

Liveability: Urban Water's Next Horizon?

Five years of case studies and learnings from Melbourne Water

H Pexton, K Nagato

ABSTRACT

The water industry has always been at the forefront of liveability in Melbourne, managing safe water supply and sewage disposal, and as shown today through Melbourne Water's vision of 'enhancing life and liveability' for Greater Melbourne. Over the past few years, we have worked with the community, State Government and our partners to better understand our contribution to 'liveability'. We have piloted a number of exciting new projects and programs, including returning concrete channels to naturalised waterways, transforming a disused sewer into a much-loved community parkland, opening up access to our extensive land estate for community uses, and working with our partners to collaboratively plan for waterways, stormwater, flood and social outcomes. This paper shares these case studies, along with learnings that can be transferred to other water utilities. It also poses the question of how planning for water and liveability outcomes can become more strongly integrated with planning for other city-shaping services, such as transport, energy, and health.

Keywords: Liveability, collaboration, partnerships, urban water, assets, integrated urban planning, city-shaping

EXECUTIVE SUMMARY

The water industry has always been at the forefront of liveability in Melbourne. In recent times, Melbourne Water has begun thinking beyond our traditional role in water, sewerage, drainage and waterway management, and started to look at the contribution we make to other factors that affect the city's liveability. Melbourne is growing rapidly,

placing pressure on public open space. The city is also experiencing the effects of climate change, including increased urban heat and heat-related deaths.

As the second largest landholder in Victoria, owning 9% of public open space within Melbourne's urban growth boundary and managing 25,000km of waterways, Melbourne Water has the potential to make a significant contribution by providing valued city-shaping services to the community.

Building on work completed by Holmes (2013) and Water Services Association of Australia. (2014) looking at the urban water utility's role in liveability, Melbourne Water has made significant progress turning ideas into reality through pilot projects and programs. These have been implemented in line with customer willingness to pay and aligned with our organisational vision and Strategic Direction of 'Enhancing Life and Liveability'. The driver behind these initiatives has been to ensure that communities are deriving maximum possible value from our role as a water utility and from the assets we manage on the public's behalf.

Collaboration is key to our shared success. We have engaged and partnered with our customers, communities, planners, and all levels of government to build a stronger understanding of the role of water and our assets, such as land, in supporting the liveability of Melbourne.

Case studies of pilots and programs we have initiated with our partners have explored the following service areas:

- activating disused assets – for example, as active transport corridors
- urban cooling
- opening up land for community use and public open space.

Piloting these projects has confirmed the benefits of delivering liveability outcomes to community, whilst delivering our day-to-day services. We've demonstrated financial, asset management, customer and organisational relationship benefits to delivering these shared outcomes. Challenges have arisen, including discussions on clear policy mandate, funding and inter-organisational role clarity.

We look to the future and ask ourselves 'What makes Melbourne liveable and how can we contribute to liveability?' By looking at our role from this perspective, it becomes clear that the potential contribution of Melbourne Water to the liveability of Melbourne extends far beyond water – in areas such as:

- providing cooler, greener, more amenable spaces
- enhancing community connection and access to nature
- creating opportunities for community recreation and enjoyment.

Planning for the city has occurred largely in silos, with no single agency having responsibility (or funding) for ensuring the liveability of Melbourne. The water sector's focus on Melbourne as a water sensitive city is a critical contributor to liveability, however bringing together the water, transport, energy, health and other sectors for truly collaborative urban

planning will be critical to maintaining and improving the world-renowned liveability of Melbourne.

INTRODUCTION

The water industry has always been at the forefront of liveability in Melbourne, and in the business of health. Melbourne Water has continuously provided Melburnians with safe drinking water and reliable treatment and disposal of sewerage since our establishment as the Melbourne Metropolitan Board of Works in 1891. Our role broadened in the 1920s when drainage and flood mitigation became essential for the burgeoning city, again in the 1970s with an increased focus on waterway health, and then again in the 1990s with the adoption of water sensitive urban design to protect water quality in Port Phillip and Westernport bays. The roles we play within the urban water industry remain the cornerstone of our contribution to the liveability of Melbourne.

Melbourne's transition along the water sensitive city continuum through this time (Figure 1 below) has been well documented (Brown *et al*, 2016)

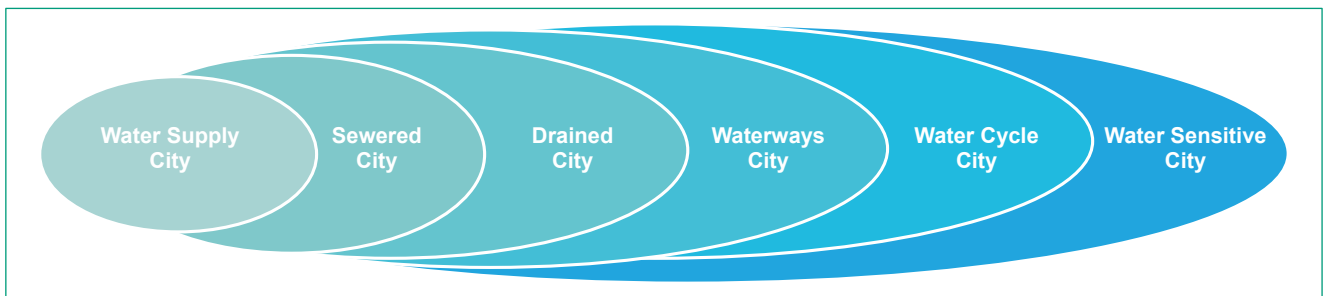


Figure 1: Water Sensitive City Transitions (Brown, Keath and Wong, 2009)

It is a model that still serves the water industry well, moving towards a city state that is 'resilient, liveable, productive, and sustainable' (CRC Water Sensitive Cities, 2019).

However, in recent times Melbourne Water has started thinking beyond our traditional role in water, sewerage, drainage and waterway management and begun to look at the contribution we make to the other factors that affect the liveability of Melbourne.

Melbourne Water is the wholesale provider of water and sewerage services to the Greater Melbourne region of

southern Victoria, Australia. We are a statutory authority owned by the Victorian Government, with responsibilities under various legislation to manage water supply catchments; treat and supply drinking and recycled water to retail water companies; remove and treat most of Melbourne's sewage; and manage waterways and major drainage systems in the Port Phillip and Westernport region (Melbourne Water, 2018).

Melbourne is growing rapidly, reaching 5 million inhabitants in 2018, 11 years earlier than predicted (Victorian

Government, Department of Planning and Community Development, 2008). If this growth rate continues, there will be 8 million people in Melbourne by 2043. Residential block sizes have decreased from an average of 750 m² in the early 2000s, to an average of 400 m² (and 300 m² in some newer suburbs) with the house footprint taking up most of the block, leaving very little private garden or open space.

As a result, pressure on public open space is increasing. Communities need access to open space and nature for health and wellbeing – being critical for child development, community connection, recreation, and physical and mental wellbeing (Twohig-Bennett & Jones, 2018; White *et al.*, 2018; Cox *et al.*, 2018; James *et al.*, 2016). In short, nature is a critical human habitat.

Melbourne Water is the second largest landholder in Victoria owning and managing 33,000 ha of land – an area larger than the country of Malta. Melbourne Water owns 9% of public open space within Melbourne’s urban growth boundary and is also manager of over 25,000 km of

waterway corridors (Melbourne Water, 2018). This makes the area of public land Melbourne Water influences much higher. In addition, it demonstrates the potential Melbourne Water has to make a significant contribution beyond drinking water and sewage management in providing valued city-shaping services to the community, as well as opportunities to provide areas of public open space where they are critically required.

The other significant pressure for liveability and public open space is climate change. Review of literature indicate that in Melbourne, the urban heat island effect can add 4-7 degrees to the city compared to surrounding rural areas (Morris & Simmonds, 2000; Torok *et al.* 2001). Heatwaves already kill more people in Melbourne than in any other Australian capital city, and these figures are set to triple by 2050 under climate change (PwC, 2011) (Figure 2). Cooling of the city is therefore critical for providing climate resilience that will benefit human health and liveability.

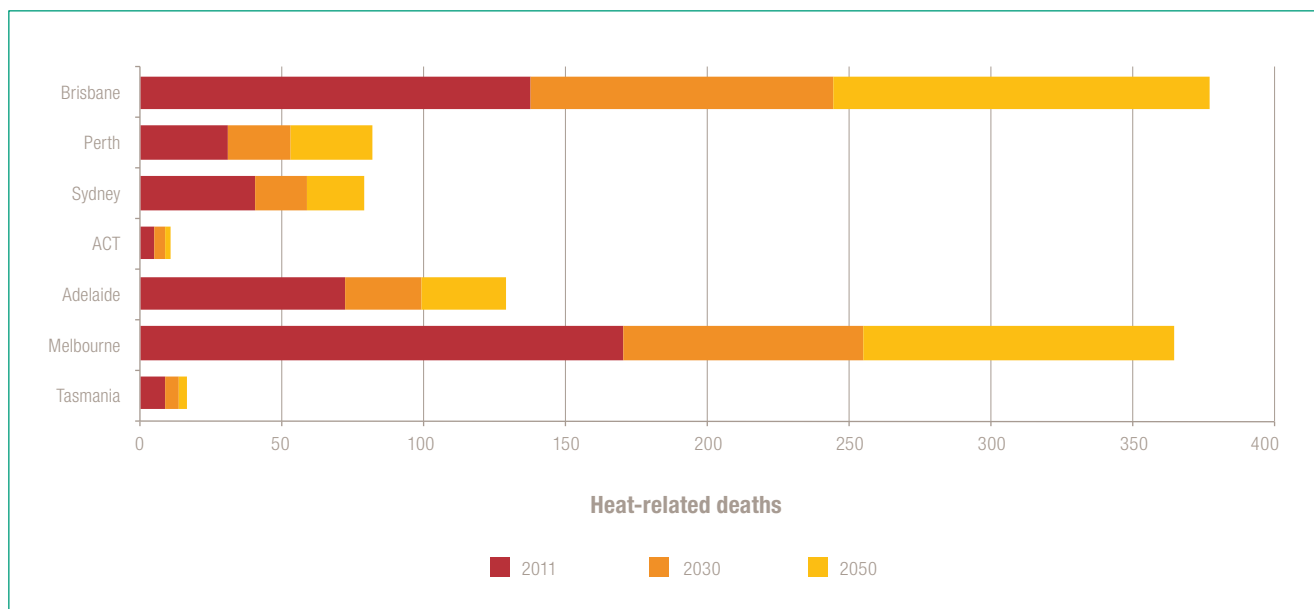


Figure 2: Estimates of heat-related deaths in major Australian cities (PwC, 2011)

Melbourne Water's work in 2013 explored in depth the additional roles and services we can provide to the community from our land, waterway and drainage management functions (Holmes, 2013). This seminal piece of work documented the various roles the water industry could play in 'liveability' (Figure 3), which was then

embedded in the Water Services Association of Australia's (WSAA) 2014 paper on 'The role of the urban water industry in contributing to liveability'; the first time that the concept of the water sector and liveability had been discussed thoroughly (WSAA, 2014).

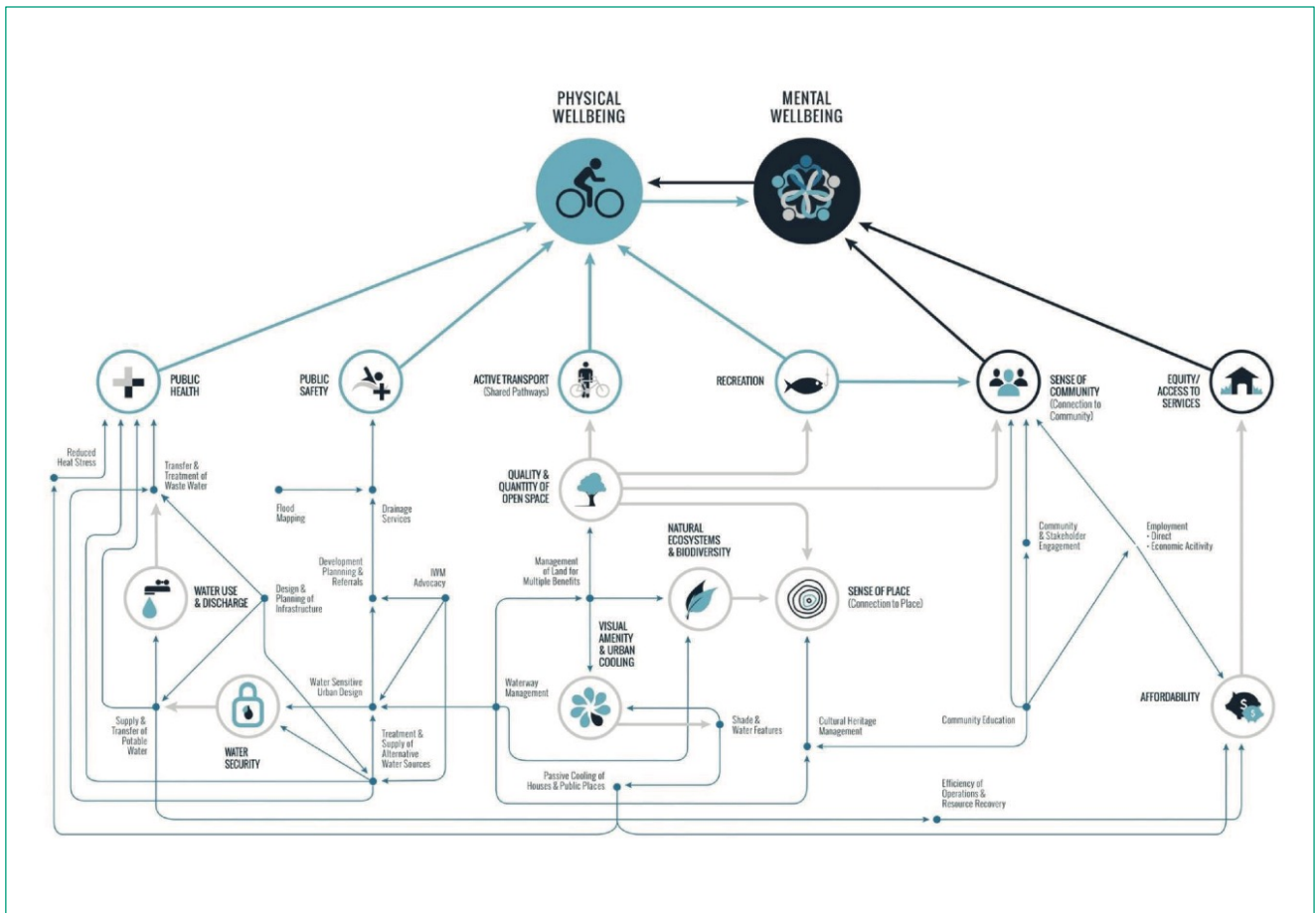


Figure 3: Interactions between water and aspects of liveability (Holmes, 2013)

This was further summarised and categorised into three key areas of water industry contribution to liveability (WSAA 2016): Amenity and wellbeing; Productivity; Sustainability and future focus (Figure 4).

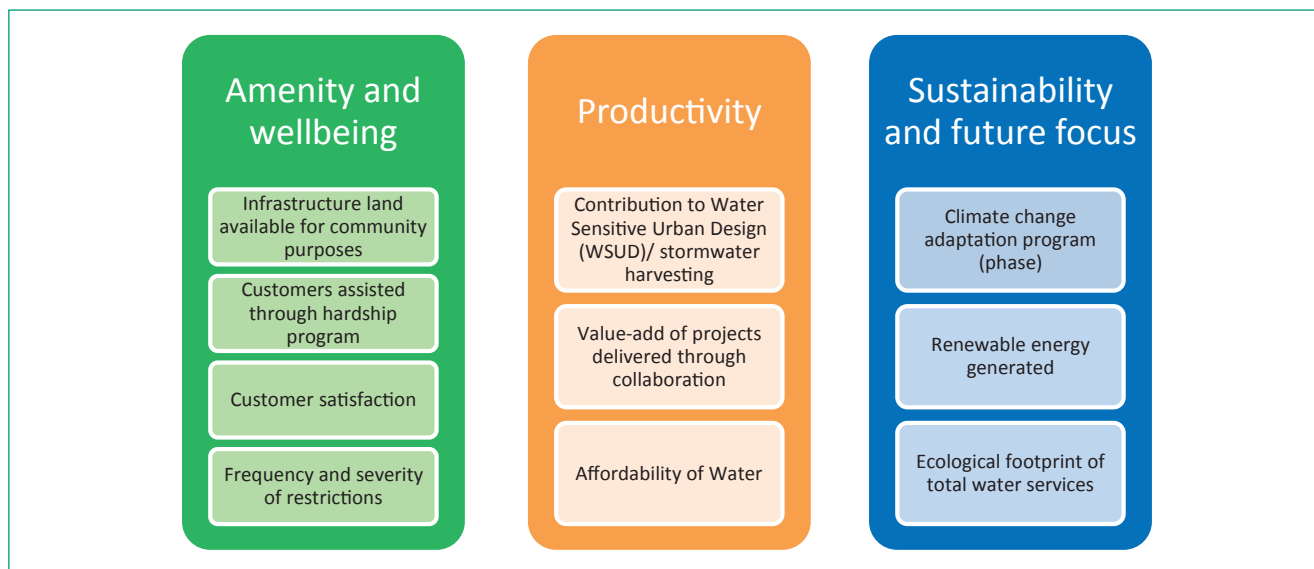


Figure 4: Liveability indicators for the urban water sector (WSAA, 2016)

Since 2014, Melbourne Water has made significant progress turning concepts of the water sector’s role in liveability from ideas to reality. We have piloted projects and programs that have driven tangible community benefits. We have explored our role in liveability in line with customer willingness to pay via consultation and engagement during our last pricing submission and review via the Essential Services Commission, the water industry financial regulator in Victoria.

Melbourne Water’s Strategic Direction contains our organisational vision of *‘Enhancing Life and Liveability’* and includes explicit reference to the organisation’s role to ‘increase community wellbeing and improve access to nature and recreation facilities’, and to ‘create more desirable places to live’ (Melbourne Water, 2018). In addition, in response to this Strategic Direction, Melbourne Water’s *Multiple Land Use Policy* states that Melbourne Water does not only meet regulatory, risk management, environmental obligations and regulations and State Government landholding policies for land that it owns and manages, but also *‘supports multiple use of the land and waterways it owns and manages for liveability outcomes’*. ‘Enhancing access to and use of our assets and land (including for recreation, amenity and visitation)’ is now recognised within our business as a sub-service. With an

overall drive to increase activation of Melbourne Water’s land, and supporting these outcomes in our Strategic Direction, we have a corporate KPI for ‘80% of capital projects achieve an improvement in the community enjoyment of nature and recreational facilities on our land and waterways’.

The driver behind these initiatives has been to ensure that communities are deriving maximum possible value from our role as a public water utility, and from the assets we manage on the public’s behalf, for additional outcomes of wellbeing and liveability. Where these outcomes clearly align with our service provision and customer willingness to pay, which is consulted upon with community via the 5-yearly Price Submission regulatory process in Victoria, they have been embedded into our day-to-day work. Melbourne Water is currently working with Victorian State Government to clarify its expectations of our work in this area. We are also engaging with customers to understand their preferences and willingness to pay for liveability outcomes as part of our next pricing submission to the Victorian Essential Services Commission, due in 2021.

We do not – and cannot – do this alone. Melbourne Water works in close partnership with a range of community and agency partners, including 38 local councils, water retailers,

developers, contractors, the community and government agencies. Collaboration is key to our shared success for the public. We have been engaging with our customers, communities, planners, and all levels of government to build a stronger understanding of the role of water and our assets in supporting the liveability of Melbourne.

METHOD

This section of our paper focuses on a range of case studies that detail how, in consultation with the community and our partners, we have rethought our role in the water, sewage, waterways and drainage services we provide and assets we manage, to derive additional community benefit and liveability outcomes, and ultimately, public value. They explore the following service areas:

- activating disused assets – for example, as active transport corridors
- urban cooling
- opening up land for community use and public open space.

CASE STUDIES

Case study 1: Opening up infrastructure and land for community purposes

One of our early initiatives was to analyse the land that we own and manage, and assess which land parcels could be made more accessible and available for community use beyond its primary function, transforming disused assets into well-used community assets. This has sometimes proved a challenging concept for the organisation as traditional asset managers protecting the primary use of the land; care has been taken to ensure that this is never compromised. Shared outcomes have been shown to be possible on a number of parcels of land. We developed the ‘*Our Space Your Place*’ online program on our website to show each parcel of Melbourne Water owned and managed land, with a traffic light approach to whether it is available for community use, with the aim to increase community use of our land. Below is a case study of a water pipe track in Croydon, north-east of Melbourne.

Hope City Mission “Seasons of Hope” Community Garden

Overview: In 2016, Hope City Mission partnered with Melbourne Water to construct a vegetable garden comprising 84 raised beds on the outer edge of a Melbourne Water pipe track adjacent to their warehouse in Croydon, to grow healthy food and provide education to the local community about gardening and cooking. This was one of the first community gardens built on Melbourne Water land (Figure 5) as part of our ‘Our Space Your Place’ online program that aims to increase community use of our land.

Stakeholders: Melbourne Water, Hope City Mission (charity organisation) and Maroondah City Council.

Funding:

- Melbourne Water: \$2K for an operational access gate to pipe track from the site
- Maroondah City Council: grant to Hope City Mission
- Hope City Mission: charitable donations

Benefits:

- provides fresh produce for the Hope City Mission foodbank program, feeding approximately 80 families per week
- gardens were constructed and managed under a ‘work for the dole’ program, providing a platform for people to learn new skills to enter the workforce
- demonstrates how water utility land can also be used for multiple benefits – in this example, open space for the community, urban greening and cooling, and local agriculture
- reduces Melbourne Water’s footprint of direct land management and therefore reduced our operational maintenance costs at the site
- provides the community a place to connect to nature, gardening and food production, and to each other, providing a sense of place and accomplishment, particularly for those who may be more vulnerable and isolated.

Management of risk: This initiative initially came up against resistance due to concerns about risk and potential threat to the pipe asset from any activity on the land above it. To overcome these risks, the original design was modified to ensure the garden was planted in transportable planter boxes, to allow large vehicle access for maintenance or renewal purposes. This enabled the garden to be established without compromising the primary purpose and function of this parcel of land.

Factors making the project successful:

- Small-scale project early in our liveability program delivery, to demonstrate the value of opening up Melbourne Water's land for complementary multiple uses

- Working together with Hope City Mission on the on-ground design to ensure that access was always possible for water pipe asset management, if required.



Figure 5: Gardens of Hope community food garden on Melbourne Water pipe track, Croydon, Melbourne

Case study 2: Activating Disused Assets

Another example on a larger scale of assessing the potential of land and assets for community benefit is the Greening the Pipeline initiative on the 40 m wide, 27 km long Main Outfall Sewer to the west of Melbourne. The sewer was constructed in the early 1890s as a reaction to the sanitation crisis caused by the phenomenal growth of Melbourne in the 1880s. For almost 100 years it transferred the majority of Melbourne's sewage for treatment at the Western Treatment Plant until it was decommissioned in 1993. Since then it has remained a disused linear asset locked away from the public, for safety reasons, and providing minimal community value.

Greening the Pipeline

Overview: Greening the Pipeline aims to transform the 27 km heritage-listed sewer reserve into a linear parkland to service the fast-growing population in Melbourne's west. The vision is to create a vibrant space that will connect communities, enhance active transport options for the region, manage water sensitively and provide a unique space to meet, play and relax. To showcase the potential of Greening the Pipeline, Melbourne Water, with partner funding from the Victorian State Government, built a pilot park along 100 m of the reserve in Williams Landing, one of the fastest growing urban areas in Australia with one of the least public open space provisions per capita. The design of the park included green open space with improved connectivity for communities on either side, added amenities

such as seats, drinking fountains, bike stands, lighting and trees for habitat creation and shading. The integrated water management element of the park includes a stormwater harvesting and reuse system to ensure the sustainable irrigation of the green space and to minimise stormwater runoff to the downstream waterway (Figures 6-8). The next phase of construction will build on the success of the pilot park and deliver the next 3.7 km creating 15 ha of new open space, funded through partnerships.

Stakeholders: Wyndham City Council, Melbourne Water, City West Water and VicRoads, and supported by Greening the West initiative: a 23- organisation strong partnership of councils, government agencies, industry and community groups committed to greening Melbourne’s west.

Funding:

- Pilot Park: Melbourne Water (\$2.1M); Vic State Government: \$760K
- Next 3.7 km: Attracted committed combined funding from Vic State Government and partners (City West Water, Wyndham City Council) of over \$10M to date. Anticipated \$15M total cost.

Benefits:

- Health – physical and mental health benefits through provision of green open space, exercise equipment, and connection to bike and footpath trails in an area with limited public open space; visitation has increased by 62%.

- Economic – property value uplift of neighbouring properties.
- Social – connection of communities from either side of previously dividing fenced-off asset; connecting community to nature on-asset and in the new community garden; provision of public open space previously contained within a fenced off decommissioned and unused sewage asset; connecting community to the heritage of the asset.
- Environmental – habitat (50 trees and 1200 m² landscaping in 100 m pilot park); reduction in stormwater discharge into downstream waterways by capturing, treating and reusing stormwater to irrigate the park itself.

Management of risk:

- Heritage: measures to preserve heritage-listed sewage pipe via burial and signage to celebrate its history.
- Maintenance of site: to be transferred progressively to Council from Melbourne Water.
- Safety and access: reduced incidents of vandalism by encouraging community connection and visitation and in turn, increased passive surveillance.

Factors making the project successful:

- Co-funding an officer within Wyndham City Council to co-lead the project and broader program
- Communications - photos, mocked-up graphics of future parkland as a prospectus, drone footage and website
- Data gathering before and after on community attitudes and visitation to the parkland



Figure 6 (Main Outfall Sewer before), Figures 7 and 8 (after - the new Williams Landing parkland)

Case study 3: Understanding community needs

Key to the success of determining what added liveability benefits a water utility can provide is understanding what the community themselves would like; listening, understanding,

and then collaborating with other key partners for success. Collaborative planning and delivery of partnership projects has been a key focus of Melbourne Water projects in all areas of our service delivery, and the example below showcases a new program developed to respond to

community expectations in the waterway and flood planning part of the business.

Reimagining Your Creek Program

Overview: When Melbourne Water asked our community and stakeholders what waterways and drainage services they'd like us to deliver in the future, their preference was for us to invest directly in naturalising waterways and drainage lines that had had significant human intervention (through straightening, channelisation, concreting, etc.) to deliver more liveability outcomes for the community. The *Reimagining Your Creek* program aims to transform 5 km of concrete/earthen channels or daylight waterways (where they are currently piped underground) to create places that enhance community health and wellbeing. The program is about more than just digging up a pipe and building a waterway focused solely on its environmental health; it is also about connecting waterways to other areas, identifying the facilities the community want in that area and focusing on creating a place for people to enjoy – 'placemaking'. As such, it requires strong partnerships with councils, other partners and the local community to understand what is missing from the site that the community want to see.

Case study: Daylighting 600 m of Blind Creek, South East Melbourne, into a naturalised waterway with streamside vegetation for habitat and canopy cover for shade and cooling, cycle and pedestrian paths, seating and stepping stones across the creek.

Stakeholders: Melbourne Water, Knox City Council, South East Water, Victorian State Government, Friends of Blind Creek.

Funding: Estimated \$2.5M, cost shared between Melbourne Water and Knox City Council.

Benefits:

- 600 m additional streamside vegetation for habitat, urban shade and cooling, and improved public open space including cycling paths and pedestrian paths, seating and stepping stones in the creek
- community connection to nature for physical and mental wellbeing outcomes
- development of open space to improve connection between local schools, parks, sports ovals and a shopping centre
- management of stormwater to manage the 1 in 100-year flood extent, and continued drainage and flood protection to the local residential properties, and water quality into downstream Dandenong Creek.

Management of risk:

- Safety: Ongoing discussions regarding community desire to have stepping stones in the creek.

Factors making the project successful:

- Genuine collaboration and openness to all options from the start with all partners
- Graphic designed images of possible outcomes for the creek
- Ability to showcase multiple benefits of the project for all partners for stronger buy-in – integrated water management, open space, revitalisation of a social space, habitat for biodiversity, urban cooling, etc.



**Figure 9 (left): Blind Creek – current (piped waterway with landscaping), after (grassed overflow channel).
Figure 10 (right): Blind Creek – proposed daylighting, reforming channel**

Case study 4: Collaborating for shared success and shared asset management

Collaboration has also been important to success where we are one of many organisations or groups involved in the management of an asset, such as Melbourne Water's role in managing waterways. The below case study outlines a co-design process utilised to help facilitate a unifying vision and collaboration for future outcomes for Moonee Ponds Creek, a 42 km creek running north-south from past Melbourne Airport into the city of Melbourne.

Moonee Ponds Creek "Chain of Ponds" catchment collaboration

The Moonee Ponds Creek has historically been highly modified as urbanisation grew north of the city in the mid-20th century. Concrete channelisation of the creek is commonplace, but so too are a number of birds, frogs, native vegetation, habitat areas and linear corridors and pockets of public open space that are highly valued in a densifying city. The community surrounding the creek are passionate advocates, and along with a number of government organisations, make up the 17 partner organisations of the Moonee Ponds Creek "Chain of Ponds" collaboration (Figure 10) established between 2016-2018. Together the collaborators developed a co-designed goal to 'transform the Moonee Ponds Creek into an iconic waterway for Melbourne that provides high social and environmental benefits'.

The collaboration has been transformative. The final collaboration structure was co-designed by all partners including community groups, government agencies, water authorities and local government. It takes a whole of catchment approach to governance and project management, reframing the public realm in the creek corridor as a cohesive piece of green infrastructure that combines ecological and social benefits. It provides a unifying vision for various projects in the public realm along the creek.

Whilst Melbourne Water is the waterway manager in this area, it takes many more organisations, individuals and energy to bring to life projects to 'transform' the creek, as this partnership aims to do. This unique collaboration brings together a range of powers, responsibilities and funding to attract new investment to revitalising the creek. It also helps bring to life priority projects such as removing the concrete channel in one section, providing better access to the creek and improving adjacent parklands. Melbourne Water's facilitation and coordination role, empowering other partners, has been vitally important to the success of this initiative, which will reap wide benefits for the creek into the future.



Figure 10: Moonee Ponds Creek collaborators sign a historic Collaboration Memorandum of Understanding (October 2018)

Case study 5: Contributing to water sensitive urban design

Melbourne Water has played a leading role over the past 20 years in its contribution to Water Sensitive Urban Design (WSUD), stormwater harvesting and the contribution of water in the urban environment more broadly. We have co-funded WSUD and stormwater management on-ground assets, tools and strategic plans, invested in capacity building of our partners, and more recently, assessed the role that our landholdings and stormwater management can play in urban greening and cooling projects. The following case study outlines these initial steps in urban cooling.

Using water and land assets for urban cooling

Overview: The urban heat island effect for Melbourne is well documented (Morris & Simmonds, 2000; Torok *et al*, 2001), impacting on public health, mortality rates, our ecosystems and biodiversity, energy demand and the economy. Natural green spaces help mitigate the impacts of

the urban heat island and contribute to cooler communities. Melbourne Water’s urban cooling program was established in recognition of the fact that as a large landholder we can play an important part in contributing to urban cooling on the land we own and manage, particularly given the vital role of water in supporting green infrastructure.

Case study: Establishing vegetation (trees and shrubs) for urban cooling on Melbourne Water-owned land around the Edithvale Wetlands in Melbourne’s south, and Jacana Retarding Basin to Melbourne’s north west.

Stakeholders: Melbourne Water, Kingston City Council and Friends of Edithvale Seaford Wetlands (Edithvale wetlands project,) and Hume City Council and Friends of Moonee Ponds Creek (Jacana Retarding Basin project).

Funding: \$500K (Melbourne Water)

Benefits:

- 24 hectares (the equivalent to nearly 10 MCGs) of canopy trees for shading and cooling of pedestrian paths used by the local community
- providing cooling benefits to encourage people into these public open space sites for passive and active recreation on more days of the year
- increased vegetated habitat for birds and animals.

Factors making the projects successful:

- Cost-benefit of actions (vegetation planting) for community urban cooling outcomes
- Ability to draw on Melbourne Water's core experience and expertise in vegetation management for delivery of works

DISCUSSION

Melbourne Water has achieved the outcomes outlined in the above case studies through a range of roles and funding, including:

- via the 'Waterways and Drainage Charge', levied on each household annually through our role as waterways and floodplain managers under the Victorian Water Act
- shared funding between Melbourne Water and partners, for example to activate a parcel of land for public open space provision, with shared outcomes for Melbourne Water in our core roles of water, sewage, waterways or drainage management
- providing up our land as an asset for our partners and community to activate (where it does not compromise the primary purpose of that land for water, sewage or drainage outcomes) – and acting as facilitator to enable this activation to occur.

Through piloting these case studies, we have confirmed the benefits of delivering liveability outcomes to our customers and the community, alongside our day-to-day services. As well as aligning to our Strategic Direction, the benefits of Melbourne Water delivering liveability outcomes include:

- **Financial:** community use of land has the ability to reduce land tax per parcel of land; co-use and future co-management of land reduces land maintenance obligations and costs.
- **Customer:** mental and physical health and wellbeing benefits through cooler, greener and more accessible spaces (in a rapidly densifying city); enhanced community connection and access to nature, and opportunities for community recreation and enjoyment; property value uplift of neighbouring properties.

- **Asset management:** 'sweating the assets' to derive best value for community from them.
- **Organisational relationships:** providing land access to partners, such as councils, for open space provision, where there are no/manageable risks to Melbourne Water's core service delivery from additional use of that land - this is particularly valuable in areas of Melbourne that are facing high levels of population growth with little available public open space; improved relationship with the community as a result of providing a visible legacy benefit in areas where major infrastructure upgrades/renewals have caused disruption.

However, delivering liveability outcomes concurrent to our traditional service provision has also been met with challenges, which are summarised below:

People: changing culture mindset from a 'why?' to 'why not?' lens for delivering concurrent liveability services; commitment from leadership and champions; individuals' skills and capability.

- **Process:** acknowledging cross-organisational and institutional barriers; budgets and funding.
- **Systems:** translating strategic direction into organisational KPIs and a service delivery and asset management framework; defining roles and accountabilities.
- **Assets:** ensuring that activation of land or other assets for multiple benefits does not compromise the primary purpose of that land for water, sewage, waterways or drainage outcomes.
- **Regulation:** Whilst we have piloted delivering liveability services in some areas, it is becoming harder to support these services through the strong regulatory environment of the water industry in Victoria without clearer direction and a mandate from Government to deliver these services, despite customers' willingness to pay.

There have been significant learnings from these past five years in embedding 'liveability' thinking within Melbourne Water. Broadening thinking beyond traditional asset management to considering community use of spaces, and 'place-based solutions', is a significant change in mindset. Traditional organisational challenges have arisen, including discussions on policy mandate, funding and inter-organisational role clarity. However, there have been significant strides forward and evolutions in thinking that have started to deliver broader community benefits from the services we offer as a leader in Melbourne's urban water industry.

As shown above, Melbourne Water is thinking more strategically about multiple benefits – both *within* the services and assets that we manage (water, sewerage, land, waterways and drainage), and also *between* organisations. We have focussed on driving solutions that deliver broader community outcomes through collaboration and partnerships. As we look to the future and what's next, we

are asking ourselves 'What makes Melbourne liveable and how can we contribute to liveability?' By looking at our role from this perspective, it becomes clear that the potential contribution of Melbourne Water to the liveability of Melbourne extends far beyond water (Figure 12), further clarifying the work of Holmes (2013) shown earlier in Figure 3.

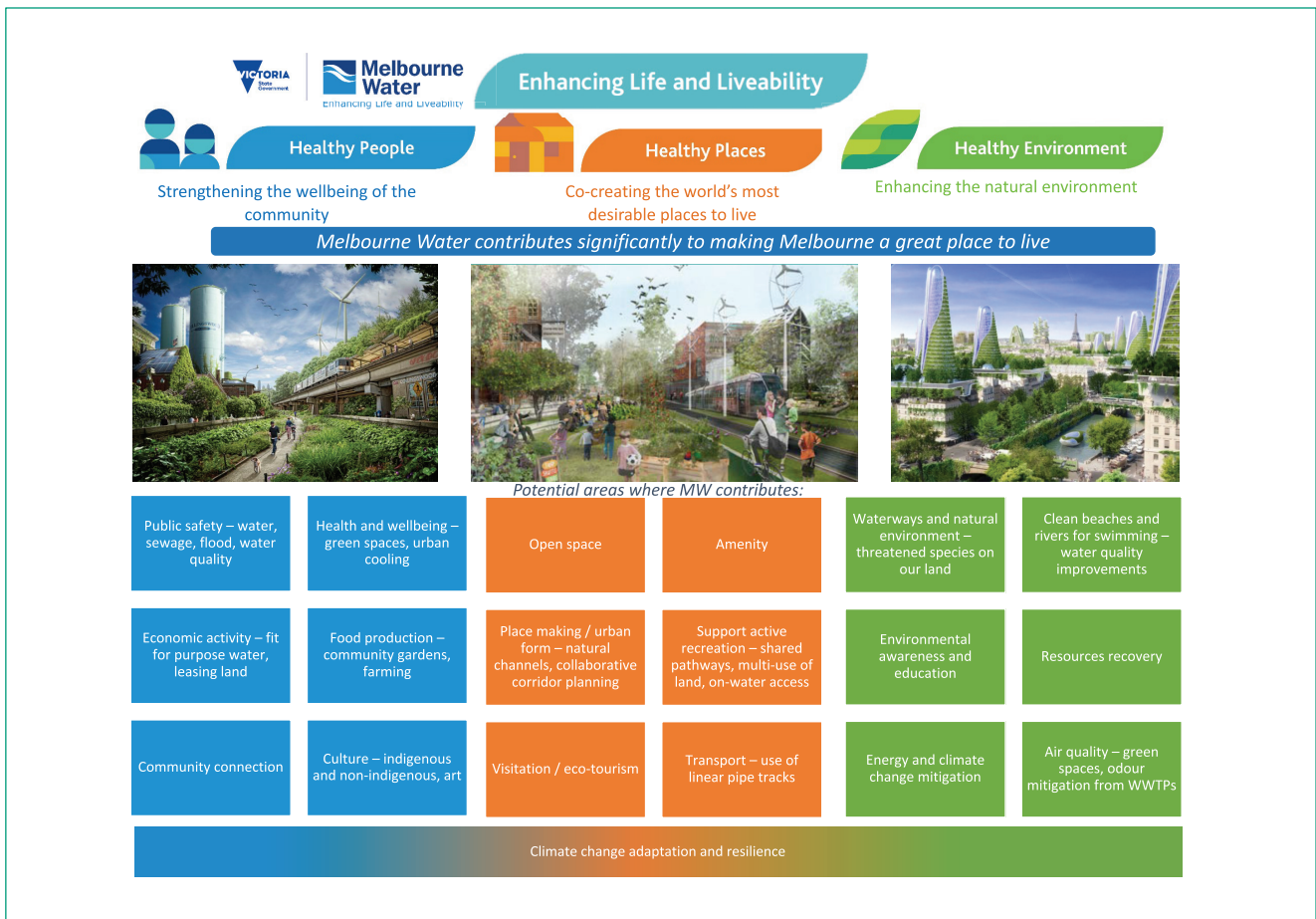


Figure 12: Potential areas where Melbourne Water contributes to the liveability of Melbourne

This perspective leads to different conversations with our partner organisations and the potential to unlock new opportunities for community liveability. For instance, and as shown in the case studies above, Melbourne Water-owned assets can be used for significantly more than their primary function, including:

- use of pipe tracks (land above major water, sewer or drainage pipes) as cycling and walking transport corridors;
- use of retarding basin land for off-leash dog walking and recreation;
- use of wastewater treatment facilities for resource recovery;
- use of land/assets for carbon sequestration or food production or energy generation.

On the land and waterways Melbourne Water owns and manages, we have opportunities to provide multiple community benefits in practical and innovative ways. As we

go about our work, we look to include actions that can further enhance life and liveability in Melbourne, such as:

- providing cooler, greener, more amenable spaces;
- enhancing community connection and access to nature;
- creating opportunities for community recreation and enjoyment.

It is apparent that planning for Melbourne has occurred largely in silos to date and that no single agency has responsibility (or funding) to ensure the liveability of Melbourne. Planning for transport occurs separately to planning for water, energy, health, waste, etc. Holistic cross-sector planning bringing together all the components of a liveable city will help unlock hidden opportunities (Figure 13).



Figure 13: Cross-sectoral linkages to deliver a liveable city

Some inter-sector discussions (e.g. health and water; energy and water; environment and health) have been occurring, albeit in silos or on specific projects. Despite there being lower overall public costs, it is often hard to make new intra-sector initiatives stick, especially where the economics of one sector 'lose out' and another gains. So, what is needed to better establish holistic planning? Holistic government targets? Tools and frameworks to build the business case? Pilot projects showing cross-benefits? Community engagement, empowerment and action?

CONCLUSIONS

Melbourne Water's exploration of delivery of liveability outcomes concurrent to delivering our day to day services has demonstrated it is possible to deliver additional customer value through multiple uses of our land and assets. We continue to work through the challenges and share learnings with our partners and the broader industry.

Partnerships are critical to everything we do. It is important that the efforts of government, urban planners and the water industry are aligned to better understand and respond to the requirements and expectations of water's contribution to the future liveability of Greater Melbourne.

The water sector's focus on progressing towards a water sensitive city is a critical contributor to a liveable city. However, bringing together the thinking of the water, transport, energy, health and other sectors for truly collaborative and integrated urban planning (Figure 13) will be critical to maintaining and improving the world-renowned liveability of Melbourne.

Greater future collaboration between these city-shaping service providers is needed to identify linkages and opportunities. For example, planning for the health benefits (physical and mental) of green open space with the health sector, alongside the water sector who have available multi-use land and water to enable these spaces to be viable in a hotter, denser city. Additionally, joint planning between the energy and water sector on the role and costs of water to provide urban cooling at the lot-scale, complementary to energy-intensive air conditioning.

ACKNOWLEDGEMENTS

We would like to acknowledge the work of the various teams at Melbourne Water in bringing new concepts of liveability life in the work they do every day, and would like to sincerely thank our many partner organisations and community groups for working with us to bring about shared outcomes in enhancing the life and liveability for Melburnians.

REFERENCES

- Brown, R. R., Keath, N., & Wong, T. (2009), *Urban water management in cities: historical, current and future regimes*. Water Science and Technology, 59(5), 847 - 855.
- Brown, R., Rogers, B. & Werbeloff, L. (2016) *Moving toward Water Sensitive Cities: A guidance manual for strategists and policy makers*. Cooperative Research Centre for Water Sensitive Cities Pty Ltd, Melbourne.
- Cox, D.T.C., Shanahan, D.F., Hudson, H.L., Fuller, R.A. & Gaston, K.J. (2018) *The impact of urbanisation on nature dose and the implications on human health*. Landscape and Urban Planning, Vol. 179, pp.72-80.
- CRC Water Sensitive Cities (2017), *What is a Water Sensitive City?* Cooperative Research Centre for Water Sensitive Cities Ltd, Melbourne.
- Holmes, M. (2013), *Melbourne Water's Contribution to Liveability*. Melbourne Water and State Government of Victoria, Melbourne.
- James, P., Hart, J.E., Banay, R.F. & Laden, F. (2016) *Exposure to greenness and mortality in a nationwide prospective cohort study of women*. Environmental Health Perspectives, vol. 124, no. 9, pp 1344-1352.
- Melbourne Water (2018), *Melbourne Water 101: Who we are, what we do and who we work with*. Melbourne Water and State Government of Victoria, Melbourne.
- Morris, C. J. G., Simmonds, I. (2000) *Associations between varying magnitudes of the urban heat island and the synoptic climatology in Melbourne, Australia*. International Journal of Climatology. Vol.20, pp.1931-1954.
- PricewaterhouseCoopers (for Commonwealth Government of Australia) (2011), *Protecting human health and safety during severe and extreme heat events: A national framework*. From: <https://www.pwc.com.au/industry/government/assets/extrem-e-heat-events-nov11.pdf>

Torok, S. J., Morris, C. J. G., Skinner, C. and Plummer, N. (2001) *Urban heat island features of southeast Australian towns*. Australian Meteorological Magazine. Vol 50, No. 1, pp 1-13.

Twohig-Bennett, C. & Jones, A. (2018) *The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes*. Environmental Research, Vol 166, pp628-637.

Victorian Government, Department of Planning and Community Development (2008), *Melbourne 2030: A Planning Update, Melbourne @ 5 million*. State Government of Victoria, Melbourne.

Water Services Association of Australia (2014), Occasional Paper 30, *The role of the urban water industry in contributing to liveability*. WSAA, Docklands, VIC, Australia.

White, M.P., Alcock, I., Grellier, J., Wheeler, B.W., Hartig, T., Warber, S.L., Bone, A., Depledge, M.H. & Fleming, L.E. (2019) *Spending at least 120 minutes a week in nature is associated with good health and wellbeing*. Nature Scientific Reports, 9:7730. <https://doi.org/10.1038/s41598-019-44097-3>

Water Services Association of Australia (2016), Occasional Paper 31, *Liveability Indicators: A report prepared for the water industry*. WSAA, Docklands, VIC, Australia.

THE AUTHORS



Hannah Pexton

Hannah is Manager Land and Collaborative Planning at Melbourne Water. She is a strategic leader in the water and environment sectors, with over 15 years' experience in roles across the UK and

Australia at local, regional and national government level, and in both operational and strategic roles. In recent years, Hannah has been leading Melbourne Water's work in growing and piloting Melbourne Water's services related to liveability, environmental stewardship and resilience, with previous roles in integrated catchment and water quality planning for drinking water, sewage, stormwater and rivers in the Greater Melbourne region, and river health operations.

Email: Hannah.pexton@melbournewater.com.au



Kate Nagato

Kate is Manager Innovation and Resilience at Melbourne Water, leading change in how the sector builds resilience to current and future pressures and better integrates land and water management in delivering its services to the community. With over 20 years' experience in strategic, operational and collaborative leadership roles in land and water management, she is particularly excited by the increased focus on liveability and resilience over the past few years. She is passionate about working together to create great places to live and work, recognising the importance of nature for our own health and wellbeing as well as the myriad other species we share the planet with and building resilience to change and future stresses.

Email: Kate.Nagato@melbournewater.com.au