

Case study report
September 2017

Greening the West

Assessment of the functioning and implications
of collaborative efforts to achieve urban
greening in Melbourne's West

Casey Furlong, Kath Phelan &
Jago Dodson

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Input and review from: Darren Coughlan and Clare Lombardi (City West Water), Adrian Gray (Brimbank City Council), Ben de Klepper (Wyndham City Council), Craig Rowley (LeadWest) and many others from the Greening the West Steering Committee.

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Abstract & Acknowledgements

Greening the West (GTW) is a regional initiative aimed at increasing urban greening, particularly the number of trees, in Melbourne's western municipalities of Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham. Western Melbourne typically has comparatively low socioeconomic and health metrics, coupled with a significant deficit in trees and quality green space. Therefore the GTW group was convened by City West Water in 2011, to bring together 23 member organisations to collaboratively address this greening shortfall, in order to support community wellbeing. Through creating a critical mass of urban greening advocates, and a sophisticated communications strategy, GTW has been able to accrue significant external funding which has resulted in noticeable changes to the form of Melbourne's west. In particular, by the end of 2017, more than one million trees will have been planted in and around the GTW region. Additionally, particularly through the efforts of its Local Government representatives, the group has changed organisational cultures and priorities, and started dialogues with private developers, which are incrementally increasing the levels of urban greening across the region.

This report details the findings of academic research undertaken by RMIT University, as part of a broader research program considering collaborative approaches to improving urban greening and liveability in Melbourne. This report contains information on: the functionality of

the GTW initiative, its challenges, factors for success, achievements, areas for improvement, future directions, and implications for other current initiatives.

Information included in this report has been based on consultation with nine GTW stakeholders, and later reviewed by 13 stakeholders (six who were already interviewed and seven more who were not) resulting in the combined involvement of 16 stakeholders. Stakeholders who were consulted and also conducted a substantive review, contributed significant effort towards the completion of this report and so have been named on the cover. Other stakeholders have not been named, but their assistance is acknowledged and greatly appreciated.

It should be noted that, although based on consultation with and reviews from GTW stakeholders, the final wording of this report articulates only the judgement and opinion of RMIT University researchers. Also, due to the nature of the information provided to the RMIT University researchers during consultations, this report can be considered to focus primarily on the more recent and high profile projects and issues associated with GTW. This is in no way intended to undermine the important efforts by many individuals and organisations during the early years of GTW, which have been crucial to its evolution and success.

Figure 1 – Recent tree planting in Maribyrnong, Melbourne



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Extended Summary

In recognition of length of this report, and the time constraints of those it is targeted at, this Extended Summary has been designed to cover all of the main findings from the investigation. Body sections of the report can be referred to selectively for additional clarification and justification.

Background

Urban greening has been shown to offer significant benefits to urban populations. Benefits include environmental and economic impacts, and human physical and mental improvements. Environmental benefits include reducing local temperatures, improving air quality, and providing habitat for biodiversity. Economic benefits include increased house prices and worker productivity. Physical health benefits include increased exercise, reduced obesity and illness, and reduced mortality during heatwaves. Mental benefits include increased community cohesion, learning, happiness, sense of place and connection to nature.

Melbourne's western suburbs are disadvantaged in comparison to metropolitan averages, from both a socioeconomic and public health perspective. These social vulnerabilities are compounded by a significant deficit in urban greening, most notably in a lack of trees, and quality public green space. According to recent research, Melbourne's western suburbs have tree canopy coverage (percentage of land area covered by trees) of approximately 5 – 10%, whereas other Melbourne suburbs are evenly spread across the 10 – 30% range (see Figure 2).

This case study report on Greening the West

Greening the West (GTW) is a regional initiative in Melbourne's west, which aims to address this greening deficit, in order to provide social benefits to the communities who live, work and commute through the region. GTW focuses on the Local Government Areas (known as "Councils") of Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham, but the group is made up of a total of 23 member organisations including State Government departments and agencies, water utilities and community groups.

The group was initiated in 2011 by City West Water, the water and sewerage retailer of Melbourne's west, through conducting a collaborative think-tank which considered local problems and solutions. Since this think-tank, a GTW Steering Committee has been convened regularly, and continues into the future. Initially this group was chaired by City West Water, but the current and previous GTW chairs have been Local Government representatives, demonstrating that Councils are adopting ownership over the initiative.

In order to achieve its objectives, GTW conducts four primary functions: provision of a regional framework and coordination, advocacy to government and other stakeholders, communication and education with the public, and collaboration with partners to implement projects. All of the major projects supported by the GTW initiative demonstrate some component of all of these functions.

There are four major, on-going projects that relate to and are supported by the GTW group as shown in Table 1.

Table 1 – Major projects supported by the Greening the West initiative

Major project	Description
1 Million Trees Project	Using Federal Government funding to plant one million trees in Melbourne's west and surrounds. 30% of these trees have gone into urban parks, waterway corridors and drainage reserves, and 70% have gone into peri-urban areas on Melbourne's western fringes. By the end of 2017 this project will have been successfully completed.
Upper Stony Creek Transformation Project	Transformation of a concreted drainage channel into a semi-natural landscaped waterway, providing public green space in an area with an existing lack of greening. This project also involves a component of stormwater harvesting. It is expected to begin construction soon.
Greening the Pipeline Project	Melbourne Outfall Sewer is a historically significant disused Melbourne Water sewerage asset which runs for 27km from Melbourne's inner west to Werribee. This project involves transforming the unused channel and reserve into a linear park. So far a 100m pilot project has been constructed, and opportunities are being looked into in regards to transforming the longer length.
Advocacy to developers and state agencies	Although not a discrete project, a large amount of effort from the GTW group goes into advocating for change from developers, and State Government agencies such as road and electricity regulators, particularly around clearance regulations which inhibit greening.

The current case study report forms part of a Melbourne Water funded RMIT University research project which investigates the role of the water sector in urban liveability, greening and cooling. Greening the West provides an interesting case study on this topic due to the crucial role that City West Water has played in the initiative, and the clear existing or potential role of water utilities in all of its major projects. This report documents the functionality of the GTW initiative, and focuses on its challenges, factors for success, achievements, areas for improvement, future directions, and implications for current projects in Melbourne. Information has been obtained through structured interviews with nine GTW stakeholders from various member organisations, and the report has also been reviewed by 13 stakeholders (six of which were interviewees and seven who were not).

Major challenges

Significant challenges exist which make attaining adequate levels of urban greening in Melbourne's west difficult. There is currently a significant deficit in regards to trees and quality green space, which means that there is a lot of ground to cover to achieve desirable standards. Also there is a lack of planning controls to protect and increase urban greening as urban development and densification

occurs. GTW brings together 23 member organisations to resolve this problem, but it is difficult to build and sustain momentum within such a large group. City West Water provides as much assistance as possible to drive the urban greening agenda, but at times, and particularly in the early stages of GTW, they have struggled to justify their involvement. They have attempted to demonstrate urban greening to be part of their core function, rather than "window dressing" or "corporate social responsibility".

There are also serious practical challenges associated with GTW projects. Particularly the 1 Million Trees project has tested the group's capacity regarding logistics and monitoring, although the assistance of Port Phillip and Westernport Catchment Management Authority (PPWCMA) has helped to resolve these issues somewhat.

Finally, it is very difficult for GTW members to provoke change in developer and State Government agency policies which affect greening, such as road and electricity wire clearance regulations which prevent the development of "green boulevards", and planning controls which mandate planting of trees in new developments.

Key factors for success

GTW has been able to overcome these challenges to a significant degree due to a variety of success factors.

Having City West Water take the initiative to convene the group was crucial, as it is difficult for individual Local Governments to establish regional partnerships and solutions. Having a variety of stakeholders involved as group members was important, because they have all played different and important roles. External funding allowed for more ambitious projects which crossed jurisdictional lines, fostered collaboration, and gave a sense of momentum. Stakeholders considered that in many cases they were fortunate about staff selection and retention within the group, with some clear champions emerging. Initially it was very important that the group was set up with the sensitivities of member organisations in mind, for example giving credit to members as much as possible, and deemphasising the role of City West Water in setting up the group. Also an effective communications strategy, and building partnerships as widely as possible, was very important.

It is important to note that although the GTW group has been very useful as an instigator, it is the Council staff that have progressed the GTW agenda on-the-ground, and its success is largely due to this commitment.

Benefits to partner organisations and major achievements

GTW has achieved a great deal in its first six years (2011 – 2017). The group has successfully managed to increase the profile and priority of urban greening within many different organisations, but particularly within the Local Governments of Melbourne's west. It has helped to create a united vision, and ongoing partnerships and networks that are now able to solve problems collectively. Brimbank City Council is considered to have been particularly proactive and progressive in regards to driving this agenda.

GTW has made substantial on-the-ground differences to Melbourne's west, most notably an additional one million trees in and around Melbourne's west, and contributed indirectly to increasing the number of street trees through changing Local Government priorities. It was estimated by one GTW stakeholder that some areas have increased the number of street trees by as much as 50%. The Upper Stony Creek Transformation and Greening the Pipeline projects, which are supported by GTW, will provide valuable liveability improvements to their surrounding areas. The existence of GTW has changed organisational priorities and community cultures, and this has made these kinds of projects more common and

easier to implement.

The other purpose and value from the group comes from publicising and showcasing these success stories to a wider audience, through online and traditional media. This publicity is most evident in the fact that Plan Melbourne (2014), Plan Melbourne Refresh Discussion Paper (2015) and the updated Plan Melbourne 2017-2050 all make references to the GTW initiative.

Areas for improvement

Overall GTW stakeholders noted very few negatives about the GTW initiative. Some minor issues that were noted include:

1. Whether the group was too large and should have been split into a steering committee and working group
2. That GTW should have had more nuanced strategies for approaching land-managers for planting permissions during the 1 Million Trees project, due to many of these requests failing to be properly considered
3. Whether the resources put into the 100m Greening the Pipeline pilot site should have been spread more thinly across a longer length

In regards to this last point, other stakeholders believed that concentrating resources on upgrading a 100m stretch of Greening the Pipeline to showcase possibilities was the best long-term strategy for improving the entire length. Also the external funding conditions required that it be used on a single site with specific Integrated Water Management outcomes.

Future directions for Greening the West and relationship to other initiatives

In the immediate future the GTW group is likely to maintain its current format. However the group could potentially become a stand-alone entity, similar to the Committee for Geelong, at some point in the future. Whatever the format, the GTW group will continue its efforts to increase greening, particularly through:

1. Progressing the larger 27km Greening the Pipeline project together with Melbourne Water, nearby councils, developers, community groups and other stakeholders
2. Collaborating with developers to promote additional greening in new developments

3. Pursuing opportunities for further collaboration with the private sector
4. Working to change utilities (particularly electrical) and road clear-zone regulations

GTW stakeholders agree that the future of the urban greening agenda is heavily reliant on two things: rebranding urban greening as “Green Infrastructure” with quantifiable economic, environmental and social benefits; and strengthening urban planning controls, preferably at the state-level, to mandate minimum requirements for trees in private gardens and public open space within new developments. In the absence of state-level regulations around trees, individual Councils will continue to develop local planning controls, such as Brimbank Council’s requirement for developers to plant two trees in the front garden of new housing lots and one in the back.

The GTW story has significant implications for other current initiatives including: the Melbourne Metropolitan Urban Forest Strategy, Melbourne Water Urban Cooling Program, Plan Melbourne 2017-2050 (including its proposed Metropolitan Open Space Strategy), Water for Victoria and upcoming Integrated Water Management Forums. GTW represents a successful collaborative model for tackling complex challenges in urban environments. There is value in sharing the factors that have made it successful, and also considering how GTW’s existing resources and networks can be leveraged to achieve benefits across all of Melbourne and beyond.

Conclusions, recommendations and next research steps

It is the opinion of the authors of this report that GTW is functioning very successfully in its current form, and we recommend that it continue to be supported in every way possible, to carry out its important work. Although, there are a number of complementary actions which can and should be carried out to support GTW in achieving its objectives. Much of this complimentary activity can be performed by the Victorian State Government, as well as Melbourne’s water sector.

Taking into account the findings from this GTW investigation, the authors recommend that the Victorian Government:

1. Explore possibilities for state-wide, or Melbourne-wide, planning regulations around minimum levels of tree coverage in streets, open space

- and private lots within new developments (to complement existing regulations around public open space and private garden areas)
2. Establish some form of preliminary inquiry into regulations around road and electricity wire clearances, to ensure the current regulations strike the right balance between public safety and community health and wellbeing
3. Explore further opportunities for metropolitan or regional-scale planning of greening, and green corridors, some of which are likely to emerge from the Melbourne Metropolitan Urban Forest Strategy, and the Metropolitan Open Space Strategy which are currently under development
4. There is an opportunity for Plan Melbourne 2017-2050 greening objectives and future Greening the West initiatives to align, giving strength to both. GTW is particularly relevant to the following Plan Melbourne Implementation Plan actions:
 - updating the Precinct Structure Planning Guidelines (Action 20)
 - a metropolitan strategy for streetscapes (Action 60)
 - a whole-of-government approach to cooling and greening Melbourne (Action 91) which commits to creating urban forests throughout Melbourne
5. Continue to prioritise funding for greening projects within Melbourne’s west
6. Find other innovative mechanisms for encouraging urban developers towards additional greening

In parallel to this, Melbourne’s water utilities have a clear role in promoting and implementing the urban greening agenda into their functions, as part of a socially and environmentally aware “Integrated Water Management” approach. Part of this may involve (a) continuing to strategically provide alternative water sources for greening, and (b) re-thinking the design of stormwater management infrastructure to more heavily prioritise other benefits, such as urban cooling, recreation and/or biodiversity.

Collaboration with the private sector to assist in urban greening is a matter which warrants substantial further investigation. Therefore it is likely that the next major research case study for the current RMIT University research program will focus on innovative funding mechanisms for supporting the ongoing Greening the Pipeline project.

Introduction

Urban greening has been shown to provide significant benefits for urban communities, including: environmental, economic and public health and wellbeing benefits (Kendal, et al., 2016). Of particular concern to Australian policy makers, are the social benefits which can be gained from urban trees, through providing shade to reduce heat (Bowler, et al., 2010), and improving community mental and physical health (Maller, et al., 2006).

Melbourne's western suburbs have comparatively poor socioeconomic and public health metrics (LeadWest, 2010), as well as low levels of green space and tree canopy cover, as shown in Figure 2 (Institute for Sustainable Futures, 2014). This research suggests that tree canopy cover in the western region is in the range of 5-10%, while other regions are spread across the 10-30% range. One stakeholder has noted that this research was based on an assessment of whole LGA areas and does not consider the impact of peri-urban farmland or industrial areas, and therefore perhaps this contrast between the east and west is partially exaggerated.

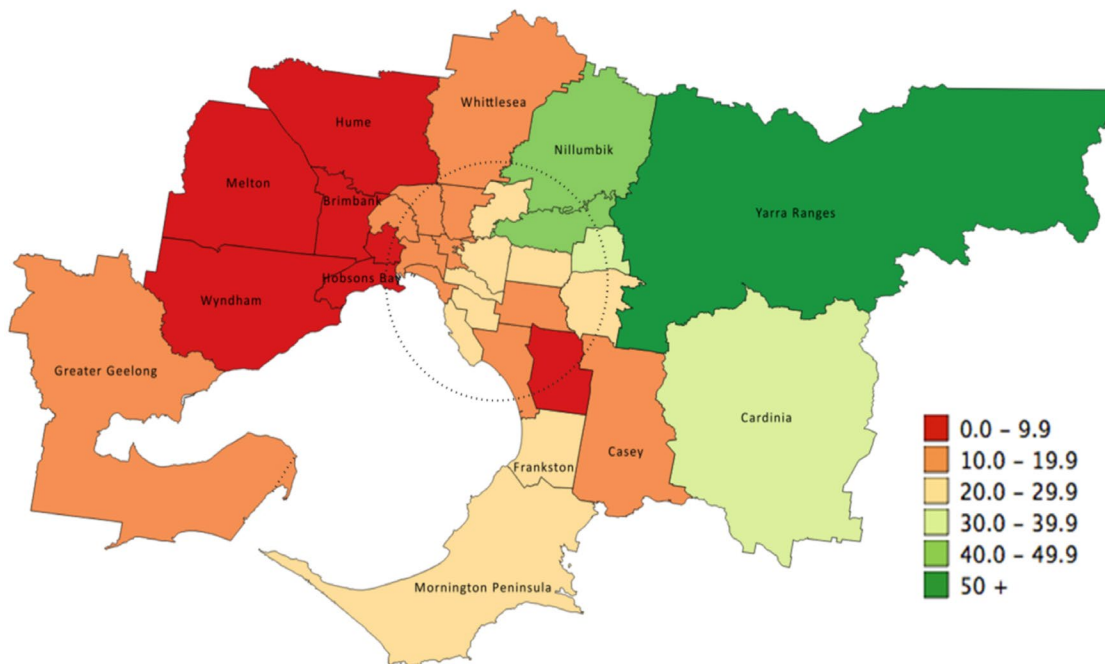
As greening has been shown to improve public wellbeing, the prospect of greening Melbourne's west is an important initiative which can provide tangible benefits. However the challenge of greening Melbourne's west is difficult for individual municipalities to deal with effectively, and therefore requires innovative and collaborative solutions.

Greening the West (GTW) is a regional initiative aimed at increasing urban greening in Melbourne's western Local Government Areas (known as "Councils") of Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham. GTW seeks to improve the health and wellbeing of residents through amenity, connection to nature, and urban cooling benefits, which come from increasing green space, tree canopy cover, and also securing water supplies for irrigation.

The purpose of this case study report is to document how the GTW initiative works, investigate the effectiveness of the initiative through consultation with GTW stakeholders, and consider the practical implications of these findings for other important urban greening and cooling initiatives in the Melbourne region and beyond.

This report has eight sections. This (1) introduction explains the basics of the GTW initiative, including how the initiative came about, who is involved, and the practical workings of the initiative explained through examples of major projects. This is followed by sections which provide stakeholder perspectives on (2) major challenges, (3) key factors for success, (4) benefits to partners and major achievements, (5) areas for improvement, and (6) the future of GTW and urban greening in Melbourne. The final sections explore (7) how the GTW initiative relates to other urban greening initiatives and (8) the research conclusions.

Figure 2 - Comparative levels of tree canopy cover (% of total area) in Melbourne's Local Government Areas (Institute for Sustainable Futures, 2014)



How did Greening the West start?

GTW has been initiated by City West Water (CWW), the water and sewerage retailer of Melbourne's western suburbs, largely at the prompting of their previous Managing Director Anne Barker. The origins of the initiative can be traced to a think-tank that was run by CWW in 2011 which identified the need for a regional solution to the greening deficiency in the west, and the community health and wellbeing problems that it contributes to. Since 2011 a GTW Steering Committee has been meeting regularly (see following section for member organisations).

CWW began working on a strategy for achieving greening and cooling in their area in 2012. A consultant was hired to develop a first draft. This first draft was perceived to be overly technical, and that the communications and engagement aspect needed further development. However, the meetings continued throughout this period, and momentum within the group continued to build.

CWW began refining the strategy internally, with a focus on communications and engagement. This new shorter and more accessible strategy document was launched in December 2013 (Greening the West Steering Committee, 2013). As a key example of the innovative and sophisticated communications and engagement approach adopted by GTW, the launch of the new strategy was done in partnership with the Western Bulldogs (a popular

Australian Football League team based in western Melbourne) at their training grounds, and tree planting was conducted around the grounds to commemorate the occasion.

Although CWW has been crucial in the convening of the GTW group and the production of the strategic approach, the functioning and outcomes of the group are largely the responsibility of the many member organisations involved, particularly that of Local Government and community groups.

Individuals and organisations associated with GTW have been involved in countless small-scale plantings across Melbourne's west. These smaller-scale planting activities in the early years of GTW have increased the capacity of the GTW members and built the momentum that has carried the group into its current success. However due to the nature of the consultation conducted for this research program, this report focuses on the more recent and higher profile projects supported by GTW.

Who is involved?

In total the GTW initiative has 23 partner organisations as shown in the Figure below. Interestingly, although GTW only addresses greening in the municipalities of Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley and Wyndham, the municipalities of Melbourne, Yarra and Hume have also joined as partner organisations

Figure 3 – Greening the West partner organisations (alphabetical order)

Brimbank City Council	City of Melbourne	City West Water	Department of Environment, Land, Water & Planning	Department of Health & Human Services
Friends of Lower Kororoit Creek	Hobsons Bay City Council	Hume City Council	LeadWest	Maribyrnong City Council
Melbourne Water	Melton City Council	Moonee Valley City Council	Parks Victoria	Port Phillip & Westernport Catchment Management Authority
Regional Development Australia	Urban Development Institute of Australia	Vicroads	Victorian Planning Authority	Western Water
	Wyndham City Council	Yarra City Council	Yarraville on the Nose	

to contribute mentoring and support. Representation of the Department of Health and Human Services, Department of Environment, Land, Water and Planning (DELWP), Melbourne Water, Western Water, Port Phillip and Westernport Catchment Management Authority (PPWCMA), VicRoads, Parks Victoria and Victorian Planning Authority as well as a number of community groups, indicates wide spread buy-in for the GTW initiative. The two most involved community groups have been Yarraville on the Nose, represented by Bruce Light, and Friends of Lower Kororoit Creek, represented by Geoff Mitchelmore.

How does it work?

GTW involves the combined efforts of a Steering Committee which includes members from all partner organisations, with support from two full-time CWW employees (this was recently reduced to one full-time employee with communications support). The Steering Committee meets regularly to discuss progress towards greening in Melbourne’s west, identifies areas for collaboration, and often invites guest speakers to give presentations. In addition to this, CWW also has an “Internal Steering Committee” which meets prior to the external Steering Committee, and includes all of their

Table 2 – Functions of the Greening the West initiative

Function	Explanation
Regional planning and coordination of greening initiatives	Planning of greening involves discussion between all partners to identify and coordinate potential greening actions. This function is particularly relevant to the implementation of the 1 Million Trees project explained below.
Advocacy to government and other stakeholders	Advocacy involves using the combined networks and authority of partner organisations to lobby for additional funding for greening, and also for changes to rules and regulations which limit greening potential (such as road and electricity wire clearance rules).
Communication and education with the public	Community education and engagement works to change attitudes and behaviours that relate to greening.
Collaboration with partners to implement projects	Collaboration involves combining knowledge and resources to contribute to and implement on-the-ground greening projects. This includes collaboration in funding and managing projects, as well as actually conducting planting through contractors and community group volunteering.

General Managers and their Managing Director, which indicates significant internal support for the initiative.

GTW achieves its goals through four interrelated functions which work in tandem to achieve results, as shown in Table 2.

Each of these functions does not operate independently. In general any project which is associated with GTW is likely to involve, or be facilitated by, a component of all four. Therefore the simplest way to describe the functioning of the GTW initiative is through an explanation of its most significant projects.

Major projects

1 Million Trees project

The 1 Million Trees project involves using \$5M Federal Government funding, and a combination of professional, volunteer and community order personnel, to plant one million trees in Melbourne's west. By the end of 2017 the planting of one million trees will be finished. Approximately 30% of these trees will have been planted in urban parks, waterway, drainage lines and schools, and 70% in peri-urban areas on Melbourne's western fringe.

LeadWest, an advocacy organisation for Melbourne's west, and a member of GTW, applied for the Federal funding, with support from the broader GTW group and was notified of their success in 2014. Funding was allocated across three years as follows: \$1 million in 2014/15, \$2 million 2015/16, and \$2 million 2016/17, and the planting needs to be finalised during 2017. Planting conducted by each organisation can be seen in Table

3. It should be noted that there is one confusing aspect to this information, which is that for contractual reasons the PPWCMA total includes planting by a number of subcontractors including Melbourne Water and Wyndham City Council. This means that although Melbourne Water conducted planting they are not included as a row in the table, and that Wyndham City Council actually planted far more than the 30,000 that they are allocated in Table 3.

Table 3 – 1 Million Trees project planting by various organisations (*subcontractors for PPWCMA included Melbourne Water, Wyndham City Council and others see text above for explanation)

Delivery Agent	Tree planting expected by end of 2017
Port Phillip and Westernport Catchment Management Authority (PPWCMA)*	716,470
Brimbank City Council	150,000
Wyndham City Council	30,000
Moonee Valley City Council	30,000
Melton City Council	30,000
Maribyrnong City Council	14,500
Hobsons Bay City Council	10,000
City West Water	10,000
Altona North Landfill	5,000
Friends of Lower Kororoit Creek	4,800
Friends of Maribyrnong Valley	500
Overall	1,001,270

Figure 4 – Previous Federal Environment Minister Greg Hunt speaking at the 1 Million Trees launch



In this project, GTW partners worked together to determine where trees should be planted, engaged with community groups, and operated collaboratively to achieve implementation. LeadWest received and coordinated the finances. Port Phillip and Westernport Catchment Management Authority coordinated some of the logistics of purchasing and distribution of seedlings, monitoring the rate at which trees were planted, and managing the peri-urban planting. The municipalities and other partners conducted the planting in urban areas, with the help of community groups, such as the Friends of Lower Kororoit Creek, and the Green Army. Corrections Victoria's Community Correctional Services Program has provided some unpaid labour in regards to gardening and maintenance.

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Lower Kororoit Creek, and the Green Army. Corrections Victoria's Community Correctional Services Program has provided some unpaid labour in regards to gardening and maintenance.

Upper Stony Creek Transformation project

Upper Stony Creek Transformation project is an initiative in Melbourne's west, to transform 1.2km of a concreted drainage channel back into a semi-natural waterway bounded by earth, trees and vegetation. CWW, Melbourne Water, Brimbank City Council, Development Victoria, and GreenFleet (with funding support from the Australian and Victorian Government's) are working in partnership to deliver the project. Primarily it has been justified by two drivers. Firstly, the previous location of the CWW office that has a 700m frontage to the concreted channel, was rezoned to enable development by Development Victoria (the development agency of the Victorian Government). Secondly, the area is located in Melbourne's west, which as explained earlier, has a deficiency in quality green space, and community health and wellbeing. In combination these two factors presented a rare opportunity for a major localised greening intervention in Melbourne's west.

GTW members supported and advocated for the Upper Stony Creek project within their own organisations, as well as publicly promoting the project to the community.

Figure 5 – Upper Stony Creek prior to transformation (source Greenfleet)



Aside from the explicit support that GTW provided for the project, simply the existence of the GTW group has had a long-term impact on the way GTW member organisations perceive greening, and the social benefits that it provides. Without this paradigm shift, projects such as the Upper Stony Creek naturalisation project would likely not have been palatable to the organisations involved.

Greening the Pipeline project

Greening the Pipeline is a partnership between Melbourne Water, Wyndham City Council, City West Water and VicRoads, supported by Greening the West, with funding from the Victorian Government. This project aims to over time transform 27km of the decommissioned and heritage-listed Main Outfall Sewer reserve into a linear park and bike track. The sewer asset is owned by Melbourne Water, and the reserve managed by VicRoads.

A pilot park project of a 100m section at Williams Landing was completed in April 2017 to showcase the potential for this project. GTW is not directly involved in the implementation of the pilot park, but has helped through support and promotion.

In regards to progressing the wider 27km project, GTW serves a number of purposes. GTW can provide guidance for a shared vision for Melbourne's west, which can help facilitate Greening the Pipeline's ability to win external funding from various sources. GTW is able to

provide knowledge and partnerships that will be necessary to implement the project successfully. A key example of this is Darren Coughlan (CWW) putting the Melbourne Water project manager in touch with local community groups who have previously been involved in planting along this pipeline. GTW provides an avenue for marketing the project, and increasing the profile and eventual usage of the reserve. GTW may also provide opportunities in the future for private sector participation and funding to contribute to the greater 27km project.

Engagement with developers and advocacy around road and electricity clearance regulations

Although not a discrete "project", the GTW group also invests significant time and energy into changing the practices and regulations of developers and various state government and private organisations. Efforts of the group have now opened the way for direct communication between Local Government and developers around urban greening outcomes, such as the layout of electricity and telecoms services in footpaths. In parallel the group has been attempting to advocate for changes to government regulations which mandate (what are perceived to be) "excessive" clearance zones around electricity wires and roads (particularly with speed limits of 80km/hour or higher).

Figure 6 – Concept for Greening the Pipeline pilot park (top image showing before intervention and bottom after)



Figure 7 – Picture of completed Greening the Pipeline pilot (provided by Melbourne Water)



Research methods for preparing this report

In order to prepare this report, researchers held face-to-face interviews with nine GTW stakeholders. The number of stakeholders consulted from each of the major stakeholder groups is shown in Table 4.

Table 4 – Stakeholders consulted to develop this report

Stakeholder group	No. of staff interviewed
City West Water	2
Local Government	2
LeadWest	2
Community groups	2
Port Phillip and Westernport CMA	1
Total	9

Each of the consulted experts was asked five questions:

- What do you believe to be the major challenges/hurdles that the GTW initiative has been confronted with?
- What do you believe to be the key factors that have allowed GTW to be successful?
- What do you consider to be the main benefits that member organisations have received from the existence of GTW? (this section was later relabelled as “achievements”)
- What are the negative aspects of GTW so far, and are there any things that you think should have been done differently?

- What do you think the future holds for GTW, and for urban greening in Melbourne more generally?

The answers to each question were collated, and then sorted into themes, which were then used to structure the following sections. Overall there was a high level of agreement between the stakeholders on most of these questions. However where stakeholders did not agree with each other, an effort has been made to include and contrast opposing views.

This findings report was then reviewed by stakeholders from the organisations shown in Table 5. Minor errors and misunderstandings identified in the reviews were corrected before publication.

Table 5 – Organisations that have reviewed this report

Stakeholder group	Number of staff who did a review
City West Water	2
Local Government	3
LeadWest	1
The Nature Conservancy	1
Victorian Planning Authority	1
Melbourne Water	1
DELWP	2
Private consultant	1
Community groups	1
Total	13

Major Challenges

Current circumstances of Melbourne's western region and lack of adequate planning controls

Melbourne's western suburbs have a variety of characteristics that make urban greening objectives difficult to achieve. In general, these suburbs have been designed and constructed with a major deficit in trees and quality green space, which means that a significant increase in greening is required to reach a desirable level. It was noted by one GTW stakeholder that urban areas should be aiming for a 30% canopy cover target (the target included in Brimbank's Urban Forest Strategy), but much of Melbourne's west currently has a mere 6% (Institute for Sustainable Futures, 2014). Overall there is not enough research completed to know if existing tree canopy cover levels are currently increasing or decreasing. Some consulted experts believed that in many developed suburbs, tree canopy is continually reducing due to urban densification, although it may be that in some greenfield areas, landscaped developments are increasing tree canopy levels above that of predevelopment grasslands. Currently there is a lack of adequate planning controls (development regulations) to protect and promote trees on private lots and in new developments. This makes reaching urban greening targets very challenging.

This significant greening challenge is further compounded by the poor soil characteristics, and low rainfall, which is prevalent across most of the western region, and a negative view of trees within some residential communities (Victorian Local Sustainability Advisory Committee, 2011). These soil, rainfall and community

culture issues represent significant additional challenges that public sector staff, from government and utilities, must account for while attempting to increase greening in Melbourne's west.

Building and sustaining commitment within Local Government

The success of the GTW initiative is predicated on the support of the Local Governments within its area. These Councils have generally shown a significant level of commitment to the group in the years since it was began in 2011, although some Councils have shown more commitment than others. Two of the six Councils have officially endorsed the GTW strategy, two have shown substantial support without official endorsement, and two have been comparatively less supportive, but still participated to a significant degree.

The level of executive support within each Council affects the ability of that Council's staff to contribute effectively to the group's functions. For example in some of these Councils a staff member is able to consider time invested towards the GTW group as part of their regular workload, while in others it is a voluntary time investment in addition to their regular workload. Additionally, the level of executive support has an impact on whether the staff members, who are selected to participate in GTW, are senior or junior. Junior staff members, such as tree planters, are less able to make effective contributions to the group than more senior staff, due to different levels of experience and authority.

Within all of the six Councils of the GTW area, there is

also some level of internal disagreement about the value of trees. Environmental and conservation focused teams within Councils sometimes value semi-native grasslands over landscaped areas, and consider that high tree numbers potentially impacts on the movement of lizards. Engineering teams sometimes view trees as both getting in the way of other infrastructure, a potential hazard, and also a waste of Council resources. Some open space teams consider trees as preventing recreational activities such as sport, and also show concern about trees limiting line-of-sight and therefore making people walking through parks in the evening feel unsafe (due to fear of crime). These examples illustrate significant competing objectives that public authorities must take into account.

Also, across some teams in Councils there is an underlying concern that tree planting and maintenance uses-up scarce funding and resources that could be used for other activities, although in more progressive councils organisational culture is shifting.

Making the case for water sector involvement in urban greening

During the period that CWW first initiated the GTW group, they received some resistance from stakeholders and community due to it being, what one stakeholder referred to as, “an idea ahead of its time.” Stakeholder organisations, internal staff, and community on a regular basis would question “what are you doing that for?” Trees are generally not valued as infrastructure assets, and so it was hard for CWW, as a water supply and sewerage service provider, to justify its involvement, purely on a greening basis. “One of the main focuses of the GTW group is still on convincing stakeholders that green infrastructure is as important as grey” stated one stakeholder.

For this reason when the group first began, a lot of the initial thinking went into “Integrated Water Management” (IWM) concepts around providing alternative water sources to support greening, rather than focusing directly on greening. One stakeholder noted that “GTW could easily have ended up only focusing on alternative water.” The IWM concept has long promoted the liveability benefits of providing alternative water to support greening, and therefore this concept provided a useful bridge between CWW’s core functions and urban greening. At present CWW still note a perception by some stakeholders that GTW is “seen as a bit fluffy, simply window dressing, or

some petty corporate social responsibility thing, rather than core function.” However the high level internal support from CWW indicates that, at least at the senior level, urban greening is now taken very seriously.

Some CWW customers have shown some resistance to the GTW initiative in its early stages. Not every residential community is positive about trees, and some residents have shown anger about “wasting money”. Although it appears that over time, with the community seeing some positive impacts from urban greening, and the media and communication efforts, perhaps this community perception is changing. One stakeholder noted that GTW has been very effective at changing cultures within organisations, but less effective in changing the perceptions of residents.

Technical and practical planning challenges

Different Councils have different levels of staff capability in regards to tree planning and planting. Some Council planting programs are meticulously designed by trained horticulturalists who consider not only what species are appropriate, but the spatial proximity of species to each other, and long-term maintenance regimes, while other Councils do not have in-house technical capacity for such sophisticated strategies.

Increasing the number of trees in an urban area, such as the 1 Million Trees project and other planting programs, involves a variety of technical and practical challenges. Such a large volume of trees, means that the coordination, logistics and monitoring issues require complex and flexible arrangements between partner organisations. Planting in different contexts requires different types of agreements and actions between stakeholders. For the 1MT trees project, a short timeframe resulted in some councils planting in areas which were easiest to organise (e.g. along waterway corridors which are already designated for conservation, and drainage lines with significant open space) rather than areas which provide the most social benefit. However in other councils, trees were strategically targeted to where they are most beneficial, such as parks.

Also, the 1MT project involves significant paperwork to meet the requirements of the funding agreement with the Australian Government. These reporting requirements have been a challenge for the GTW members, but have somewhat eased through assistance from the Port Phillip and Westernport Catchment Management Authority,

which has assumed some of this burden.

Influencing developer actions and government regulations

As stated earlier in this report, one of the major focus areas of GTW is influencing developers, government agencies, and other stakeholders towards altering their policies and regulations. This is because these policies and regulations create significant hurdles for achieving GTW's objective, in a number of respects.

Firstly, as new areas are developed, it is important that they include adequate levels of green space and trees. The Victorian Planning Authority (VPA) is the lead planning agency for new suburbs in growth areas and some existing suburbs undergoing rapid change. The VPA's planning activities are governed by the Victoria Planning Provisions and direction provided by the Precinct Structure Planning Guidelines, which includes relevant standards for levels of public open space. In addition, recent reforms to residential zones now mandate 25 – 35% of lot areas for private gardens (i.e. front and backyards) in the Neighbourhood Residential Zone and the General Residential Zone. However neither the Precinct Structure Planning Guidelines nor the reformed residential zones, specifies a minimum number of trees, or tree canopy covers. Also there is some level of confusion amongst stakeholders in regards to what the Precinct Structure Planning processes can do in regards to requirements for trees.

Therefore existing policies are likely to result in adequate open space, but without adequate tree coverage, on both public and private land. If new developments are not created with adequate tree canopy

levels, then the western region will continue to lock-in and worsen its urban greening deficit. In order to address this, GTW has been attempting to build relationships directly with developers, and convey the benefits of trees and greening.

Secondly, stringent guidelines around electricity wire and road clearances affect the ability of Melbourne's Councils to increase tree canopy cover through street trees. In particular, it prohibits the transformation of arterial roads into "green boulevards" which are common in Melbourne's inner and eastern suburbs. GTW members believe the creation of green boulevards is important for addressing the greening deficits in Melbourne's west.

VicRoads recently released new road clearance guidelines which make greening easier on 60km streets, but harder on 80km arterial roads. GTW stakeholders expressed frustration that electricity poles are allowed near 80km roads, but trees, when they are allowed, must be set back and surrounded with crash guards, making them more costly and less appealing.

Electricity wire clearance regulations are currently based on the Victorian Government's Bushfires Royal Commission findings, which increased clearances to stop bushfires. A number of GTW stakeholders expressed the opinion that restricting greening in Melbourne to prevent bushfires (which do not happen in the city) is pointless, or at least from a public health perspective, does more harm than good. This is particularly pertinent considering the death toll from heatwaves in Australia (Coates, 1996).

GTW members are actively pursuing dialogues with developers, VicRoads, and appropriate energy authorities to affect change on all these fronts.

Key Factors for Success

Having City West Water take the initiative

All interviewed stakeholders recognised the significant role that CWW played in kick-starting the urban greening agenda in Melbourne's west. Due to the fragmented nature of Local Government in Melbourne, with limited resources and collaborative forums, it was difficult for any one Council to create the critical mass and momentum needed to drive this agenda. Therefore having CWW take the initiative to define the problem, and convene the group, has proven to be immensely valuable. One stakeholder said "if City West Water didn't drive the bus, who would have driven the bus?" CWW also served as a "neutral party", which sidestepped any issues of competitiveness between Local Governments.

Such decisive action on the part of CWW was possible because the main internal champion of the agenda was Anne Barker, who was not only CWW's Managing Director, but also a board member of LeadWest, which had strong links with all of Melbourne's western Councils. One stakeholder stated that: "Anne Barker wanted to demonstrate through action, and was ahead of everyone in terms of seeing the links between water and liveability."

CWW's role has been most strong at the beginning of the GTW group, such as having two full-time staff to make things happen, and chairing the group for the first few years. Since this time, Councils have become the primary champions of the GTW group and wider greening agenda,

but CWW has continued to assist. Some other examples of support from CWW has included the provision of free water to help establish trees, and collaborating with Corrections Victoria to change a graffiti removal truck into a water truck.

Diversity of stakeholder groups represented

In contrast to the idea that the GTW group may have been too large, many of the stakeholders attributed its level of success to the diversity of its members. Local Governments are clearly the most important players in the overall agenda, through being responsible for the majority of urban greening actions, and having the ability to regulate greening on private properties through local planning schemes. The most important example of this is Brimbank Council's regulations that home renovations require two trees to be planted in the front yard, and one in the back (triggered when proposed works require a planning permit). Brimbank's success with this regulation has inspired other councils to begin to implement similar requirements.

However other than Councils, and CWW's role as described above, the involvement of many other players was necessary to make GTW a success. LeadWest facilitated the achievement of funding for the 1MT project. The Port Phillip and Westernport Catchment Management Authority (the CMA) was mentioned by many stakeholders

as being “the most crucial player in implementing the 1MT project.” “The CMA was the strong rural arm of GTW, linking the health outcomes of GTW with environmental efforts.” Also the CMA was the broker for the 1MT project, providing monitoring for all organisations to see if planting was conducted as expected, as well as conducting significant planting, and purchasing and delivering plant stock for some partners. Having community groups involved also made a serious difference in terms of assisting with planting, understanding community sentiment, and recruiting other community groups to partake in activities.

External funding

Many stakeholders were of the view that external funding has been pivotal to the success of the GTW initiative. This is true on two levels. Firstly, State and Federal Government funding was involved all of the main GTW projects: 1 Million Trees, Upper Stony Creek Transformation and Greening the Pipeline. State Government funding also assisted planting in the west prior to the commencement of the 1MT project. One stakeholder suggested that “Government loves to give funding to regional initiatives because they present a robust, well-thought-out, business case.” However, other than the funding making a difference for implementing projects, the funding also helped the group come together as a collaborative forum, through providing opportunities to work together across geographical and conceptual institutional borders.

Staff selection and retention

Success of initiatives such as GTW often comes down to the specific personalities and capabilities of the people involved, and ensuring that they stay involved over an extended period. One stakeholder described this as “getting lucky with staff selection and retention.” Many important characters in the GTW story, who will not be named to avoid being exclusionary, became involved in GTW early on, and have been important champions ever since. On the flipside of this, staff turnover when it occurs, can be damaging. The most notable example of this was the temporary loss of Western Water representation within the group due to the turnover of an important staff member.

Format and functioning of the group

All stakeholders referenced a variety of positive elements about the way the GTW group is set up and run. Most importantly, the group was set up in a way that encouraged Local Governments to participate in a number of ways:

- The group brings Councils together to work on common problems, and also facilitates aspects of competition and benchmarking which help greening proponents advocate to their management for increased action
- GTW has a broad, loose and fluid scope, allowing the group to focus on whatever the most pressing issues are at any given time
- CWW set up the group in such a way that it only required in-kind funding contributions from Councils, and provided two full-time staff to assist the group (recently reduced to one)
- The Steering Committee was able to see action early on, with small projects such as the Footscray Primary School transformation, which gave the group a sense of being able to get things done

Also consecutive GTW group chairs have made an effort to invite renowned speakers to present at Steering Committee meetings to bring the latest ideas on urban greening to the group, and also having the added benefit of increasing attendance.

Communications strategy that is mindful of member sensitivities

Many stakeholders attribute the success of GTW to its sophisticated and well-thought-out communications strategy, which involves a number of elements. Most important early on, has been CWW’s mindfulness of the sensitivities of GTW member organisations. CWW has specifically removed its branding from most GTW documentation, given credit to members whenever possible, and represented itself as an equal member of the group whenever names and logos are listed. Also the communications for GTW were designed initially to go through a third party, rather than be controlled internally by CWW. Stakeholders recognise this strategy as being an important factor in the success of the group.

Other important elements of the communications

strategy included:

- Having a good slogan (“Greening the West”)
- Sharing success stories to build momentum and show that “this place is changing”, because “without such a sense of progress, the Councils may go back to silos”
- Advocacy around the social benefits of urban greening, particularly around its relationship with urban heat and community wellbeing.

Community/developer/researcher partnerships

Even though the GTW group includes a broad range of stakeholders, in order for the GTW initiative to be

successful it must create partnerships even more broadly in the community. These partnerships are continuously building and are seen as important to the lasting success of the initiative. Some examples include partnerships with researchers, in particular at Monash University who have provided assistance in regards to urban cooling issues. Also, GTW has teamed up with lecturers from RMIT University to develop student projects relating to greening Melbourne’s west. GTW involves two community groups, but over its lifespan has had contact with the community more broadly through planting days. Also, as mentioned earlier in this report, GTW members are actively building relationships with developers to advocate for greening outcomes in new developments.

Benefits to partner organisations and major achievements

Making greening a priority within Local Government

Before the GTW initiative began, urban greening was not a major priority in the Local Governments of Melbourne's western region. "Although there were urban forestry professionals within many of these Councils, they had no voice internally, prior to Greening the West." Even the more progressive Councils were reluctant to "stick their neck out" to pursue regional solutions in the urban greening space.

The establishment of GTW had a profound impact on the level of priority placed on urban greening within these Councils. Through seeing neighbouring Councils taking action, this empowered urban greening supporters to advocate up the management chain for further action. The majority of the Councils in the GTW region have now seen cultural shifts within their organisations towards making urban greening a priority.

Brimbank City Council is considered to be particularly progressive in terms of the priority that they place on trees and greening. Since endorsing the GTW strategy, Brimbank City Council has:

- Implemented Planning Scheme Changes (to require trees in the private gardens of new

developments)

- Created an Urban Forest Strategy in 2016
- Created the Branchout Brimbank Website dedicated to promoting trees
- Planted nearly 180,000 trees (150,000 from the 1 Million Trees project plus 30,000 more) in parks and waterways (their Urban Forest Strategy states that 700,000 needed to attain 30% canopy target)
- Won an Australian Institute of Landscape Architects (AILA) award in 2016 for submission "Greening The West: A Brimbank Perspective", in the category of Research, Policy and Communication

United vision, collaboration and partnerships across Melbourne's west

GTW has made a substantial contribution to the creation of a "united west", with well-established partnerships/networks, a collegial environment, and healthy competition. "Since the establishment of the group there has been six years of energy and passion." One stakeholder suggested that "the biggest success to come out of the GTW group is this coming together." Members now have the ability to discuss problems, and approach these problems as a group. "Everyone has access to each

other now, and they are talking.”

This also extends beyond collaboration between GTW members. As stated earlier in this report, GTW members are also making inroads towards collaboration with researchers, developers and other stakeholders.

More trees in the ground, actual action and projects

There are significantly more trees in the streets, parks, waterway corridors and drainage reserves of Melbourne's western suburbs now, than there would be had the group never existed. It is likely that approximately all of the one million trees from the 1MT project, would never have been planted, as it was the regional model of GTW that facilitated the achievement of State and Federal Government funding. Also changing Local Government priorities has led to increasing numbers of street trees. Some of the consulted experts were of the opinion that street tree numbers have increased by as much as 50% in some areas due to the existence of the group, although this is a subjective perception of some stakeholders, rather than a conclusion based on data. The Upper Stony Creek Transformation and Greening the Pipeline projects have also been supported by the existence of the GTW group.

Generating publicity and showcasing success to community and government

The GTW group not only attempts to change the physical form of Melbourne's west, it also seeks to

transition the culture. To achieve this, it is not enough to implement greening projects. Publicity and communication is also required. GTW creates an avenue for sharing the success of the group with the wider community through its brand recognition and website.

GTW now has increased credibility due to the successful implementation of the 1MT project, and GTW stakeholders hope that State and National Governments have recognised GTW as an effective change delivery mechanism. One stakeholder noted that GTW has become such a successful example of a regional solution, that often when they are in important meetings “everyone begins sentences with ‘like Greening the West’.”

Perhaps the most notable example of GTW's successful publicity and brand recognition is the mentioning of GTW in the Victorian Government's Plan Melbourne (2014), Plan Melbourne Refresh Discussion Paper (2015) and updated Plan Melbourne 2017-2050. In these documents GTW is noted as a successful regional collaborative model, and also these documents have recognised the value of creating “green boulevards” in Melbourne to support urban greening. Having these policies adopted into Melbourne's planning strategy is giving GTW increased leverage for their ongoing campaign to change electricity wire and road clearance regulations.

Areas for Improvement

Very few problems

Interestingly, almost all of the consulted GTW stakeholders struggled to think of anything about the initiative that should have been done differently. Approximately half the stakeholders, even after further discussion of issues, were unable to pinpoint anything negative about the group. For example one stakeholder said “the group hasn’t been perfect, but it is always improving and moving in the right direction.” For such a complex and innovative initiative, this is surely a very positive indication of success. The other half of the consulted stakeholders noted some minor concerns.

Problems with group function and representatives

Some stakeholders noted issues with the GTW group relating to the size and makeup of the Steering Committee. As mentioned earlier in relation to building and sustaining commitment within member organisations, at certain points in the group’s history, some have been concerned that member organisations have not always nominated the most appropriate staff member (e.g. a planter instead of a planner or middle management). Separate to this issue, some stakeholders expressed some uncertainty around the size of the Steering Committee, raising the question of whether it would have

been better to split the group into a Steering Committee (similar to the present group) and working groups that meet more regularly. One stakeholder noted that “everyone is very collegial, but such a big group is hard to coordinate without feeling like a show and tell”.

On the other hand, the majority of the stakeholders were of the view that the GTW group functions effectively in its current form, and “has a good balance between community input and organisational input.”

1 Million trees project – Stakeholder engagement methods for planting locations

One of the consulted stakeholders detailed some problems during the 1 Million Trees project in regards to reaching out to organisations for permission to plant on their land. In particular, GTW partners had trouble reaching agreement with Melbourne Water, Parks Victoria, VicRoads and VicTrack, around permission to plant on their land. Apparently there were problems in regards to how these organisations were contacted. In some circumstances senior staff were contacted when middle management or content experts would have been more appropriate, and in other circumstances vice-versa. This led to the conclusion that GTW requires more nuanced stakeholder engagement methods for this specific task, because had they been approached in a different manner,

it is likely that many of these organisations would have been happy to have trees planted on their land.

1 Million Trees project – other concerns

Overall stakeholders were happy with the 1MT project. There were some concerns that the \$5M Federal funding was not actually enough to plant one million trees, and that Councils were forced to contribute some of their own money, but others did not see this as a problem. One stakeholder was of the opinion that the money would have been better spent on street trees (much fewer trees but with a higher social value due to their proximity to humans). There was some disagreement around choices of native trees as opposed to European trees which provide better shade, which is a topic of continued interest in the area of urban greening.

Greening the pipeline perceived problems

Some of the consulted stakeholders expressed some concerns about the Greening the Pipeline project.

Firstly, community groups have done significant planting along the pipeline, and feel that there is a “lack of acknowledgement” of their efforts. Unless told otherwise, residents tend to make the assumption that the planting has been conducted by council. In the future, as community group support for planting is vital for the success of GTW, it is important that efforts by community groups be appropriately acknowledged.

Secondly, the community groups have a perception that Melbourne Water does not permit planting close to the pipeline itself, which is contradictory to the aims of the project and likely to be a misunderstanding. In any case, this means that a communication channel directly between Melbourne Water and the community groups would likely benefit the situation.

Thirdly, a number of stakeholders expressed some concerns around the concentration of investment on a 100m stretch of the pipeline (referred to by one stakeholder as the “Rolls Royce” option), rather than spreading the resources more thinly across a longer length. Another stakeholder was concerned that people will not use the 100m section if it is isolated from other green space. In contrast, other stakeholders believed that concentrating resources on upgrading a 100m stretch of Greening the Pipeline to showcase possibilities was the best long-term strategy for improving the entire length. Also the external funding conditions required that it be used on a single site, and also achieve specific Integrated Water Management objectives.

Future directions for urban greening in Melbourne

Future of the Greening the West initiative

In the near future it is likely that the GTW group will continue to operate in its current model, with in-kind contributions from members, and CWW providing one full-time staff (this was recently reduced from two), plus communications support. Some stakeholders noted that there are a number of ways this model could change in the future. The group and CWW may at some point decide that CWW's contribution of resources has successfully created enough momentum in the group and is no longer necessary. One CWW representative mentioned a goal to "work themselves out of the job", although the current Managing Director of CWW has indicated support for a continuing CWW focus on GTW. It may be that at some point in the future, the GTW group becomes a stand-alone entity such as the Committee for Geelong, which is funded by public and private members.

If the GTW 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. Already GTW stakeholders have been contacted about replicating this model for catchment management activities in South East Queensland, and some see potential for this model to be implemented in western Sydney, where there are similar characteristics to western Melbourne.

Continuation of existing actions

GTW has achieved significant progress towards their objectives, but the challenges are so significant that the work will likely continue indefinitely into the future. Much of the efforts listed in this report are ongoing. The Greening the Pipeline project has so far had 100m of a 27km pipeline transformed, and landscaping of the rest of this length is now a priority for GTW stakeholders. A subsequent component of the current RMIT University research is likely to focus on advancing this project through the use of innovative financing.

The concept of implementing "green boulevards" in Melbourne's west was included in Plan Melbourne, and the Plan Melbourne 2017-2050 Implementation Plan includes a long-term metropolitan strategy for streetscapes, including boulevards, but much work is still needed before this GTW objective becomes a reality. It is likely that substantive changes to road and electricity wire clearance regulations must be made before these boulevards can be developed. Therefore changing these regulations is an ongoing priority for the GTW group, and they desire any support that they can find to assist in this task.

A necessary component of further work is to continue to publicise urban greening success stories from Melbourne, and continue to refine communications strategies to target

particular populations. Particularly the success of the 1 Million Trees project should be shared as widely as possible. It is hoped that the current report may contribute to this goal to some degree.

Exploration of new contractor and community partnership possibilities

Aside from these actions, urban greening advocates in Melbourne will continue to incrementally increase the level of greening in the city through standard Council and community group planting programs. These programs are currently investigating new contractor payment mechanisms, such as paying contractors a bonus if trees survive a certain time period, and new models of community funding, such as Councils offering to match any revenue raised from a particular residential community.

Collaboration with the private sector

There is a general awareness among GTW stakeholders that possibilities for private sector participation in urban greening are currently untapped. As stated throughout this report, continuing collaboration with private developers to advocate for additional greening is a clear place to begin collaboration with the private sector. Indeed it was noted that one particular developer actually wanted to be on the GTW Steering Committee but was not allowed due the idea that this may give the developer an unfair commercial advantage.

However there are additional avenues which are only beginning to be explored. The Upper Stony Creek Transformation project includes a non-profit company named GreenFleet, which conducts tree planting for free in return for carbon abatement credits and publicity. The Greening the Pipeline project (and its adjacent Federation Trail) has had much of its mulch provided free of charge by a private company. Greening the Pipeline stakeholders are interested in opportunities to further explore private sector participation, for example seeking private sponsorship in return for advertising rights to fund further greening. In particular it may be possible to have road construction contractors take on the maintenance of the Federation Trail in return for publicity. Also it may be possible to lease or sell-off parcels of land, for various uses, in order to pay for landscaping and planting.

Strengthening of planning controls to promote trees on private land

Regardless of any efforts to increase urban greening in the public domain, there is a risk that loss of greening from

urban densification on private lots will prevent any overall improvements in greening and tree canopy cover. Therefore any holistic urban greening strategy must also include changes to the planning controls (development regulations).

Currently there are state-wide regulations for:

- Mandating minimum levels of public open space in new developments (parks, sporting and recreation areas) through the precinct structure planning process
- Mandating minimum private garden areas (25 – 35%) for each lot in the Neighbourhood Residential Zone and General Residential Zone

However according to GTW stakeholders, urban greening also requires state-wide, or Melbourne-wide regulations for:

- Mandating a minimum level of tree canopy cover in public areas of new developments (currently much of the green space in new developments does not have trees and so limits potential urban cooling benefits)
- Mandating the planting of trees in front and back yards of lots as part of the development approvals process (a small number of Councils, such as Brimbank, have already done this)

GTW stakeholders have stated that “we need a champion at State Government to push for these planning reforms, and we need all the support we can get from other stakeholders, including water utilities.”

Quantification of benefits and reframing as “Green Infrastructure”

Almost all GTW stakeholders noted the need to quantify the benefits of urban greening, in order to help reclassify urban trees and parks as “Green Infrastructure” assets. The idea is that through rebranding urban greening as vital urban infrastructure it will be easier to accrue and justify funding for the urban greening agenda. The perception among the group is that trees are not adequately valued in the present political climate. A large part of this is the need to value the health benefits of trees, and potentially use this evidence to source funding from government health budgets. Also many stakeholders would like to see analysis done on road and electricity wire clearance regulations, to see whether they do more harm than good from a community wellbeing perspective.

If trees become adequately valued, it may change the way urban development occurs, by having landscape plans done before road and lot plans, to protect existing greenery. One stakeholder noted “landscape had more value in the old days, if you look at Royal Parade for example, planners protected the trees and made the road fit around them. This is how it should be done now, start with the landscape first, and make the urban form fit around that.”

Coordinating the urban greening agenda with Integrated Water Management

Over the past decade Melbourne’s water utilities have put significant energy and resources into developing Integrated Water Management (IWM) solutions. The IWM concept promotes the consideration of broader environmental, water security and liveability objectives through the integrated planning of a water utility’s basic functions (water supply, sewerage and drainage). This is achieved through, among other things, green stormwater infrastructure in urban areas, landscaping of waterways, and reusing treated stormwater and wastewater for beneficial uses including irrigation of private gardens and public open space.

IWM solutions are generally designed in collaboration between water utilities, Local Government and developers. Although these solutions have always had some form of positive impact on urban greening, greening outcomes have generally not been the highest priority. IWM advocates have promoted the fact that reuse water can be used to support greening, but have not been directly involved in promoting and increasing the greening itself. IWM advocates have promoted green stormwater infrastructure as a way of providing amenity, but have generally not directly considered the urban cooling and biodiversity supporting factors that could be built into this infrastructure. The implementation of collaborative IWM in Greater Melbourne is improving consideration of how reuse and stormwater management systems can be planned at a regional scale to help create regional green corridors together with parks, street trees and waterways, but this is not yet common practice.

GTW provides two examples of efforts to integrate the IWM and urban greening agendas. Firstly, there is an example of developers constructing recycled water pipes running along streets underneath street trees, with recycled water costs being paid by developers for the first 3 years to support tree growth. This is something that Melbourne’s water utilities could directly support and replicate. Secondly, there is continuing research into passive street tree irrigation

with stormwater. This creates water savings, promotes tree growth, and also retains stormwater. It may be that passive street tree irrigation can complement other stormwater management devices such as raingardens (biofilters), while more actively supporting urban cooling and other social objectives.

Scoping the broader role of water utilities in the urban greening agenda

As stated above, it is clear that there are links between urban greening and IWM which warrant further investigation. However there are broader questions to explore around the changing nature of water utilities and how this relates to the urban greening agenda. GTW stakeholders expressed the views that water utilities need to change their models to become “more open and organic, less hard engineering, to place the community at heart. Water is life, and we need healthy communities.” “Water companies need to follow City West Water’s lead, to make the environment, and public health a customer.” A large part of supporting the environment and public health in urban areas into the future is going to need to include a component of urban greening, particularly increasing tree canopy coverage to support urban cooling.

Water companies that attempt to take a stronger role in urban greening will inevitably be asked why they are required in this space. Stakeholders noted a number of potential justifications:

- Water is required to support greening
- Water utilities own a lot of land which can be greened
- Water utilities develop green stormwater infrastructure which can be redesigned to also support urban cooling, recreation and biodiversity
- Water utilities have a “unique social governance position” through having more influence over State Government agencies (e.g. road and electricity regulators) than Councils have

This final point suggests that one of the most significant ways that water utilities can support urban greening is through helping Councils lobby State Government agencies and regulators to change policies. This is something that the water sector could do for little to no cost, if it decided that it provides a net community benefit. One stakeholder noted that the current research to explore the water sector’s role in urban greening could be “a real game changer”, if it created any movement on this issue.

Implications for other initiatives

It appears that there is significant potential for the lessons from GTW, its functional collaborative model, and its networks to contribute positively to other initiatives within Melbourne and beyond. On the most obvious level, there is clear opportunity for the group's success to be replicated to achieve urban greening in other areas. For example the model could be replicated in other areas of Melbourne, or other cities around Australia and the world. Some GTW stakeholders expressed the view that such a group could provide value in Western Sydney, which has similar characteristics to the GTW region.

On another level, this group provides a replicable model for dealing with other complex urban challenges, such as Integrated Water Management, climate change mitigation, unemployment, homelessness, active transport links etc. GTW provides an excellent example of how a regional collaborative model can be set up by keeping in mind the sensitivities of member organisations, and attracting external funding through a united vision and combining skillsets to create a collective capability. GTW stakeholders noted that South East Queensland Water is currently seeking to use GTW as a template for catchment

management initiatives.

There are four specific initiatives within Melbourne with direct practical links to GTW, and so these relationships will be briefly discussed here.

Melbourne Metropolitan Urban Forest Strategy

Recently the Rockefeller Foundation began its 100 Resilient Cities program. This program selects a cohort of 100 cities, and provides resources to assist them to prepare and implement resilience strategies. A Flagship action within the Resilient Melbourne strategy is the development of a metropolitan urban forest strategy to extend and link existing urban greening, reforestation and nature conservation initiatives across Melbourne, to improve wellbeing and reduce exposure to hazards such as heatwaves and flooding. The Nature Conservancy, a global platform partner with 100 Resilient Cities, is leading the development of the Strategy.

The objective of the Strategy is to enable strong natural assets and ecosystems alongside a growing population. In particular, the:

- Associated improvement of sustainability

(e.g. stormwater water runoff, ecosystem improvements), liveability (e.g. heat and flood mitigation), viability and community wellbeing (e.g. amenity physical, mental, neighbourhood pride and overall enjoyment of a place)

- Enhancement, maintenance or increase in vegetation, with a particular emphasis on native vegetation, and the ecosystem services that they support with stress on outcomes relating to biodiversity and conservation and community health and wellbeing
- Enhancement of natural values (biodiversity) such as the native fauna presence and movement.

This strategy will map the current state of urban vegetation and analyse its relationship to ecosystem services and some elements of urban biodiversity within the context of urban growth and densification. This analysis will be used to develop recommendations about policy and implementation. The project manager for this strategy, Martin Hartigan, was previously a Local Government representative within the GTW group. Therefore there are clear opportunities for the Melbourne Metropolitan Urban Forest Strategy and the GTW group to leverage off each other to achieve their objectives.

Melbourne Water Urban Cooling program

Melbourne Water has recently begun its urban cooling program. This program involves a short term pledge to invest directly in improving the urban cooling potential of 30 hectares of green space in Melbourne, and a long term aim to embed consideration of urban cooling across a range of decisions and activities. There is significant potential for the GTW group to support and advise this program, particularly through assisting with site identification and planting, and for building collaborative networks so that water utilities can work hand-in-glove with Local Governments and community groups, to pursue the urban greening agenda in the future.

Plan Melbourne 2017-2050

The current metropolitan strategy for Melbourne is Plan Melbourne 2017-2050 (DELWP, 2017a) which seeks to manage the city's growth to 2050. The plan draws on earlier iterations including Melbourne 2030 (2002) and Plan Melbourne (2014). Within Plan Melbourne 2017-2050 various measures are proposed to improve the city's environmental performance, including water, greening and

open space. In relation to water, Plan Melbourne 2017 proposes to integrate urban development and water cycle management under Policy 6.3 (DELWP 2017a, p.114) by making better use of water sources, adopting integrated management policies, and protecting water assets. In relation to urban greening, policy 6.4 seeks to 'make Melbourne greener and cooler' by greening buildings, urban areas and transport corridors to create an urban forest (DELWP 2017a, p.119), while sub-policy 6.4.1 seeks to strengthen the open space network (DELWP 2017a, p119). Furthermore, policy 6.5 seeks to protect and restore natural habitats including via a network of green spaces (DELWP 2017a, p.121) and protecting and enhancing urban waterways under Policy 6.5.2 (DELWP 2017a, p.121). Spatial planning objectives with greening elements include Policy 4.5 (DELWP 2017a, p. 87) that seeks to plan Melbourne's green wedges to protect biodiversity and water supplies, and provide a recreational resource.

From a research perspective, whether Plan Melbourne 2017 is able to meet its various green objectives is a pertinent question. Melbourne is experiencing intense population growth, with a population expected to increase from 4.5 million in 2017, to 8 million in 2050. Therefore Plan Melbourne 2017 provides for significant expansion of suburban development which consumes green open space and encroaches further into green wedge catchments. The plan also must cater for infill development within established areas, where modest dwelling footprints surrounded by vegetation are replaced with high site coverage dwellings, resulting in net loss of vegetation and private green space (Hurley, et al., 2016).

While Plan Melbourne 2017 is a strategic document the substantive planning actions to be undertaken as part of the plan are presented in the accompanying Implementation Plan (DELWP, 2017b), which contains a number of greening actions. Precinct Structure Plans are to include greening elements on public and private realms to increase vegetation levels (DELWP 2017b, p. 13) while green wedges are to have dedicated management plans under Action 73 (DELWP 2017b, p. 24). Action 93 proposes an open space strategy to be prepared (DELWP 2017b, p. 31) to expand green space. Perhaps the most substantive greening actions appear in Action 81, in conjunction with efforts to achieve urban cooling via a raft of efforts, including: improved vegetation data; local government greening targets; coordination with water agency strategies; coordination of urban forest strategies; developing

greening strategies for state owned land; targeted grants for innovative green neighbourhoods; and demonstration projects for green subdivisions and developments (DELWP 2017b, p.30).

While these are encouraging they are largely focused on public or semi-public land. By contrast Hurley et al (2017) have noted that much of Melbourne's vegetation lies on private land and is thus vulnerable to clearing, especially through infill development. Hence, by targeting public land these greening elements of Plan Melbourne's implementation risk overlooking large-scale loss of green space on private property. As discussed in the Future Directions section of this report, Greening the West stakeholders recognise the need for using planning controls to protect and improve urban greening on private land.

Plan Melbourne actions reveal significant opportunities for DELWP and GTW stakeholders to share knowledge and collaborate. It appears likely that through such collaboration DELWP may be able to support GTW through changes to policies and legislation and provision of funding, and GTW may be able to support DELWP as an effective delivery agent for on-the-ground projects.

Water for Victoria and upcoming Integrated Water Management Forums

Water for Victoria lays out the Victorian Government's strategic vision for water management across the state. Chapter 5 of this document (Resilient and liveable cities and towns) includes a number of policies that relate to urban

greening including:

- Use diverse water sources to protect public spaces
- Improve stormwater management for greener environments and healthier waterways
- Work across government for healthy and resilient urban landscapes
- Put Integrated Water Management into practice

As part of the implementation of this strategic vision, DELWP has produced an Integrated Water Management Framework (DELWP, 2017c). A key component of this framework will be the rollout of Integrated Water Management Forums, which bring together water stakeholders at a sub-regional scale to discuss issues and potential solutions and projects (in what may be a similar format to GTW Steering Committee meetings).

GTW can provide knowledge that assists in the implementation of Water for Victoria, and Water for Victoria can provide additional justification for GTW members, particularly water companies, to increase urban greening efforts. In addition to this, the story of GTW, particularly in regards to its "key factors for success", can provide very important lessons for the design of DELWP's IWM Forums in order to increase attendance and buy-in from a range of stakeholders.

Conclusions, recommendations and next steps

GTW is a very successful collaborative regional model to support urban greening. It has overcome significant challenges, through well-thought out functional and communications strategies, which have resulted in significant results. Anyone can catch the train from Melbourne's CBD into the western suburbs, and see the amenity and environmental improvements which have come as a result of this initiative, particularly in relation to the tree planting in parks and along waterway and drainage corridors. GTW's perceived negative aspects, or areas for improvement, are relatively insignificant in comparison to its positive aspects, labelled in this document as key factors for success. The GTW initiative provides an excellent template for regional collaboration on complex urban issues, and further research would be warranted to consider its application to problems other than urban greening.

It is the opinion of the authors of this report that GTW is functioning very successfully in its current form, and we recommend that it continue to be supported in every way possible, to carry out its important work. As one stakeholder noted, "the real test of the success of GTW

will be an increased canopy cover and green space in the region in the years ahead".

There are a number of complementary actions which can and should be carried out to support GTW in achieving its objectives. Most of this work requires changes to State Government policies and actions. Taking into account the findings from this GTW investigation, the authors recommend that the Victorian Government:

1. Explore possibilities for state-wide, or Melbourne-wide, planning regulations around minimum levels of tree coverage in streets, open space and private lots within new developments (to complement existing regulations around public open space and private garden areas)
2. Establish some form of preliminary inquiry into regulations around road and electricity wire clearances, to ensure the current regulations strike the right balance between public safety and community health and wellbeing
3. Explore further opportunities for metropolitan or

regional-scale planning of greening, and green corridors, some of which are likely to emerge from the Melbourne Metropolitan Urban Forest Strategy, and the Metropolitan Open Space Strategy which are currently under development

4. There is an opportunity for Plan Melbourne 2017-2050 greening objectives and future Greening the West initiatives to align, giving strength to both. GTW is particularly relevant to the following Plan Melbourne Implementation Plan actions:
 - updating the Precinct Structure Planning Guidelines (Action 20)
 - a metropolitan strategy for streetscapes (Action 60)
 - a whole-of-government approach to cooling and greening Melbourne (Action 91) which commits to creating urban forests throughout Melbourne
5. Continue to prioritise funding for greening projects within Melbourne's west
6. Find other innovative mechanisms for encouraging urban developers towards additional greening

In addition to state government actions, it has been found that the urban water sector has a clear supporting role in the urban greening agenda. Some GTW stakeholders have noted that water utilities appear to have a "unique social governance position" which can provide assistance to Local Governments when they approach and attempt

to advocate to State Government departments and agencies on these issues. Also there are practical changes that Melbourne's water utilities can make to link the urban greening agenda into their core functions. For example, reimagining the way stormwater management and water reuse assets fit into and support the broader urban greening agenda, and taking into account emerging priorities such as biodiversity, urban cooling and recreation. The actions of water corporations are somewhat limited by the Water Act and Water Corporations Act, however the current dominant ideology of "Integrated Water Management", and associated social and environmental objectives, provides sufficient justification for increasing water sector action in the urban greening agenda.

Collaboration with the private sector to assist in urban greening is a matter which warrants substantial further investigation. GTW stakeholders, Melbourne Water, Resilient Melbourne, DELWP, and other stakeholders have all shown an interest in exploring what role the private sector could play in progressing the full 27km length of the Greening the Pipeline project. Therefore it is likely that a future case study for the current RMIT University research program will focus on innovative funding mechanisms for Greening the Pipeline.

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