WATER SERVICES
ASSOCIATION OF AUSTRALIA

Blue + green = liveability

THE VALUE OF WATER TO LIVEABLE COMMUNITIES

"While Australia's cities are the economic powerhouses of our nation, we need to remember that cities are also fundamentally about people.

Creating liveable places is not optional for governments; it is essential.

Liveability is intrinsically linked to economic growth and will play a key role in maximising the opportunities of population growth in our cities in the future."

Infrastructure Australia

Overview

Australian and New Zealand cities and regions are in a period of rapid transformation as populations grow, our climate shifts and communities seek improved infrastructure delivery for a better way of life

Liveable, sustainable and productive cities and regions are critical to our economic wellbeing and quality of life and enhancing liveability outcomes — in particular improved health outcomes — for the community is vital

The water industry has a strong reputation for contributing to the liveability of Australian and New Zealand cities and regions by providing safe, secure and affordable drinking water, wastewater and drainage services

Investing in water-enabled green and blue infrastructure can deliver benefits to physical and mental health by making our communities cooler, healthier and more attractive places to live, work and play

Liveable, sustainable and productive cities and regions are critical to our economic wellbeing and quality of life

Australian and New Zealand cities and regions are in a period of rapid transformation as populations grow, our climate shifts and communities seek improved infrastructure delivery for a better way of life. Enhancing liveability outcomes – in particular improved health - for the community is vital to support this change. Our communities need to be designed to be appealing places to live, work and play by providing easy access to key services, enabling healthy behaviours, and protecting environmental values in a way that provides resilience to drought, urban heat and climate change.

Liveable, sustainable and productive cities and regions are critical to our economic wellbeing and quality of life. The international competitiveness of Australia and New Zealand relies on the liveability of our cities and regions to attract top global talent and tourism.[1]

The water industry has a strong reputation for contributing to the liveability of Australian and New Zealand major urban communities by providing safe, secure and affordable drinking water, wastewater and drainage services.

Various independent state and national reporting programs demonstrate water utilities deliver improved performance for drinking water safety and protection of the environment.

But the bigger picture is compelling. As health expenditure for state and Federal governments takes an ever-increasing slice of the budget, investing in water enabled green and blue infrastructure can deliver benefits to physical and mental health.

The water industry also enables broader liveability outcomes including:

- The provision of water and land for green infrastructure including green parks, open space and corridors to support active, healthy lifestyles.
- Supporting blue infrastructure including clean, healthy beaches and waterways with community and ecosystem benefits, including tourism and healthy lifestyles.
- Supporting cool, healthy environments by using water and greening to reduce heat in the urban landscape, providing resilience to chronic and acute heat events and improving air quality.
- Supporting the community through engagement, education, hardship programs and other initiatives.
- Unlocking even more value from our assets through initiatives such as renewable energy generation, waste management and resource recovery.

1 World Economic Forum (2014). The Competitiveness of Cities. A report of the Global Agenda Council on Competitiveness; Deloitte Access Economics (2016), Economic and social value of improved water quality at Sydney's coastal beaches

While the water industry recognises there are many dimensions to liveability which extend well beyond water, going forward, decisions about water will be vital to transforming our cities and regions into cooler, greener and more liveable places. Recent work to quantify the benefits of delivering liveability outcomes for Australian and New Zealand communities has further confirmed that **liveability and water all adds up.**

Considering green and blue infrastructure as a vital investment at the same time as early land use planning decisions can unlock significant value to the liveability of our cities (Case Study: Western Parkland City evaluates benefits of up to $6.5 billion for Sydney). The water industry believes there is now clear evidence for the value of wide scale adoption of water-enabled green and blue infrastructure to deliver liveability outcomes.

Business as usual approaches to urban planning and infrastructure service delivery means communities are unable to realise the full potential of liveability outcomes. **Currently there are significant impediments to realising the liveability benefits of urban water investments.**

The current way of doing things can restrict the amount and quality of land available for recreation and physical activity, decrease affordability, expose communities to extreme heat and climatic shifts and reduce community connectedness, which in turn exacerbates poor outcomes for the community and the environment, particularly in lower socioeconomic regions where it is needed the most.

While planning for green and blue infrastructure can start to unlock improved liveability outcomes, there are currently no clear pathways to deliver and fund these initiatives. There are opportunistic case studies (within this paper) that can show the way, however there are no systemic pathways from a policy or regulatory point of view that enable this approach consistently.

The urban water industry sees this challenge as an opportunity

We believe that a bold, innovative and integrated approach to planning and service delivery is required to maintain and enhance the liveability and prosperity of our communities.

Our vision is

- To engage with our communities to understand and unlock the full value of water in the landscape to deliver economic, environmental and health benefits.
- That the water industry is recognised as a key enabler by government and industry stakeholders, and also by customers and the community, to achieve liveability outcomes nationally, beyond our traditional role in water and wastewater services.
- To help communities respond to the challenges of climate change and ensure a sustainable future for all by playing our part in advancing the Sustainable Development Goals.
- To expand our collaboration with other sectors (including health, urban planning, development, transport, energy and waste) as well as Federal, State and Local governments to ensure the best liveability outcomes are delivered for the community at lowest community costs.

To achieve our vision, the water industry is committed to taking action and in particular strengthening our capacity to better partner and collaborate with governments, other sectors, and continuing to engage with our customers and the community to meet their needs.

We call on Australian and New Zealand governments of all levels to take leadership to enable green and blue infrastructure to deliver liveability outcomes for cities and regions.

Summary of recommendations

	HARNESS THE WHOLE WATER CYCLE	INTEGRATED APPROACH TO PLANNING	MEASURING BENEFITS	FUNDING OF GREEN AND BLUE INFRASTRUCTURE
Government leadership	Initiate a new National Water Initiative focused on the liveability of our cities and regions across the urban water cycle			
	Ensure all water supply options are on the table	Develop governance principles and water plans that reflect the importance of water to liveability and clearly state the role of urban water utilities to contribute to liveability outcomes	Implement policies and methodologies that enable effective evaluation of liveability outcomes	Allocate funding, resources and accountability within government to liveability outcomes in the same way as other social infrastructure such as health and education
Urban water industry	Evaluate the cost effectiveness of all water supply options available for a particular city or region	Strengthen our capacity to partner and collaborate with other sectors to deliver green and blue infrastructure	Continue to measure the financial, social and environmental value of water-enabled liveability outcomes	Identify funding arrangement opportunities that consider green and blue infrastructure as social infrastructure For example, public-private partnerships, contributions from beneficiary stakeholders and direct government funding
	Undertake community engagement for water supply options	Continue to engage with communities to understand their future needs	Continue to engage with customers to ensure we understand their preferences and willingness to pay	
Collaborating partners Local government Health Planning and development Energy Waste	Support the water industry in engagement with communities to ensure all water supply options are on the table	Form a coalition of key players as a united voice for enhancing liveability	Commit to collaborating and sharing best practice information and data	
		Develop joint principles to clarify governance, roles and responsibilities for collaborative programs		

It all adds up

LIVEABILITY AND WATER

A liveable city or region is one that meets the social, environmental and economic needs of its people. It also addresses community values and preferences for amenity, wellbeing and a sense of place. To be long lasting and resilient a liveable city or region must consider the needs of future generations to understand and respond to shocks and long-term change.

An integrated, collaborative approach

URBAN WATER

WASTE SECTOR

ENERGY SECTOR

HEALTH SECTOR

COMMUNITY GROUPS

PLANNING AND DEVELOPMENT SECTOR

REGULATORS

GOVERNMENTS

A liveable city or region

- Provides suitable and affordable housing
- Supports economic development and employment opportunities
- Protects environmental values and biodiversity
- Embraces indigenous values
- Provides opportunities for active, healthy lifestyles and promotes walking and cycling
- Provides access to nature and open space
- Promotes public safety
- Is resilient to climate change and future challenges and shocks
- Provides key services (including transport, health, water and education)
- Promotes a sense of community by providing places to meet and connect

Green infrastructure

The range of natural and built landscape assets which incorporate natural vegetation. It includes areas of public and private lands such as parks, fields, verges, rooftop gardens, green facades, walking and cycling tracks, street trees and backyards

Infrastructure Australia

Ideally, green infrastructure incorporates natural vegetation indigenous to the area and be designed to take into account prevailing physical parameters such as the available water budget, soil, topography and climate

Blue infrastructure

Beaches and waterways, such as harbours and rivers, and facilities that support them, including foreshores, surf lifesaving and water recreation clubs, jetties and wharves

Infrastructure Australia

The urban water industry contributes

Key services

$135/person	The benefits of providing safe drinking water per year[2]
$446 million	The broader value to society of Yarra Valley Water providing essential water and wastewater services to 1.8 million Melburnians (2014–15)[3]

Opportunities for active, healthy lifestyles and promotes walking and cycling and access to nature and open space

≤$94/person	Liveability-related benefits per person per year attributable to integrated water management[4]
≤$28	Benefits from increased activity
≤$48	Increased well being from exposure to green space
≤$14	Benefits from reduced urban temperatures
≤$4	Benefits from increased air quality
31%	Lower odds of developing psychological distress for Australian adults with 30% or more of their neighbourhood covered in some form of tree canopy[5]
£950 million	London residents avoid in health costs per year due to public parks[6]
£580 million	Physical health costs
£370 million	Mental health costs

2 Tooth, R and Zhang, H. (2018). 'Benefits of water quality in Sydney'. Sapere Research Group prepared for the Independent Pricing and Regulatory Tribunal of New South Wales. 11 October 2018
3 Pamminger, F., Sukhdev, P. and Baldock , C., (2017), A new way to measure the value a company creates, Water e-journal, Vol. 2(3)
4 Water Services Association of Australia (2019), Health benefits from Water Centric Liveable Communities.
5 Astell-Burt, T. and Feng, X. (2019), Association of Urban Green Space with Mental Health and General Health Among Adults in Australia. JAMA Netw. Open, 2(7):e198209.
6 Vivid Economics (2017), Natural capital accounts for public greenspace in London, report perpared for Greater London Authority, National Trust and Heritage Lottery Fund

Continues to focus on resilience to climate change and future challenges and shocks

$30 billion Value the urban water utilities across Australia invested to diversify and secure water supplies for the future in response to the Millennium Drought.

$1.8 billion Economic cost to Melbourne community due to hot weather. Of this, urban heat island effect contributes about $300 million in present value terms.[7]

A combination of water, greenery and cool materials in western Sydney[8] can lead to

-2.5°c Reduction in average peak ambient temperature

-5% Reduction in peak energy demand

Protects environmental values and biodiversity by supporting clean, healthy beaches and waterways with community and ecosystem benefits

The value of Sydney beaches[9]

$137 million Value of coastal beach water quality per year for Sydney residents

$332 million Value to the economy due to tourism

Rehabilitating a constructed waterway in an area lacking open space can provide[10]

$75,000 Public benefits of avoided health costs per annum

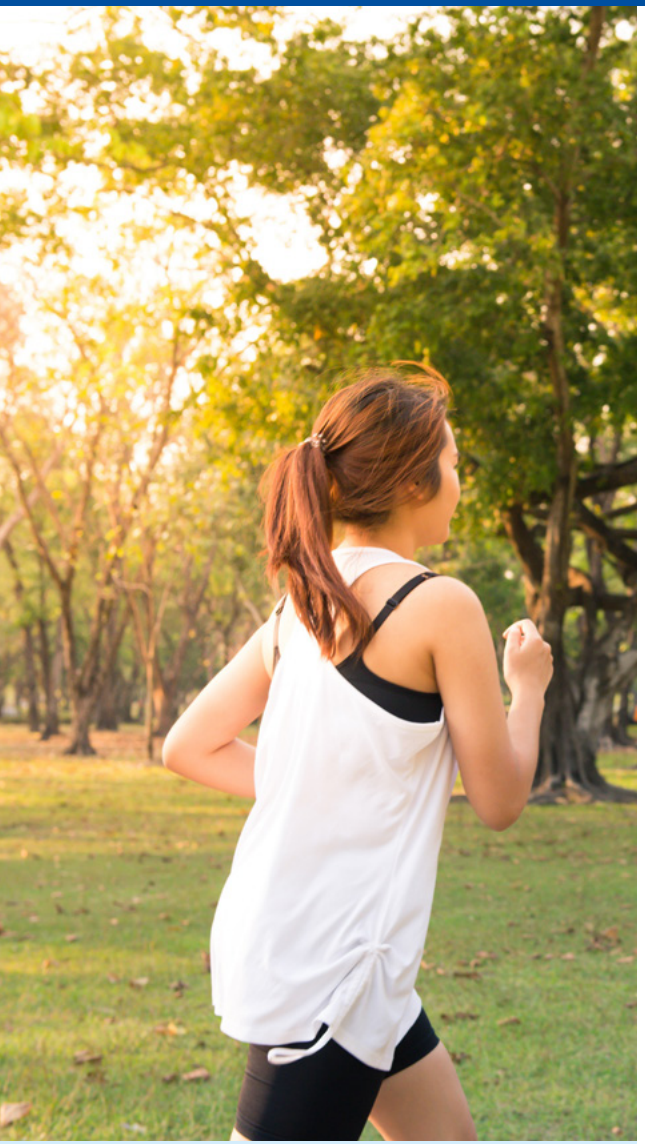
$3.9 million Private benefits

Supports economic development

0.75% Value of Australia's Gross Domestic Product (GDP) the urban water industry directly accounts for[11]

30x Annual revenue generated by urban water in Australia is 30 times more than rural water[12]

7 AECOM (2012). Economic Assessment of the Urban Heat Island Effect, prepared for City of Melbourne.
8 Sydney Water Corporation (2017), Cooling Western Sydney. A strategic study on the role of water in mitigating urban heat in Western Sydney.
9 Deloitte Access Economics (2016), Economic and social value of improved water quality at Sydney's coastal beaches
10 Mekala, G.D., et al. (2015). Valuing the benefits of creek rehabilitation: building a business case for public investments in urban green infrastructure, Environmental management 55(6): 1354-1365.
11 Water Services Association of Australia and Infrastructure Partnerships Australia (2015), Doing the important, as well as the urgent: Reforming the urban water sector, Sydney.
12 Water Services Association of Australia and Infrastructure Partnerships Australia (2015), Doing the important, as well as the urgent: Reforming the urban water sector, Sydney.



The water industry makes a vital contribution to liveability outcomes

The water industry has always played a role in delivering liveability outcomes for the community by protecting public health and amenity through its core services involving

- Safe, affordable and reliable supply of water to meet the needs of households, business and irrigated green space
- Effective and affordable collection, treatment and disposal of wastewater, with human health and environmental benefits
- Effective stormwater management[13] to protect waterway health and manage risks of floods to people and property

13 Where water utilities have responsibility over stormwater management.

The urban water industry ensures these fundamental services are affordable and available to all members of the community, through both government-funded concessions and water utilities' targeted hardship programs. In addition to these core services, water utilities are publicly owned businesses tasked with achieving broader community outcomes.

In recent years, the water industry has explored how it can more widely contribute to liveability, including maximising the potential of water and land use as well as other initiatives such as circular economy hubs, education programs and collaborative partnership models. This is more fully explored in the WSAA Occasional Paper: Next Gen Urban Water.

Green and blue infrastructure is already a highly valued asset for the water industry, providing ecosystem services that enhance the quality of water and wastewater for people and the environment.

The water industry is now leading work on how Integrated Water Management (IWM) – a planning approach that considers the how a whole of the water cycle framework can generate environmental, social and financial benefits – can improve liveability outcomes. IWM solutions for example can mitigate flooding risk through improved management of stormwater runoff and provide climate resilient sources of water to irrigate private and public spaces. This can keep our cities and regions green and cool, enable passive and active recreation, provide biodiversity benefits and improve neighbourhood amenity even in times of drought.

Importantly, where water utilities own or manage land they can make a notable difference to urban amenity and community outcomes by enabling green and blue infrastructure (see Case Study: Greening the Pipeline). Connecting people through green parks and open spaces and through urban habitat creates opportunities to improve the physical and mental health of our communities. This land is likely to become even more valuable for the community moving forward, as urban green space becomes limited as a result of urban densification and the trend towards smaller backyards.

The urban water industry has a unique advantage in delivering liveability benefits at the city and precinct scale

Water utilities

Often cover large geographic areas and can therefore take a whole of catchment approach to planning, allowing them to co-ordinate across council boundaries.

Can coordinate stakeholder groups from diverse sectors.

Act as a voice for engaging, partnering and empowering the community.

Have a high degree of competitive neutrality with ongoing public ownership, which facilitates the achievement of broader community outcomes and the ability to work with and across competing interests in the private sector.

The water industry is well placed to contribute to the liveability of the community

Mitigate flooding risk through reducing and managing stormwater runoff through water-sensitive urban design

Augment natural flows to support waterway health

Improving waterway health by reducing the level/pollution in stormwater runoff or wastewater discharge

Health benefits arising from more amenable and accessible green space

Provide resilient water sources to complement rainfall-dependent drinking water supplies

Improved urban amenity and liveability through supporting green space and providing wetlands and waterways

Urban cooling benefits from water in the landscape and increased drought-proof irrigation

Avoidable upstream water and downstream wastewater costs arising from reduced augmentation requirements

CASE STUDY

Greening the Pipeline

Greening the Pipeline aims to transform a 27km heritage-listed Main Outfall Sewer pipeline reserve into a linear parkland to service 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, Melbourne Water built a pilot park in Williams Landing, one of the fastest growing urban areas in Australia with one of the lowest public open space provisions per capita.[14] The park was designed with the community and included a number of options to enhance health outcomes, including the provision of green open space, exercise equipment, drinking fountains, and connection to bike and footpath trails. The pilot park was opened in 2017 and early monitoring and evaluation shows increased usage as well as reducing heat island impacts. The next phase of construction will deliver the next 3.7km creating 15ha of new open space, funded through partnerships.

CASE STUDY

Liveable Auckland and the Central Interceptor

Auckland is consistently ranked among the most liveable cities in the world. Rankings are often determined by criteria including stability, healthcare, environment, culture, education and infrastructure. Auckland's natural beauty and in particular its proximity to water – its two large harbours and nearby beaches – is often cited in liveability rankings. Watercare is working to further improve Auckland's liveability and the health and visual amenity of waterways with the construction of the Central Interceptor.

In the older parts of central Auckland, wastewater and stormwater flow into a combined network of pipes. When it rains, stormwater overwhelms these pipes that are designed to overflow into Auckland's waterways. To ensure everyone can enjoy clean waterways, Watercare are building a billion-dollar, 13 km wastewater tunnel in the centre of Auckland called the Central Interceptor. The Central Interceptor and associated works are expected to reduce overflows into waterways by up to 80% in the central Auckland areas. Watercare are also contributing to greener parks and better habitats by planting two trees for every tree removed in construction.

14 Wyndham City, Environmental Determinants of Health: Health and Wellbeing Profiles, accessed 26 August 2019, available at wyndham-digital.iconagency.com.au/node/15#public-open-space

Transforming our cities and regions

The urban water industry has had success in delivering green and blue infrastructure projects that deliver liveability benefits to the community beyond safe and secure water and wastewater services

However, these initiatives have typically been at the pilot or project scale, rather than precinct or city scale

We believe the water industry can unlock more value in our assets and investments through integrated planning approaches

Australian and New Zealand cities are regularly recognised as some of the most liveable in the world. Retaining that competitive advantage in the face of emerging challenges will require innovative solutions and collaborative planning, particularly around essential services and infrastructure.

As discussed earlier, designing communities to be more appealing places to live, work and play can be achieved by providing easy access to key services (including green and blue infrastructure), enabling healthy behaviours, and protecting environmental values in a way that provides resilience to drought, urban heat and climate change.

An example of how planning for innovative approaches rather than simply adopting business as usual has the potential to achieve more liveable cities and regions is the work undertaken to date in planning for accommodating more than 1.5 million people in Western Sydney over the next 40 years.

This case study demonstrates how the consideration of green and blue infrastructure as an essential and early land use planning decision has the potential to deliver significant liveability benefits.

CASE STUDY

The Western Parkland City

As Sydney heads towards a population of 8 million by 2056, the NSW Government's vision for Greater Sydney is based on a 'Metropolis of Three Cities': the Eastern Harbour City, the Central River City and the Western Parkland City. Most of the Western Parkland City lies within the South Creek Catchment, a major part of the NSW Government's designated 'growth areas', which are earmarked to accommodate a signification portion of Sydney's population growth over the next 40 years.

The development of a highly productive and liveable Western Parkland City is central to realising the NSW Government's vision for Greater Sydney. To compete successfully with the more established Eastern Harbour and Central River Cities – and attract people and businesses to the area – the Western Parkland City will need to offer a 'cool and green' environment, attractive urban communities and appealing places to live, work and play.

This urbanisation of the catchment will place major pressure on the health of South Creek, its tributaries and the local environment and pose significant challenges in meeting a much higher community demand for water, wastewater and stormwater services in one of the hottest, driest and flattest parts of Greater Sydney. Water will also be needed to increase the urban tree canopy, maintain shaded, open and green spaces, and support water features in the landscape.

A strategic business case undertaken by Infrastructure NSW and Frontier Economics found that adopting integrated land use and water cycle management strategies would best deliver the Government's Western Parkland City vision and provided $6.5 billion in value for the community through:

- Cost savings associated with deferring the augmentation of infrastructure in the potable bulk water supply and Malabar wastewater systems
- Open space benefits including improved urban amenity, increased recreation opportunities and lower healthcare costs associated with reduced inactivity
- Urban cooling benefits, including a reduction of up to 2.2°C in forecast maximum summer daily temperatures, and associated reductions in energy consumption, peak demand, and heat-related deaths, illness and healthcare costs
- Greater protection and conservation of native vegetation and biodiversity, and benefits associated with the improved environmental health of South Creek and the Hawkesbury-Nepean River
- Additional benefits from a more compact urban form, such as lower housing construction costs.

This analysis showed that a robust framework to monetise the economic value that water investments can contribute to the community is a key enabler for effective policy, regulatory and investment decision-making, and ultimately more attractive, liveable and productive places.

Our changing cities and regions

Population growth and urbanisation are placing significant pressure on key infrastructure and services and on the health of our waterways, environment and people – both in infill and greenfield development.

Over the next 30 years, Australia's population is projected to increase by over 11 million people. While around 80% of this growth will occur in our five largest cities – Sydney, Melbourne, Brisbane, Perth and Adelaide – many of our regional centres will also face strong population pressure. New Zealand's population is expected to increase by 1 million people (up 20% to 6 million) over a similar time.

Climate change, variability and drought are exacerbating these challenges. Australia is experiencing some of the driest conditions on record, with average declines in rainfall of up to 20% across Southern and Eastern Australia since 1990.

Since 2017 Australia has been in an unprecedented dry spell, with rainfall well below recorded averages. Globally, the period from 2014 to 2018 were the warmest years on modern record.

The Office of Environment and Heritage in NSW estimate that a drier and hotter environment will contribute to a 2°C increase in average temperatures in urban areas, exacerbating already existing issues around urban heat and impacting the health of residents.

The New Zealand Ministry for the Environment projects temperature increases of between 0.7°C and 1.0°C by 2040, with the greatest warming experienced in the northeast.

At the same time, our communities are changing – one of most threatening issues being the current health crisis. Almost 50 per cent of Australians now live with one of eight chronic diseases, including heart disease, diabetes, cancer and mental health issues (up from two in five Australians, ten years ago). Two thirds of adult Australians and New Zealanders, 28% of Australian children and 24% of New Zealand children are overweight or obese, a major risk factor for many chronic conditions.

There is a growing body of evidence that highlights the role the urban environment plays in contributing to our health. In particular, the provision of green infrastructure has been linked to increased physical or relaxation activity, with physical and mental health benefits.

Small individual changes can make a difference – if we all did an extra 15 minutes of brisk walking, 5 days a week, Australia's disease burden due to physical inactivity would be cut by about 14%.

There are high financial and societal costs if our approach does not change. With much of Australia's future economic growth being fuelled by knowledge workers, liveable cities and regions are critical to attracting and retaining the best human capital. The CSIRO reports that if challenges around emerging technology, climate change and demographics are not addressed, Australia risks falling into a "Slow Decline" scenario of relatively low social, environmental and economic outcomes. Key to overcoming this scenario are liveable cities and regions that are developed in a way that provides equal access to quality jobs, lifestyle, amenities, health, education and other services.

The water industry is committed to continuing to collaborate with other sectors to expand our contribution to liveable cities and regions beyond our traditional role in water and wastewater services.

References for this section are provided on page 32

The path to liveability

Going forward, decisions around water will be vital in transforming our cities and regions into cooler, greener and more liveable places

However, unlocking the potential range of liveability benefits from water industry investment requires addressing several key challenges

- Harnessing the full water cycle
- Integrating our approach to planning
- Implementing an effective framework for measuring liveability benefits
- Funding green and blue infrastructure as social infrastructure

Harnessing the full water cycle

Since the Millennium Drought, the urban water industry has worked to secure climate resilient sources of water through both supply side (e.g. desalination, recycled water) and demand side (e.g. leakage reduction, water efficiency, behavioural change) interventions. As the climate continues to shift and population grows and changes, the urban water industry must continue to ensure we can support and enhance our communities.

At present, in most Australian states not all options for water supply are on the table for planning decisions. This could inhibit effective selection of the lowest long-term cost and most resilient resourcing options. While most of our major cities have turned to desalination plants as a reliable and climate resilient source of water, it is not always the lowest cost or most efficient water supply option.

Options which are constrained, and in some cases may be subject to implicit policy bans, include purified recycled water for drinking, stormwater harvesting and rural-urban trade of water. In Australia the primary limitations are not technical, but rather around public perception and political will. In practice it makes sense to have a portfolio of options available, which includes both supply and demand side opportunities, to ensure water resilience for cities and regions. In the case of purified recycled water for drinking, experience globally and in Western Australia, has shown that any potential community concerns can be addressed through effective education and engagement.

CASE STUDY

Water resilience in Perth

Perth's rainfall has reduced significantly over 40 years, impacting stream flows and groundwater supplies. A 12% reduction in rainfall since 1990 has resulted in a 50% reduction in stream flows into Perth's reservoirs.

The Water Corporation 'Security through diversity' strategy integrates a range of supply options such as desalination, groundwater replenishment, and recycling for non-drinking purposes with demand side initiatives to reduce water use. Plans to secure Perth's water supply into the future include:

- Continuing to help Perth households and businesses use even less water and make greater use of recycled water
- Expanding the Groundwater Replenishment Scheme and investigating further opportunity for reuse of treated wastewater
- Increasing the capacity of existing desalination plants and investigating new desalination plants
- Expanding the deep groundwater network

Key to the success of the ongoing security of Perth's water supplies at lowest community cost is the ability to consider all water supply options and make best practice decisions and work with the community to gain the social licence to make best practice decisions.

CASE STUDY

Salt Torquay Residential Development

Salt Torquay is a newly created, 5 hectare subdivision showcasing that innovative, new and liveable residential neighbourhoods can also deliver a strong commercial return for developers. In this development Barwon Water will achieve an investment return in excess of 20%.

Barwon Water applied integrated water management and One Planet Living principles to the design from the outset. Permeable driveways, swales and raingardens not only retain and filter rainwater, but are used as nature play spaces. Streetscapes and wayfinding have been designed in partnership with the area's Traditional Owners, the Wadawurrung, to reference and reintroduce indigenous vegetation to site and maintain visual and pedestrian links to the nearby creek and ocean.

Salt Torquay will include 100 diverse, energy efficient homes - generating the equivalent of over 90% of their energy needs. Smart water meters and rainwater harvesting / reuse within homes will provide for a 30% reduction in drinking water demand.

Images courtesy Salt Torquay Residential Development

The value of an integrated approach to planning

Current institutional arrangements have resulted in complicated governance arrangements where no one party has full responsibility for managing all aspects of the urban water cycle.

A number of organisations are involved in decision-making for the urban water cycle, including water utilities, local governments, stormwater managers and urban land use planning authorities.

As noted by the Productivity Commission and Infrastructure Australia, this can often lead to ad hoc outcomes due to a lack of clarity on who should lead planning, who is accountable, and funding arrangements including who should ultimately pay for the benefits.

Whilst there are some examples of coordination between agencies at a precinct level (e.g. Victorian IWM Forums, Greater Sydney Commission), existing regulatory frameworks can often constrain green and blue infrastructure initiatives. Clearer governance principles that confirm roles and responsibilities and collaborative frameworks would assist in improving liveability outcomes (see case studies on Victorian IWM Forums and SDG Working Group 6: Clean Water and Sanitation).

Further, city planning itself is fragmented which means that we are missing opportunities to enhance community outcomes. From a city planning perspective, water is often considered late in the process, when most major decisions have been made.

This not only poses a challenge in supporting regions with core water and sewer services, there is also the potential to miss out on key opportunities to deliver green and blue infrastructure and support liveability outcomes such as reducing water demand, improving flood resilience, increasing greening and providing cooling services. Water infrastructure needs to be considered early in the process to better enable it to support land use and support growth.

Further, examples such as the Western Parkland City case study demonstrate that there are liveability benefits in considering green and blue infrastructure as an essential first step to land use planning decisions. Fragmented institutional arrangements produce inefficiencies, increased costs and missed opportunities.

These could be avoided by:

- Providing clarity on the lead party for planning and identification of options at precinct and local level.
- Providing frameworks for joint planning, or creating a lead planning entity to develop improved liveability outcomes through integrated design.
- Enabling planning for growth that considers green and blue infrastructure up front, including considering how water flows through the catchment and interacts with the environment.

CASE STUDY

A common language
SDG Working Group 6: Clean Water and Sanitation

The Sustainable Development Goals (SDGs) are a useful lens with which to consider the broader contribution urban water makes to a prosperous, sustainable and equitable society. More than 20 water utilities have signed the WSAA urban water industry commitment to support and promote the SDGs.

One key benefit of the SDGs is that it provides the urban water industry with a framework and common language with other sectors to better engage towards common goals to progress community outcomes. Goal 6: Clean Water and Sanitation highlights the fundamental role of the water industry's core operations and the contribution our activities make to future prosperity both locally and globally. However, the SDG framework has identified a need for greater cross-sector coordination to achieve 100% access to water and sanitation within Australia and globally. In several cases, the water industry has partnered with others to improve access to safe and secure water and wastewater services in remote Australia and our Asia Pacific neighbours.

The Australian SDG Working Group has been established to report and provide advice at a national level on Australia's achievement of SDG 6: Clean Water and Sanitation. The water industry is represented by WSAA on the Working Group.

SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION

CASE STUDY

Fishermans Bend
The benefits of collaboration

Fishermans Bend is Australia's largest urban renewal project covering approximately 480 hectares in the heart of Melbourne. By 2050, it will house 80,000 residents and provide employment for 80,000.

A number of key challenges such as limitations to sewer capacity, regular flooding and limited green open space meant that a green infrastructure approach was adopted. As a result, precinct plans were updated to include water sensitive urban design elements, stormwater and rainwater capture, sewer mining, recycled water supply for toilet and laundry end use and dedicated recreation areas to control flood risk.

This strategy has the potential to reduce the water footprint of Fishermans Bend by 45%, whilst also enhancing community liveability, supporting a greener and cooler environment and reducing insurance costs.

Implementing an accepted framework for measuring liveability benefits

To ensure the right projects proceed, it is important to ensure they are evaluated using quantitative evidence based on robust and consistent frameworks and methodologies.

Without monetising the full economic, environmental and social benefits, decision-making is typically based on financial costs to each party, and does not adequately consider the full economic, environmental and social benefits and costs across the whole of community. An outcomes-based planning approach based on quantitative evidence can lead to investments that support liveability outcomes.

In recent years, the water industry and others have done significant work to better quantify the intangible benefits of investments. This includes an economic evaluation framework being developed by the CRC for Water Sensitive Cities to understand social, environmental and economic benefits and WSAA work led by Frontier Economics to quantify the health benefits of water industry investments (see case study).

While the value of water enabled liveability outcomes is now clear, translating that value into deliverable business cases for green and blue infrastructure for liveability outcomes, and also expand our collaboration with other sectors to share and align our frameworks.

In recent years the water industry has made considerable progress in measuring liveability benefits by understanding what customers want and are prepared to pay for. A number of businesses have undertaken willingness-to-pay surveys as part of their regulatory pricing submissions.

While the willingness to pay framework provides one pathway to progress green and blue infrastructure projects to deliver liveability outcomes, we note water utility customers are not the only beneficiary receiving the broader benefits and therefore are not necessarily the most appropriate source for funding.

CASE STUDY

Quantifying health benefits of water-enabled liveability investments

While there is a considerable body of evidence on the benefits of green infrastructure and the value it provides in terms of improved health and well being, up until recently, very little work has been done to credibly link water investments to improved health outcomes. The framework and supporting ready reckoner modelling tool developed by Frontier Economics identifies and quantifies (where possible) the relationships between the water industry investment and improved health-related economic outcomes. The study identified four key pathways by which water industry investments could lead to health benefits:

- Improvements in health resulting from more active recreation
- Improvements in mental health resulting from exposure to open space
- Improvements in health resulting from reduced urban heat island effect
- Improvements in health resulting from lower air pollution.

The research supports the potential for significant health benefits arising from water industry investments. One demonstration case study considered integration of IWM into a large greenfield development in an outer suburban area with a catchment of 1.5 million people. The provision of recycled water sources for non-drinking purposes means there is increased green and blue infrastructure in the landscape. This provided increased opportunities for active and passive recreation, reduced urban temperatures and improved air quality, with estimated health benefits from a cost of illness approach of $141 million.

See also page 8 for value of per person per year health benefits.

CASE STUDY

Hunter Water community survey of willingness to pay for discretionary liveability and environmental services

Hunter Water wanted to assess whether its residential customers have the capacity and willingness-to-pay more for higher liveability and environmental standards over the next price period (2020-25). It commissioned a customer survey of almost 700 Hunter Water residential customers which was designed to meet best-practice requirements and recommendations of IPART and the NSW Government, including around customer consultation.

The community survey results provide clear evidence that over 70% of Hunter Water customers are willing to pay more to deliver higher levels of some amenity and environmental services.

- Around 75% of survey respondents were willing to pay $1 more per year for Hunter Water to reduce its carbon emissions.
- Around 80% of survey respondents were willing to pay $2 or more per year towards increasing stormwater harvesting.
- 77% of survey respondents were willing to pay more ($1.00 to $2.50 per year) for Hunter Water to increase the amount of wastewater recycled for irrigation of parks and sporting grounds.

Funding green and blue infrastructure as social infrastructure

The water industry has a strong history of implementing full cost recovery whereby water and wastewater customers (as beneficiaries of the service) pay the full cost value including a commercial return on assets.

However, water-enabled liveability outcomes provide benefits to the broader community not only to water utility customers. It makes sense to think of green and blue infrastructure as providing essential services and fund them in the same way other social infrastructure such as health and education.

In its recent 2019 audit, Infrastructure Australia identified that green and blue infrastructure is often treated in isolation by governments. This presents funding challenges where the economic benefits, for example avoided health costs, may be high but it is not possible to identify a direct funding source.

In other sectors, mechanisms exist to fund social infrastructure where there is no direct funding source. For example, transport projects, such as urban rail lines, often need to acquire expensive inner-city land but are able to subsidise the cost through value uplift and property development rights. The costs of operating these rail lines is then only partially funded by customers, with the large proportion subsidised by governments representing the value in reduced traffic congestion. To date these funding mechanisms are generally not available to deliver green and blue infrastructure.

Models that should be considered by governments and water utilities to fund green and blue infrastructure for liveability outcomes include:

- Public and private partnership models.
- Contributions from beneficiary stakeholders such as local government, developers and industry.
- Direct government funding.

The water industry is now confident in the value of the water industry's contribution to green and blue infrastructure to deliver liveability outcomes. In our view, the water industry should be included at early stages of planning; this requires funding, resources and accountability within government to be allocated to liveability outcomes in the same way as other social infrastructure such as health and education.

Our call to action

The urban water industry recognises the need for change

We bring a strong understanding of the value water and wastewater services can bring to the liveability of a community through the links to health, urban planning, prosperity and social connectedness

The industry is building a range of tools and techniques to assist in the provision of liveable outcomes, but we recognise there is a need to do more, and we cannot do it alone

We need to work in partnership with others, across all levels of government, along with the health, planning, development, energy and waste sectors

The urban water industry commits to taking action

Harness the full water cycle

Evaluating the cost effectiveness of all water supply and demand options available for a particular city or region.

Continuing to engage with the community to understand their values and attitudes and reflecting these in our decision making.

Engaging with the community using clear simple evidence-based messaging to ensure there is full community support for progressing all water supply and demand options.

Continuing to exceed best practice delivery of our core services so that we are able to focus on and optimise our broader service offering.

Continuing to investigate and integrate innovative solutions to supply and demand planning to best serve our community

Integrate our approach to planning

Strengthening our capacity to better partner and collaborate with other sectors to deliver green and blue infrastructure, including:

- Developing a corporate culture that aligns with creating value for communities.
- Understanding where the water industry can better enable others to carry out their own contribution to liveability (e.g. facilitating use of land for liveability outcomes, fast-track approvals for development, availability of climate resilient water supplies to support communities).

Continuing to engage with communities to ensure we meet their needs into the future.

Moving to ensure liveability elements are incorporated into strategic decision making and asset delivery as business as usual.

Continuing to review and revise our business as usual assumptions as necessary (e.g. climate scenarios) and ensure our decisions are robust and adaptive to future challenges.

Implement an effective framework for measuring liveability benefits

Continuing to measure the financial, social and environmental value of water-enabled liveability outcomes.

Investing in improvements in modelling capabilities and data at a local scale.

Continuing to engage with customers to ensure we understand their preference and willingness to pay.

Committing to collaborating and sharing best practice information and data with partners in other sectors.

Fund green and blue infrastructure as social infrastructure

Continuing to apply full cost recovery to our core water and wastewater services.

Identifying funding arrangement opportunities for green and blue infrastructure as social infrastructure. For example, public-private partnerships, contributions from beneficiary stakeholders and direct government funding.

Preparing business cases for green and blue infrastructure that enables liveability outcomes.

We ask the Federal Government to take leadership

Harness the full water cycle and integrate our approach to planning

Initiating a new National Water Initiative that includes a focus on urban water and recognises the future challenges of climate change and extreme events, urban growth (including population growth) and liveability of our cities and regions across the urban water cycle. The National Water Initiative update should also:

- Reflect the role stormwater management can play in the overall urban water cycle. This can be through harvesting, reuse or use in creating green infrastructure in cities and regions
- Recognise the importance of having all water supply options on the table, including purified recycled water for drinking, so that water supply decisions can deliver highest community benefits at least cost
- Integrate the Australian Drinking Water Guidelines and the Australian Recycled Water Guidelines to provide uniform national guidance.

Ensuring water plans include the importance of water to liveability and resilience, and clearly articulate the roles and responsibilities of water utilities in delivering green and blue infrastructure.

Implement an effective framework for measuring liveability benefits

Implementing policies and methodologies that enable effective evaluation of liveability outcomes and recognises the role of water to enable these.

Fund green and blue infrastructure as social infrastructure

Allocating funding, resources and accountability to liveability outcomes in the same way as other social infrastructure such as health and education.

The urban water industry is looking for leadership from the New Zealand Government and Australian Federal and State governments to enhance liveability outcomes.

We ask the State Governments to take leadership

Harness the full water cycle

Engaging collaboratively with the Federal Government to establish a new National Water Initiative that includes a focus on urban water and recognises the future challenges of climate change and extreme events, urban growth (including population growth) and liveability of our cities and regions across the urban water cycle.

Ensuring all water supply options are on the table, including purified recycled water for drinking, stormwater harvesting and rural-urban trade so that water supply decisions can deliver highest community benefits at least cost.

Integrate our approach to planning

Developing clear governance principles that define the roles and responsibilities of government agencies and water utilities in planning and contribution to liveability outcomes.

Developing water plans in consultation with the community that include the importance of water to liveability and resilience, and clearly state the role of urban water utilities to contribute to liveability outcomes in addition to delivering water and wastewater services.

Fostering collaboration, including mechanisms for community input to decision-making, through the development of frameworks, guidelines and incentives to achieve liveability outcomes.

Considering green and blue infrastructure as an essential first step in integrated land use planning.

Developing frameworks to integrate stormwater management into the overall urban water cycle. This can be through harvesting, reuse or use in creating green infrastructure in cities and regions.

Requiring new developments to include green and blue infrastructure, for example specifying a certain amount of irrigated green open space in local planning instruments.

Implement an effective framework for measuring liveability benefits

Implementing policies and methodologies that enable effective evaluation of liveability outcomes.

Fund green and blue infrastructure as social infrastructure

Allocating funding, resources and accountability to green and blue infrastructure delivering liveability outcomes in the same way as other social infrastructure such as health and education.

Identifying funding arrangement opportunities for green and blue infrastructure including public-private partnerships, contributions from beneficiary stakeholders and direct government funding.

Identifying funding arrangement opportunities, including partnerships, that consider green and blue infrastructure as social infrastructure.

An integrated, collaborative approach

The greatest value from an integrated, cross-sector engagement would be achieved through collaboration with other sectors (local government, health, planning, development, energy and waste)

Harness the full water cycle

Supporting the water industry in engagement with communities to ensure all water supply options are on the table.

Integrate our approach to planning

Creating a united voice for the enhancement of liveability outcomes via a coalition of key players.

Local governments supporting requirements for new developments to include green and blue infrastructure, for example specifying a certain amount of irrigated green open space in local planning instruments.

Implement an effective framework for measuring liveability benefits

Committing to collaborate with the water industry and each other to share best practice information and data (e.g. via the formation of a joint national think-tank or knowledge sharing platform).

Developing joint principles to clarify governance, clear roles and responsibilities, and funding mechanisms for joint projects.

While we rely on strong policy and leadership by governments to progress, the water industry believes the greatest impact will be enhancing our collaboration efforts with other sectors. In particular, we have identified local government, health, urban planning, development, energy and waste sectors as key partners to delivering on our vision.

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