for your stakeholders.

### **TIP:** Setting targets

*Be clear on what the purpose of your target is and how you will measure it. While things like 'changing community sentiment' are obviously important outcomes, if you are unable to measure this change it is meaningless. Targets should consider other council strategies and plans. For example, if your council has an Open Space Strategy with a target of a 20% increase in open space, you might want to reiterate that target in your strategy or build upon it. Some suggested targets may surround:*

- *Increased canopy coverage*
- *Increased diversity in species*
- *Number of trees planted*
- *Average Useful Life Expectancy (ULE)*
- *Increase in number of people using a particular space*

*It often helps to break big missions into smaller, achievable 'chunks' that have specific outcomes attached to them. You will also need to prioritise specific elements of your Urban Forest Strategy into things that you have the power to change directly, or the power to influence indirectly.*

## EXERCISE 7

# DRAFT YOUR VISION, OBJECTIVES, GOALS AND TARGETS

*Your vision should be written collaboratively within your organisation. Still, before you get to that, it's a good idea to try writing one yourself below.*

*Stuck for ideas? Have a quick look back at the work you have done so far for key words. An extension of your 'why' is a great place to start.*

*My draft vision:*

*My draft objectives:*



*My draft goals:*

*My draft targets:*

*My draft timeline:*



STEP EIGHT

# COMMUNITY ENGAGEMENT

***Communities are generally passionate about trees – they either love them or hate them! If you want to implement an Urban Forest Strategy then you need their support.***

While we've put this chapter toward the end, the truth is, the best time to talk to your community is as early as possible in your planning stages and continuing on a regular basis into the future. Don't make the mistake of thinking that you are the 'expert' and therefore will produce the best strategy by yourself.

An Urban Forest Strategy fundamentally shapes, designs and changes urban spaces, so understanding what the community values in urban spaces and working with them to create these is really important. Your community are experts in local issues and, at the end of the day, the Urban Forest Strategy will be implemented in their streets and their parks; if you don't engage meaningfully with them, they are unlikely to support your strategy, no matter how good it is.

True participation results in the community genuinely feeling as though they have played an important role in creating a legacy for their city. To achieve this, transparent and accountable processes are critical.

If you consider the decisions that we make to plant trees, they are 100-year decisions. Those trees are going to grow and outlast us, they're going to develop and contribute to the character of the future city, so why shouldn't the community participate?

Community participation enables you to tap into that local knowledge that you'd otherwise never discover, and it allows you to make better decisions.

## STEPS TO COMMUNITY ENGAGEMENT

**Step 1** *Explore the issue that needs to be resolved and determine who will make the final decision – what is the decision to be made and who is responsible for making it? Discuss this with those who are close to the issue then develop it into a succinct statement that clearly defines the project. Start with ‘This project is all about...’. The effort made at this stage to clearly define your project will simplify all other planning steps.*

**Step 2** *Identify the purpose for engaging – how will community input inform specific project decisions? Be clear about what you want to achieve – your engagement goal and objectives – noting that your engagement objectives will define how you will achieve your goal.*

**Step 3** *Explore the community’s background – history, values, influence and what they care about, then consider how the project fits with these. Think about the impact the project might have, if it is controversial, if there could be anger or outrage, or if there might be constraints that could impact engagement.*

**Step 4** *Determine the negotiable aspects of your project – what is on the table? Use these and your project statement to develop the questions that need to be answered – the key driver for engaging. The response to these questions will feature in your community engagement report, so make sure they’re right. How will you analyse what you hear?*

**Step 5** *Identify communities and stakeholders – who could be interested in, impacted by or could impact on the project. This could include people, groups of people or organisations. Some will be more interested or impacted than others, making them more crucial to your engagement program. Think about how your project could impact on these communities and ensure you shape your program to meet their engagement needs. Make sure you consider internal stakeholders.*

**Step 6** *Determine the level of engagement – is your project something we should inform or consult the community about, or actively seek their participation in (involve/ partner/ collaborate)? The IAP2 Spectrum will help determine the correct level of engagement for each community or stakeholder group.*

**Step 7** *Develop a methodology – This should include face-to-face techniques and online tools (if appropriate) to engage with your communities and stakeholders, using the insight you have from previous steps. Make sure you provide diverse opportunities for people to learn about and provide feedback on your project. Identify how you will close the loop and keep participants informed of the outcomes.*

**Step 8** *Prepare to evaluate – this ensures you know how effective you’ve been and you can improve next time.*

### TIP: Effective community engagement

- You need to provide the community with the tools to understand the topics and ensure that you impart the information for decision making effectively.
- Remember that engagement with the community isn’t just about talking anymore, it’s about actively listening and responding in a meaningful way.
- Make an effort to visit your community members, don’t summon them to the Town Hall unless you are hosting a very large meeting. Go to their local areas, their precinct centres at times that are convenient for them.
- Organise meetings with existing groups that are already interesting or engaged with urban forests, gardening, biodiversity, etc.
- Don’t assume that the usual suspects who turn up to meetings are your only community members! Make an effort to map and reach your community. It is important to include all key groups within your community, including culturally and linguistically diverse communities, such as:
  - Children and schools
  - Indigenous communities
  - People with disabilities
  - Online communities
- Provide multiple platforms to enable the community to participate, such as:
  - Online forums
  - Meetings
  - Workshops
  - Surveys
  - Interviews

**TIP:** *“Having a broad cross section of views, rather than just the usual suspects in the room, meant that the group of citizens becomes self-moderating – letting everyone have a say is really important if you are realistic about moving beyond a ‘consult’ level of engagement.”*

Yvonne Lynch, City of Melbourne



## IAP2'S PUBLIC PARTICIPATION SPECTRUM

*IAP2's Public Participation Spectrum is designed to assist with the selection of the level of participation that defines the public's role in any community engagement program. The Spectrum shows that differing levels of participation are legitimate depending on the goals, timeframes, resources and levels of concern in the decision to be made. However, and most importantly, the Spectrum sets out the promise being made to the public at each participation level."*

International Association for Public Participation, Australasia, The iap2 Public Participation Spectrum, <http://www.iap2.org.au/>

|                    | PUBLIC PARTICIPATION GOAL  | PROMISE TO THE PUBLIC  | increasing<br>impact on<br>the decision |
|--------------------|--|--|---|
| <b>empower</b>     | to place final decision-making process in the hands of the public  | we will implement what you decide  |   |
| <b>collaborate</b> | to partner with the public in each aspect of the decision-making process, including the development of alternatives and the identification of the preferred solution | we will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible                 |   |
| <b>involve</b>     | to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered                    | we will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision |   |
| <b>consult</b>     | to obtain public feedback on analysis, alternatives and/or decisions   | we will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision  |   |
| <b>inform</b>      | to provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions              | we will keep you informed  |   |

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### Other resources that might help:

Queensland:

<http://www.qld.gov.au/web/community-engagement/guides-factsheets/documents/engaging-queenslanders-methods-and-techniques.pdf>

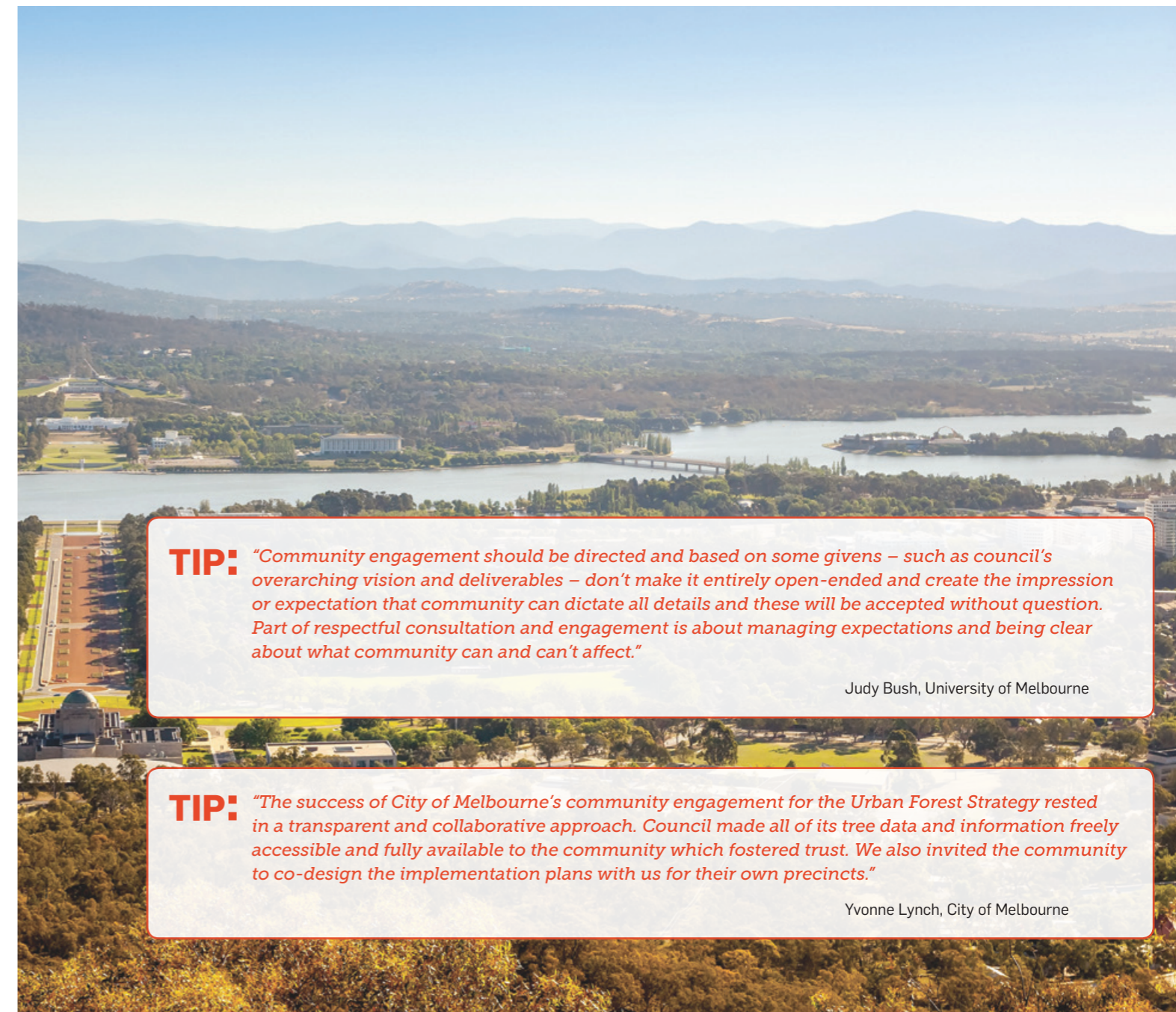
Victoria:

<http://www.dse.vic.gov.au/effective-engagement/introduction-to-engagement/what-is-community-engagement>

## ACT GOVERNMENT

*In 2010 the ACT Office of the Commissioner for Sustainability and the Environment launched an investigation into the ACT Government's tree management practices and the renewal of Canberra's urban forest. Here's what it had to say...*

"In 2009 the ACT Government had begun implementing an 'Urban Tree Program' to create a positive legacy for Canberra's urban forest. Although the principles underpinning the program were robust and took a whole of forest approach, the Commissioner's report highlighted the importance of community several times and recommended strengthening communication and community engagement processes, as well as specifically developing a communication policy and a community engagement tree program."



**TIP:** *"Community engagement should be directed and based on some givens – such as council's overarching vision and deliverables – don't make it entirely open-ended and create the impression or expectation that community can dictate all details and these will be accepted without question. Part of respectful consultation and engagement is about managing expectations and being clear about what community can and can't affect."*

Judy Bush, University of Melbourne

**TIP:** *"The success of City of Melbourne's community engagement for the Urban Forest Strategy rested in a transparent and collaborative approach. Council made all of its tree data and information freely accessible and fully available to the community which fostered trust. We also invited the community to co-design the implementation plans with us for their own precincts."*

Yvonne Lynch, City of Melbourne





**Step 5** *Who are the communities and stakeholders who could be interested in, impacted by or could impact on the project?*

**Step 6** *What is the level of engagement you seek? Information, involvement, partnership or collaboration?*

**Step 7** *What is your engagement methodology? What tools will you use?*

**Step 8** *How will you evaluate your success?*

STEP NINE

# THE FINAL CHECKLIST

*So you now know the lay of the land, a clear sense of what you want to achieve, the tools you'll need to do it and where to get them.*

Having identified the goals and objectives that will help you to achieve your vision and something to benchmark it against, now comes the business of putting it all into play.

To make things happen you will now need:

1. Buy-in
2. Budget
3. Know-how

All of these start with one thing: a pitch to council to get your plan approved.

## Pitching your idea to council

Now comes the time to pitch your idea to council. They will need to endorse development of a strategy prior to you developing the implementation plan.

Different councils have different requirements for this step. You may need to write a business case outlining the issues your council is facing, and how an Urban Forest Strategy will address these. Include a summary of all of the work you've undertaken in the previous steps.

### This could include:

1. Why an Urban Forest Strategy is needed in your council (drivers)
2. How an Urban Forest Strategy will address these issues (benefits)
3. What vision and objectives you hope to achieve and how
4. What data, resources and budget you have or need
5. How will council know you are meeting the objectives (target setting and reporting)
6. What are the next steps (including community consultation and ultimately endorsement)

*In summary, you need to submit a proposal outlining why it's the great idea you know it to be, in a way that makes sense to them. This is where language and drivers from existing council plans are useful and where data comes in handy, particularly if you can show how the plan will address council issues or save them money.*

## EXERCISE 9

# WRITE YOUR FINAL CHECKLIST

Before you pitch to council, make sure you have considered each of the below – or have an idea of how you will deal with them.

### A collective vision

- a. That has been workshopped, agreed to and can involve everyone

### A plan

- a. An articulation of what success actually looks like
- b. How success will be measured
- c. Key milestones identified
- d. A timeline for action
- e. Who does what

### Buy-in

- a. Stakeholder engagement plan
- b. Community engagement plan
- c. Communications plan

### Know-how

- a. A good consultant or research partner to whom you can delegate some aspects
- b. A way of using your data effectively
- c. Realistic and achievable targets
- d. Ways to integrate or link the UFS into other strategic plans i.e. open space plans, asset management plans, maintenance budgets etc.

### Budget

- a. A business case
- b. An idea of opportunity cost
- c. Projected costs and gains

### Effective politics

- a. An understanding of how to work with council and councillors
- b. A good lay of the land as far as internal drivers and interdepartmental collaborators go
- c. A working knowledge of external partners and advocates who can help create demand







## HOW DID THE CITY OF MELBOURNE DO IT?

*To implement the City of Melbourne's Urban Forest Strategy, 10 Urban Forest Precinct Plans were developed to determine how the objectives and targets would be achieved at a local level. Precinct plan consultation included community workshops in each precinct, meetings with community groups and stakeholders and an online consultation using the Participate Melbourne website. Breakfast workshops with up to 100 community members at a time were key parts of the consultation in each precinct.*

The workshops began with an explanation of the principles that should guide the development of the precinct plans (based on the Urban Forest Strategy), followed by a series of exercises that elicited the community's views on the type of landscape they wanted in their area, and what they most valued about existing vegetation and streetscape elements.

### **The principles that underpinned the planning were:**

- increase canopy cover
- increase urban forest diversity
- improve vegetation health
- improve soil moisture and water quality
- improve biodiversity
- inform and consult with the community

The resulting plans are performance based in that they establish the desired outcomes for the streets, but do not prescribe specific species for each location. The precinct plans direct the annual tree planting program and help prioritise works and budgets within each precinct. Implementation of the Urban Forest Strategy is also guided by existing master plans and site specific plans.

*"When it comes to implementation, it's worth looking at the precinct planning approach the City of Melbourne has used. Its success rests on the vision and principles of the main strategy, and working with the community to set out smaller-sized plans for local areas. These plans then direct annual programs of work to implement the overall Urban Forest Strategy."*

Yvonne Lynch, City of Melbourne







2. Now order your to-do list starting with the items in Quadrant 1 and ending with those in Quadrant 4.

|    |    |     |     |
|----|----|-----|-----|
| 1. | 5. | 9.  | 13. |
| 2. | 6. | 10. | 14. |
| 3. | 7. | 11. | 15. |
| 4. | 8. | 12. | 16. |

3. Last of all, put it on a timeline. You can of course combine this with the timeline you created in Exercise 7. Doing so will bring together your goals and targets with your work flows and project planning. Actions and outcomes, what a perfect match!



LEARN FROM THE EXPERTS

# INTERVIEWS



**ALVIN KIRBY***Senior Urban Designer**Office of the City Architect, City of Gold Coast***WHAT IS THE OFFICE OF CITY ARCHITECT RESPONSIBLE FOR?**

Our unit is part of City Planning. We provide a policy, projects and advocacy role for high-quality architecture, urban design and cultural heritage in order to enhance our city's unique character and to make our city a truly liveable and sustainable one.

**SO WHEN THINKING ABOUT THE FUTURE OF THE GOLD COAST'S URBAN FOREST, DOES DENSIFICATION AND THE SIZE OF YOUR LGA POSE SPECIFIC CHALLENGES?**

Yes. Not only does the Gold Coast LGA extend approximately 60km north-south and 30km east-west, but there is great diversity in the landscape. The rate of deforestation in some areas has threatened the koala population.

But through our City Plan 2015 we're working on more positive outcomes for our urban centres so that we can increase density in these areas to capitalise on the light rail and existing transport corridors.

**HOW MUCH OF A FOCUS IS THE URBAN FOREST IN YOUR CITY PLAN 2015?**

Tree-lined boulevards along key streets, consistent and dense canopy cover and green links along transport corridors all feature heavily in our future vision for the Gold Coast's urban centres – these will be vital to transforming urban areas in the coming decades, but will require constant funding.

*"Increased funding and greening programs/projects are required to keep up with the constant clearing and development..."*

Delivering amenity and livability are the key drivers for providing trees and quality open space within our City Plan. However, other programs and policies need to be put in place to ensure that more trees are delivered on the ground to reduce such things as heat island effects particularly in urban environments.

**AT THE IMPLEMENTATION LEVEL, WHAT ARE SOME OF YOUR KEY CONSIDERATIONS?**

Parks and Recreation Services already undertake a lot of planting and maintenance work, but the drivers for species selection are really different depending on the particular requirements of the location.

For example, there has been a lot of work to improve biodiversity within the Gold Coast's bioregional corridors – so selecting native plant species has been a priority in the past, but these species may not be appropriate for urban centres.

Due to our city having utility services above and below ground, it constrains our planting palette to species which don't conflict into their clear zones, such as electricity wires.

Increased funding and greening programs/projects are required to keep up with the constant clearing and development and increasing the urban forest and tree-lined, shady boulevards.

**SO WHAT DRIVES PLANT SPECIES SELECTION IN URBAN AREAS?**

Outside of the bioregional corridors, species are selected with due consideration to:

- Desired tree form and scale to provide ornament, stature and shade to the street and footpaths for pedestrian walkability.
- Suitability to soil and environmental conditions.
- Durability and longevity in a harsh urban environment.
- Whole-of-life asset manageability.
- Trees which have reduced maintenance requirements and do not drop seeds, pods and berries which may increase the chances of trip, slip and falls in areas which are not regularly street swept.
- The extent to which they help mitigate the urban heat island affect.
- Ability to not hinder above and below ground services and infrastructure.

Based on the City of Melbourne's experience, whereby some species were controversially removed, our focus will be to ensure that our species are selected with the above criteria in mind.

*"Strategically, our focus is on taking easy wins on priority streets and then looking to build on success."*

**WHAT ARE SOME OF THE PRACTICAL STEPS YOU ARE TAKING AND METHODS YOU ARE EMPLOYING?**

Strategically, our focus is on taking easy wins on priority streets and then looking to build on success. Some of the ideas under consideration are:

- Commencing with pilot projects in urban centres (e.g. Southport CBD).
- Trialing latest technology to deliver long-term tree solutions (e.g. structural cell systems).
- Publicise progress to celebrate key milestones and build confidence.
- Trialing new species which can tolerate our sub-tropical climate with sandy soils and salt laden winds.

From a technical viewpoint we are considering the use of:

- Sub-surface construction using structural cell systems.
- Techniques to minimise risk of damage to sub-surface services.
- WSUD irrigation solutions including rain/stormwater harvesting.

In terms of data collection and analysis, we are:

- Using GIS platforms to record tree data, health and management, track project progress and report issues
- Developing a digital 3D city model which has the potential to measure tree canopy cover, shade and cooling to mitigate urban heat island effects
- Analysing broader impacts and the value of trees in the urban environment

## STUART POPE, JANELLE ARBON & PAUL SMITH

Adelaide City Council



### WHAT ARE THE KEY DRIVERS FOR URBAN FORESTS IN THE CITY OF ADELAIDE?

Adelaide is in a slightly unique position. It is a metropolitan centre like other cities, but unlike most Adelaide is surrounded by a ring of heritage-listed parklands. While climate change and urban heat island mitigation are key drivers for more and better plants and trees, place activation and improved amenity on streets is also very important. How we connect the parklands into the city, such as providing shade and considering landscape as interactive places.

### DO YOU CURRENTLY HAVE A STAND-ALONE, URBAN FORESTRY DOCUMENT TO ACHIEVE THESE OUTCOMES?

No we don't, but we are working on it. The first document that supports more plants and trees is our Green Infrastructure Guidelines. We have found it useful to work within a planning framework and incorporate the Green Infrastructure Guideline within the broader Adelaide Design Manual, which focuses on works within the public realm.

The Adelaide Design Manual is effectively a toolbox that helps to guide the process and outcomes we want to achieve for the public realm, but what we now need is an overarching strategic approach similar to the City of Melbourne's Urban Forest Strategy – this will allow us to set targets and better influence asset management and capital works programs.

### HOW DO YOU INFLUENCE COUNCIL TO INCORPORATE GREEN INFRASTRUCTURE INTO ASSET AND CAPITAL WORKS PROGRAMS?

Already, as part of our Green Infrastructure Guidelines we are identifying the multiple benefits of green infrastructure. We know that the challenge we need to overcome is to change the traditional 'value' paradigms within asset planning and project management practices. Further work and information is needed to prove these benefits and give them a dollar value to justify the expense – and then communicate these to the city community and council.

### WHAT MEASUREMENT TOOLS ARE YOU EXPLORING TO HELP YOU QUANTIFY AND COMMUNICATE THE BENEFITS OF GREEN INFRASTRUCTURE?

We work closely with external consultants who have good technical experience and who are familiar with GIS mapping and i-Tree tools and methods.

But for us it's about starting simply. The first stage is to benchmark and understand the quantity and variability of our existing plants and trees, tree canopy and other green space. Then once we have a handle on this we will look into quantifying the more complex aspects, like how plants and trees benefit property prices and things like that, which is where a tool like i-Tree Eco could come in.

### WHAT OTHER TACTICAL APPROACHES ARE YOU TAKING TO IMPROVE THE LIKELIHOOD OF COUNCIL ADOPTING AN OVERARCHING AND ENDORSED URBAN FOREST STRATEGY?

We've been proactively talking to and looking for opportunities to collaborate with State Government Departments – especially with the Department of Environment Water and Natural Resources and the work that Dr Sheryn Pitman is doing at the Botanical Gardens of Adelaide. We're also working with service providers like SA Water to overcome barriers to delivery.

We're aware of the need to avoid duplication of work and the need to extrapolate the value of green space, which was highlighted in the Adelaide 2020 Vision Tour workshops in Adelaide.

### WHAT ARE SOME OF THE MAJOR CHALLENGES YOU NEED TO OVERCOME?

One of the biggest challenges for Adelaide is finding the appropriate balance to encourage growth and also focus on green infrastructure approaches in the medium to long-term future while also attracting more business in the short-term and attracting people to the city.

### SO IS RESOURCING ALSO AN ISSUE?

While there is quite a lot of support to invest in green infrastructure, like most councils, investment in green infrastructure competes with other council priorities, some of which have more immediate results – such as new roads or energy efficiency projects.

It looks at assets as single elements and follows very standardised procedures which do not consider their interrelationship with other assets within the city. Therefore part of increasing and improving green infrastructure is about having a larger conversation about how council approaches city design and the systems that are in place to deliver it.

*"We're aware of the need to avoid duplication of work and the need to extrapolate the value of green space..."*

### WHAT ARE COMMUNITY ATTITUDES TO GREEN INFRASTRUCTURE?

In Adelaide the community attitude towards green space largely depends on where they are located. There are some really engaged residents groups who care a lot about green space and preserving heritage and ecology.

We are noticing more resident groups emerging in the populated parts of the city that are being transformed from industrial/commercial to residential areas. These people want more urban greenery and are vocal about overcoming the harshness of these areas.

Dialogue with these groups is important because there is a lot of competition for space in these areas, for example trees compete with underground services, footpaths and parking, but the understanding of these issues by residents is quite sophisticated.

### DO YOU HAVE ANY PRACTICAL ADVICE TO OFFER OTHER COUNCILS?

**Dialogue is key:** We have been focusing a lot of attention on talking to utility service providers, for example we have set up regular meetings with SA Water to understand their priorities in terms of managing sewerage infrastructure and the administration of pipes etc. and how this influences species selection. There has traditionally been limited dialogue with these organisations in the past, so making the effort to talk to them and involving them in projects will ultimately lead to better policy and project outcomes.

We also have regular discussions with other third party service providers.

**Make submissions:** There has recently been a review of the planning system in South Australia. Adelaide City Council made submissions on a range of issues; specifically we recommended more strategic ways of planning and funding green infrastructure.

**Look at open space contributions:** We have encouraged, through the planning review process, how open space contributions can go beyond the provision of just open space to broader incorporation green infrastructure in the public realm.



**JEN GUICE**

*Senior Sustainability Planner  
Penrith City Council*



*Jen Guice is the Senior Sustainability Planner at Penrith City Council. When developing her variation of an Urban Forestry Strategy to address the impacts of the Urban Heat Island Effect, research, a focused approach and talking to people not only saved her time and money, but also helped navigate local politics.*

*Jen shares some of her key insights.*

**WHAT'S THE FIRST STEP YOU TOOK?**

We did not have buckets of money allocated to this project, so before diving in and employing consultants I spent a lot of time researching all different types and variations of green cover, heat and Urban Forestry Strategies [from other councils] paying special attention to heat as this is a key driver at Penrith.

I studied the reference lists attached to each strategy and got in touch with the authors of the work, specifically I asked them:

- What data did you collect?
- What order did you collect your data in?
- Did you collect data internally or externally?
- Did you end up using the data you collected in the strategy or its implementation?
- How much did it cost?

The benefit of conducting these interviews on the phone was that it gave me some great strategic insights into what I could realistically achieve within our budget, but more importantly it gave me an opportunity to begin forming a network of experts I could draw upon as our project progressed.

**SO YOU KNEW YOUR KEY DRIVER WAS HEAT, AND WHAT INFORMATION WAS AVAILABLE; HOW DID YOU DETERMINE THE OBJECTIVE OF YOUR STRATEGY AND HOW TO GET IT THROUGH COUNCIL?**

It was really important to frame our strategy as an implementation program that had very tangible heat reduction results. It was also critical to understand and overlay the City of Penrith's political context on our strategy, demonstrating that we could clearly articulate the benefits it would deliver to the community.

We couldn't just focus on areas that were hot, but [prioritised the] areas that were hot and that had people at risk – all of this relates to tree cover, but by putting it in the context of how heat affects those most vulnerable in the community was important as we felt it would get more leverage than just talking about trees. This also provided an opportunity to bring a social element to our work.

Throughout the process I realised I needed to change the approach we had initially set upon, so that our strategy focused on cooling the city rather than urban forestry or green cover specifically. I developed a matrix outlining options for data by priority from 'nice to have' to 'must have', with the associated outcomes and cost. I was then

able to make some strong recommendations on what a good use of resources would be and what would be delivered as a result of expenditure.

**WHAT WAS THE PROCESS YOU TOOK?**

I was very aware of what the outcome of the strategy needed to be and the potential issues that had to be overcome. Creating an evidence base that was credited to third party experts was really important to give the recommendations credibility.

**In a nutshell the process followed was:**

1. Research.
2. Clearly define the scope.
3. Understand what type of data you need (and what would be nice, but perhaps not crucial).
4. Get data efficiently and cheaply.
5. Have not only the data but also the resources to analyse it.
6. Take a 'snapshot approach'; a whole Local Government Area (LGA) approach is not necessarily required. We focused on five hotspot suburbs that we plan to address.
7. Once we've generated results in five areas we'll be able to gain the leverage we need to roll out a strategy across the whole LGA.

The focus was to demonstrate and prove that there was a problem, pinpoint where the problem was most pronounced, and suggest solutions. Next we hope to demonstrate that the solutions work and then scale them across the city.

**HOW DID YOU SAVE MONEY?**

Having spoken to a range of experts, and working with a tight budget, I knew that it was important to keep the scope narrow and be strategic with spending.

Fortuitously, I connected with Guy Barnett from the CSIRO who provided heat map, free of charge. This saved \$50,000 (our annual budget!) and meant that I was able to allocate research into analysing and interpreting this data instead of just collecting it. The trade-off was that the data wasn't absolutely current, rather three to four years old.

When tendering for consultants, I went to specialist consultants instead of larger companies that would propose things we couldn't afford. Again, I leveraged the network to understand who was most expertly qualified.

I hired two consultants who cost \$5,000 each and kept the scope really narrow so that it was all about interpreting the data. We had an assessment of the LGA to identify top five hotspots – this was done using a combination of the CSIRO heat maps, council Census Data and GIS data – so expertise went toward providing rationale and practical recommendations.

The team at the Institute for Sustainable Futures at University of Technology Sydney (UTS) complemented the analysis work, and specifically targeted one hotspot area and came up with heat reduction methodology and actions that could be implemented at the street level and easily replicated across the LGA.

*“Having spoken to a range of experts, and working with a tight budget I knew that it was important to keep the scope narrow and be strategic with spending.”*



**WHAT DID YOU GO WITHOUT?**

For us things like a tree inventory or comprehensive i-Tree assessment were 'nice to haves' as heat was our main driver and means by which we could increase tree canopy. I also learned that data from 2011 is good enough to provide a useful baseline and it doesn't have to have been collected last week to be relevant and useful.

**WHAT WAS THE MOST VALUABLE THING YOU DID?**

The critical element to our strategy was the satellite imagery from CSIRO. Without the initial research and scoping, which meant reading through the Victorian Centre for Climate Change Adaptation Research (VCCCAR) and the National Climate Change Adaptation Research Facility (NCCARF) papers, and other Urban Forestry Strategy reference lists and literally cold calling the people whose names kept appearing, we never would have gotten those maps.

It takes time to do the research, but it's really valuable to understand what's available and to become a part of a network of experts. Had I neglected the initial scoping we probably would have allocated \$50,000 into imagery and consequently not had the resources to analyse the information.

One of the guiding principles when you have little budget is that things don't have to be perfect, but it can be good enough to get a good understanding of what is going on.

Target small areas and then get bigger. Accept that you can't have everything all at once, but if you can get some quick wins you can build up to other things.

**JEN'S TIPS:**

- Understand your context and tighten your scope.
- Research to find a network of experts and get to know them.
- Overlay social council Census data and GIS data (most councils already have this) with environmental data to make it about people and trees.
- Target small areas and then get bigger.
- Accept that you can't have everything all at once, but if you can get some quick wins you can build up to other things.
- You don't have to create a pure Urban Forest Strategy – that can be overwhelming. Give it a name and a scope that reflects your key drivers.
- Anecdotal information is good enough – talk to your parks people – they will be able to tell you what's going on.
- Engage broadly with other parts of council for example talk to people in traffic, disability access, or cycle ways.

One of the most valuable insights gained from the 202020 Vision Tour and program is that there is plenty of good information available, often at low or no cost, but it's not always easy to access. Here are some good places to begin (more resources can be found on the 202020 Vision website at <http://202020vision.com.au/>).

*"The critical element to our strategy was the satellite imagery from CSIRO."*

**WHERE TO GET DATA FOR FREE:**

- Your State Government may have access to LIDAR data
- Local research institutions and universities often have an abundance of research papers and/or potential raw data. Anything produced in the past three to five years is fine to use
- Australian Research Infrastructure Network (AURIN)
- 202020 Vision website (research and resources page)
- i-Tree (see information as follows)
- Census data

**HEAT MAPPING:**

Airborne thermal remote sensing is one option for identifying hotspots in your town or city, and it can enable you to identify priority areas for urban forest implementation. Airborne thermal remote sensing provides high-quality and high-resolution (1-5 mb) images of surface temperatures, allowing the identification and analysis of individual landscape elements. But it is an expensive exercise that costs tens of thousands of dollars.

An alternative is to acquire satellite data for thermal mapping. Current satellite products provide coarser resolution images, but still provide the ability to broadly identify hotspots across your municipality. Landsat is commonly used to map hotspots in cities and provides the highest spatial resolution mapping from space. Landsat ETM+ thermal data is free from the USGS website. GIS officers within council should have the necessary skills to acquire and process Landsat ETM+ data, or could do so with some additional training. This is likely to be simpler than what is required for the acquiring, processing and analysis of the high-resolution, airborne thermal remote sensing.



**NATALIE REITER**

*City Strategy General Manager  
City of Ballarat*




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**WHAT ARE THE KEY DRIVERS FOR INCREASING URBAN FOREST/ CANOPY COVER IN THE CITY OF BALLARAT?**

Ballarat's history of alluvial mining and agriculture has heavily impacted on its natural values. Particularly related to mining, when the gold rush was on, the biodiversity values of many areas of the municipality were decimated.

Over the past couple of years, Ballarat has been developing its long-term land-use plan for 2040. It started by engaging with the community in our largest ever community conversation, asking: What do you love about Ballarat? What do you imagine for Ballarat? What are the things in Ballarat we need to retain? The results identified strong community values around greenery, our rural identity, value of our existing network of boulevards and strong aspirations for better integration of trees into urban areas.

The key driver for increasing urban forest/canopy cover in Ballarat is therefore responding to the aspirations of the community, for a greener city, which has urban areas which better reflect our identity as a historic but high amenity regional city in a rural location.

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**WHAT WERE SOME OF THE FIRST STEPS YOU TOOK?**

Often, the hardest part of influencing change is getting to the starting line. In Ballarat we first looked to the community for their aspirations and support. In doing so, we got the justification we needed to recognise the value of trees and biodiversity, and the support we needed to embed the urban forest approach in our decision making.

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**IS RESOURCING A CHALLENGE FOR YOU? WHAT ARE SOME OF THE MORE CREATIVE WAYS YOU HAVE DEALT WITH THIS?**

Although ultimately we need detailed individual tree data to properly manage the urban forest over the long-term, at this initial stage it is crucial to deliver a supported, inclusive and integrated Urban Forest Strategy. This will formally set the clear policy direction that Ballarat needs, and is transitioning towards, a greener future.

The long-term land-use strategy to 2040, Today, Tomorrow, Together: The Ballarat Strategy proposes increasing our 17% canopy coverage to an aspirational target of 40% by 2040. Adopting such an aspiration target doesn't need enormous resources, but it is crucial to gathering momentum for change. Broad scale assessments of canopy coverage are already available for many areas of (see [http://2020vision.com.au/media/7141/benchmarking\\_australias\\_urban\\_tree\\_canopy.pdf](http://2020vision.com.au/media/7141/benchmarking_australias_urban_tree_canopy.pdf)) – use what data you already have available, and schedule in a long-term plan to refine it over time.

*“The key driver for increasing urban forest/canopy cover in Ballarat is therefore responding to the aspirations of the community...”*

*“The urban forest concept is about better management on both public and private land, so opportunities for the community to make change on their own properties is also crucial...”*

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**WHAT ROLE DOES COMMUNITY ENGAGEMENT AND OUTREACH PLAY IN ACHIEVING THE VISION FOR YOUR URBAN FOREST?**

It is crucial for the community to understand the benefits to generate the momentum needed for real change. The urban forest concept is about better management on both public and private land, so opportunities for the community to make change on their own properties is also crucial.

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**DO YOU HAVE ANY TIPS OR PIECES OF WISDOM YOU CAN IMPART TO OTHER COUNCILS?**

Start by recognising the values important to your community, their aspirations and vision – and use the concept of the urban forest to bring those elements together. Once explained in those terms, investing time, effort and resources in more trees and biodiversity, and better management of natural values in developed areas, becomes an obvious requirement for any progressive municipality.

Discuss and work across the various levels and departments within council on an agreed approach to achieve urban forestry goals. Success requires buy-in and cooperation from a strategic level to the operational level.



**SHANE MOOHAN**

*City Arborist  
City of Christchurch*



### HOW IS CHRISTCHURCH'S IDENTITY AND VISION FORMALISED INTO A REGULATORY FRAMEWORK?

Christchurch has been known and promoted internationally as New Zealand's Garden City since 1914, which is helpful in terms of building a narrative and identity that supports increased and improved urban forest. It is this identity that has informed and become enshrined in the Community Outcomes and Christchurch District Plan – these are the key strategic documents that determine council's overarching social, economic, environmental and cultural interests for the region.

### THERE IS A RANGE OF DOCUMENTS THAT PROVIDE A REGULATORY FRAMEWORK TO GOVERN URBAN FOREST ACTIVITIES IN CHRISTCHURCH, TELL US A LITTLE ABOUT THEM.

To govern and sustainably manage, lots of documents exist to inform activity at varying council levels and departments, the most notable are The Open Space Strategy, Biodiversity Strategy, Draft Tree Policy, Christchurch City Council Smart Strategy, Draft Citywide Planting Strategy, and the Christchurch City Council Construction Standards.

While some documents are informed by a set of principles and standards and are high reaching, others work at a more granular level. Of note is the evolution of the Draft Tree Policy – which encapsulates elected members vision for the city. Prior to the September 2010 earthquakes, the key driver for planting in Christchurch was to increase amenity. In the first draft review of this document I introduced the concept of planting for environmental, social and economic benefits. Now, I am working to influence current perceptions of these 'benefits' instead as essential services.

Although we have lots of different documents, the key challenge we need to overcome is to create an overarching strategy that ties it all together so that designers, developers and landscape architects don't have to go rummaging through multiple documents and instead just find what they need in one go. We are pursuing this through the The Elected Member Tree Policy Working Party, which is very much in favour of writing one.

*"Although we have lots of different documents, the key challenge we need to overcome is to create an overarching strategy that ties it all together..."*

*"By taking this approach we were able to provide details as to what the benefits of those services were, i.e. environment, social and economic..."*

### HOW WERE YOU ABLE TO PROVE THE BENEFIT OF GREEN SPACE TO COUNCIL?

We incorporated vegetation (roadside and park) into Asset Management Plans, which requires that you detail what activities will be undertaken to maintain its 'level of service' to the community. By taking this approach we were able to provide details as to what the benefits of those services were i.e. environment, social and economic.

To quantify the benefit of urban street and park trees – and in the absence of a computer program – I used the figures published by the City of New York and the USFA Forest Service and some of the thermal imaging data published by the City of Melbourne.<sup>1</sup> These images demonstrated how street trees could mitigate temperatures in the Melbourne CBD.

We are also proposing to formalise the valuation of council-owned trees in the replacement District Plan, where we provide an indicative assessment of the number and quality of environmental services a tree is likely to perform, i.e. oxygen, recycling of nutrients, soil stabilisation etc, as well as landscape (amenity) services.

### WHAT ARE SOME THINGS THAT YOU HAVE LEARNED AND WOULD LIKE TO SHARE?

- Know a lot about your 'product' i.e. plants and trees and keep selling the benefits of what it can do for people and the city – tell that story
- Be familiar with all of the council policies and strategies that say what they want an urban forest to deliver, specifically look for principles and actions that would support the new planting or retaining species
- Keep niggling away – eventually you will find someone who will listen and who agrees with you
- Establish a good reputation and working relationship with elected members. Remember – they were elected to do a job and if they disagree with you that is their prerogative and it is not personal.
- Don't be afraid to prod people a bit. I found that asking "why is it that Melbourne can do this and we can't?" actually got me somewhere.

1 Shears. I. City of Melbourne. Transitioning from Vulnerability to Resilience: Transforming Melbourne's Urban Landscapes Power Point Presentation. City of Melbourne. 2013



# BENEFITS OF TREES

The extreme heat experienced in Melbourne between 14 and 17 January 2015 is estimated to have cost businesses in the municipality approximately \$37 million in lost revenue, according to City of Melbourne research.

(<http://www.lgnews.com.au/city-combating-heatwaves-protect-melbournes-economy/>)

In New York in 1994, the value of the city's trees in removing pollutants was estimated at US\$10 million per year. Planting 11 million trees in the Los Angeles basin saves US\$50 million per year on air conditioning bills.

(Moore, University of Melbourne, 2009, [aila.org.au/lapapers/papers/trees/Moore-UrbanTreesWorthMoreThantheyCost.pdf](http://aila.org.au/lapapers/papers/trees/Moore-UrbanTreesWorthMoreThantheyCost.pdf))

During 2013, Commonwealth Scientific and Industrial Research Organisation (CSIRO) modelled the relationship between vegetation and mortality during extreme heat in relation to predicted future warming. They reported the overall trend showed that urban vegetation can potentially reduce excess heat-related mortality. These researchers predicted between 60 - 100% reduction in excess mortality rate depending on the degree of vegetation coverage, and recommended that urban vegetation be a key component in heat wave mitigation and for preventative health.



One of the best ways to reduce the urban heat island effect is by increasing the amount of vegetation and soil moisture in a city. Public parks, remnant woodlands, residential gardens, nature strips, street trees, green roofs, green walls, and rain gardens all assist in keeping the temperatures of a city down and improving its liveability. Thermal mapping in Melbourne shows that, on average, a 10% increase in urban green cover could reduce the daytime surface temperature in cities during heatwaves by around one degree Celcius.

(Williams, N., Coutts, A. & Livesley, S. (2014). Our cities need more trees and water, not less, to stay liveable. Viewed 6 June 2014.)

The 30,500 urban trees located along a 19-kilometre stretch of the Pacific Highway in Northern Sydney store an estimated \$1.65 million of carbon (based on a carbon value of \$23 per tonne) and have been shown to deliver a combined annual benefit of \$97,770 from carbon sequestration, air pollution removal, building energy savings and avoided carbon emissions.

(Amati, M. (2013). (2013). Understanding the carbon and pollution mitigation potential of Australia's urban forest. Final Report - Project Number: NY11002. Melbourne: La Trobe University.)

Giving children access to nature promotes their mental and emotional wellbeing and has a positive effect on the behaviour of some children.

(London Sustainable Development Commission, 2011, [london.gov.uk/documents/Sowing%20the%20Seeds%20-%20Full%20Report.pdf](http://london.gov.uk/documents/Sowing%20the%20Seeds%20-%20Full%20Report.pdf))

U.S. research found that customers prefer shopping in well-tended streets with large trees. The study also found they would pay 9-12% more for goods sold in central business districts with high-quality tree canopy, and would travel further, visit more often, pay more for parking, and stay longer in a shopping district with plenty of trees.

(Akbari, H. (2009). Cooling our Communities. A Guidebook on Tree Planting and Light-Colored Surfacing. Berkeley, CA: Lawrence Berkeley National Laboratory)

A positive relationship is found between the percentage of public green space in a resident's local area and their self-reported life satisfaction. On average, it is found that there is an implicit willingness to pay \$1,168 in annual household income in return for a one-per-cent (143m<sup>2</sup>) increase in public green space. The value of green space increases with population density

(Ambrey and Fleming, Griffith University, 2012, [equella.rcs.griffith.edu.au/research/file/22f0aba3-be8f-4bdf-9e28-a440c6735c8b/1/2012-01-public-greenspace-and-life-satisfaction-in-urban-australia.pdf](http://equella.rcs.griffith.edu.au/research/file/22f0aba3-be8f-4bdf-9e28-a440c6735c8b/1/2012-01-public-greenspace-and-life-satisfaction-in-urban-australia.pdf))

A study of over 200,000 Australians aged 45 years and above found those living in areas with more than 20% green space within a one-kilometre radius of their home were significantly more likely to walk and participate in moderate-to-vigorous physical activities. Greener neighbourhoods promote not only weekly participation, but also more frequent sessions of walking and moderate-to-vigorous activity, such as jogging and team sports. Green space was found to increase the odds of a resident taking a weekly walk or engaging in moderate-to-vigorous exercise by 6 and 8% respectively. It may be concluded that increased green spaces may increase health benefits of those residing nearby.

(Astell-Burt, British Journal of Sports Medicine, 2013, <http://bjsm.bmj.com/content/early/2013/04/29/bjsports-2012-092006.abstract?sid=b518a389-9704-436b-8de6-021614987406>)

The presence of shady trees can increase the useful life of asphalt pavement by at least 30%, which can be of considerable value in the hot climate of Australia, where asphalt degrades quite rapidly.

(<https://www.aila.org.au/LApapers/papers/trees/Moore-UrbanTreesWorthMoreThantheyCost.pdf>)



An aerial photograph of a lush green park with winding paths, trees, and people. A large green rounded rectangle is overlaid on the right side of the image, containing text. The park features a playground area with a slide and sandpit, a large lawn where people are sitting and walking, and various trees and garden beds.

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