A regional approach to delivering community health and wellbeing

Strategic plan 2020-2025

greening the west

Acknowledgements

This strategic plan has been facilitated by the Greening The West Steering Committee; a project control group consisting of Adrian Gray, Emma Pryse, Darren Coughlan, Chris Arabatzoudis and Simon Wilkinson; GHD consultants Dr Casey Furlong, Myles Coker and Dr Libby Mitchell; Associate Professor Marco Amati and Associate Professor Joe Hurley of the RMIT; Charles Solomon of Garawana Creative; and First Nations advisor Terori Hareko-Samios. Significant assistance with data, narrative and visuals has also been provided by Resilient Melbourne, DELWP and DHHS.

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The **Greening The West** Steering Committee consists of these collaborative and committed partners:

State Government

Local Government

Community & Partners

Affiliates & Partners

Greening The West continue to be inspired and informed by the First Nations People of Australia, who as the original custodians have a deep spiritual connection to the country and a unique ability to care for it. We acknowledge the peoples of the Kulin Nation as the traditional owners of the lands on which Greening The West operate. You have ensured the continuation of culture and traditional practices for tens of thousands of years.

We pay our sincere respects to Elders past, present and emerging.

Foreword

I have worked with a multidisciplinary team of researchers and students for over 20 years, studying the impact that the way we design cities has on people's health and wellbeing. When I started out on this journey, I felt like a lone voice and people have recently admitted to me that they thought it was a fringe topic and never likely to be mainstream (and perhaps as a consequence, my career was headed no-where). How pleased I am that history has proved the naysayers so wrong on all fronts!

Twenty years ago, we had to prove why a focus on city planning and urban design was so important for health and wellbeing, and to understand the active ingredients of a city that were critical. Hence, my team's early studies focussed on auditing thousands of public open spaces to measure their quality attributes, observational studies from dawn until dusk measuring who and how public open space was used, and which types of public open space attracted more users; and then studying the physical and mental health impacts of access to public open space.

Fast forward to the present: there is now a vast body of evidence globally showing that **green infrastructure is not only important, it is *essential* community infrastructure with co-benefits for the health and wellbeing of residents, the eco-system, the environment and the economy.** With these facts now well established, the next challenge is to ensure that all residents have access to the essential green infrastructure that will provide opportunities for recreation, protect and enhance human health and biodiversity, and mitigate and adapt to climate change.

In some ways, it is frustrating being a public health academic: I'm not a planner or an urban designer, or a landscape architect, a public official or a major land holder who – through their professions – can change the way cities are planned, designed and delivered. My job has been to provide policy-and practice-relevant evidence that puts the 'wind beneath the wings' of the visionaries whose job it is to shape and create healthy, liveable and sustainable communities. I call these the 'good guys' and every day I am encouraged by their efforts to fight the good fight and to translate evidence into policy and practice.

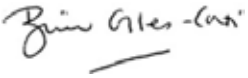
So I was honoured to be given the opportunity to write the foreword for the Greening The West Steering Committee's Greening The West Strategic Plan. As readers will discover, this is the report of 'good guys': visionaries who want to deliver positive health and social outcomes and to enhance the liveability for communities in the western suburbs of Melbourne. They aim to 'enable sustainable, liveable and healthy communities through urban greening' with full knowledge that this can only be done through the integrated efforts of multiple stakeholders. The committee has not only articulated why achieving their vision of a greener west is so important and the co-benefits across multiple sectors of doing so, it has also laid out a comprehensive plan with goals and targets including standards and benchmarking and monitoring over time. As the saying goes 'what gets measured gets done', and I commend them for coming up with a real measurable plan that can be regularly reviewed and adapted in order to achieve their vision.

This is not a 'pie in the sky' report: it considers the barriers and constraints. None of this is easy – there will be challenges ahead. This includes the tensions of building a more compact city - which is also so essential for healthy and sustainable lifestyles - yet at the same time maintaining green infrastructure which is so essential for human, ecosystem and planetary health. These challenges cannot be ignored – they must be managed to avoid unintended negative consequences.

The only way we can deal with these complex issues confronting communities and cities is through transformative multi-sector and multidisciplinary efforts: we can and must come up with transformative solutions for moving forward. This is not a dress rehearsal: on our watch, the climate is changing, obesity is rising, and chronic preventable diseases are putting pressure on our health care system and the economy.

We need innovative transformative interventions to mitigate and adapt to climate change and to promote health and wellbeing. That is what the Greening The West Strategic Plan seeks to do, and it is now our collective job to get behind it to ensure it is delivered. As a public health academic who has been championing the concept of healthy liveable cities now for two decades, you can be assured that I will be on the sidelines cheering you all on.

There's a Chinese proverb that "One generation plants the trees, and another gets the shade". This is a great report that will benefit generations to come. Congratulations to all those who have been involved. Thank you on behalf of all the future generations who will benefit from your hard work, commitment and vision.



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Contents

Executive summary

Established in 2011, Greening The West is an initiative that aims to deliver positive health and social outcomes and enhanced liveability for communities in the western suburbs of Melbourne. It is driven by a steering committee consisting of the following collaborative and committed partners:

State Government: Department of Environment, Land, Water and Planning; City West Water; Department of Transport; Parks Victoria; Melbourne Water; Department of Health & Human Services; Victorian Planning Authority; Port Phillip & Westernport CMA; Metro Trains; Western Water.

Local Government: Moonee Valley City Council; Maribyrnong City Council; Wyndham City Council; Melton City Council; City of Melbourne; Hobsons Bay City Council; Hume City Council; Wyndham City Council; Brimbank City Council; City of Yarra.

Affiliates: Lead West; Greening The Pipeline; Western Alliance for Greenhouse Action; Urban Development Institute of Australia; EcoDynamics Nursery; Loci Environment & Place; Living Melbourne; Victoria University.

Community & Partners: Friends of Lower Kororoit Creek; Hobsons Bay Wetland Centre; Friends of Steele Creek; Friends of Moonee Pond Creek- Chain of Ponds; Werribee River Association; Friends of Stony Creek; Nature West; Friends of Melton Botanic Gardens; Friends of Maribyrnong Valley; The Friends of Kororoit Creek.

The vision of Greening The West is "to enable sustainable, liveable, healthy communities through urban greening", and the steering committee seeks to realise this by taking a regional approach in fostering projects and activities that deliver increased vegetation and public use of quality green space.

Adopting a regional rather than local approach delivers elevated benefits such as enabling of cross-border projects and consolidation of resources to promote the benefits of green space. Greening The West is able to achieve more as a collective than any partner could achieve in isolation. As such, the project is much more than an urban greening initiative with certain local objectives. **Greening The West presents a proven and replicable model for joint regional pursuits of community health and wellbeing.**

Since the start of Greening The West, over one million trees have been planted in parks, waterway corridors and peri-urban areas, and Greening The Pipeline, a proposed 27km green corridor connecting Werribee to central Melbourne, has been launched and had its first-stage development completed. Other projects include revegetation of waterway corridors, trees for schools, university greening actions and the establishment of botanic gardens and the transformation of a concrete channel into a green waterway.

The west is today known as the only region of Melbourne where tree canopy cover is not decreasing, but increasing, and Greening The West is considered by researchers to be a world-class example of urban greening through collaborative action. With urban greening now forming a cornerstone of Plan Melbourne and Living Melbourne, the initiative has over the past six years received as many significant awards:

- **Vic Health Award 2014**
- **Stormwater Victoria design award (SWV) Upper Stony Creek Naturalisation Project 2015**
- **Australian Institute of Landscape Architects (AILA) Govt Leadership-Urban Development Award 2016**
- **Australian Water Association (AWA) Program Innovation award 2016**
- **Planning Institute Australia (PIA) President's Award for Planning Excellence 2018**
- **GTW-1MT Premier's Sustainability Award 2019**

The regional approach, with multi-disciplinary teams collaborating on overarching strategies as well as on individual projects, has been key to achieving this success. However, community groups, private landowners, university students and the general public have also been instrumental to Greening The West. Over four thousand volunteers have poured in tens of thousands of work hours to put plans into practice. This underlines the unique position of the initiative; Greening The West links high-level policy with tangible project delivery.

A core driver for Greening The West is improving community health. Victorian Department of Health data suggest that, from a health perspective, the people of the west are disadvantaged. The department recognises the provisioning of quality green space that allows for passive and active recreation as a critical strategy to tackle health conditions such as obesity, diabetes, heat stress and the deleterious effects of air pollution. Influencing planning outcomes, including the establishment of new housing developments, is therefore considered an important aspect of Greening The West.

In addition to enhancing and protecting community health, Greening The West will address the numerous other benefits offered by urban greening. Notable examples include:

- energy savings through natural temperature regulation;
- mitigation of the urban heat island (UHI) effect;
- provision of natural habitat and wildlife corridors; and
- enhancement of business activity.

Comprehensive data exists on vegetation cover, health status, demographics, socio-economic indicators and housing, all of which will assist in identifying priority sites where green space can deliver the most significant benefits. Having reviewed this data, the steering committee has developed the following four key goals for Greening The West:

In order to achieve these goals and harness the full potential of urban greening, project partners must acknowledge and overcome a number of challenges, including social disadvantage and limited financial resources as well as limited sites, poor soils and low rainfall. The strategic directions for Greening The West are therefore as follows:

1. Collaborate and plan for greening, water and health
2. Communicate, connect and educate
3. Seek funding opportunities through partnerships
4. Advocate for policy and institutional change

From a practical point of view, the single greatest challenge is perhaps sourcing water for irrigation, so the inclusion of the relevant water corporations (City West Water, Western Water and Melbourne Water) is integral to the success of Greening The West. It is an initiative that will further our knowledge and open up opportunities to better integrate planning for urban greening with alternative water projects.

Table 1. **Greening The West intended outcomes**

Intended outcomes	What we will achieve
Maximise urban greening	• Increase tree and vegetation cover and diversity to meet the targets set out in the Living Melbourne Strategy • Increase quality and quantity of green open spaces • Protect and increase greening in the private realm
Support greening with sustainable water supplies	• Deliver alternative water projects for climate-resilience • Make use of local stormwater and recycled water
Increase climate adaption, urban cooling, liveability and health	• Increase climate change adaptation and heatwave mitigation • Increase community outdoor activity, recreation and exercise • Increase community mental and physical health
Improve community education and participation	• Increase participation, inclusive of First Nations peoples, in planting events and private gardening • Increase community awareness of greening benefits

Introduction

Established in 2011, Greening The West is a collaborative initiative that delivers positive health and social outcomes in Melbourne's west through green infrastructure. It is driven by a pro-active and supportive steering committee consisting of the following dedicated partners:

State Government

- Department of Environment, Land, Water and Planning
- City West Water
- Department of Transport
- Parks Victoria
- Melbourne Water
- Department of Health & Human Services
- Victorian Planning Authority
- Port Phillip & Westernport CMA
- Metro Trains
- Western Water

Local Government

- Moonee Valley City Council
- Maribyrnong City Council
- Wyndham City Council
- Melton City Council
- City of Melbourne
- Hobsons Bay City Council
- Hume City Council
- Wyndham City Council
- Brimbank City Council
- City of Yarra

Affiliates

- Lead West
- Greening The Pipeline
- Western Alliance for Greenhouse Action
- Urban Development Institute of Australia
- EcoDynamics Nursery
- Loci Environment & Place
- Living Melbourne
- Victoria University

Community & Partners

- Friends of Lower Kororoit Creek
- Hobsons Bay Wetland Centre
- Friends of Steele Creek
- Friends of Moonee Pond Creek- Chain of Ponds
- Werribee River Association
- Friends of Stony Creek
- Nature West
- Friends of Melton Botanic Gardens
- Friends of Maribyrnong Valley
- The Friends of Kororoit Creek

Working across regional borders, **Greening The West aims to realise the vision "to enable sustainable, liveable, healthy communities through urban greening".** The scientific and economic rationales for this vision are well-documented and speak a very clear language. As indicated by the facts and figures contained within this strategic plan, they point to a wide range of benefits that affect almost every aspect of life in the city. Greening The West is therefore seeking to inspire the implementation of urban greening in all forms – from pot plants, rooftops, walls, nature strips, private backyards and car parks to sporting fields, streetscapes, waterways, parks, community gardens and nature reserves. Such projects can not only achieve set urban greening goals; by involving the whole gamut of local organisations and individuals in the process, the very process itself can build social cohesion.

The geographical focus of Greening The West are the municipalities of Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham (see map). It is the express priority of this strategic plan to provide advice and support to these municipalities as they translate the vision of Greening The West into on-ground actions. However, thanks to the success of the initiative to date, it is relevant far beyond local endeavours.

Greening The West is powered by its function as an alliance and collaborative forum, where expert knowledge and local insights are freely shared among a multi-disciplinary team of committee members and external parties. The steering committee includes members from six local governments, four state government departments, three water authorities, three national industry associations and several local community groups. Wielding significant intellectual capital, these members drive and advocate for progress within their respective spheres of influence, meeting quarterly to discuss progress, challenges, new research, opportunities for greening projects, funding, policy advocacy and community involvement.

Greening The West also rely on valuable partnerships outside of the core group. Such partnerships include community groups, private businesses, developers, researchers, the Australian Government and many others. In particular, universities and community groups have played integral roles in the success of Greening The West. Universities have provided assistance with the mapping of tree canopies and heat as well as advice regarding climate-resilient species selection and the design of streets and parks. Community groups have been the grassroots elements of Greening The West and most active in the delivery of planting days and other community events.

This approach creates synergies and streamlines workflows in order to achieve the long-term vision of the group. Greening The West is able to achieve more as a collective than any partner could achieve in isolation. As such, the project is much more than an urban greening initiative with certain local objectives. **Greening The West presents a proven and replicable model for joint regional pursuits of community health and wellbeing.**

It should be noted that Greening The West acts in a supporting capacity; the initiative does not impinge on the powers of local government. This document does consequently not replace the existing municipal strategies relating to open space. Rather, it is designed to reinforce the evidence base for investments in urban greening and identify opportunities to expand and complement the many exciting activities that are already underway.

Project background

The western suburbs of Melbourne are disadvantaged in terms of community health and wellbeing. There is also a general lack of quality open spaces and urban greenery, and the area is home to some of the fastest growing populations in Australia. In March 2011, City West Water therefore facilitated a think tank to explore the opportunities for collaboration across the western region. More than 100 representatives from local government, government agencies, community groups and the water industry attended.

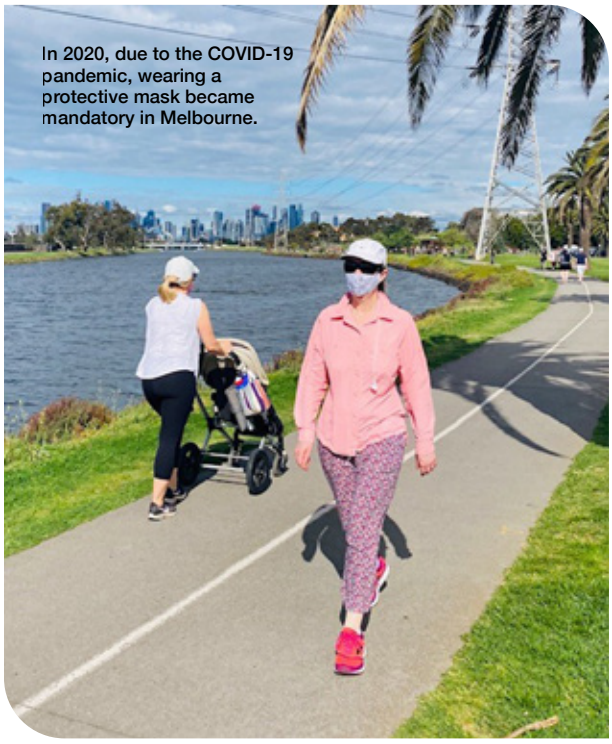
The resounding outcome of the think tank was an express desire to form an alliance to identify opportunities and support urban greening initiatives in the west. As a result, the Greening The West Steering Committee was formed in 2011 and set to work on a strategic plan. Nearly two years of research, analysis and in-depth discussions followed, upon which the first strategic plan was published in 2013. It was hailed as a crucial communications and advocacy piece that influenced change within water authorities, state and local government and a range of other stakeholders.

Notably, Greening The West has shifted the mindset within member and partner organisations toward recognising that urban greening is about the health and wellbeing of people rather than about purely aesthetic or environmental values. This is reflected in the growing number of local urban forest strategies, a concept not previously introduced in Melbourne's west. It is also shown in the practical, on-ground implementation.

Since the start of Greening The West, over one million trees have been planted in parks, waterway corridors and peri-urban areas, and Greening The Pipeline, a proposed 27km green corridor connecting Werribee to central Melbourne, has been launched and had its first-stage development completed. Other projects include revegetation of waterway corridors, trees for schools, university greening actions and the establishment of botanic gardens and the transformation of a concrete channel into a green waterway. As of September 2020, Greening The West has helped leverage some $40M in federal and state government funding, launching a veritable green transformation of Melbourne's western suburbs.

The west is today known as the only region of Melbourne where tree canopy cover is not decreasing, but increasing, and Greening The West is considered by researchers to be a world-class example of urban greening through collaborative action. With urban greening now forming a cornerstone of Plan Melbourne and Living Melbourne, the initiative has over the past six years received as many significant awards.

The regional approach, with multi-disciplinary teams collaborating on overarching strategies as well as on individual projects, has been key to achieving this success. It must not be forgotten, however, that community groups, private landowners, university students and the general public have been instrumental to Greening The West. Over four thousand volunteers have poured in tens of thousands of work hours to put plans into practice. This underlines the unique position of the initiative; Greening The West links high-level policy with tangible project delivery.



In 2020, due to the COVID-19 pandemic, wearing a protective mask became mandatory in Melbourne.

Credit: *Werribee Park Mansion*

Policy drivers

Greening The West transcends a number of policy drivers, including preventative health, economic development, environment and planning, all of which are key elements to a sustainable city. The following sections outline a few of the many relevant bodies, strategies and policies on the international, national, state and local levels. Each of the bodies and their supporting strategies and policies are both the drivers and the support for Greening The West.

International drivers

Greening The West directly addresses many of the **UN 17 Sustainable Development Goals (SDGS)**, including: **3. Good health and wellbeing; 10. Reduced inequalities; 11. Sustainable cities and communities; 13. Climate action; 14. Life below water; and 15. Life on land.**

Perfectly aligned with the main goal of **WHO** – "To improve equity in health, reduce health risks, promote healthy lifestyles and settings, and respond to the underlying determinants of health" – Greening The West is relevant to a large number of distinct WHO concerns and programmes. Notable examples include: **Creating Healthy Cities, Mental Health, Diabetes, Cardiovascular Disease and Ending Childhood Obesity.**

OECD has undertaken the project **Green Cities.** This initiative not only supports the tangible outputs of Greening The West; it also highlights the less obvious benefits of urban greening. OECD invokes the importance of urban greening for creating jobs, attracting skilled workers, increasing the value of real estate and fostering innovation and entrepreneurship.

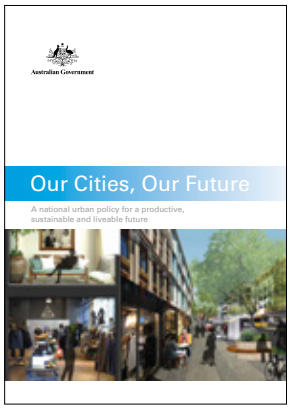
SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

National drivers

The **Australian Federal Government** has developed **Our Cities, Our Future,** a national urban policy document for a productive, sustainable and liveable future. The policy articulates the role of the Australian Government in helping our cities work better, whether through direct investment or in partnership with other stakeholders.

The **Council of Australian Governments (COAG)** has produced **Creating Places for People,** an urban design protocol that outlines reforms in capital city planning "to ensure Australian cities are globally competitive, productive, sustainable, liveable and socially inclusive and are well placed to meet future challenges and growth".

The **Heart Foundation** has launched the **Healthy Active By Design** programme in partnership with a range of government departments and centres for knowledge.



State drivers

Greening The West relates directly to several of the desired outcomes of **Plan Melbourne.** These include: **Outcome 4. A distinctive and liveable city** (in particular, 4.1.3 Strengthen Melbourne's network of boulevards; 4.1.4 Protect and enhance the metropolitan water's edge parklands; 4.5 Plan for Melbourne's green wedges and peri-urban areas; and 4.6 Strengthen community participation in the planning of our city); **Outcome 5. Melbourne is a city of inclusive, vibrant and healthy neighbourhoods** (in particular, 5.1 Create a city of 20-minute neighbourhoods; 5.2 Create neighbourhoods that support safe communities and healthy lifestyles; and 5.4 Deliver local parks and green neighbourhoods in collaboration with communities); and **Outcome 6. Melbourne is a sustainable and resilient city** (in particular, 6.1 Transition to a low-carbon city to enable Victoria to achieve its target of net zero greenhouse gas emissions by 2050; 6.2 Reduce the likelihood and consequences of natural hazard events and adapt to climate change; 6.3 Integrate urban development and water cycle management to support a resilient and liveable city; 6.4 Make Melbourne cooler and greener; 6.5 Protect and restore natural habitats; and 6.6 Improve air quality and reduce the impact of excessive noise).

Greening The West is a core delivery arm for **Living Melbourne**, which was launched in response to the **Rockefeller 100 Resilient Cities** initiative and is endorsed by over 40 government agencies, local governments, utility providers and professional associations. Presenting an urban forest strategy for greater Melbourne, this initiative recognises Greening The West as the benchmark for efficient regional collaboration.

The **Department of Environment, Land, Water and Planning (DELWP)** has created a framework for **Integrated Water Management (IWM)**. It outlines how to achieve a climate-resilient and safe water supply, urban greening, diverse landscapes and effective wastewater and stormwater management, all of which are integral to Greening The West. The **Department of Health and Human Services** are another key partner to Greening The West and have provided the updated health data to support this document.

Each LGA partner has their own Urban Forest Strategy

Local drivers

Local government is responsible for planning and managing the majority of public green open space areas (street trees, parks, streetscapes, etc.). Each council is required to have a **Council Plan, Public Health and Wellbeing Plan and Local Planning Scheme** to guide decisions to ensure equitable outcomes for the community and environment. Beyond these policies, each council can develop a wide range of other strategies relating to urban greening. The goals and objectives of existing strategies of this kind align with many of the goals of Greening The West.

As a result of the impact of extended drought, growing community interest in environmental management and the increasingly obvious need to plan for population growth and climate change, local councils are today in a strong position for influencing urban planning. This is evident in the new and evolving presence of integrated water cycle strategies, climate change strategies and urban forest strategies.

Key issues and opportunities

Urban greening encompasses all activities that enhance the quality and amount of vegetation in the urban environment. Such activities can be undertaken to address a wide range of issues, which for the purpose of this strategic plan will be grouped according to how they relate to the following broad fields:

1. Health and wellbeing **2. Environment** **3. Economy**

In exploring these fields further below, it should be noted that all greening activities result in multiple overlapping benefits regardless of what issues they were designed to address. The health issue of obesity can for example be addressed through the creation of more accessible and higher-quality public open green space, which encourages a more active lifestyle whilst also yielding environmental and economic benefits by providing wildlife habitat and natural temperature regulation. For all the flow-on benefits of urban greening, the reader should however bear in mind that the first priority of Greening The West is the health and wellbeing of residents.

1. Health and wellbeing

Lifestyle-related disorders, environment-related illness and mental illness pose a significant burden in Australia. The economic costs of this burden go beyond the immediate treatments of disorders, extending to loss of productivity, unemployment and insurance costs, and the social impacts are immeasurable.

Lifestyle-related disorders

Over the past couple of decades, there has been a marked global increase in the prevalence of non-communicable diseases, such as cancer, diabetes and heart disease, which are largely caused by unhealthy lifestyles. WHO states: "Driven by forces such as rapid unplanned urbanization, globalization of unhealthy lifestyles and population ageing, these diseases now account for 70% of all deaths."

This is to be expected as, compared with past generations, we are increasingly geared toward sedentary behaviour. Inactive leisure activities such as playing video games and watching television take up ever more of our time. Almost 60 per cent of Australians aged 15 and over do not do enough physical activity (as defined by the national guidelines of the Australian Institute of Health and Welfare, 2012) to benefit their health.

The ramifications of this collective inertia are immense, with a tell-tale metric being that of body mass index. More than two-thirds of all Australian adults and nearly one quarter of all children are overweight or obese. This leads to untold suffering for the individual, and the impact on Australia's economy is very significant, indeed. No less than 8.6% of the national health expenditure goes toward addressing diseases caused by weight issues. Labour output is lowered by the equivalent of 371,000 full-time workers per year. As shown by a 2019 OECD study, the combined costs amount to a reduction of Australia's GDP by 3.1%.[1]

As outlined in the following sections, greener urban environments can offer low-cost preventative strategies to improve community health and wellbeing, increase amenity and foster social cohesion.

Urban greening for healthier lifestyles

Improving the quantity and quality of urban green spaces within close proximity to residents can assist in promoting physical activity. Street trees with broad canopy cover offer shade and amenity that may encourage residents to utilise active means of transport. Well-serviced parks also provide opportunities for active recreation. Both have multiple flow-on health benefits, including a reduction in obesity and an improvement in mental wellbeing.

A large-scale European study including nearly 7,000 subjects from eight countries found that people with the greatest access to green space were more than three times as likely to frequently engage in physical activity than those with the least access. They were also 37% less likely to be overweight or obese.[2]

A Victorian Department of Health research paper features similar findings, concluding that "Municipalities showing high levels of obesity and type 2 diabetes should be encouraged to invest in appropriate green infrastructure to facilitate exercise as physical activity can reduce obesity and lifestyle-related diseases".[3]

"If all Australians managed an extra 30 minutes of brisk walking for at least five days each week, this could reduce cardiovascular disease in the population by approximately 25%"

- Australian Institute of Health & Welfare, Commonwealth Govt.

Table 2.

Scale of benefits that can be achieved from increased quantity/quality of green space*	
Adults not meeting physical activity guidelines	• 24 minutes more moderate-to-vigorous physical activity per week [4] • 150 minutes more recreational walking per week [5] • Increase in walking by 9%, increase in moderate-to-vigorous activity by 10% [6] • Increasing physical activity in children, reducing obesity by 7% [7]
Adults overweight/obese	
Adults with type 2 diabetes	• Reduction in type 2 diabetes by 28% [8] • Reduction in type 2 diabetes by 13% [9]
Adults with self-reported health fair or poor	• Increase in incidence of good self-reported health by 12% [8]
Adults with high/very high psychological distress	• Reduction in heart rate by 2.57% [8] • Reduction in depression of 1.4%, anxiety of .4% and stress of .7% [10]
Adults diagnosed with anxiety or depression	
Adults diagnosed with hypertension (high blood pressure)	• Reduction in blood pressure of 1.97% [8] • Reduced incidence of hypertension (high blood pressure) by 30-40% [11]
Hospitalisation, heart disease and stroke	• Reduction in hospitalisation rates by 37% [12] • Reduction in total of heart disease and stroke by 16% [12]
Heat Island Effect	• Reduced physiological equivalent temperature by 7 – 15 degrees [13]

(*whole community average improvement, as indicated by discrete research programs, exact greening metrics vary study to study, refer to references for further details)

Environment-related disorders

Among medical issues directly related to lack of urban green space, two stand out from the rest: heat-related illness and diseases caused by air pollution.

Diseases caused by air pollution

Air pollution is among the top eleven factors driving the most death and disability in Australia.[14] Figures show that pollution from the electricity sector bring annual Victorian health costs ranging between $420 and $600 million, with the corresponding range of values for the transport sector being $660 million to $1.5 billion.[15]

It should be noted that these figures do not account for the substantial health costs caused by bushfire smoke pollution. Studies estimate that, during the period from November 2019 to February 2020, more than 400 people were killed by bushfire smoke pollution.[16] Thousands were admitted to hospital, and Melbourne recorded the worst air quality in the world. A consequential spike in the rates of lung cancer is expected in the next couple of decades.[17]

The total health costs of the 2019/2020 bushfires are yet to be calculated, and the issue of smoke pollution is forecast to become exacerbated as climate change drives more severe bushfire events.

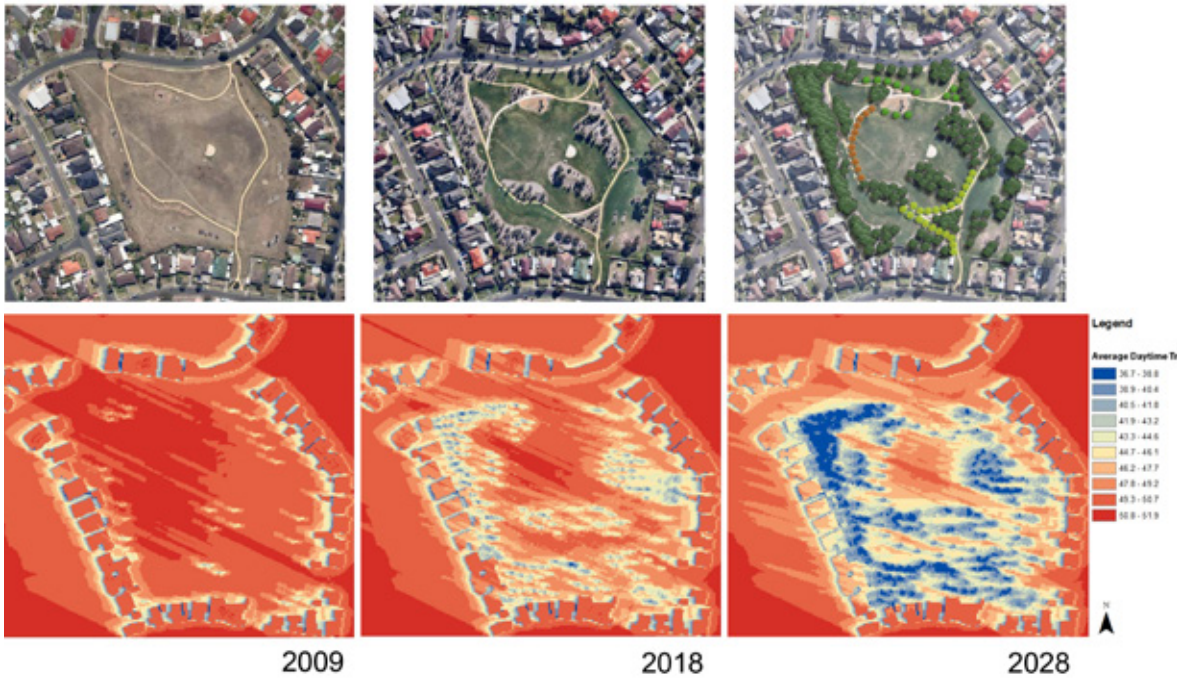


Figure 1. **Modelled mean radiant temperature values for International Gardens to 2028. Predictions show tree planting will reduce radiant temperature by up to 15 degrees**

Credit: *Brimbank*

Heat-related illness

Heatwaves have caused more deaths in Australia than the sum of deaths from all other natural disasters combined.[18] The prevailing conditions *in the week prior to* the 2009 Black Saturday bushfires are a case in point, with temperatures then exceeding 43°C for three consecutive days. During this period, the state death rate rose from an average of 90 per day to more than 200 per day. The Victorian State Coroner reported 374 excess deaths during this time, and the incidence of similar heatwaves is forecast to increase in Victoria. Projections indicate that, barring significant global emission reductions, the annual number of days above 35°C is likely to increase from the nine days currently experienced in Melbourne to up to 21 days by 2070. Maximum temperatures are also forecast to increase. A recent study conducted by DELWP and CSIRO indicates that by 2100, in a worst-case scenario, maximum summer temperatures could increase by up to 5.3 degrees.

Compounding the impact of heatwaves and increased average temperatures is the increasing urbanisation of Melbourne, which creates large numbers of impervious surfaces in the form of buildings, roads and car parks. These impervious surfaces generate artificial warmth, so-called urban heat islands (UHI), resulting in Melbourne's urban areas having much higher temperatures than their rural surroundings.

Analysis by The Nature Conservancy and Resilient Melbourne as part of the Living Melbourne Strategy has found that about half of metropolitan Melbourne is 5°C above the city's estimated non-urban baseline temperature and that Melbourne's west has a large percentage of hot spots that are more than 10°C warmer than non-urban conditions.[19] Such heat islands can rapidly lead to tangible health impacts; Monash University research has shown that maximum temperatures need only exceed 29°C for heat-related morbidity and anomalous health outcomes to increase in people over 64 years of age.

Furthermore, certain population groups are at greater risk of heat-related illness than others. The Monash University Hot Spots Project identified the following key variables leading to increased vulnerability, and many of these factors co-exist in the western suburbs:

- high proportions of very young (0-4) or elderly;
- high proportions of pre-existing health conditions;
- large numbers of aged-care facilities;
- demographics featuring low socioeconomic status;
- high-density housing;
- significant numbers of single persons aged 65+ living alone;
- high incidence of disability among residents;
- high-density population significant numbers of non-English-speaking residents; and
- sizeable urban heat island.

Urban greening for a healthier environment

Well-planned urban greening provides both cooler temperatures and cleaner air.

Cleaner air

Urban vegetation stores carbon dioxide and releases oxygen, providing fresher air to breathe as well as mitigating climate change. It can significantly reduce street-level concentrations of street-level pollutants by as much as 40% for nitrogen dioxide and 60% for particulate matter.[20]

Just how much air pollution can be captured by urban greening was shown in a U.S. study. Some 711,000 metric tonnes of O3, PM10, NO2, SO2 and CO were estimated to have been removed by urban forests across the United States, representing a value of US$3.8 billion for the year in question.[21]

Cooler local temperatures

Vegetation can provide cooling through two main mechanisms: shading and evaporative cooling of the air. Whilst the benefits of shading are obvious, the value of evaporative cooling is not as widely known. It is achieved through evapotranspiration, the evaporation of water from within leaves. This is a very cost- and energy-efficient means of temperature regulation, and the microclimate surrounding plants can provide significant relief to people during heatwaves. However, for sufficient evapotranspiration to occur, plants need to receive enough water to ensure that they do not merely survive, but that they thrive. For this reason, irrigation is often necessary on hot days and during extended dry periods.

The cooling effects of different vegetation types is summarised in Table 3, which is an excerpt from a comprehensive guide released by the US Environmental Protection Agency.

Table 3. **Cooling benefits of urban greening**

Function	Benefit
Shade from trees	Surface temperature reduction of 11-25°C for walls and rooftops
Vines on walls	Temperature reduction of 20°C
Trees shading parked cars	25°C cooler inside shaded car
Shade from small groups of trees	5°C cooler than open terrain
Suburban areas with mature trees	2-3°C cooler than new suburbs with no trees
Air temperatures over irrigated fields	3°C cooler than bare ground

Source: *USA EPA 2008*

Research conducted by Monash University for Greening The West supports the US findings, establishing that, on average, vegetated areas are 11°C cooler than the darkest non-vegetated areas.

The city of Shanghai offers further testament to the value of urban greening. In response to a devastating heatwave in 1998, urban green space was here expanded from 19.1 per cent to 35.2 per cent. Despite the city's "at-risk" population remaining constant, the number of deaths then declined in the 2003 heatwave, which was the hottest on record.

Mental illness and social issues

Mental illness is Australia's leading cause of non-fatal illness. The national cost has been estimated at $20 billion per year, which includes the cost of lost productivity and labour force participation.[22] Mental illness is also the largest contributor to the disability burden in Victoria, costing an estimated $5.4 billion a year through healthcare costs and associated impacts on workforce participation and productivity.

One in three Australians will suffer from depression or an anxiety disorder at some point in their lives. Such conditions can be extremely debilitating and impact on a sufferer's ability to engage with others, maintain steady employment and live a healthy, productive life.

A measure of mental health is the percentage of people reporting psychological distress, so-called self-reported psychological distress. As per the table below, the levels of self-reported psychological distress in Brimbank, Maribyrnong and Melton were above or well above the state average.

In this context, it is important to note that the mental health of First Nations People must be viewed in a holistic context encompassing cultural as well as spiritual health, and connection to the land is central to this.[23] To Aboriginals and Torres Strait Islanders, the urban forest is a matter of personal identity.

Table 4. **Self-reported psychological distress occurrence in local government areas**
(cells shaded light green denote outcomes above the state average)

Municipality	percentage of people reporting high/very high psychological distress (ii)
Brimbank	16.7% RANK 3
Hobsons Bay	10.9%
Maribyrnong	13.9%
Melton	15.5% RANK 9
Mooney Valley	10.3%
Wyndham	8.7%
VIC average	11.4%

Source: Department of Health Victoria 2013

Urban greening for social cohesion and mental health

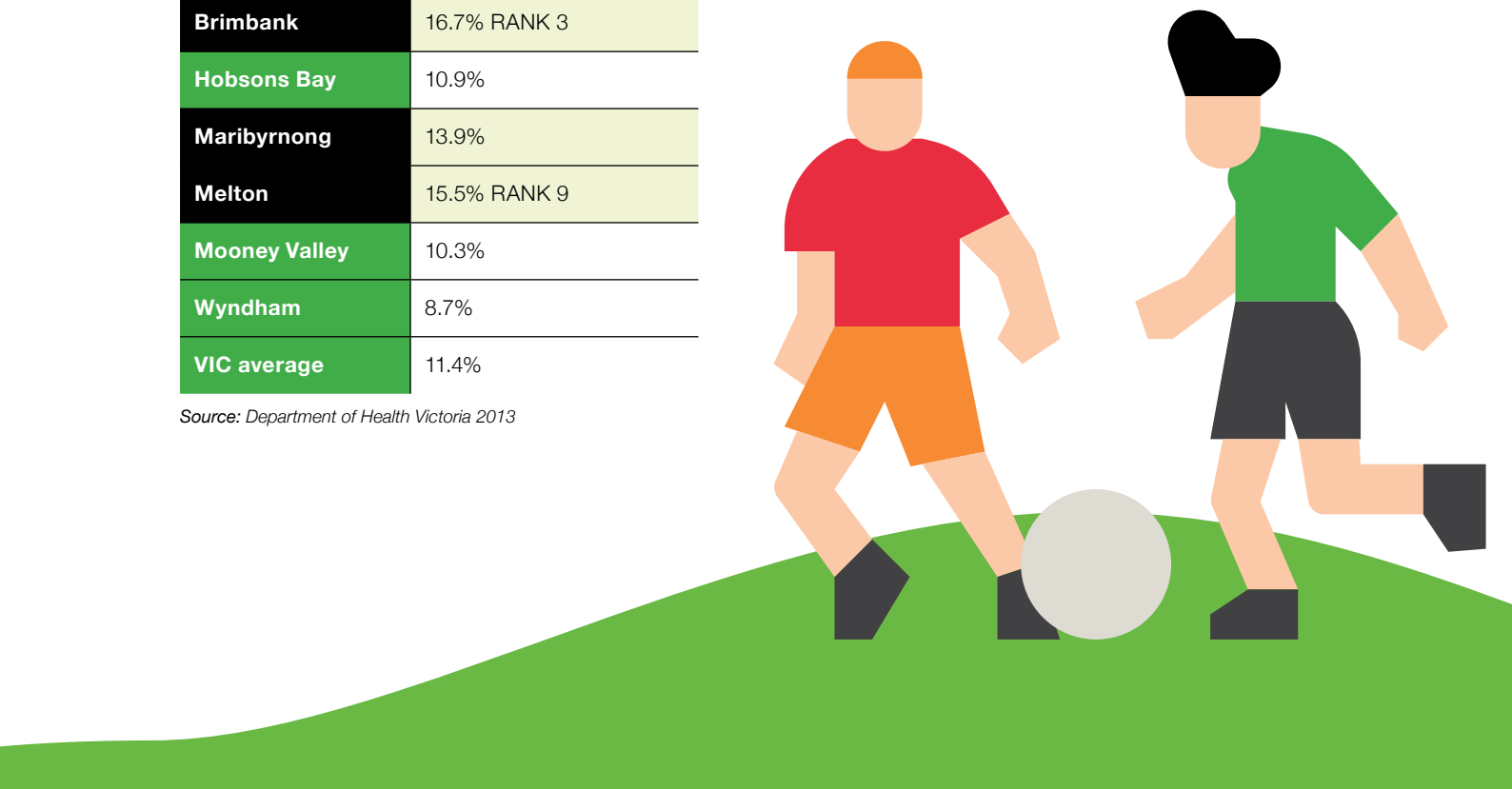
In a Western Australian study, it was reported that those living near moderate- or high-quality public open space were twice as likely to report low psychological distress as people in neighbourhoods containing only low-quality public open space. Indeed, as far as mental health is concerned, the quality of public open space appears to be more important than the quantity of public open space.

A 2010 Beyond Blue research report investigating the benefits of contact with nature for mental health and wellbeing described a range of psychological benefits for people who visit green, open spaces, including:

- improvements in mood;
- lower levels of anxiety;
- lower levels of stress;
- lower levels of depression; and
- increased physical activity.

It should be pointed out that greener urban environments not only benefit the individual by enabling and encouraging activities such as the playing of sports, walking and cycling. They also open up for many of the interactions that build social cohesion within a community, for example involvement in "Friends of" groups, planting days and various public events.

Overall, social interactions in green spaces tend to be relatively relaxed and friendly, creating the strong sense of place and belonging that forms the very foundation of society. This is of particular importance in the western suburbs, which are home to many First Nations People as well as a large ethnically and culturally diverse immigrant population.



2. Environment

Urban greening provides a range of environmental services such as temperature regulation, air quality improvements and carbon-dioxide storage as well as improved habitat and stormwater and catchment benefits that will assist in creating a truly liveable city.

Natural water cycle and stormwater treatment

Urban greening is crucial for the natural water cycle, encouraging infiltration, and protecting waterways and bays. Tree canopies intercept rainfall, and pervious surfaces such as grass and soils allow water to permeate into the earth.[24] Engineered "Water Sensitive Urban Design" features, such as raingardens, wetlands, and passively irrigated street trees, are specifically designed to retain and treat stormwater before it enters waterways and bays. Treating stormwater through vegetation provides the co-benefit of increasing water availability, as discussed in the following section on "Challenges".

Climate change mitigation

Urban greening can help reduce the effects of climate change. Carbon offsets through tree planting is a solution supported by the Victorian Government, which has accepted independent advice which states that there is "significant potential to increase the carbon sink from forest management on public land".[25] Furthermore, by cooling streets and buildings, urban greening helps to reduce the use of cars and coolers that emit greenhouse gases. As Melbourne has a temperate climate with cold winters, vegetation also plays a role in reducing the use of heating in buildings by planting for windbreaks and letting winter morning sun into buildings.

Biodiversity and habitat

Biodiversity refers to the diversity of plants, insects and animals within an environment. Ecosystems across the world are under threat from development, pollution and climate change. In Melbourne, grasslands with dense diversity of species are being replaced with residences that include very limited species diversity. Adapting urban environments to encourage the inhabitation of insects and animals is becoming increasingly important.

Insects and animals can be supported by increasing the overall quantity and quality of greenery in general, through the creation of habitat. However, this is significantly affected by landscape design choices. Whole-of-life-cycle requirements must be considered including diverse native vegetation that provides multiple resources for animal species at different life stages, including shelter (e.g. dense, protective shrubs), food (e.g. flowers, fruits, seeds, pollen, nectar), nesting sites/ shelter (e.g. tree cavities) and water. It is possible to design public and private landscapes for biodiversity, while simultaneously meeting urban cooling and amenity objectives.

Supporting biodiversity also supports human health. Evidence shows that diversity of plants and animals is an important factor in the human health and wellbeing benefits achieved from urban greening. Humans generally respond more favourably to biodiverse plants and animals than they do to monocultures (one plant species without animals present).[26]

3. Economy

Many of the benefits of green infrastructure previously discussed are obvious and have been known for some time. What has been harder to articulate in the past are the substantial direct financial benefits. However, urban greening not only provides financial benefits as a preventative measure; it also provides funds through higher property values and increased retail expenditure as well as reduces energy and stormwater costs.

Reduced energy costs

On a city scale, replacing or shading heat sinks with vegetation could reduce the urban heat island effect, thus reducing overall temperatures and energy use. Annual energy conservation from California's 177 million city trees has been estimated to save utilities $500 million in wholesale electricity and generation purchases. Planting 50 million more shade trees in strategic locations would provide savings equivalent to seven 100-megawatt power plants. The cost of peak load reduction was $63/kW, considerably less than the $150/kW amount that is deemed cost-effective for energy conservation measures by the California Energy Commission.

Locally, direct shading of residential and commercial buildings with vegetation can make for further significant reductions in energy consumption and shield critical infrastructure from solar radiation such as UV damage, thermal expansion and melting. Trees in close proximity to buildings, in private gardens and streets, can reduce requirements for air conditioning, reducing energy usage by up to 25%.[27]

Reduced contamination and retrofitting costs

By harnessing stormwater as a resource rather than regarding it as a liability, integrated water management can reduce erosive stormwater flows and prevent contaminated runoff from entering waterways. This approach provides a low-cost solution with many co-benefits. New York City aims to capture the first inch of rainfall across 10 per cent of existing impervious surfaces in regions with combined sewer overflow systems. The City's $1.5 billion green infrastructure plan details the range of green solutions they will utilise to achieve this. They have calculated that the cost of using a multitude of rainwater tanks, street trees, porous pavements, swales and raingardens is $2.5 billion less than the cost of traditional infrastructure solutions.

Higher property values and retail expenditure

The green attractions of an area can have significant impacts on the value of real estate. One study showed that a broad-leaf tree on the street verge increased the median property price by about $16,889.[28] Other research has found that if green infrastructure equivalent to a 440-acre park was introduced to a typical suburb, the benefit of this would be valued by residents and prospective home buyers at $32,139 - $57,991 per property.[29]

Through creating pleasant environments, greening can also encourage economic activity by encouraging customers to visit an establishment more frequently and for longer.[30] Consumers have been found to be willing to pay 12 per cent more for both fast-moving consumer goods and higher-value items such as sports shoes in retail precincts with more street tree shading.

Investment in trees, in general, has a significant positive cost-benefit ratio when social, economic and environmental outcomes are taken into account. One major study determined that $6 of benefits are achieved for every $1 of investment.[31]

Urban greening can also be a means of rapidly stimulating the economy through government spending. Greening projects are able to be rolled out with a very short lead-time compared to traditional infrastructure, and with spending directly supporting local economies.

CASE STUDY A.

Greening, electricity bills and community perceptions

Hobsons Bay Council in collaboration with Gallagher Studio and Cred Consulting have implemented a Cool Streets program. Two streets in Altona Meadows were selected based on their vulnerability to increased heat and their capacity to accommodate new tree planting. The project involved multiple phases of consultation. At the start of the project, community members were asked about their views on street trees. The majority then indicated a preference for small trees. However, once modelling had shown them that larger trees saved $70 - $122 of air conditioner energy usage per household per year, the majority indicated a preference for larger trees.

Educating community members may in other words be key to engaging residents in local urban greening projects.

OPTION A

Small evergreen trees of the same species along the length of the street.

BEFORE 53%
AFTER 0%

OPTION B

Medium deciduous trees of the same species along the length of the street.

BEFORE 13%
AFTER 20%

OPTION C

A mix of medium deciduous and evergreen species along the length of the street.

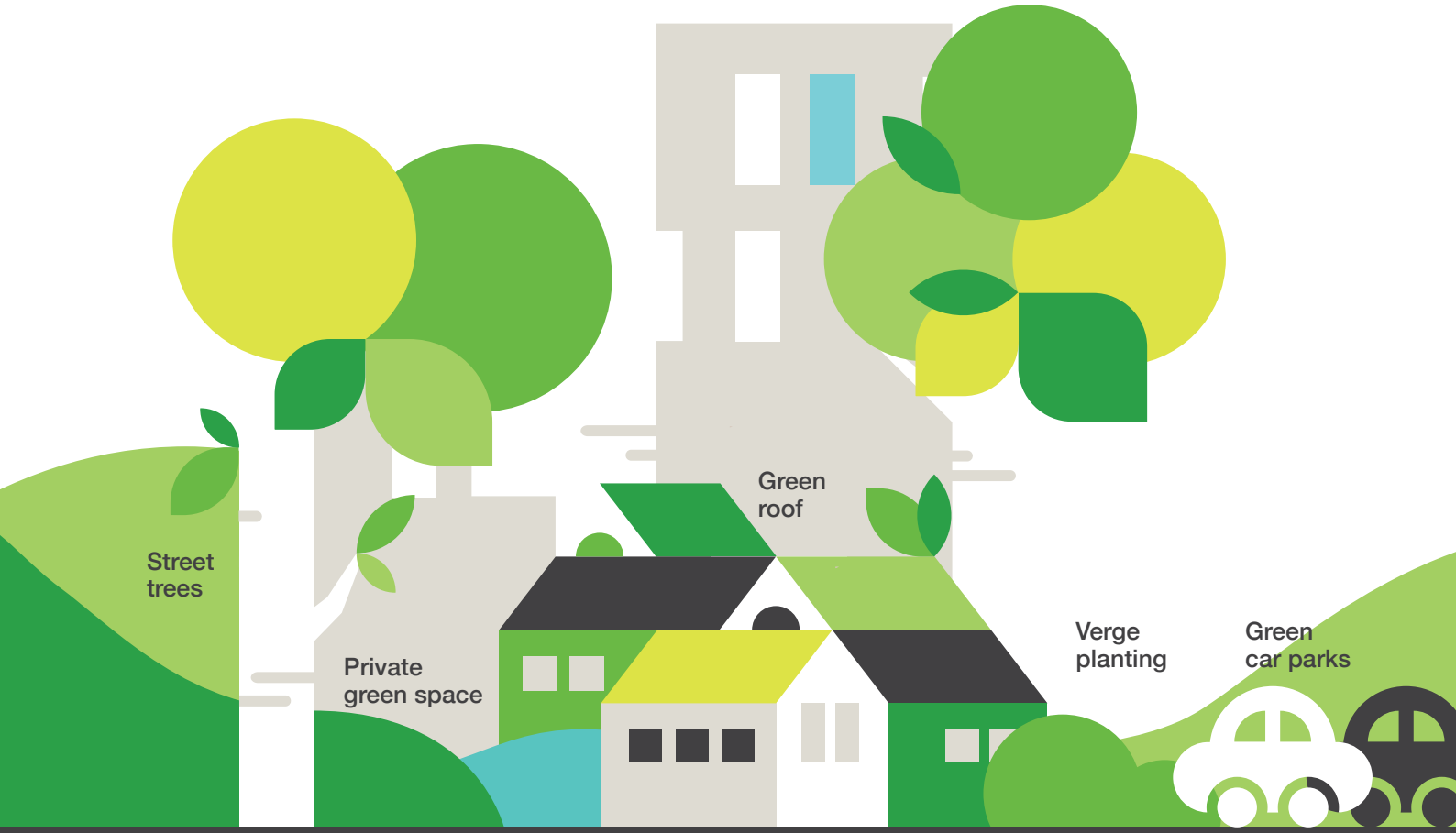
BEFORE 33%
AFTER 80%

Proportions of community members in favour of urban greening before and after being informed of associated energy savings.

Summary of key issues and opportunities

Urban greening presents opportunities to mitigate or prevent a wide range of health issues, ranging from obesity and diabetes to mental illness and heatstroke. It also builds social cohesion within communities and provides numerous environmental benefits, such as slowing global warming, preserving terrestrial habitats and protecting aquatic ecosystems from runoff. In addition to these benefits, which all bring significant indirect financial savings, urban greening offers direct economic benefits through cost-efficient temperature regulation and increased property value and retail expenditure.

Major types of vegetation and their benefits are described below. Different forms of vegetation fill different roles. Tree-canopy cover is for instance critical to temperature regulation, whilst shrubs may provide a better wildlife habitat. It should also be remembered that the provisioning of green space requires careful consideration of factors such as accessibility, facilities and safety in order to yield optimal outcomes.



Benefits of urban greening

Stormwater mitigation and treatment

Urban greening reduces impervious surfaces and provides a low-cost alternative for stormwater treatment.

Carbon sequestration

Urban greening can assist in capturing and storing carbon and improve air quality by reducing fine particles in the atmosphere.

Biodiversity

Introducing a variety of native vegetation to the urban environment will provide habitat for our local fauna and increase biodiversity.

Social cohesion

Urban greening can increase the opportunity for social interactions through a shared interest in sport, gardening and conservation activities.

Increased property value

Tree-lined streets can increase property values by up to 9%.

Reduced electricity costs

Appropriately placed trees can provide thermal insulation and assist in reducing electricity costs incurred from air conditioners.

Sustainable food source

Urban orchards and community gardens offer an accessible and sustainable food source for the public and encourages social interaction.

Reduced temperature extremes

Shade, evapotranspiration and insulation provided by greening can assist in reducing the impact of extreme temperature events.

Encourage an active lifestyle

Shade provided by street trees can encourage active transport and walkable neighbourhoods. Well-serviced parks offer opportunities for passive and active recreation.

Increased sense of place and urban amenity

Trees can improve a community's sense of identity and pride.

Improved infrastructure life

Vegetation can reduce UV exposure, which in turn can increase the longevity of infrastructure such as roads and footpaths.

Improved air quality

Leaves capture and hold pollutants preventing them from remaining in the air. These are then washed away with rain (hopefully into raingardens, not into our waterways).

Environmental Financial Wellbeing

Project area environment

Landscapes of Melbourne's west

Melbourne's west has a rich, diverse natural environment including an extensive coastline along Port Phillip Bay. Formed from volcanic activity around 10,000 years ago, this unique land is today known as the Western Volcanic Basalt Plains.

This volcanic history has provided the backdrop to an amazing array of flora and fauna in the region, including native grasslands, the Growling Grass Frog, Fat-tailed Dunnart and Legless Lizard.

A number of wetlands in Melbourne's west, including Cheetham Wetlands and those within Melbourne Water's Sewage Treatment Plant in Werribee, are included within a large Ramsar-listed site, and are home to many thousands of migratory birds on an annual basis. These sites are recognised as having international significance, attracting many visitors to this coastal bird haven.

Three significant ecological communities remain in Melbourne's west. The first is natural temperate grassland, the second is grassy eucalypt woodland, and the third is plains grassy woodland. For the first two of these ecosystems, less than five per cent of the original extents remain. These communities are among the most under-represented and threatened ecosystems in Australia.

The environment in Melbourne's west is distinctly different to the landscapes in the eastern region of Melbourne, and should be protected for its unique biodiversity. Feral animal invasion, weeds, loss of native biodiversity, and development has reduced their capacity to maintain a natural ecosystem function, and several councils have expressed concerns that final pockets of threatened grassland communities are being compromised by further development.

Greening The West is committed to increasing overall tree and canopy cover whilst also protecting the remaining significant ecological communities, many of which have naturally low canopy cover.

Tree canopy in Melbourne's west

For urban cooling, trees are of particular importance. Tree canopy cover is inversely proportional to urban heat, and Melbourne's western suburbs have less canopy cover than other regions of Melbourne. Western suburbs are typically in the 4 – 10% tree canopy range, while much of the eastern suburbs are in the 10 – 25% range.

There are many contributing factors to relatively scant tree canopy cover in Melbourne's west. Compared to Melbourne's east, Melbourne's west has lower rainfall and poorer soil quality. Rainfall in Melbourne's west (approximately 500 mm/year) can be less than half of that in Melbourne's east (over 1000 mm/year in some suburbs). Due to rainfall and soils, much of Melbourne's west was native grasslands prior to colonial settlement, while the east was covered in forest.

Differences in urban planning and design have also played a role. Some areas of Melbourne's west were designed in Garden-City-style housing estates, such as Essendon and Moonee Ponds. But much of Melbourne's west was primarily industrial, with factories and manufacturing in Footscray, Sunshine and Deer Park.[32] Industrial areas have historically been built with less focus on amenity and greening, resulting in reduced tree and vegetation cover in streets and parks.

Recent analysis comparing 2014 tree and vegetation canopy data to 2018 data has shown that overall tree canopy in Melbourne is reducing over time. The areas with the highest tree canopy have lost the most trees, particularly in the Yarra Ranges, Maroondah and Mornington Peninsula (see **Figure 2** below). Most of the change can be explained by small houses with large gardens being replaced by large houses or apartment buildings. Some of the tree losses may be the result of some species failing to adapt to a hotter and drier climate.[33]

DELWP, CSIRO and RMIT University have found that Melbourne's total tree cover shrunk from 32,980 hectares in 2014 to 32,295 hectares in 2018, an overall decrease in tree canopy of approximately 0.3%.[32] Over this same period, the western suburbs of Melbourne increased their total tree canopy cover by approximately 0.8%. This is due to a combination of planting in streets and parks, as well as new urban developments in what was previously grasslands.

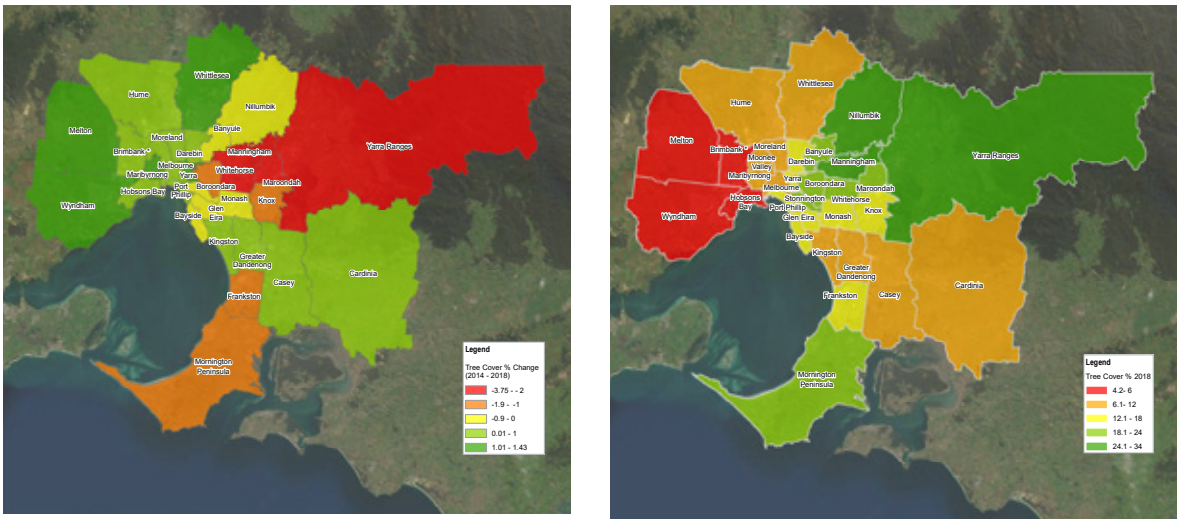


Figure 2. **Tree canopy in Melbourne's Local Government Areas.**[33]

Waterways of the west

The population of the west region is predicted to double by 2050. This urban growth presents significant challenges, including increased stormwater, flooding, litter and other pollution issues. There will be increased pressures on the waterways and connecting parklands where community members enjoy passive and active recreational activities. In addition, the warming and drying climate is already impacting these waterways, placing increased pressure on ecosystems and reducing the water available for consumption both for environmental and cultural needs.

Waterways are essential to community health and liveability as well as to the broader environment. Furthermore, they are of special significance to Traditional Owners. First Nations people managed the waterways for hundreds of generations. The waterways of the west have consequently become intricately linked with the identity of Kulin Nation peoples, encompassing cultural, spiritual, social, economic and environmental values.

Colonisation had rapid and profound impacts on these waterways as pastoralism and urban settlement spread over what would become Melbourne's west. Intense industrialisation followed in the last half-century, and an accelerating population growth in the last decade has added further environmental pressures. The waterways of the west are therefore at crossroads today; they represent an opportunity to maintain a unique, high-value natural environment – but they can only be saved through strategic and targeted collaborative efforts. It should also be underlined that the waterways of the west are of pivotal importance to all aspects of the urban greening in this area.

Working with a wide range of partners, Greening The West is committed to improving the community values, supporting the Healthy Waterways Strategy and Waterways of the West Action Plan (in prep).

The waterways of Melbourne's west form part of the unique Victorian Basalt Plains. Gorges and river flats support biologically diverse and nationally significant grasslands, woodlands and internationally recognised wetlands and estuarine ecosystems.

Credit: *Adrian Gray, Kororoit Creek*

Project area population

Demographics

The population of Melbourne's west is currently forecast to double by 2050, increasing by around 2 million. Wyndham and Melton are in the top five fastest growing municipalities in Australia, with Point Cook, Tarneit and Wyndham Vale North being the suburbs growing at the most rapid pace of all. To cater for such an increase in populations, there will be significant greenfield development with large areas on Melbourne's fringe to transition to a suburban environment.

Established, inner suburbs such as Altona, Werribee, Footscray and Sunshine are expected to become yet more dense, utilising larger residential blocks for multiple townhouses and apartments. This type of rapid growth typically results in the loss of established vegetation. Large canopy trees in backyards are lost to new urban developments, resulting in smaller private gardens and increased demand on shared community parks and other open spaces.

Health

Department of Health and Human Services data from 2017 shows that many of the western suburbs of Melbourne continue to perform worse than Victorian averages in relation to meeting physical activity guidelines, obesity, type 2 diabetes, overall health, psychological distress, anxiety, depression, and hypertension. Residents in Melbourne's west also have shorter life expectancies, higher rate of avoidable deaths, and higher smoking rates.[34]

Table 5. **Health data for the Greening The West strategy refresh** *(cells shaded light green denote outcomes above the state average)*

	Brimbank	Hobsons Bay	Maribyrnong	Melton	Moonee Valley	Wyndham	Victorian average
Adults not meeting physical activity guidelines	49.8%	41.7%	44.2%	40.4%	36.7%	55.6%	44.1%
Adults overweight/ obese	47.5%	53.7%	45.0%	57.4%	47.6%	57.9%	50.8%
Adults with type 2 diabetes	7%	5%	8%	7%	3%	7%	5%
Adults not eating recommended amounts of fruit and vegetables	48.6%	52.0%	52.6%	57.9%	49.5%	57.4%	51.7%
Adults with self-reported health fair or poor	30.2%	24.2%	25.1%	27.3%	22%	23%	24.4%
Adults with high/very high psychological distress	19.9%	12.1%	18.0%	20.1%	12.5%	15.9%	15.5%
Adults diagnosed with anxiety or depression	27.8%	26.4%	25.3%	31.5%	30.4%	25.9%	27.4%
Adults diagnosed with hypertension	29%	22%	23%	32%	24%	28%	25%

Source: DHHS, Victorian Population Health Survey 2017

Achievement highlights

Testament to the long-term commitment and dedication of its committee members and partners, Greening The West has completed or influenced a number of projects since its inception.

Below are a few brief case studies of some of Greening The West's landmark projects.

15 organisations

4,510 volunteers

1,755 hectares revegetated

61 community events

100 private landowners

1, 072,320 trees & shrubs

One Million Trees

In 2015, Lead West on behalf of Greening The West received $6 Million from the Australian Government to plant an additional one million trees across Melbourne's west. This funding included $5 Million from the Australian Government's National Landcare Program, with an additional $1M to engage Green Army teams to deliver key revegetation projects in partnership with Conservation Volunteers (CVA) and Councils partners of Greening The West.

The Federal Minister for Health, Greg Hunt, officially launched the Greening The West One Million Trees project at Kororoit Creek in mid-2014. Over the following four years, more than a million trees were planted across parks, reserves, open spaces and private land, covering an area of 1,755 hectares across Melbourne's west.

This outcome was achieved thanks to Lead West, who secured the Federal Landcare funding and the collaboration via Greening The West, with great coordination and support from LGA partners: community groups, volunteers and landowners, many participating in multiple community plantings over four years.

The Greening The West One Million Trees project is a shining example of how seemingly ambitious goals can be achieved when local, state and federal governments work collaboratively with passionate community groups. It has made significant and lasting difference to Melbourne's west by increasing urban greening and improving the amenity of public open spaces. Canopy shading has reduced heat stress and community cohesion has been strengthened through the active involvement of the residents as well as through public usage of the green facilities.

Time will tell, but the massive scope of Greening The West One Million Trees project is such that it might well have turned the tide on the decreasing local canopy cover. As shown in Figure 2, whilst the canopy cover is decreasing across most of Melbourne, it is today increasing in the western suburbs.

Credit: *GHD, Greening the Pipeline Pilot Park, Williams Landing*

Greening The Pipeline

Greening The Pipeline is an example of a project supported by Greening The West that is specifically targeted toward improving community health and wellbeing. Greening The Pipeline aims to over time transform 27 km of the decommissioned and heritage-listed Main Outfall Sewer reserve into a linear park and bike track, creating a green spine connecting the communities of Melbourne's west to central Melbourne. Part of this reserve is the Federation Trail, a strategic cycling corridor and off-road shared-use path.

The project is a partnership between Melbourne Water, Wyndham City Council, City West Water and Department of Transport, with support from the Victorian Government.

A pilot park project of a 100 m section at Williams Landing was completed in April 2017 to showcase the potential for this project. This pilot project was originally initiated in 2013 by Melbourne Water who received initial Victorian Government funding and was supported by Greening The West.

Shady, vegetated spaces now line the old channel, providing a healthy and enjoyable environment for social engagement and recreational activities in an area that was once divisive and underutilised. As a demonstration site for best-practice integrated water management, the park is also fitted with assets to capture, filter and reuse local stormwater to irrigate grass, shrubs and trees. The result is a cooler, more comfortable microclimate and new habitats for native species.

Solar lights throughout the park save energy and keep the area active and safe, while a shared-use bicycle and pedestrian path links suburbs from Brooklyn to Werribee, improving liveability and providing physical and mental health benefits.

Thanks to the success of the Greening The Pipeline collaborations, investigations are under way to co-design the entire length of the Main Outfall Sewer into a world-class linear park. Once completed, this 27-km green active transport corridor will represent a project of regional significance, connecting communities of Melbourne's west to inner Melbourne, creating significant uplift in community health, wellbeing and sense of pride in where they live and work.

Project partners are currently implementing the Zone 5 masterplan: a 3.8-km section of the reserve stretching from Williams Landing to Skeleton Creek in Truganina. This project is funded by the Victorian Government's Suburban Parks Program, City West Water, Wyndham City Council and Melbourne Water.

GREENING the PIPELINE

Upper Stony Creek Project

Upper Stony Creek in Sunshine North has been rejuvenated by transforming the Retarding Basin into a natural, revegetated wetland system adjoining Stony Creek with connected community spaces and a walking trail. The wetlands and parkland are situated adjoining Stony Creek between Furlong Road and Gilmour Roads.

Although the final scope of the Upper Stony Creek Project did not see the restoration of the concrete channel section, it has transformed the area into quality open space by connecting parklands and adding new wetlands along Gilmour Road. It was co-funded by the Federal Government, Melbourne Water, Department Environment Land Water & Planning, City West Water, GreenFleet, Brimbank City Council, Development Victoria and supported by Greening The West.

Works are expected to be completed by late 2020, and may, granted additional funding and collaboration, inspire further works upstream.

PICTURE OF A BLUE-GREEN FUTURE

This picture, taken at the point of seeding in July 2020, shows the expanse of the new Stony Creek wetlands. The lightly coloured soil surrounding the system has been seeded with grass whilst the areas covered in bright jute weave are planted with wetland plants. The dark-brown areas are canals and reservoirs that will fill with stormwater and sustain the wetlands.

Ryans Creek

Launched in 2014, this project was a collaboration between the City of Melton and the Victorian Government. It transformed a concrete drain into a flourishing creek, connecting the Melton community to the adjoining public open space along the waterway down to Toolern Creek. The waterway corridor was transformed into an active green space, achieving a range of benefits for residents and visitors, enhancing the public open space along the creek and enhancing the ecological, social and amenity values.

Key outcomes included improved flood protection and water quality and amenity as well as improved habitat for indigenous local flora and fauna.

The social uplift to community from Ryans Creek rehabilitation works were significant for health and liveability, connecting this waterway to Melton Botanic Gardens, a result appreciated by the Friends of Melton Botanic Gardens and the broader community.

Melton Botanic Gardens

In 2003, a community forum was held to explore the establishment of a Botanic Garden in Melton, and as an outcome, the Friends of the Melton Botanic Garden (FMBG) was established. Between 2004 and 2011 a site was selected, a masterplan was developed, and Town Centre Park renamed.

Since 2011, and with support from Melton City Council and community volunteers, FMBG have poured more than 60,000 hours, along with their heart and soul, into creating an important natural asset in the centre of town. The group have now established approximately 30 per cent of the 25-hectare site, transforming a bare patch of land into an impressive garden and gathering place for the community. The Botanic Gardens have also featured on ABC's Gardening Australia, which promoted the establishment of the garden and acknowledged the drive and enthusiasm of the friends and volunteers.

FMBG is another example of the important role that the community can play in urban greening projects and the value that can be generated when Greening The West members invest time and effort into supporting these groups.

Friends of the **Melton Botanic Garden**

Lower Kororoit Creek

This is an example of the power of community participation in changing the urban landscape for the better, in this case largely driven by Friends of Lower Kororoit Creek (FOLKC). Having started planting in 2001, FOLKC partnered with Greening The West to increase their efforts to rejuvenate Kororoit Creek. Thousands of volunteers from many diverse cultural and industrial organisations joined with FOLKC in planting in excess of 50,000 trees, shrubs and understory plants along the creek. Within the Hobsons Bay area, the creek has now been transformed from an unkempt and hazardous drainage reserve to a biodiverse, accessible waterway.

FOLKC believes that, in twenty to thirty years, the Kororoit Creek health, environment and tourism values will have changed dramatically for the better and that the creek will then be part of a biodiversity corridor that allows active transport and flora and fauna migration along its length.

Transformation of Lower Kororoit Creek from an industrial drain to a magnificent community space thanks to Sir Geoff Mitchelmore and his FOLKC (Friends of Lower Kororoit Creek). Kororoit Creek is where both the first and the last of the million trees were planted.

Friends of Lower Kororoit Creek

Vision for the future

Greening The West's vision is to enable liveable places and healthy communities through sustainable urban greening. We see people in Melbourne's west of all ages and abilities being able to relax, play, commute and exercise outside throughout the year amongst green, shaded urban environments. These highly liveable places are connected by healthy waterways and vegetated corridors to support active transport and habitat creation. Such urban greenery reduces the severity and incidence of health problems in Melbourne's west, including deaths from heatwaves, social isolation, depression, anxiety, diabetes, obesity, high blood pressure, heart attacks and strokes.[39] These outcomes are enduring because our green areas are supported by appropriate planning controls, sustainable water supplies and climate-resilient landscapes.

In working to achieve these outcomes, we acknowledge that First Nations Peoples are the traditional custodians of the land, building on the culture, knowledge and practices developed over 60,000 on country. First Nations' values, stories and connection to country form important aspects in our vision for Melbourne's west.

Greening The West's vision incorporates four key intended outcomes:

Table 11. **Greening The West intended outcomes**

Intended outcomes	**Maximise urban greening**	**Support greening with sustainable water supplies**	**Increase climate adaption, urban cooling, liveability and health**	**Improve community education and participation**
What we will achieve	• Increase tree and vegetation cover and diversity to meet the targets set out in the Living Melbourne Strategy • Increase quality and quantity of green open spaces • Protect and increase greening in the private realm	• Deliver alternative water projects for climate-resilience • Make use of local stormwater and recycled water	• Increase climate change adaptation and heatwave mitigation • Increase community outdoor activity, recreation and exercise • Increase community mental and physical health	• Increase participation, inclusive of First Nations peoples, in planting events and private gardening • Increase community awareness of greening benefits

Challenges

While the opportunity for improving community health through urban greening in Melbourne's west is significant, there are also significant challenges that will need to be overcome. These challenges include climate change, water availability, development pressures, conflicting policies and regulations, and funding constraints.

Melbourne's air quality was severely impacted by bushfires in 2020

Climate change

In order to grow to full potential, vegetation requires adequate water and soil. Melbourne's west has significantly less rainfall, and lower quality soils, compared to other regions of Melbourne. Water availability is further strained by the impacts of climate change, which will worsen into the future.

Climate change is the greatest threat to the future of human civilisation and is increasingly referred to as a climate and ecological emergency.[35] In 2019, the average state and national temperatures were already 1.05 and 1.52 degrees higher than normal respectively.[36] Australia is today experiencing increased heatwaves, reduced rainfall, more intense storm events, and worsening bushfire seasons.

DELWP has recently collaborated with CSIRO to update the climate change projections for Melbourne. These indicate that by 2100, in a worst-case scenario, maximum summer temperatures could increase by up to 5.3 degrees, annual rainfall could reduce by up to 26%, and evaporation could increase by up to 51%.[37]

Climate change will also result in more intermittent rainfall, more frequent and intense droughts, and increase the incidence and severity of heatwave events, which are already resulting in more deaths than all other natural disasters in Australia combined.

It is also clear from previous droughts that reducing rainfall in combination with other factors results in declining quality and health of open spaces and other urban greenery. Climate change is already noted as one of the likely contributors to declining tree and vegetation cover in Melbourne's east. This decreased canopy cover in turn results in an exacerbation of the Urban Heat Island effect, increasing temperatures further.

This damage can be mitigated through increasing the provision of water for irrigation. Much of Melbourne's open space and urban greenery is not currently irrigated. If nothing is done, the evidence is clear that climate change will result in damage to urban greenery, leading to reduced community health and wellbeing.

The challenges presented by climate change require innovative solutions, including the selection of resilient species and the provision of climate-resilient water sources for irrigation. It is important to recognise that while urban greenery must be protected from the impacts of climate change, they can also play a part in both mitigating and adapting to climate change.

Water availability

Currently many councils predominantly irrigate active open spaces, where formal sporting and recreation occurs, and do not actively irrigate passive open spaces, which are used for walking, informal recreation and social activities. However, as climate change worsens, the proportion of urban vegetation that requires some form of irrigation will increase.

Health

Department of Health and Human Services data from 2017 shows that many of the western suburbs of Melbourne continue to perform worse than Victorian averages in relation to meeting physical activity guidelines, obesity, type 2 diabetes, overall health, psychological distress, anxiety, depression, and hypertension. Residents in Melbourne's west also have shorter life expectancies, higher rate of avoidable deaths, and higher smoking rates.

Development pressures

In order to accommodate a rapidly growing population, significant greenfield development and infill development will need to occur. Currently there is a trend toward reducing private garden areas, which is reducing the tree canopy in established suburbs and placing more pressure on public green space. Considering that the majority of Melbourne's land is privately owned, and that the majority of the private land is residential, efforts to protect and increase the level of vegetation on this land is essential.

In order to achieve the vision of Greening The West, it will be necessary to guide private development, in both established suburbs and greenfield areas, toward achieving positive community health outcomes.

Conflicting policies and regulations

There are a number of other policy areas that impact on urban greening outcomes. Two of the issues that are discussed most frequently within Greening The West are electricity clearances and road clearances. Greening The West must therefore continue to work with all government partners to get the balance right between community safety, electricity reliability, and positive community health outcomes.

Funding constraints

Due to Victorian Government rate-capping policies, councils in Melbourne have limited ability to increase expenditure. This makes it difficult for many councils to invest in increasing the quality and quantity of urban greening. Living Melbourne estimates that a total of $1 billion will be needed to meet metropolitan urban forest targets.[38] For this to be possible, it will be necessary to tap into funding from other sources, including partnering with the Victorian and Australian Governments as well as with the private sector.

Strategic directions

Based on the premises discussed thus far, Greening The West has set out four major strategic directions to support the achievement of its vision:

Table 6. **Greening The West strategic directions**

Strategic directions	What we will do
Collaborate and plan for greening, water and health	• Continue to run a successful forum for action coordination • Contribute to delivery of Living Melbourne, Plan Melbourne, Healthy Waterways Strategy and other strategies • Support regional planning and monitoring
Communicate, connect and educate	• Work with universities to support research dissemination • Collaborate to demonstrate urban cooling and other benefits • Engage the community of all ages, including First Nations peoples, community groups, primary, secondary and tertiary students
Seek funding opportunities through partnerships	• Fund and deliver green infrastructure with partners, including the public and private sector • Communicate and cross-promote the work of partners
Advocate for policy and institutional change	• Engage with stakeholders to influence development, road, electricity and water regulations and outcomes toward improved greening outcomes

Priority actions

Actions to be led by individual members

Greening The West functions as an alliance, whereby much of the success is driven by the actions of individual members. Over the next five years these individual actions will include identifying priority greening sites, designing "shovel-ready" projects in preparation for funding opportunities and engaging with developers and the community.

Table 7. **Priority actions for individual members over the next five years**

Strategic direction	Actions for individual members	Description
1	**Identify priority greening sites and corridors**	Identify priority sites for greening by: • engaging with local communities; • taking stock of existing strategies and datasets, including sharing datasets between partners; and • identifying priority social and environmental outcomes.
2	**Engage with developers and the community**	Individual members must build meaningful relationships with their local stakeholders. Some priorities for action in this area include: • participate in community events targeted at community groups, primary, secondary, and tertiary students; • educating residents in regards to the benefits of vegetation; and • influencing developers through sharing the impact of vegetation on house prices.
3	**Design "shovel-ready" projects**	• If funding is not available to support the greening of priority sites, Greening The West recommends that individual members progress project designs in preparation for future funding opportunities. The group will then be able to collectively advocate for external funding.
4	**Advocate for internal change**	• Individual Greening The West members will explore opportunities for changing internal policies and regulations towards supporting greening outcomes, with a particular emphasis on supporting tree health with adequate soil and water.

Collective action

Over the next five years, Greening The West will focus its collective attention where it can provide the most benefit. This will involve coordinating the actions of individual members so that they contribute to the delivery of Living Melbourne, Plan Melbourne, the Healthy Waterways Strategy, and many other local, state and national policies, strategies and plans.

This coordinative role will include exploring data, trends and progress toward vision, as well as resolving technical delivery issues and supporting research outcomes. In some instances, the group will collectively engage with developers and the community, with a particular emphasis on the meaningful participation of First Nations peoples. In order to influence funding as well as urban planning, electricity, road and water regulations, the group will also undertake advocacy collectively.

Table 8. **Priority collective actions for Greening The West over the next five years**

Strategic Direction	Collective action	Description
1	**Run a successful collaborative forum**	Run a successful quarterly forum which brings together all stakeholders with the aim to: • coordinate individual sites to create corridors; • explore data, trends and progress towards vision; • identify and resolve technical challenges with researchers; • contribute to delivery of Living Melbourne, Plan Melbourne, Healthy Waterways Strategy and other strategies; and • increase the participation of developers to help collectively identify and address barriers.
2	**Identify and implement priorities for collective engagement**	Where it is deemed more effective to work as a collective, Greening The West will deliver joint efforts to: • build meaningful relationships with First Nations elders, Koori Youth Council and student networks; • plan and implement community education including dissemination of research findings around cooling and economic benefits, and share success stories; and • improve functionality of website.
3	**Bundle individual greening opportunities to seek funding**	• As a collective, Greening The West will support the coordination and alignment of priority greening projects by individual members and develop a joint funding strategy and improved business case.
4	**Regulation-focused advocacy**	• The group will undertake collective advocacy to influence relevant stakeholders on key issues. These issues will focus on Victorian Government development of road, electricity and water regulations.

Actionable advice

Guiding urban development

Development outcomes can be influenced in many different ways. Two of the most efficient approaches are: (a) affecting formal local and state government planning controls that regulate minimum greening requirements; and (b) encouraging developers to choose designs above and beyond what the regulations require.

Guiding planning controls

Victoria's state and local planning provisions can be used to mandate specific types of development greening development greening outcomes across the whole state or in particular municipalities, zones and overlays.

There are many examples of this, including:

- The Victorian Government recently introduced a planning control to require a minimum garden area size for all greenfield developments
- Brimbank City Council have introduced a local planning control for subdividers to include two trees in their front garden and one tree in their back garden
- Melton City Council have introduced a control to require passive street tree irrigation in greenfield developments
- Moonee Valley City Council have introduced a heritage tree register for private land, and a permit is required to remove listed trees
- Wyndham City Council have a renewed focus on setting financial incentives for developers to retain existing trees, through a significant tree register. There are fees for legal tree removal and fines for illegal removal.

Greening The West members believe that the Victorian Government has an important role in the development of further planning policies (such as those listed above) that encourage high-quality urban environments. By introducing additional controls within state-level legislation it would be possible to improve community health outcomes across the state. DELWP are currently preparing new guidelines and regulations that support greening new subdivisions and developments as part of Plan Melbourne Action 91, a Whole-of-Government approach to greening and cooling.

Guiding developers

Engaging directly with developers can involve discussing the benefits of greening and the impact that greening has on the desirability of developments. A significant body of research has shown that houses in green areas sell for higher prices in comparison to less green areas. As stated earlier, a broad-leaf tree on the street verge increases the median property price by about $16,889, and constructing a new large park in a suburb can increase prices by $32,139 - $57,991 per property.[28, 29]

One particular topic on which it is important to engage with developers is around the layout of services within streets in relation to street trees. If not designed correctly, tree growth can be significantly stunted by the absence of adequate accessible soil volumes. DELWP, in collaboration with various partners, have developed the "**Trees for Cooler and Greener Streetscapes: Guidelines for Streetscape Planning and Design**" (available online) to help build capacity in both the public and private sector around streetscape design.

Greening The West will endeavour to increase the participation of developers within its collaborative forum and help build meaningful relationships between the public and private sector around urban design outcomes.

Influencing greener developments - Harpley Estate, Wyndham

In 2015, Greening The West were invited to a discussion with Wyndham City Council, City West Water, SMEC and GbLA Landscape Designers. The purpose was to put forward ideas for Lendlease to implement green infrastructure when developing new streetscapes in the west. As a result, Lendlease agreed to trial green design concepts in the next phase of their streetscape development of Larapinta in Harpley Estate, Wyndham. Key outcomes of this trial included:

- The nature strips in Larapinta were connected to class A recycled water
- Tree canopy cover was increased, leading to a more comfortable environment conducive to walking and other outdoor activities.
- Tree health and eventual canopy dimensions were optimised, leading to long-term reductions in the urban heat island effect.
- Tree species diversity was promoted by introducing trees not traditionally planted in Wyndham.
- Root establishment and growth was protected by co-locating services, minimising crossover locations, maximising nature strip width and designing an automated irrigation system. This was achieved through Wyndham Council working in close collaboration with CWW.
- Larapinta Entrance was fitted with an independently metered third pipe system for sustainable irrigation of street trees, grassy areas and garden beds.

As a result of the Larapinta trial, GbLA Landscape Designers have now implemented urban greening in Bradfield Street and Town Centre of the Harpley Estate development. The objective is to create a greener, cooler town centre with long-term tree canopy cover and understory plants as per the green infrastructure principles of Greening The West.

Incorporating both active and passive irrigation measures, the new Harpley Estate development will set a new benchmark in water-sensitive urban design. Stormwater capture will be combined with urban greening infrastructure to ensure immediate liveability benefits as well as long-term viability. As Melbourne's west keeps growing, what is happening at Harpley Estate is showing the way forward.

Supporting VPA, LGA's and Developer to create greener, healthy and more liveable communities by providing sustainable urban design options, cooler streetscapes and walkable, connected open spaces in Melbourne's west

CASE STUDY B.

Planning control case study

Melton City Council have recently included a new planning permit condition that requires all greenfield developers to prepare an Integrated Water Management Plan. This plan is to include the delivery of passive stormwater irrigation of street trees. Such irrigation can be achieved by creating water storage areas in naturestrips and allowing stormwater to enter tree pits through the kerb.

To cater to local rainfall conditions, soil types, service and deliverability constraints, Melton Council have developed a customised passive irrigation system. It is a system that creates the dual benefits of healthy trees and healthy waterways. Well irrigated trees can grow twice as fast unirrigated trees, and the retention and treatment of urban stormwater further protects waterways from pollution.

The initiative was prompted by Melton City Council's Integrated Water Management Plan and is now being implemented in collaboration with developers to further improve the design of passive irrigation tree pits.

Melton City Council estimate that they currently have over 2,000 passive tree pits that are either established or in the process of being delivered, and it is estimated that there is likely to be thousands of new tree pits installed each year as Melton's growth areas develop. Standard procedures for procurement and installation is continually being refined, and with the economy of scale is leading to lower costs for developers.

It is a model that creates significant flow-on benefits for community, including reduced heat, improved liveability and healthier waterways.

Improving water availability

Greening The West members are committed to improving water availability for urban greening, with a focus on areas where people live and spend their leisure time. Decisions around water supply for urban greening will be informed by DELWP's Integrated Water Management (IWM) Framework for Victoria, which aims to help government, the water sector and the community work together to better plan, manage and deliver water in Victoria.

There are several solutions for providing additional water to the urban environment without drawing on the limited supply of potable water from natural sources. Such alternative water sources can be grouped into climate-dependent sources (from rain that falls on the city), and climate-independent sources (recycled water and desalination).

Integrated Water Management (IWM)

IWM is a collaborative approach to water management that brings together organisations with an interest in managing the whole-of-water cycle. It has the potential to provide greater value by identifying and leveraging opportunities to optimise community outcomes.

Making better use of rainwater

Climate-dependent sources include (a) "passive" irrigation with stormwater; (b) "active" stormwater harvesting, treatment, storage and reuse; and (c) rainwater tanks connected to building roofs.

Passive irrigation is when untreated urban stormwater is directed to vegetation/landscape by making use of tree pits, rain gardens or swales. These systems require no electricity or moving parts and are a key principle of Water Sensitive Urban Design (WSUD). Melton has recently made an amendment to their planning scheme to require that all new greenfield developments must include passively irrigated street trees (see **Case Study B** on page 43).

Rainwater tanks on private properties are also common and help to support the irrigation of private gardens for improved amenity, cooling and ecological benefits. Melbourne Water's Healthy Waterways Strategy also emphasises the need to maximise all stormwater reuse in order to protect urban waterways from the litter and pollutants introduced via stormwater drains.

Active stormwater harvesting typically refers to capturing and treating stormwater through wetlands or mechanical treatment systems, and then using a pump to irrigate open space. Constructed wetlands are becoming standard for both industrial and residential developments in Melbourne. However, with the expected growth in Melbourne's west, it is anticipated that all new developments incorporate innovative IWM options for every new suburban street. This is a prerequisite to establishing sustainable urban greening and cooling as the new standard practice.

Stormwater harvesting is an important intervention for water security, urban greening and downstream waterway protection. As urban areas densify, more of the catchment is covered by hard surfaces (roofs, roads, footpaths), creating more stormwater runoff than natural catchments. The increase in runoff and pollution causes poor water quality and erosion issues to downstream waterways. Stormwater solutions are central to Melbourne Water's Healthy Waterways Strategy (2018) and City West Water's commitment to Greening The West in providing in localised stormwater projects.

City West Water is leading in this space, supporting the infrastructure for active stormwater harvesting across six sites. These sites capture 285ML of stormwater per year, helping council partners keep their parklands irrigated and green all year round. CWW are now co-funding support at an additional six new sites, providing innovative stormwater projects right across the west.

ENSURING ALTERNATIVE SOURCES ARE FIT FOR PURPOSE

The use of recycled and storm water is an attractive water management strategy to meet growing needs for water in the long term, particularly in drought-prone areas like Melbourne's west.

These practices explore fit-for-purpose applications, including both non-drinking uses within households as well as irrigation of private as well as public open spaces and gardens.

CASE STUDY C.

Woodlands Park (Essendon) Stormwater Harvesting Project

The Woodlands Park Stormwater Harvesting Project was developed in a partnership between Moonee Valley City Council, Melbourne Water and City West Water. It centres on transforming existing ponds into functional wetlands that increase the capacity to harvest and treat stormwater. Every year, over 53ML harvested water will be treated through a filter and UV unit to produce 12ML high-quality water for the irrigation of the beautiful surrounding parklands. This provides a great number of benefits, including an improved aquatic environment and visitor amenities on site as well the numerous and far-reaching beneficial effects that urban greening has on the wider community.

Co-funded by Moonee Valley City Council, Melbourne Water and City West Water, Woodlands Park is one of six innovative and collaborative projects supported by City West Water's Stormwater Harvesting Partnering Fund, launched in 2018. The other projects are Melbourne Olympic Park (Tennis Centre), Laverton State Baseball Centre, Balmoral Reserve, Edinburgh Gardens and Arndell Park (part of Greening The Pipeline). These projects represent the tangible outcomes of high-level policies, including the Victorian Integrated Water Management Framework, Waterways of the West Action Plan, Melbourne Water's Healthy Waterways Strategy and City West Water's Urban Water Strategy.

Credit: *Woodlands Park, Essendon.*

Utilising climate independent supplies for urban greening

Climate-independent sources include recycled wastewater and desalinated water. While stakeholders agree that it is preferable to use local rainwater and stormwater where and when it is available, during periods of low rainfall some areas of vegetation will require supplementary water from a climate-independent source.

Recycled water is highly treated wastewater that can be used to irrigate open space. In a drying climate, this is a precious resource. Since much of the recycled water in Melbourne's west has a high salt content, City West Water has invested in a salt reduction plant at Western Treatment Plant. Recycled water is less salty further west and north, such as in Melton and Hume, so there is also potential there for supplying recycled water to open space.

Melbourne's drinking water supplies were put under immense strain during Melbourne's millennium drought. Water restrictions introduced over this period did significant damage to parks and trees. In response, the Victorian Government, in consultation with water corporations, made the decision to construct a 150 GL/year desalination plant, which is now in operation. Desalination uses a large amount of electricity, but all the power used to operate the desalination plant and transfer pipeline is offset by Renewable Energy Certificates.

Non-potable water options being sought in the first instance; and only where no non potable options available, potable remains the best source for urban greening and mitigating a changing climate.

CWW STORMWATER HARVESTING: CO-FUNDED PROJECTS

WOODLAND PARK
12ML/year $1,567,482
Moonee Valley City Council

BALMORAL RESERVE
20ML/year $2,638,261
Brimbank City Council

ARNDELL PARK
26ML/year $2,100,000
Wyndham City Council

EDINBURGH GARDENS
24ML/year $1,780,000
City of Yarra

STATE BASEBALL CENTRE
10ML/year $180,000
Hobsons Bay City Council

MELBOURNE OLYMPIC PARK & TENNIS CENTRE
12ML/year $564,000

Measuring success

Measuring success is an important element in any strategy or initiative. It is important that members, broader partners, and the community see a return on their investment. If success is not measured, initiatives risk losing focus, direction and/or momentum.

However, measuring success also requires investment to collect data and benchmark progress. It is therefore important to get the balance right between investing in actions to achieve the group's vision, and investing in efforts to measure success over time. To get this balance right, the group will separate the measurement of outcomes, which are measured against the group's vision and from the measurement of outputs, which are measured against the group's strategic directions. Outcomes will be measured and documented a minimum of every five years, while outputs will be measured each year.

Greening The West adopts the tree and vegetation targets developed through the Living Melbourne Strategy, which include 9% tree canopy and 20% combined tree/shrub area by 2030, 14% tree canopy and 25% combined tree/shrub area by 2040, 20% tree canopy and 30% combined tree/shrub area by 2050.[37]

Table 9. **Measuring success against intended outcomes – to be measured at least once every five years**

Intended outcome	*Indicator*	*Target*
Maximise urban greening	Tree and shrub coverage (measured through LiDAR and/or i-Tree)	Exceed progress required to meet Living Melbourne targets
Support greening with sustainable water supplies	ML/year of alternative water provided to support greening (individual members to record contributions)	The sum total of targets already endorsed in relevant member strategies and policies, including Integrated Water Management strategies
Increase climate adaption, urban cooling, liveability and health	Community health (measured through Victorian Population Health Survey results)	Improvement in all areas inclusive of: physical activity, obesity, type 2 diabetes, self-reported health, psychological distress, anxiety, depression and hypertension (high blood pressure)
Improve community education and participation	Community support for greening (qualitatively measured through the combination of community surveys from members over 5 years)	Overall increase in support for greening interventions compared to current baseline

Table 10. Measuring success against strategic directions – to be measured at least once every year

Strategic direction	*Indicator*	*Target*
Collaborate and plan for greening, water and health	Member enthusiasm (annual survey)	80% enthusiastic or very enthusiastic about Greening The West as a whole at the end of each year
	Average attendance at forum	Averaging above 15 attendees over the course of each year
Communicate, connect and educate	Number of meetings held with First Nations stakeholders	Three meetings per year
	Community planting days and other events held and attended	At least one planting day, and at least one other community event supported every year
Seek funding opportunities through partnerships	Portfolio of shovel-ready projects	Greening The West combines the projects of members into a portfolio at least once per year to seek external funding
	Further funding received from Victorian Government, Australian Government or private sector	At least one project receives external funding per year
Advocate for policy and institutional change	Collaboration with policy makers	Contributing to at least one regulatory review each year (e.g. electricity wire clearance review)
	Collaboration with developers	Holding one joint meeting/workshop with the development industry each year

Awards won

- **Vic Health Award 2014**
- **Australian Institute of Landscape Architects (AILA) Govt Leadership-Urban Development Award 2016**
- **Stormwater Victoria design award (SWV) Upper Stony Creek Naturalisation Project 2015**
- **Planning Institute Australia (PIA) President's award for Planning Excellence 2018**
- **Australian Water Association (AWA) Program Innovation Award 2016**
- **GTW-1MT Premier's Sustainability Award 2019**

A blueprint for urban greening

If the Greening The West group's success is widely shared across Australia and the world, it is possible that the group will become a model that is replicated in other cities. Greening The West stakeholders have already been contacted about replicating this model for Melbourne's north as well as for catchment management activities in South East Queensland. Many also see potential in western Sydney, an area that has much in common with western Melbourne.

In 2017 a team of academics did an assessment of Greening The West, and many lessons emerged from this analysis. The research program identified challenges, benefits to member organisations, key factors for success, areas for improvement and future directions for the group. The most important findings emerging from this work, which can be applied to other regional collaborative initiatives, were the factors for success. These included:

- Having a cross-jurisdictional authority take the initiative (in this case City West Water)
- Including a wide variety of stakeholders, so that policy and regulatory challenges can be proactively and collectively addressed as they are identified
- Securing external funding early in the life of the group, and completing some early small-scale projects to build momentum
- Giving equal credit to all member organisations, regardless of investment, developing a "we are in this together" mindset
- Building partnerships as widely as possible, including with academics, the private sector and the Australian Government

How you can contribute

Now driven by Local Governments, Greening The West invites new members and partners, including researchers, community members, business owners and developers as well as State and Federal government to work with us. Some existing partnerships are described in greater detail below, but since urban greening can create such a variety of benefits for such a wide range of stakeholders, the opportunities for mutually beneficial relationships are virtually limitless.

Victorian and Australian Government

Greening The West members have already demonstrated the ability to turn Victorian and Australian Government investment into on-the-ground outcomes for the community.

Greening The West members are grateful for funding leveraged to date, and welcome additional opportunities to partner with Victorian and Australian Governments on greening projects.

In return, governments can expect Greening The West to deliver on all commitments and improve community health. Investment in greening can also be a means of rapidly stimulating the economy through government spending, directly supporting local economies, including nurseries and landscaping contractors, while at the same time bringing communities together.

Community groups

To achieve the group's vision, direct inclusion and engagement of community members is essential. Greening The West already includes several community groups and welcomes new partnerships with anyone committed to greening and community health.

Industry partners and businesses

Greening The West has developed and implemented a variety of one-off projects with contributions from private industry. An ongoing relationship with a local nursery is currently being explored, which may result in the in-kind contribution and planting of 10,000 trees per year. Another example of involvement from the private sector has been Toyota, who have been a major sponsor of rehabilitation works along Lower Kororoit Creek, providing a total of $1.8M in funding.

Greening The West welcomes expressions of Interest from businesses who may facilitate greening in return for recognition, publicity and corporate social responsibility outcomes.

Developers

Through its diverse membership, including Urban Development Institute of Australia, Greening The West has an understanding of urban development processes, but there is room for deeper collaboration.

Greening The West welcomes more proactive and collaborative relationships with developers and invites all developers in Melbourne's west to get in touch regarding opportunities for presentations, workshops, and other forms of engagement.

Researchers

Greening The West has already been involved in significant collaboration with universities. This has included student landscape architecture design competitions, and collaboration around vegetation and heat mapping.

Greening The West invites researchers in relevant fields to make use of the group and quarterly forums to communicate research outcomes and explore opportunities for collaborative practice-based research.

If you are interested in supporting the vision of Greening The West, please get in touch with the group through **greeningthewest.org.au**

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State Government

- Department of Environment, Land, Water and Planning
- City West Water
- Department of Transport
- Parks Victoria
- Melbourne Water
- Department of Health & Human Services
- Victorian Planning Authority
- Port Phillip & Westernport CMA
- Metro Trains
- Western Water

Local Government

- Moonee Valley City Council
- Maribyrnong City Council
- Wyndham City Council
- Melton City Council
- City of Melbourne
- Hobsons Bay City Council
- Hume City Council
- Wyndham City Council
- Brimbank City Council
- City of Yarra

Affiliates

- Lead West
- Greening The Pipeline
- Western Alliance for Greenhouse Action
- Urban Development Institute of Australia (UDIA)
- EcoDynamics Nursery
- LOCI Environment and Place
- Living Melbourne
- Victoria University

Community & University Partners

- Friends of Lower Kororoit Creek
- Hobsons Bay Wetland Centre
- Friends of Steele Creek
- Friends of Moonee Ponds Creek- Chain of Ponds
- Werribee River Association
- Friends of Stony Creek
- Nature West
- Friends of Melton Botanic Gardens
- Friends of Maribyrnong Valley
- The Friends of Kororoit Creek