



THE
DEAKIN
ORATION



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It is a tremendous honour to be invited to deliver the 2017 Deakin Oration – although I must acknowledge a certain degree of apprehension, being a migrant with little knowledge and appreciation of Australian political history, beyond the headlines that we often hear about.

The theme of this year's Deakin Oration is “water and sustainability”, and I have been called on to recognise Alfred Deakin's pioneering role in water governance, and to give a contemporary context to his legacy in relation to how we use and value water today.

But first, allow me to acknowledge those who cared for this land long before European ideas of water governance existed. I want to expressly acknowledge the Aboriginal peoples of Victoria as the Traditional Owners of the land, and pay my respects to their Elders, past and present, and the Elders from other communities who may be here this evening. Traditionally, Indigenous peoples lived as one with the natural environment, sustaining the viability of its natural resources. I have tremendous respect for this immense connection between Aboriginal people and Country, and this attitude should serve as an inspiration for us all.

That lesson is pertinent given that in contemporary times, water resource management has been a much-contested space – across borders, competing priorities, and economic rationalism. Good water management is ultimately pivotal – to both our economic wellbeing and to the aspirations of liveability that characterise Australian life. And today, the pressures placed on our natural environment are bringing many of our everyday discourses into sharp focus, not just amongst colleagues in our professional lives, but throughout our communities. The extreme

weather that we have witnessed over the past few years brings to mind a host of questions about how we manage our natural environment: Have we left it too late to moderate a fiercely changing climate? Do we have the resilience to preserve our quality of life in an increasingly uncertain future? And will the inertia and narrow remit of our institutions continue to hamper the collective, whole-of-society actions required? These are challenges to contemporary nation-building, and they therefore provide a fitting lens through which we can reflect on Deakin's quite profound legacy. Nation-building by definition is constructing or structuring a national identity. Our Australian identity is constantly evolving as we grow and mature as a nation. Tonight, I would like to propose that our national identity is, in part, defined by our actions in addressing contemporary challenges, both in terms of the infrastructure and associated governance systems that we establish, and our social capital.

Over the past month, I have delved into the biography of Alfred Deakin and spoken with people who are knowledgeable and passionate about his lasting influence. This has left me with a great appreciation of the often difficult part that Deakin played in the creation of the Commonwealth of Australia: a defining period of building the structures and governance systems that would underpin a new, prosperous, and stable nation.

Alfred Deakin's story embodies fundamental ingredients of diplomacy, cooperation, and a focus on public good. Indeed, these qualities are highly relevant to the kind of leadership we need to address large challenges for Australian society today. Even though contemporary challenges are different in nature to those of Deakin's time, the key ingredients for navigating the required solutions remain the same. The complex social and technical dimensions of some of these challenges require Deakin's style of leadership and vision more than ever.

When reflected against the backdrop of contemporary politics in Australia – and around the world in recent times – my regard for Deakin and his contributions has grown enormously. There are indeed lessons for all of us.

A pioneer in Australian water resource governance

In the inaugural Deakin Oration last year, Professor Judith Brett pinpointed Deakin's greatest legacy as the stability of the new federation. This stability was supported by several of Deakin's admirable qualities. First, he was unwaveringly courteous and refused to engage in petty arguments, thus keeping the path open for cooperation and progress; for resolving disagreement and enabling good policy. This even earned him the nickname "Affable Alfred". Second, in his pivotal contributions to the federation movement, from the Constitution to a newly founded governance system. He focused on structuring the governance and administration of this new nation for public good, rather than being absorbed in party politics during a period of minority governments.

Deakin was also a visionary when focusing on public benefit in his work on water governance in Victoria prior to federation. Primary production, the essential ability to grow food for a growing population, was of course critical for Victoria and the new Australia. Facilitating large-scale agricultural production saw irrigation emerge as a strong theme in Australia, following Victorian efforts to transform large estates into closely settled communities engaged in agriculture. The establishment of these “Closer Settlements” and the introduction of irrigation to make land increasingly productive had to be supported by contemporary design concepts and technology, and by certainty in the reliable governance of the State’s water resources.

Let me take you back to the year 1884 in Victoria. Drought had been putting a strain on the colony, and much of the country, since the beginning of the decade. A Victorian Royal Commission on Water Supply was called, particularly in relation to the supply of water for irrigation. Already the Commissioner of Public Works and Minister of Water Supply, Deakin was asked to lead this Royal Commission. He made a trip to the United States to investigate irrigation technology, during which he met the Chaffey Brothers, known for their entrepreneurial development of irrigation schemes in the United States. Deakin reported to the parliament on the suitability of irrigation development for Victoria, with case studies of successful irrigation schemes from California as proof-of-concept. He introduced the Water Encouragement Act in 1886. With much persuasion and drawn out negotiation, he ultimately convinced the Chaffey Brothers to set up an irrigation colony in Mildura in 1887. The development of the Mildura Irrigation Scheme saw the introduction of steam-powered pumps and engineering works in modernising irrigation schemes – this was effectively Australia’s first irrigation colony. Their plans included many visionary concepts of town-planning and development. The Chaffey Brothers were credited with having “turned water into gold”, and one need only visit Mildura today to appreciate their enduring legacy. There are many more interesting stories on the Chaffey Brothers, some not so complimentary, but I will have to leave this for another time.

And while taken by the Californian model irrigation settlement that would be used to catalyse much of the development of irrigation schemes in Victoria, Deakin was not impressed by everything he saw. He was particularly troubled by the Californian water governance system of “prior appropriation”. Under this system, whoever first put a water source to productive use had a greater legal right to keep using it – in other words, a system of “first in, best dressed”! Disputes on water rights were to be resolved by the courts. Thus, Deakin also learnt what not to do from the Californian experience. He became adamant that a government should have a central role in managing water resources to ensure equitable access by primary producers and others, including miners.

In June 1886, Deakin introduced the Victorian Irrigation Act, which promoted large-scale irrigation schemes. It also restricted riparian water rights – in those who owned land spanning the banks of a watercourse. While strengthening the statutory rights of these landowners to extract water for stock and domestic uses, this new act granted the Crown the right to use and

control most surface waters, and allowed landowners to apply for a diversion licence to take water for commercial or irrigation uses. In essence, these were measures designed to establish the Crown's ability to distribute water to new and existing landholders for the purpose of sustaining irrigated agriculture. Setting the governance structure laid the necessary enabling foundation but the journey itself is not without its missteps, mishaps and unintended outcomes in implementation.

By 1899, some thirteen years later, there were nearly thirty Irrigation Trusts formed to administer water supply throughout Victoria. However, in the absence of investments in major capital works, the trusts were unable to provide reliable water supplies and a stable business environment for ambitious irrigated land developments. Many fell into financial difficulty. The Relief Act of 1899 wrote off much of the liabilities of the trusts. Subsequently the 1905 Water Act saw the State Rivers and Water Supply Commission established and all of the trusts abolished, with the exception of Chaffey's First Mildura Irrigation Trust. The State's control of virtually all surface waters was reasserted in even stronger language. The State Rivers and Water Supply Commission brought much needed skill and state-wide coordination to irrigation practices, and this determined the future of irrigation in Victoria for the next 80 years.

Deakin's legislative framing around water was adopted throughout Australia, at least to an extent, reflecting Victoria's historical and ongoing leadership. Although not without difficulties, the pioneering successes of Victorian irrigation was widely acknowledged, including a colour picture of the Goulburn Weir featured in the first issue of Commonwealth banknotes.

The pace of water development, particularly rural irrigation schemes, continued unabated over the 100-year period since Deakin's Irrigation Act of 1886, only punctuated by the Great Depression and two World Wars. This is a true testament to the calibre of Deakin's recommendations about how to manage water.

Incredibly, the next major reform in Victoria was not until 1989.

The 1989 water reform was based on a growing understanding that water is not an unlimited resource, on the need for integrated and sustainable water resource management, and on the need to protect environmental values. A focus on effectively utilising that resource brought together all water sources under the one act, and introduced a major change: the separation of land and water entitlements.

Water entitlements were now recognised as a financial asset that irrigators could sell for use elsewhere; previously, water could only be locally used because land and water rights were linked. In essence, that change created a water market. Together with new technology for modernising the irrigation schemes, we saw new horticultural enterprises develop and significant expansion in economic activities, for instance, in the Sunraysia region well known for its grape, citrus, and grain production. Farmers now had the opportunity to generate an income by selling water for use in growing higher value crops during periods of water shortage.

Many farmers and irrigation enterprises not only survived the Millennium Drought, but fostered continued strength in primary productivity. In the critical period between 2006 and 2008, water availability in the Murray Basin dropped by 43%, yet the gross value of irrigated agricultural production barely fell – a remarkable policy achievement.

The irony here is that Californian delegations are now flocking to Victoria, keen to learn of our experiences and innovations leading up to, during, and after the Millennium Drought. The reality is that no amount of technology can overcome the legacy of “prior appropriation” in California, and we are indebted to Deakin’s visionary construct of water governance in Victoria and Australia.

But it is not just water management for the rural sector that has caught the attention of the Californians and others. How our cities survived the prolonged drought, and how we are now planning proactively for the next inevitable period of water scarcity, are also of great interest. In today’s context, with most Australians living in cities, that preparation is very much about urban planning, a topic that has large ramifications for how we continue to envision water and its critical role and interplay in building human settlements, just as Deakin did in his time.

The contemporary water picture

Since that time, however, much has changed. We now live in an era where the global human population is fast reaching, and in some cases exceeding, the carrying capacity of planet Earth. We have excessively consumed and exploited our planet’s natural capital: a shift starkly visible in the overwhelming evidence of a changing climate. This profound issue directly impacts our community’s fundamental aspirations of safety, prosperity, and longevity in the pursuit of sustaining and improving the quality of our existence.

In many ways, the impact of environmental degradation and a changing climate is amplified in urban areas. Today, Australia’s cities and towns contribute as much as 70% to our GDP and are home to nearly 80% of our population. But alongside these facts is the question of what cities are, exactly. Unlike in the past, where visionary thinkers like Deakin were focused on the still-forming structures of federation society, we now need to imagine cities and towns as complex ecosystems of built, natural, and social elements. The natural environment of soil, air, water, plants, and animals combine with the built environment and the social fabric of our societies in a single complex ecology of a city. Yet many, engineers and economists included, have ignored the interconnectedness of these elements by trying to control and manage each one in isolation.

The perils of such an approach were masked in the past, when our planet had the natural capacity to buffer or absorb the unintended consequences. For example, in decades past, the unchecked discharge of pollution into our waterways and groundwater were readily assimilated by the natural environment because we were polluting in relatively small volumes. But with

7.6 billion people now in the world – set to grow to about 10 billion by the year 2050 – the environment is no longer able to assimilate the waste produced by our global population, nor provide a reliable water source as it once did.

We know that climate is central, and crucial, to this environmental picture. But in many ways, the climate crisis is very much a water crisis, expressed through crippling droughts and devastating floods, as well as the impact that those events have on global economies and political stability. Such events are magnified in cities, where space for conveying flood water is progressively squeezed out, the financial losses from floods are increasing simply by the number of properties affected, and the pressure on water supply is intensified by fast-growing populations. How do we manage such complex challenges? And how do we foster new waves of growth, prosperity, and quality of life – an aspiration central to Alfred Deakin’s thinking – while ensuring our future sustainability and resilience?

In contrast to Deakin’s day, we now need to view water management within the context of a mature water economy. We have grown beyond the immediate economic imperative of Deakin’s federation, a time when primary production was essential, and environmental impacts and limits little understood. We now have a greater knowledge of the severity of environmental degradation, its irreversibility in some cases, and its consequences. And in economic terms, water is managed in a context of rising marginal costs, increasing scarcity, stronger competition between water needs, and increasing interdependencies amongst water users.

Critically, the landscape of current urban water management is typically characterised by inertia in the institutions that administer and manage our city systems. Traditional government mechanisms reinforce the separation of infrastructure and services. In the traditional approach, water is sourced and conveyed into cities through large infrastructure such as underground pipes. Wastewater is then collected, treated to meet environmental standards, and discharged to rivers and bays. And stormwater is swiftly conveyed out of cities, taking with it the contamination from the urban environment. This compartmentalisation has been physical, in terms of infrastructure, and institutional, in terms of the agencies responsible for providing, operating, and maintaining these water services. But these boundaries are arbitrary in many ways, and they have acted to compartmentalise and narrow the philosophy of how we consider the water systems that underpin a city.

At this point, it is important to acknowledge that there is now widespread agreement that conventional water management approaches are ill-equipped to meet the diverse and complex needs of our cities. But to date, there has been limited progress in implementing and mainstreaming the compelling alternative approach of an integrated water paradigm. Cities are continuing to pursue conventional twentieth century solutions to urban water management of contemporary, twenty-first century water challenges.

I want to lay out several themes that speak to the contemporary challenge of transforming cities, through the way we construct and manage urban water systems, to leave them robust for the

future. I will outline that we need planning and management that is more adaptive, and more integrated. To our leaders, I say there are two big areas that offer solutions for achieving those goals: integrated infrastructure and associated governance, and social capital. And in the context of liveability, I will draw those ideas together, and reflect on how our own City of Melbourne is travelling in delivering sustainability, innovation and change in transforming into a thriving urban community. A community that, by placing water at its core, can be full of cooling greenery and healthy waterways, has water secured by a diverse array of water sources from within the city, and is resilient to drought, heatwaves, and floods.

But firstly, why do we need new levels of flexible, adaptive thinking about water? The reason is that we can no longer design infrastructure with confidence about the future conditions in which it will operate. We are in the precarious position of reaching some of the planet's "limits to growth", with symptoms both global and local. Global in terms of climate change. And local, in terms of how growing populations and increased urbanisation place pressure on the security of our water supply, the health of our water environment, and protection from the hazards of flooding. So what are the specific consequences for infrastructure planning?

Much of our understanding of water resources hydrology and the ways in which we have engineered and designed our water infrastructure, such as dams, water pipes, sewerage systems, and drainage works, have been based on statistical analysis of past conditions – the streamflows, the rainfall, the floods. We are all familiar with references to the "100-year flood" or the "50-year drought". But we need to understand that such references may be increasingly meaningless. In 2008, scientists published a definitive warning that we cannot rely on past data and its statistical properties to predict future events. Globally and in Australia, hydrological and meteorological data and trends no longer follow the statistical properties of the past.

To use an example close to home, take the Millennium Drought of the late 1990s to the first decade of this century. Not only was this the worst drought recorded since European settlement, the drought was broken by big floods, and followed by periods of record-breaking heatwave conditions. This 14-year-long period of contrasting climatic extremes is a stark reminder of how vulnerable our cities and towns are to a changing climate. During the early periods of this drought, many in the scientific community advised government that the drought conditions would break, in keeping with the statistical properties of historical streamflow and rainfall data. But it would soon become clear that streamflow and rainfall sequences were not following known statistical trends. By then, the window of opportunity for a "softer" and more adaptive approach to building resilience to such climatic conditions was fast closing – leading to large and expensive engineering solutions.

And yet, even now that science and experience have debunked the idea that we can rely on past data, many of our investment decisions about water infrastructure still cling to this fallacy. They adopt conventional design and analytical approaches based on optimisation and economic-risk analyses – yet we know that we no longer have the reliable risk estimates critical for those approaches.

While we anticipate a future of more severe droughts and heatwaves, and more frequent floods, we do not actually know the likelihood or probability of these future occurrences. That means that we can no longer reliably design infrastructure to achieve a desired level of service or protection. Instead, in entering new ground, we have to base our approach to planning and designing future infrastructure around the concept of resilience – the capacity to adapt our system of water management to respond to the known unknowns and ideally, the unknown unknowns.

Reorienting existing infrastructures, institutions, and capacities from their traditional approach towards a water management approach better equipped for uncertainty is therefore a key challenge.

What, then, would such an approach look like?

Over 10 years ago, at the height of the Millennium Drought, researchers from Monash University created the concept of “water sensitive cities”. This concept was based on three key principles of practice. The first is that cities themselves are “water supply catchments”. That is, there are water resources within a city’s limits that should be harnessed to supplement the traditional sources of water. In the case of Melbourne, those “internal” water sources include rainwater, stormwater, and wastewater. It is a fact that the combined volumes of stormwater runoff and treated wastewater discharge far exceeds the total water used in the city. Why shouldn’t we harness these water resources, especially for use that does not require a drinking-water standard? Here, we need to ask ourselves some pivotal questions: As Melbourne’s population grows to 8 or 9 million people, should we still be flushing our toilets and watering the gardens with drinking water? Is our community sufficiently savvy to operate two kinds of taps in the household, one for drinking and another for everything else? Could our famously high quality water, coming in from those incredibly clean catchments outside of Melbourne, be preserved for drinking, while our water for toilets, clothes washing, and gardening comes from a combination of rainwater, stormwater and recycled wastewater? We have done the analysis to determine the optimum mix of water sources that would serve Melbourne most effectively. We have the evidence that rainwater and stormwater storages such as lakes, ponds and tanks can significantly reduce the threat of flooding. And we can demonstrate that infill development – or re-developing blocks within existing built-up areas to accommodate higher population– can be more effective when it includes water recycling initiatives, which reduce the costs of augmenting existing infrastructure such as underground water and sewerage pipes and pumps.

The second principle of practice for water sensitive cities is that cities can be developed to deliver ecosystem or environmental services. We can innovate through the interplay between the built and natural environments and introduce green infrastructure in urban design. We have evidence that green infrastructure, such as constructed wetlands and bioswales, cleanse the stormwater that flows into our waterways and therefore reduce environmental pollution. “Biomimicry” is the new buzz word, describing our ingenuity in mimicking nature’s processes, for instance, in filtering and assimilating environmental pollution. Evidence shows that if these biotechnologies are planned out in green corridors, they can provide safe passage of flood water

and cool our cities by degrees – providing health and economic benefits, particularly given predictions of more frequent and severe heatwave conditions in the future.

Therefore, well-designed cities can provide a range of environmental services and deliver increased resilience through strategies including protecting and enhancing urban biodiversity and the ecological health of urban waterways. Such cities can mitigate urban heat, re-establish cultural connections to water, and enhance urban liveability through public spaces created for active and passive recreation and to support mental health and wellbeing. These are elements that support the liveability of cities. Of course, “liveability” means different things to different people, and socioeconomic settings matter. Nevertheless, we are all proud that Melbourne has again been voted the world’s most liveable city, for the seventh year in a row, reflecting how the places in which we live and work contribute so intimately to our quality of life. Urban water management contributes to urban liveability in many ways – from the very basic in terms of water security, to the amenity of an ecologically healthy waterway, to the water features and amenities built around a clean water environment, to the cooling and biodiversity effects of green corridors and urban forest. These are urban design and planning issues that can be guided by the two principles of practice for water sensitive cities that I have outlined. It will add a new dimension to our claim as the world’s most liveable city.

That connection to liveability, and all of the benefits I have mentioned – of integrated infrastructure grey, green and blue, and a city as a water catchment – must be complemented by the third and last principle of practice. That principle is strengthening social capital, the social fabric of our communities, to achieve sustainability and resilience. Ultimately, the resilience of a city in responding to future challenges and uncertainties is defined by the combination of its social capital and infrastructure capacity. The way our citizens use water is key to reaching our desired future.

In the urban water sector, the question of community water literacy is a fundamental one. How much does our community understand about where our water comes from and where our wastewater goes? Do people know whether stormwater is polluted, and if it is, if it is treated? Do they understand how critical it is to reduce our vulnerability to climate-change-related water challenges?

A study of community water literacy by the Cooperative Research Centre for Water Sensitive Cities, based on a survey of over 5000 people, found that only just over half of respondents knew the source of their household drinking water. This is sobering. A more concerning result was that only 41% understood that the amount of water available for use is finite. Less than a third of people correctly understood that stormwater is not treated before it enters waterways, and that wastewater and stormwater are not carried through the same pipes.

And yet, with households as substantial consumers of water, citizens are also an incredible resource for shaping their own, more sustainable futures. While not a widely published fact, the efforts of Melbourne’s citizens in water conservation behaviour during the Millennium Drought prevented Melbourne from completely running out of water by June 2009, some 12 months

before the drought was to break. Thus, improving water literacy, and a genuine and meaningful engagement of local citizens in co-developing and implementing water management strategies, is the approach we need to adopt in building resilience.

If we can transform our cities into water sensitive cities, we will be able to withstand the future threats of climate and water scarcity. And even more: we will be well placed to maintain our growth, prosperity, and quality of life. But realising those ambitions requires us to change our approach in infrastructure planning, city design, and community engagement and empowerment. A whole-of-government approach will be critical.

New institutional and governance frameworks are needed to bring together agencies responsible for the environment, water, climate change, land planning, and urban design, and facilitate strategic alignment across those various portfolios. Success will also require improved integration and coordination between the water sector and organisations responsible for urban development, including local government and relevant state government departments and agencies.

It will take time for such a change to take hold, and in delivering improved water management outcomes that also enhance the resilience and liveability of our cities. But do we have this time?

Recently, Melbourne Water analysed the effect of a growing population on our water supply security, amidst the possibility of worsening droughts due to climate change. That analysis found that, at worst, our demand for water could outstrip supply by 2028; the best-case scenario had the city facing a water crisis within 50 years. There is some urgency for us to act proactively.

The transition to a water sensitive community, guided by the three principles of practice I have described, is now emerging in many cities in the world, including Melbourne. In some form, a water sensitive Melbourne has been the aspiration of successive governments in Victoria since the breaking of the Millennium Drought. Supporting policies have been formulated and implementation plans executed. But, like in so many cities, Melbourne has had its “false starts”. As was the case in Deakin’s time, establishing the policy framework and governance is foundational but in itself insufficient. We have yet to see the tangible outcomes from water sensitive policies for sustainable, resilient and liveable Victorian cities and towns.

We are again well placed to enact transformational, successful change in Melbourne and Victorian cities and towns. The Victorian Government, through the establishment of super departments such as the Department of Environment, Land, Water, and Planning, has set up the governance structure for fostering a whole-of-government approach to planning urban water infrastructure. Water for Victoria, the Government’s framework to guide smarter water management, bolster the water grid, and support more liveable Victorian communities, makes integrated water management the key focus of urban water management, with community engagement at the centre.

Melbourne Water and the three water retailers in Melbourne are working collaboratively to define their respective roles in executing the water plan – linking infrastructure planning with

city planning, creating integrated infrastructure for a broader range of community outcomes, including liveability, and engaging community in co-development of water management strategies. The significance of these organisations being State-owned Enterprises in executing the Government's Water Plan for Melbourne cannot be over-stated.

The City of Melbourne is implementing its urban forest and resilient Melbourne strategies with water management and urban liveability as key elements.

Over the next twelve months, we will see the implementation of the Victorian Water Plan across the greater metropolitan area of Melbourne through a series of integrated water management industry and community consultation forums. Ongoing political support for the initiatives and plans fast emerging will be important.

Securing Victoria's water future

What happens from this point on?

We are at an incredibly promising point in time, and there are lessons from the past that remain valuable.

In reflecting on the water foundations set down during Australia's federation, we've seen that we need to set the right visionary governance. And we need political buy-in and cooperation.

Both of these principles were embodied by Alfred Deakin: in his political legacy; and the personal, "affable" qualities that characterised his conduct.

It's worth reiterating that Deakin's 1886 Irrigation Act, so important for nation building at the time, is a striking story in itself.

The fact that it framed our management of water for the next 100 years is incredible. The 1989 reform was a pivotal piece of legislation in itself with impressive achievements. We should nevertheless recognise that these were only possible because of the enabling foundation that Deakin's water vision established. We need to be reminded of the legacy burden the Californians still carry in undertaking their water reform.

In 2017, what we make of those lessons could have far-reaching consequences. We are very much on the cusp of enduring reform in urban water management. Reform that could be comparable to the influence of Deakin's work.

There is huge potential here in how we choose to grapple with contemporary challenges in water management for our cities. The case for transformation is compelling; the consequence of doing nothing, disturbing. The vision is clear. There is great reason to be optimistic.

We have to base our approach to planning and designing future infrastructure around the concept of resilience. Our water infrastructure has to be adaptive, and integrated for delivering multiple services. Spatial planning and urban design capture the integrative processes. A whole-of-government governance framework will guide the investment, implementation and operation of such infrastructure. And, community empowerment through improved water literacy and participation in the co-development of water management strategies are key initiatives for building social resilience.

The stakes here are high, and they demand a political climate that is decidedly cooperative and collaborative. There are far-reaching implications at hand if our leaders can embrace that principle.

In the vein of forward-looking governance and structure that Deakin envisioned, our political leaders need to maintain bipartisan support of integrated water management and water sensitive cities, and the governance to enable the shifts we need. That bipartisan leadership will provide industry, and individual practitioners within, with the certainty they need to invest, innovate and transform for a new paradigm. This in itself will not be an easy shift for practitioners who have built their career executing the conventional approach. Yet their participation is essential for capturing their wealth of knowledge.

Perhaps most powerfully, bipartisan support for integrated water management and water sensitive cities will create the uncontested narrative that will enable community to build the social capital for resilience to complement investment in structural solutions to meet future climatic challenges.

Now more than ever, we need the leadership style of Deakin at all levels of enterprises and community to execute an ambitious but necessary vision and to foster the collaboration needed in our government and industry to meet the challenges that lie ahead.

Thank you.



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Professor Tony Wong is Chief Executive Officer of the Cooperative Research Centre for Water Sensitive Cities, a \$120million research centre with four research hubs based in Brisbane, Melbourne, Perth and Singapore and involving over 75 organisations across the academia/research, industry, and government sectors.

He is internationally recognised for his research and practice in the sustainable urban water management, particularly in Water Sensitive Urban Design. His expertise has been gained through national and international consulting, research, and academia and he has led a large number of award-winning urban design projects in Australia and overseas. Tony has over 150 publications, notably *Australian Runoff Quality: A Guide to Water Sensitive Urban Design*.