SHAPING OUR CITIES WITH PRECINCT BASED WATER SYSTEMS

HOW DOES IT WORK?

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ABSTRACT (500 WORDS MAXIMUM)

Urban Planning is evolving towards *precinct-planning* and *place-making* to create attractive places for people to live in with their own sense of community. Water planning is evolving beyond provision of essential water, sewerage and drainage services provision to city and landscape shaping, to enhance the natural environment and create sustainable places for communities.

Urban water and wastewater systems have traditionally followed a centralised approach. Although they have been technically and economically viable for some time precinct scale schemes have not been widespread to date. Local, precinct based water solutions take a different approach to delivering water services. It involves collaboration with stakeholders, integrated and adaptive water cycle planning and more sophisticated economic analysis and funding.

The paper outlines learnings and experience with case examples of how local water solutions have been brought to life.

KEYWORDS

Decentralised systems, Integrated Water Cycle Planning, industry disruption, stakeholder engagement and collaboration, economic, social/ customer and environmental benefits.

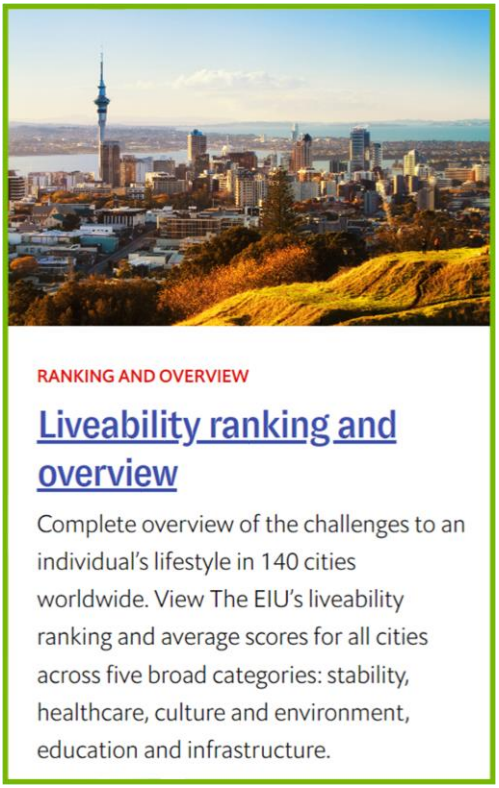
PRESENTER PROFILE

Robert is a Technical Director with Aurecon, operating in the water industry. With qualifications in Civil Engineering, Science and a Masters in Business Administration, he views planning from a range of perspectives. He has practiced his craft as a consultant for 20 years, and as a Senior Manager in Sydney Water for 16 years. At Sydney Water he developed the receiving waters investigation for the Clean Waterways, led wastewater services across the city, and was the Area Planning Manager for Northern Sydney. He played an instrumental role in developing the organizational capability to implement Integrated Water Management, and local servicing solutions. This included a role as Project Director of the Water Smart Communities project, an initiative to enable local water solutions to be implemented.

Robert now lives in Auckland where he hopes to indulge in his other passions for water, such as swimming and sailing.

INTRODUCTION

The opportunity for water planners to shape our cities has arrived. Up until now water has played an important role in making and creating cities. Clean drinking water, sewerage and drainage service have played a pivotal role in improving the health of our citizens. But water can deliver much more. As our cities get bigger, water plays a part in improving the wellbeing of our communities and bringing people closer to the natural environment.



Businesses are looking to base themselves in the most 'liveable' cities to attract the best staff. Cities now pride themselves on where they stand in the 'liveability' index.

Fortunately, many cities in our part of the world have rated highly on the index due to the benefit of being relatively small and the proximity to an unspoiled natural environment. Our challenge ahead is to ensure these cities maintain their liveability as they grow, by creating the things that people treasure in their lives such as a sense of community, and access to the natural environment.

To build communities through precinct planning and place making, urban planners need the support of transport, water and social infrastructure. This is a golden opportunity for water planners the opportunity to contribute to the shaping of our cities.

Figure 1: The Global Liveability Index 2021, Source: The Economist Intelligence Unit)

Using water to shape a better city can be a complex and at times, a challenging task in practice. With this paper I aim to highlight the significant advances made in real projects in recent times, which should help make it more widespread practice.

1. THE OPPOTUNITY

1.1 WHERE WE HAVE COME FROM

For over a century, the traditional approach to water and wastewater services has been based on linear systems with sources and sinks at each end, and relied on engineering economies of scale. This followed the transport planning model of building bigger to accommodate increasing traffic. With water, this leads to ever bigger dams, water treatment plants, pipe networks and ever greater impact on water sources and receiving environments. Population and economic demands are pushing these impacts to the limits of the environment. Decentralised, modular and nature-based solutions along with technological enablers offer viable options

for the future.There has been a belief within the water industry for some time now that better water management would make our cities a better place. With time, we are realizing that the key to bringing this about would need a increasingly localized, or precinct based solutions. The water industry has traditionally relied on economies of scale to provide services economically.

We were standing on the precipice of a disruptive change. Changes in water technology and control systems has lowered the cost of small-scale systems, to be increasingly cost-competitive with centralized systems. Some would say this is creating a paradigm-change for the industry, where technology, rather than scale is overtaking as the primary economic driver.

We are also realizing that water plays a very important role in sustainability and liveability, meaning that water management is no longer driven by lowest cost of essential water and sanitation, and is moving towards what brings best value for the customer.

However, it has not necessarily been straight forward to bring about this change. In the Water Smart Communities project in Sydney Water in 2015, there was an awareness that community scale water solutions were technically feasible and brought economic environmental and social benefits. However, there were considerable barriers to implementation, largely around pricing/funding, regulation, policy and governance.

Since then, our industry leaders have been overcoming these barriers. Very significant progress has been made on some significant projects, and through this paper we will be sharing our experience from some of the more notable projects.

1.2 HOW WATER CAN SHAPE OUR CITIES

How do we *shape a city*? One place and precinct at a time. City planners start with places and precincts with focus on local communities, as the building blocks for city-shaping.

The Water Sensitive Cities Institute describes this as moving from supplying water, sanitation and drainage services to supporting liveability, sustainability, resilience and productivity as shown in Figure 2. Water management has an increasing multi-discipline focus as we progress to a water sensitive city.

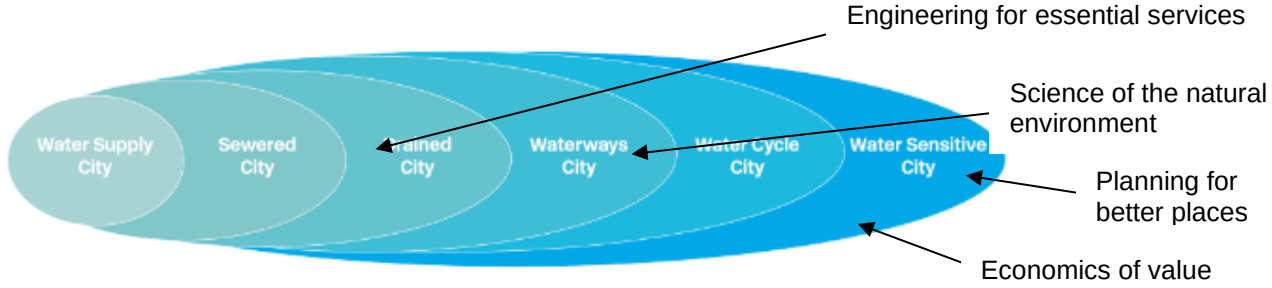


Figure 2: The transition to a water sensitive city (Source: Water Sensitive Cities Institute)

The Water Sensitive Cities Institute (Reference WSCI) identifies a water sensitive city as one that:

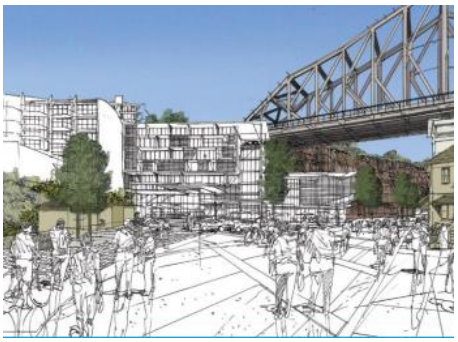
- provides the water security essential for economic prosperity through efficient use of diverse available resources;
- enhances and protects the health of waterways;
- mitigates flood risk and damage; and
- creates public spaces that collect, clean, and recycle water.

The value water creates is most effectively delivered on a local precinct or place scale.

1.3 WHAT IS A PRECINCT AND PLACEMAKING?

The Water Industry generally has a poor understanding of the planning process and doesn't take advantage of the opportunities it provides. The planning system is powerful and can facilitate delivery of water sensitive solutions along with other community infrastructure. Incorporation of water servicing solutions into the urban design of precincts is as important as the technical analysis.

Urban planners designing cities around local communities using precincts and places. Precinct structure is fundamental to making cities great places to live and deals with the transformation of sites to liveable and desirable urban places. An Urban Precinct aims to establish a sense of place and community centered around accessible and vibrant activity centers with local employment and business activity and better transport choices, and respond to climate change, increased environmental sustainability and more liveable communities.



A place is a location where residential, commercial, leisure and recreational activities occur. Placemaking aims to create places where people dwell in longer. It involves investing in public areas and infrastructure in urban places which are greener, accessible and climate resilient thus creating cities which are more liveable, productive, inclusive and sustainable. A place aims to have a character and form that merges with environment to create a sense of identity within the community.

The vision of developing Water Sensitive Cities needs to embrace the concept of precincts and placemaking to succeed. Incorporating water serving solutions into the urban design of precincts is as important as the technical analysis.

1.4 THE OPPORTUNITIES TO ADD MORE CUSTOMER VALUE

The opportunities to create customer value on a local scale were identified in the Water Smart Communities project as follows.

Wellbeing effect of 'green and blue' landscapes

Green and blue spaces create a sense of wellbeing and encourages outdoor activity. Water treatment and storage ponds also have a very significant customer and community benefit.

Customer's security of water supply

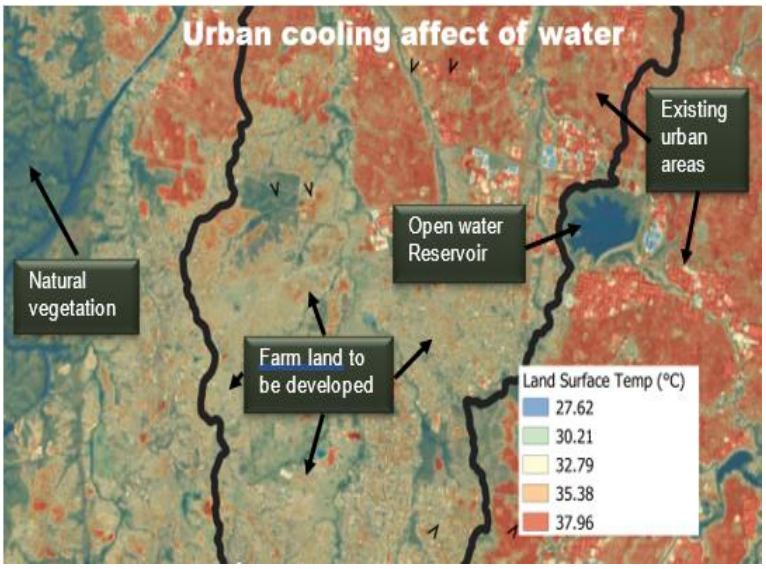
Customers look for an alternative water source to supply non-drinking uses such s toilet flushing and garden watering. Recycled water is a better product than rainwater tanks, and it is more climate resilient and requires less maintenance on the part of a landowner.

Drought proofing

Water restrictions come at a cost to community. Playing fields become unplayable, the quality of public open space is diminished as grass, landscapes and trees are lost. Recycled water is rainfall independent water source that has a lower overall cost to maintain these community assets.

Ecological value of local waterways

Healthy waterways provide significant ecological health and biodiversity value. Land and water management practices have caused a range of problems, including flooding, erosion, poor water quality, loss of aquatic and riparian vegetation, loss of aquatic flora and fauna, algal blooms and fish kills.



Urban cooling

The urban heat island affect is becoming a significant issue in many cities. The Heat Island effect is shown in Figure 3 - the land surface temperatures in Western Sydney. Temperatures in urban areas are 10 degrees higher than in green areas. Irrigation keeps green areas lush and keeps trees alive during droughts. It reduces the cost of cooling buildings and heat related effects on health.

Figure 3: Heat map of Western Sydney Source: Cunningham and Gillam

1.5 WHAT IS NEEDED FOR A PRECINCT WATER SOLUTION

A local water system typically involves the integration of locally available sources of water, including rainwater harvesting, grey water re-use, stormwater capture or purified recycled water.

Making a precinct based local water solution has proven to be a complex task. In 2015 the Water Smart Communities project in Sydney Water identified the need to address a range of governance, regulation, pricing and planning issues to pave the way for precinct-based water solutions to work.

Work has been done since then on several fronts to enable local water solutions possible. The progress made in these areas can be summarized in the headings:

2. Creating a shared vision for water management that support the vision for the precinct
3. Integrating stormwater and water/wastewater into precinct scale solutions
4. Collaboration, and incorporating water into urban plans, by embedding requirements into precinct plans, planning schemes and building approvals
5. Keep options open for innovative solutions with Adaptive Planning
6. Building the economic case by comparing the value and efficiency to alternative ways of achieving the precinct vision
7. Appropriate financing strategies/ funding and implementation mechanisms

2. CREATING THE VISION

Although precinct solutions need to stand on their merits, it is easier to achieve in the context wider vision for an area, as demonstrated in the case examples below.

CASE EXAMPLE – WESTERN PARKLAND CITY

Planning for Western Sydney has been a collaborative exercise starting within government planning circles, with close collaboration between the water management agencies and the Greater Sydney Commission. The vision to create a metropolis of three cities included a new city called the Western Parkland City, where water would provide greening and cooling of the parklands, with South Creek as the centre-piece environmental asset and the Western Sydney Airport as the anchor economic asset. Each of the other 'cities' – Central River City (centred around Parramatta renewal and revitalisation) and Eastern Harbour City (centred on the harbour and beach protection and enhancement)

Figure 4: Sydney a metropolis of three cities (Source: Greater Sydney Commission)

This was expanded on in the Precinct Plans (ref: NSW Govt. (a) The spine of South Creek and its tributaries are being re-imagined providing new cool and green neighborhoods and centers with generous open space in a parkland setting. Increased tree canopy cover would provide shade and shelter for walkable neighbourhoods within easy reach of shops and services. The Aerotropolis precinct will make a significant contribution to 200,000 new jobs for Western Sydney by establishing a new high-skill jobs hub.

Figure 5: Waterways in the Parkland City Source: NSW Government DPE (a)

Significant investigations were done to characterise the waterway and the objectives for the future development. These led to performance criteria for protecting and improving the waterways including instream water quality objectives and guidelines for stormwater solutions for particular urban typologies (types of development)

Figure 6: Vision for Western Sydney Parkland Sydney Source NSW Government (b)

A set of principles were developed for the Western Sydney Aerotropolis precinct (within the Western Sydney Parkland), starting with the "Recognise Country" guidelines (ref: NSW Gov (b)). Some of the principles included:

- Connecting water systems to the broader water landscape.
- Increasing connection and encourage engagement with water.
- The use innovative water management to avoid overengineering.

CASE EXAMPLE - FISHERMANS BEND REDEVELOPMENT MELBOURNE

A vision was developed for urban renewal project covering approximately 480 hectares in the heart of Melbourne to become the home to approximately 80,000 residents and employment for up to 80,000 people by 2050. The vision was to transform this under-utilised area to ensure liveability as the precinct grows.

Figure 7: Fishermans bend redevelopment

It included a suite of strategies and plans with more than 12 months of engagement with community and collaboration other stakeholders, including the Department of Jobs, Precincts and Regions (DJPR), the Department of Environment, Land, Water and Planning, Melbourne Water, South-East Water, the City of Melbourne, the City of Port Phillip, the Office of the Victorian Government Architect and Water Sensitive Cities Australia.

CASE EXAMPLE - GOLD COAST WATER AND WASTEWATER

The Gold Coast is a coastal city in approximately 66 kilometers south-southeast of Brisbane with a population of approaching 700,000.

Figure 8: The Gold Coast (Source: Gold Coast a)

The Gold Coast is characterised by high-rise development alongside its beaches, significant urban areas around inland waterways, and natural forests covering about half of the Council area. Tourism and a spectacular natural environment is at the heart of the sustainability of the city.

Gold Coast Water's water strategy recognises the critical role water plays in their way of life, cultural identity, health and well-being, and long-term economic stability and growth. The Gold Coast Water Strategy 2019-2024 was developed in response to this vision to ensure residents and visitors continue to enjoy (amongst other things) a unique water lifestyle, healthy catchments and waterways beautiful urban spaces that feature water and bring the community together. (Ref: Gold Coast Water and Wastewater a))

3. INTEGRATED WATER MANAGEMENT

Integrated Water Management (IWM) is the mainstay for water planning and continues to evolve into new territory as is shown in the case examples of Western Sydney Aerotropolis and Fishermans Bend below.

CASE EXAMPLE: WESTERN SYDNEY AEROTROPOLIS PRECINCT

A feature of the IWM at the aerotropolis was the integration of stormwater and water supply strategy. Stormwater and water/wastewater services are not effectively integrated in many cases, perhaps due (in part) to the often being governed by separate institutions.

Aurecon supported Sydney Water in providing stormwater, flood and waterway health inputs to set new standards for achieving IWM solutions that included the development of stormwater management models, water, wastewater and recycled water servicing strategies on a precinct level.

The project was driven by a concern that increased stormwater runoff from the development would was out the creek and destroy its ecological integrity. The potential for this to happen was shown with examples of where this had happened in the past, as shown in Figure 9.

Figure 9: Illustration of the increased flows for urban development on a stream (Source: Dan Cunningham, Sydney Water, Peter Gillam Aurecon)

Therefore, the objective of the water management plan was to reduce the stormwater flows creeks downstream. The water balance diagram in Figure 10 shows that:

- Even with current day WSUD standards applied to stormwater designs, runoff from urban development would increase runoff by five times.

- Runoff volumes would need to be reduced to a maximum sustainable volume of two times current runoff.
- This could be done by harvesting water for landscape irrigation and secondary (re-use) water supply to residents.

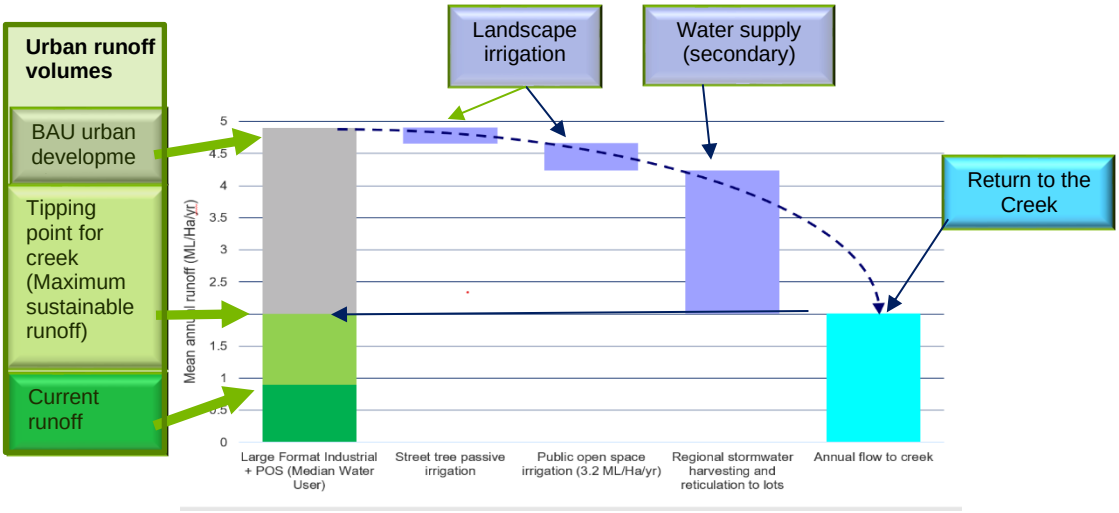


Figure 10: Water Balance Sydney Aerotropolis precinct (Source: Dan Cunningham, Sydney Water, Peter Gillam Aurecon)

Significant stormwater storages were needed to hold these wet weather flows. Farm dams that were historically part of the agricultural heritage of the area as well as new storage basins within the urban precincts were needed to achieve this. The water will be used for a combination of uses including landscape irrigation or for secondary water supplies for residents and businesses after further treatment.

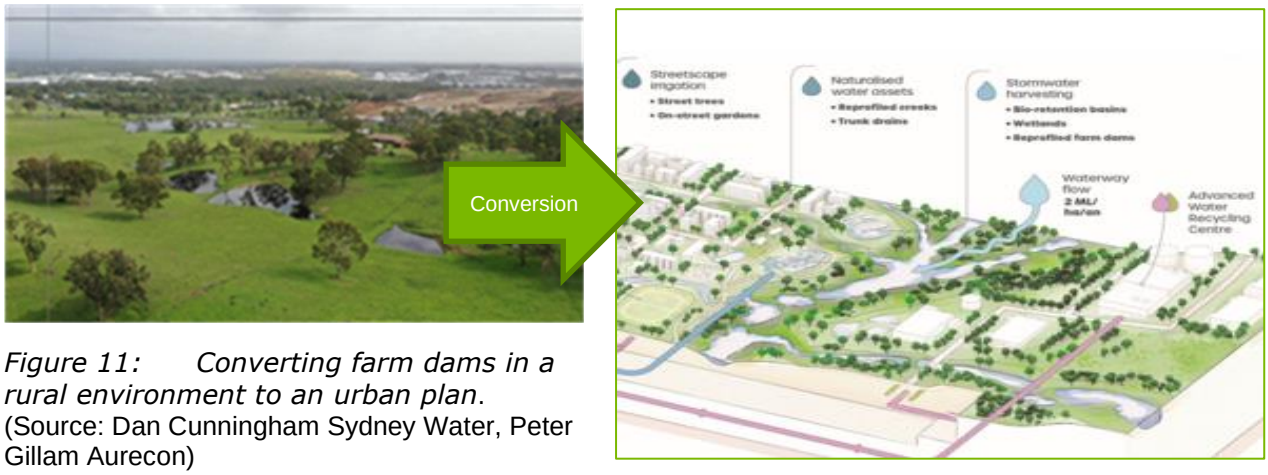


Figure 11: Converting farm dams in a rural environment to an urban plan.
(Source: Dan Cunningham Sydney Water, Peter Gillam Aurecon)

The effective integration of stormwater and water supply provided a dual benefit, an additional source of secondary water supply as well as the protection of the downstream creek.

CASE EXAMPLE: FISHERMANS BEND PRECINCT

The Fishermans Bend project was notable in the way meant precinct-based opportunities were integrated with urban planning decisions across buildings, along streets, and within precincts, integration at a range of scales resulted in unprecedented overall levels of water efficiency, and liveability at a lower cost than would otherwise have been the case.

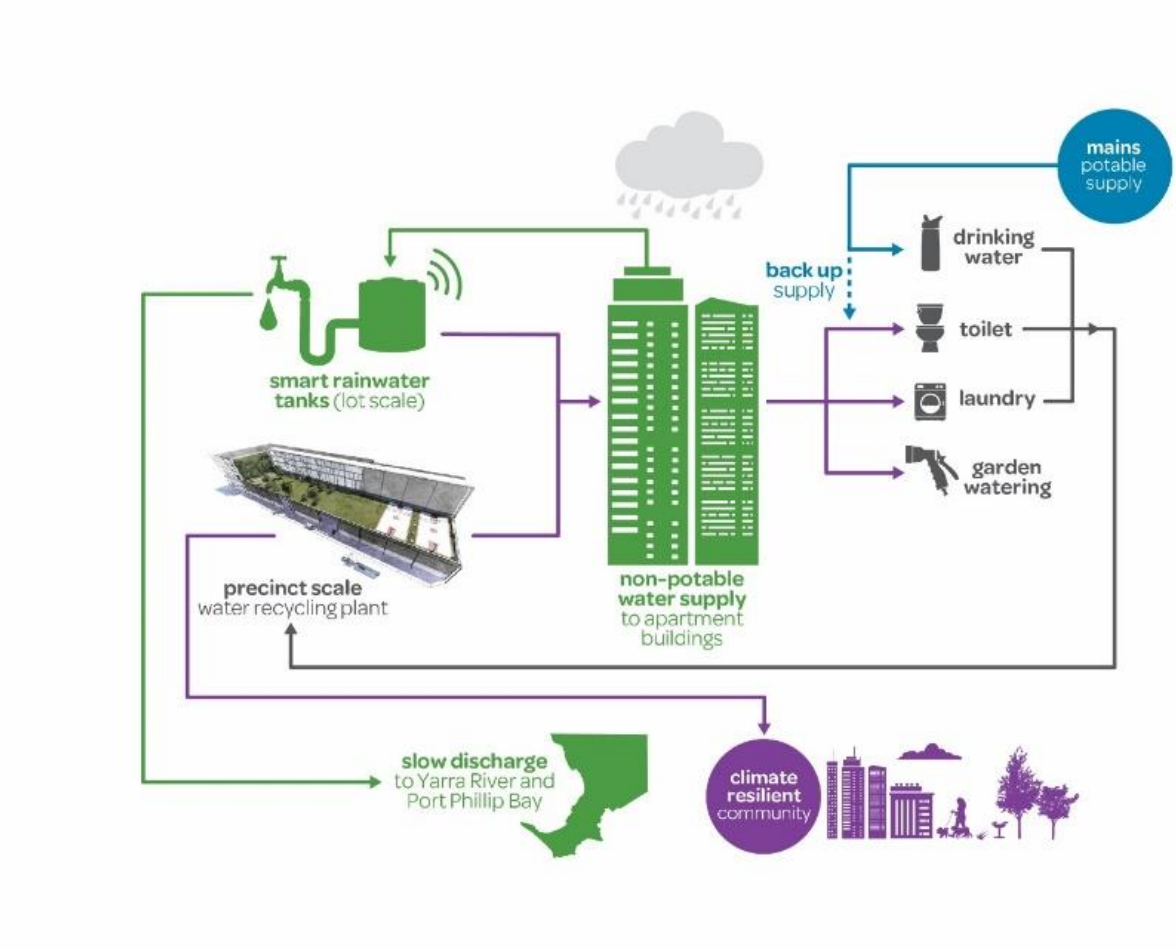


Figure 12: Integrated Water Management at Fishermans Bend Bend)

The initiatives at each of precinct, street and building scale included:

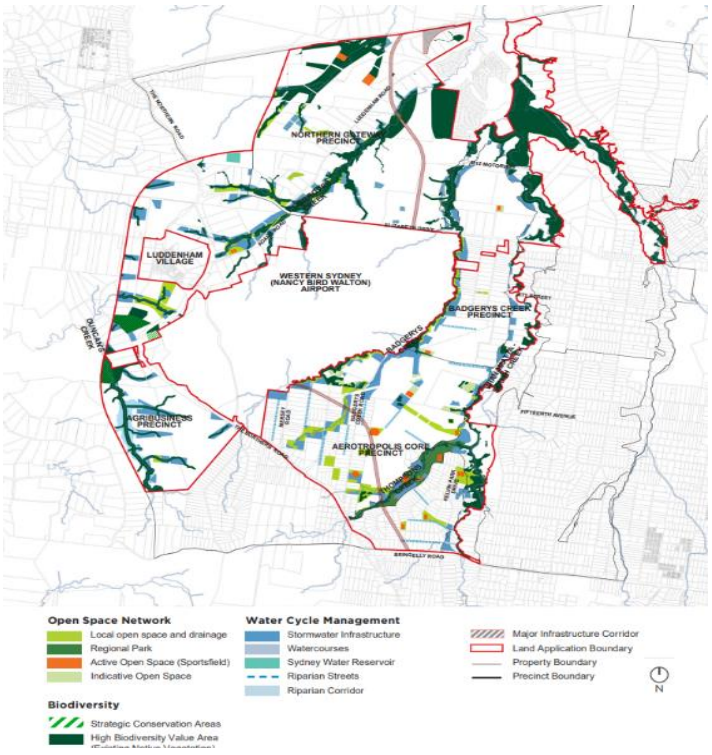
- Precinct scale water recycling plant and network for residential re-use
- Street scale water capture, including storages, raingardens and tree pits.
- Building scale Green roofs, green walls, and smart rainwater tanks.
- Building-scale rainwater capture, storage and treatment for re-use.

4. COLLABORATIVE URBAN PLANNING

To achieve a Water Sensitive City, we need to integrate urban development and water cycle management. Many well-thought projects have been thwarted in their implementation due to the realisation that adequate land area had not been made in the early masterplans.

The approach involves engaging in city planning and linking to stakeholders' policy plans and vision. In essence it involves building a partnership of stakeholders to identify the best solutions for the community, bearing in mind that the broader ideas and expertise of a diversity of participants can create more wholistic and multi-value solutions

Precinct-based water schemes effectively become partnerships between local Councils, Planning Authorities, Government agencies and Developers.



CASE EXAMPLE : WESTERN SYDNEY AEROTROPOLIS

Significant land area was needed for water storage and management in the precinct plan for the Western Sydney Aerotropolis. The specific land allocations for water are shown in an extract from the urban plan shown in Figure 12.

These storages will become an asset to the area. This is reinforced in planning guidelines that specify that the precinct plans should increase people's visibility of the water system and integrate it into the fabric of the built form.

Figure 13: Land allocation for water management within Western Sydney Aerotropolis (Source: NSW Govt.(d) Western Sydney Aerotropolis Precinct Plan)

5. ADAPTIVE PLANNING

Flexibility and adaptability become important in a rapidly evolving environment. We need to build infrastructure in ways that don't lock us into a way of doing things that may change in the future. Our customer behaviour, stakeholder expectations, and technological solutions are changing rapidly. Dynamic Adaptive Policy Pathways (DAPP) provides flexibility to move investment pathways while minimising investment that may be regretted in the future.

The methodology developed by Aurecon and Deltares is shown in Figure 13.

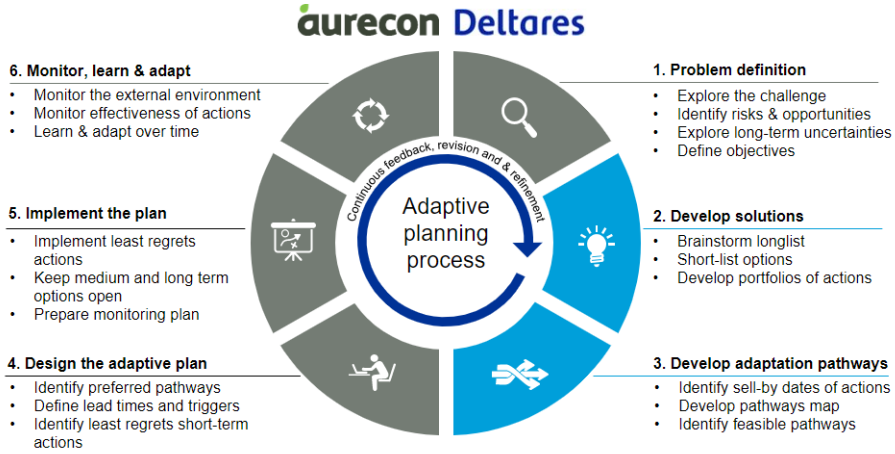


Figure 13: The adaptive planning methodology Aurecon developed with Deltares, suited to large capital investments in long life assets characteristic of the water industry.

Adaptive planning aims to:

- the identify the most desirable investment pathway,
- understand the decisions that need to be made ahead of time
- build the capacity to foresee and maneuver between pathways to achieve the best result.

The DAPP method is most useful when:

- decisions are being taken when the system is particularly sensitive to the changes in its most uncertain aspects,
- when the impact of failing to meet planning objectives is large, and
- when prior decisions constrain later options.

An adaptive methodology identifies:

- Tipping points – when actions are needed (eg. a new treatment plant)
- Lead times for implementation (eg. 5+ years to build a treatment plant)
- Decision dates (eg. planning and design of a new treatment plant)
- External signals to be monitored (eg. treatment plant performance)

- Knowledge gaps to be filled (eg pilot studies or technology development)
- Plans in consultation with stakeholders and the community

Decision pathways are illustrated as per the generic diagram in Figure 14 below.

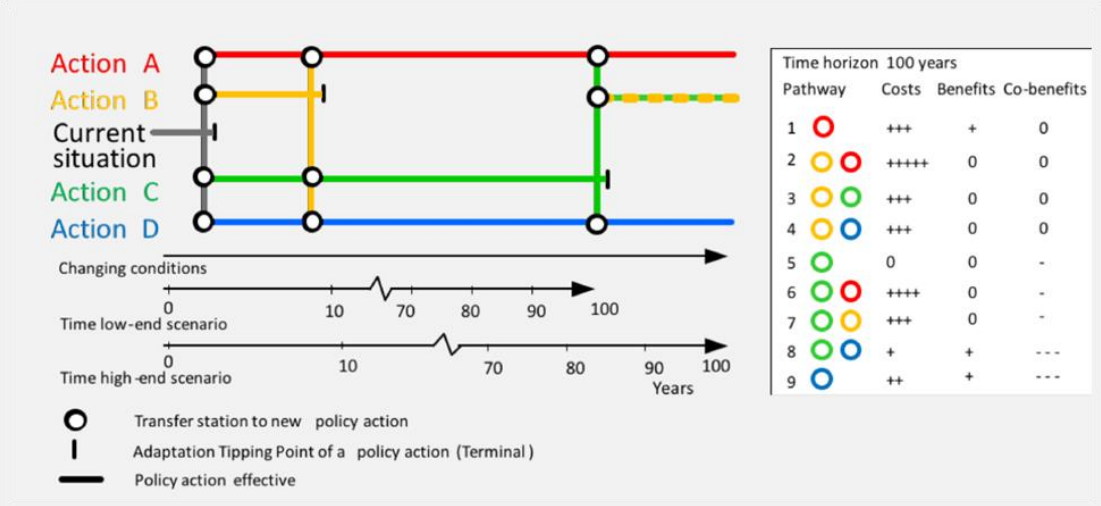


Figure 14: Adaptive plan decision pathways

CASE EXAMPLE - GOLD COAST

The next phase to implement the strategy was to develop plans and specific projects. Gold Coast Water and Wastewater wanted to open opportunities to develop local schemes which enhanced the local environments. It was evident that the opportunities to do so would emerge progressively and an adaptive and integrated approach would be needed to create the plans. Aurecon developed an Integrated Adaptive Plan methodology to assist with this.

The methodology would enable local schemes to be developed and progressively incorporated into the larger centralised system servicing the city. It is now being used plan the upgrades to the wider system while leaving options open for local innovative schemes now and in the future.

The planning process has identified "challenge areas" where there are local recycled opportunities, and the adaptive approach maps out the decision-making timelines.

An adaptive approach can be used for the progressive introduction of recycled water. As purified recycled water does not yet enjoy the widespread public acceptance for drinking water, it can be progressively introduced with locally for irrigation and toilet flushing. Treatment plants can be designed with the provision for potential upgrade in the future. Smaller pilot plants can be used to demonstrate to the public that consistent production of drinking quality water is possible and leaves the option open for a rapid transition to drinking water uses when it gains widespread public support.

6. BUILDING THE ECONOMIC CASE

As part of the concept development, it will be important to quantify the relative value and efficiency of achieving precinct vision with the water solution. Techniques have been developed to demonstrate the economic viability of local water systems as outlined below.

6.1 CAPITAL COST

Small scale state-of-the-art treatment, collection and controls systems are coming down in whole-of-life cost, and if smart control systems are used, they are cost-competitive with centralized systems. Out-of-sequence developments in greenfields areas are more economically serviced with local solutions.

6.2 OPERATIONS AND MAINTENANCE

Traditional wisdom has been that large infrastructure is cost effective due to economies of scale. However, as our centralized large systems get older, we face increasing risk and cost of maintenance and operation. Managing leakage and the risk of failures is growing exponentially. By contrast, older local water systems are easier to maintain and are more resilient to shock events.

6.3 WATER SECURITY AND SYSTEM RESILIENCE

Source diversification increases water security. Augmenting large surface water supply dams with local sources reduces supply risk and improves the resilience of the whole system. Similarly, diversification of wastewater treatment, reuse and disposal reduces overall risk and increases the resilience of the whole system. Deploying digital technologies enables dispersed risks to be managed well. Digital economies of scale are out-performing traditional physical economies of scale.

6.4 ADAPTABLE TO CHANGE

Changes in resource management, circular economy and net zero carbon will almost certainly change how we manage water in 50-years' time. We need to think twice about building infrastructure today that locks out of other options in the future. Smaller systems servicing more immediate needs leaves the option open for more contemporary solutions in the future.

6.5 VALUE OF WATER CONSERVATION

The value of conserving of our drinking water supplies needs to be incorporated into an economic analysis for a local water supply source to be viable. This has not often been the case, which is part of the reason why many recycled water schemes have not been considered economically viable.

Assessing the value of water conserved is not straight forward. Its value depends on a range of factors, including:

- The current outlook for drinking water supplies (scarcity)
- The nature of the new water source being considered (ie. its scale relative to the supply shortfall, time to implement, and how long the water savings will last).

A demand management program can be implemented relatively readily and conserve water in the short term. Its value will depend on the scarcity of water at the time. For example:

- The water saved is not very valuable if there is ample water available. (ie not great value in water conservation if the dams are overflowing)
- The water saved is valuable if water is scarce at the time (ie the dams are running low and restrictions are in place)

However larger projects that have long lead times, can often not be built in time to rescue a situation if dam levels are already critically low. A value of the water conserved for such projects needs to reflect the long-run value of water.

The value of water conservation will be very specific to the current outlook and the term of the project being considered. This is not unlike the principle of the value of interest on long term and short-term money markets. Figure 15 shows how (in principle) the value of water in an economic business case would depend on these factors.

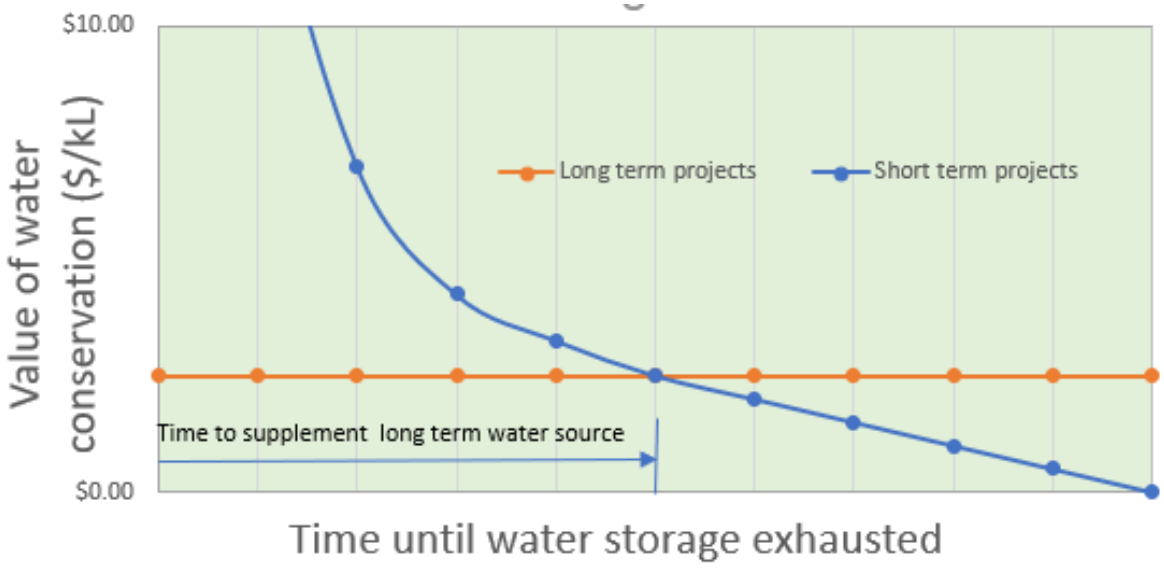


*Figure 15: Conceptual Diagram of t*he Value of Water Conservation

6.6 AVOIDED COST

Avoided cost will be a key factor in the economic evaluation a precinct or place-based water solution. The avoided cost is (in effect) the cost of achieving the same outcomes without that scheme being in place.

Quantifying avoided costs is not straightforward. In most cases, consideration needs to be given to whether the cumulative effect of several precinct-based solutions will mean projects to amplify centralised infrastructure can be deferred or avoided. Avoided cost tends to be minimal in systems which have latent (spare) capacity, but substantial in systems which have constrained capacity and increasing demand that will exceed that capacity. The calculation needs good information on current system capacity, projected demand increase and forward capital works programs to calculate the expected benefit of the precinct-based project within the wider system.

6.7 VALUE OF THE NATURAL ENVIRONMENT

It is difficult to putting a monetary value to the ecology and recreational value of waterways in an economic analysis. Often it is more productive to set the criteria that there should be no degradation of the natural environment, as this cost will be significantly less than the cost of restoration in the future.

6.8 VALUE TO CUSTOMERS

Possibly the most significant value of local systems is the ability to provide additional customer value.

Studies have been done to quantify the value to customers of water sensitive designs. The values in these economic studies are not usually directly applicable to each new precinct or place, but provide an indication of their order of magnitude.

Urban Cooling: An economic study on the benefits of integrated water management and its urban cooling effects on people's wellbeing and mortality rates. First estimates are that the economic cost of extreme heat is in the order of $500 per year per person. To put this cost into perspective, it is the same order of magnitude as the average annual household bill for water and sanitation services.

Liveability benefits of a healthy and attractive waterway: An economic study monitored house values within 200 m of the creek rehabilitation project showed property prices dropped during the construction but increased by an average of $40,000 (relative to other houses in the area) after it was completed.

Recycled water: An economic study of a new development area in Sydney showed houses with recycled water sold for on average $5,000 more than a home with rainwater tanks. The cost of rainwater tanks is accepted to add about $7,000 cost to the value of a new house.

CASE EXAMPLE - WESTERN SYDNEY PARKLAND CITY

The economic case for water in Western Sydney was based on achieving the Parkland City objectives.

A cost benefit analysis showed an incremental cost of $2 billion in servicing the Parkland city objectives over the baseline $24 billion to service the area. In effect the additional cost to achieve the objectives was less than 10%.

The additional benefits were derived from liveability and amenity outcomes associated with greener and bluer urban environment and made it economically preferred over conventional servicing.

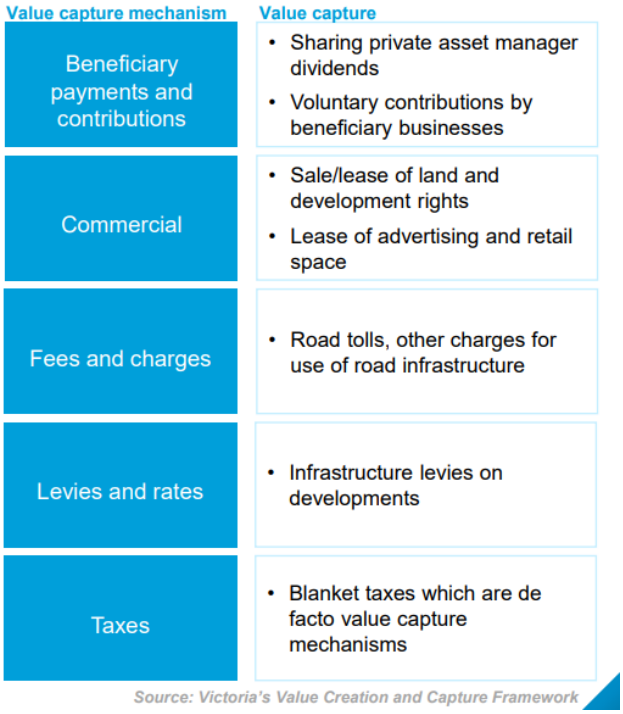
CASE EXAMPLE - FISHERMANS BEND MELBOURNE

Economic analysis used to underpin the business case included benefit cost ratio, cost recovery and strategic value creation for the estimated $5 billion+ of infrastructure across all services (that included water).

7. FUNDING MECHANISMS

Even if a project is good value for money, it needs to be funded. The challenge becomes showing that the additional cost of a water sensitive approach is affordable, and there is an appropriate funding mechanism for it.

Water supply and sanitation often has a specific funding mechanism that don't provisions for the benefits afforded by integrated water solutions. Hence separate funding mechanism is needed to capture the cost of a scheme.



Value capture is a mechanism by which to fund precinct or place-based projects not covered by general revenue. Some value capture mechanisms recognised by the Victorian Government in Australia are shown in Figure 16. These value capture mechanisms requires long term planning, cost quantification, market acceptance and time to implement.

Figure 16: Value creation and Capture Framework (Source: State government of Victoria)

CASE EXAMPLE: FISHERMANS BEND PRECINCT

The Fisherman's Bend Taskforce developed a Business Case (BC) Investment Strategy which included options for different value capture mechanisms to fund the estimated $5 billion+ of infrastructure. Financial models were used to analyse cost recovery and the strategic Value Capture Plan. The final business case was considered affordable in the context of the value of land uplift from the transformation. The revenue was raised through a state government infrastructure charge specific to the development area.

CASE EXAMPLE : WESTERN SYDNEY STORMWATER AUTHORITY

Stormwater infrastructure is normally managed by local Councils in Sydney. Sydney Water were gazetted as the stormwater Authority for the Sydney Aerotropolis precinct. The implementation of the integrated water supply and stormwater vision needed Sydney Water's technical and financial capability. Sydney Water will levy stormwater charges in addition to water and sewer charges. The nature of the charges has yet to be determined and will be regulated by the Independent Pricing and Regulatory Tribunal.

CASE EXAMPLE - VICTORIA'S GROWTH AREAS INFRASTRUCTURE CONTRIBUTION

The Victorian Government introduced a Growth Areas Infrastructure Contribution (GAIC) in 2010 as a one-off contribution paid by developers. It collects funds for growth infrastructure at key points of the land development process. It captures the costs of creating infrastructure, usually at the point of rezoning. The funds are in addition to developer contributions and based on place-based infrastructure forward program.

CONCLUSIONS

Water is a key aspect of shaping our cities. As urban planning and water management turns towards more localised solutions, an opportunity is emerging for water planners to become more active in making our cities better places to live work and play in.

As the projects highlighted in this paper demonstrate, the way forward for precinct and place-based water solutions can be carved out. It's now up to water managers 'to step up to the plate' and make their case for shaping a better city.

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