

Urban water management

Shifting to urban sensitive water design – One Water

Urban planning has adopted liveability as its new catch phrase, and is seeking to create an urban landscape where residents get to enjoy green open spaces, trees that keep the concrete jungle cool, and water systems that are resilient to drought and disruptions. For the water industry this has meant a shift in the way services are delivered, from an approach that traditionally aimed to avoid the bad impacts of nature (flooding) and humans (sewage), to one where the services we provide add more value – designing water systems that are sensitive to the urban needs – urban sensitive water design.

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For the land use and urban planning sector, this has meant thinking about how to incorporate water as a complementary component to the urban landscape, by viewing all forms of water in the urban landscape as essential to a healthy urban environment and potential resources, and not as problems to get rid of – **net positive infrastructure**.

To move in this direction, specific attention will need to be placed on the interplay between the different kinds of factors that affect successful collaboration and integration between urban and water planners. Some that ‘push’ for change through present day needs (drivers), such as the impending infrastructure capacity and resource constraints, the need to reduce flooding and nutrient discharge to waterways through sewer overflows.

Others that ‘pull’ or attract change through fresh aspirations (visions of the future) for liveable urban environments, with new water systems that mimic and work with nature and provide

potentially lower economic costs to society while ensuring resilience to climate change and mitigate the heat island effect, improve green open space and improve health outcomes. And still others that act as ‘weights’ or barriers for change (challenges), that prevent the institutional changes and collaboration required. Foremost of these is the inertia associated with the dominant paradigm of centralised and siloed systems. This is evident in funding and institutional arrangements and in training that often favours non-integrated infrastructure and management.

The management of urban water systems is often fragmented, with the design, construction and operation of the various elements carried out in isolation from one another. Short-term solutions are selected with little consideration for the long-term impacts on the entire urban water system. More specifically, the conventional approach to planning for urban water management is typically associated with the following issues:



(Source: Pathways to One Water. A guide to institutional innovation)

The six key elements that contribute positively to a One Water paradigm

Fragmentation – An overall systems approach to urban water infrastructure and resources is still missing. The various elements of the urban water system are often planned and operated in isolation. Such a fragmented approach can result in technical choices that are based on the benefits to an individual part of the system, but may neglect the impacts caused elsewhere, such as flooding, pollution, and heat island effects, to mention a few.

Short-term solutions – Water management tends to focus on today's problems, opting for short-term, politically expedient solutions despite the risk that the implemented measures are not cost effective or sustainable in the long term. Collaboration between institutions and levels of government can offer an opportunity for risk sharing and longer term planning, beyond the political election cycles and budgets.

Lack of flexibility – Conventional urban infrastructure and management tends to be inflexible to changing circumstances. Planning for water management has tended to address problems through large investments in a limited range of long-established technologies. Water supply, wastewater treatment and stormwater drainage systems are constructed to match fixed capacities and when these are exceeded, problems occur. Likewise, the management of these systems becomes dysfunctional when faced, for example, with increasing climate

variability and rapidly growing urban demand. Incremental planning and implementation that accommodate changing circumstances can provide the flexibility needed.

Research led by the Institute for Sustainable Futures (University of Technology Sydney) synthesised common themes from twenty seven case studies in Australia and the USA that can transition organisations to work towards urban sensitive water design, or a One Water approach:

Strong leadership and vision from senior officials are key to driving a One Water approach. At a political level, public funds must be made available to incentivise the transition to One Water management. At the institutional level, executives and boards must drive implementation of One Water strategies and address institutional capacity requirements.

Institutional coordination to proactively pursue long-term, mutually-beneficial relationships with a broad range of agencies, including the private sector. This will foster the collaboration and data-sharing needed for development projects to be aligned with the One Water strategy and implemented in a coordinated manner. This coordination should be driven at both the state and city levels.

Changing organisational culture to incorporate the One Water approach into everyday practices and thinking. It is useful to identify what One Water “success” would look like in an organisation, set the measurable indicators, and then work backwards to identify the steps necessary to build professional capacity. Getting buy-in from senior level executives is equally important so that they “walk the walk” and support One Water initiatives.

Transparent stakeholder engagement that involves both the private and public sectors is key to confirm the vision and support the implementation of the strategy. This could include dedicated public involvement and staff education; customer awareness, satisfaction, and values surveys; and online public engagement tools. This fosters worthwhile conversation with customers, stakeholders and policy makers, which avoids confusion and can often aid acceptance of required rate increases, fees, or costs.

Considering the full economic impacts of the One Water management approach in urban planning decision-making and investment would ensure that financial, environmental, and social costs and benefits are included in the analysis. Making the financial argument has been raised as a challenge to innovation, however, a number of strategies have been deployed to ensure that the business case stacks up. In some examples, public capital funding was allocated to key bulk infrastructure schemes to create an enabling infrastructural environment, which encouraged the private sector to invest in decentralized infrastructure.

New pathways for cost-effective revenue generation should be explored, as they provide multiple benefits to customers and could cross-subsidise the creation of liveability benefits. Stormwater improvements can be funded through separate stormwater utilities or segregated funding mechanisms. Subsidies for on-site treatment and use could be an incentive for decentralised systems, which relieves the need for expensive network upgrades.

Enabling legislation and regulations are needed that encourage integrated water management, and that are consistent across government agencies respectively. Local government leadership has been demonstrated through the enactment of ordinances or guidelines to encourage or require One Water approaches. A streamlined permitting process (e.g., for non-potable recycling) makes the compliance processes for design, construction and operation of these schemes more attractive to operators and owners.

By moving to a situation where water services are designed and managed to meet the express needs of the urban form and its residents, directly ensures that liveable cities become a reality. The One Water approach endeavours to integrate the planning and management of water supply, wastewater and stormwater systems in a way that minimises the impact on the environment and maximises the contribution to social and economic vitality.

To support planners and policy makers, the research team produced a Guide for transitioning to a One Water approach, which provides a range of enabling actions (and illustrative

examples) required to begin a successful transition to urban sensitive water design.

To access the guide, visit
<http://www.werf.org/c/KnowledgeAreas/IntegratedInstitutionsinfo.aspx>

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