

Guiding integrated urban and water planning: Project overview

Integrated Research Project 3



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Introduction

Urban planning in Australia's major cities has struggled to accommodate population growth in a way that promotes water sensitivity. The business as usual approachincreasing urban sprawl and piecemeal densificationplaces pressure on existing infrastructure and the environment, and commonly leads to more impervious surfaces, urban heat, degraded waterways, as well as loss of biodiversity and fewer green open spaces. Under this trajectory, cities will not be able to meet policy aspirations for sustainability, liveability, resilience and productivity, highlighting a gap between strategic city shaping goals and on-ground practices (Hamnett & Freestone, 2018). This poses a challenge for the planning of cities as they continue to accommodate a growing population in the context of increasing resource scarcity, climatic shifts and economic change

If cities are to protect and enhance their unique environmental, cultural, social and economic values, then the role of water in shaping city form and function needs to be more clearly recognised and advanced in the planning and management of urban growth, as emphasised in the concept of a 'water sensitive city' (see e.g. Wong & Brown, 2009; Ferguson, et al., 2013). This requires a more integrated approach to planning, with processes that promote cross-sectoral collaboration and recognise the interlinkages between water and urban systems (Webb et al., 2018). **Urban planning** is concerned with shaping cities, towns and regions by managing development, infrastructure and services in order to deliver liveability, productivity and sustainability benefits for the whole community (Planning Institute of Australia, n.d.). It is both a forward-looking activity, in allocating land for future uses, and a decisionmaking process, in controlling the pace and type of development (The Planning Academy, 2013).

Water planning refers to the planning and management of urban water systems (i.e. water supply, wastewater and stormwater, waterways and floodplains) to enable the sustainable growth of cities, towns and regions. This broad understanding of water planning moves beyond traditional conceptions—focused on the safe and reliable delivery of segregated water supply, sewerage and drainage services—to emphasise a total water cycle planning and management approach that supports the delivery of a broader range of urban liveability, productivity, resilience and sustainability benefits (Marlow et al., 2013).

Based on these definitions, **integrated urban and water planning** describes a means for achieving water aspirations through the urban development process. This enabling context is created through the conscious and systematic integration of water planning with urban planning.

The project, *Guiding Integrated Urban and Water Planning*, is one of five Integrated Research Projects within the Cooperative Research Centre for Water Sensitive Cities (CRCWSC). The project, which ran from July 2018 to December 2020, was developed after extensive consultation with industry partners and stakeholders to understand ongoing barriers and challenges to achieving water sensitive cities. It sought to address a need for practical guidance on ways to systematically improve integration across disconnected actors, governance structures and processes involved in delivering urban development and water services.

Project activities were guided by the overarching research question, *"How can different types of urban development be deliberately guided, at a range of planning scales, to achieve water sensitive outcomes?"* A framework for integrated urban and water planning was developed through stakeholder consultation and case study research. It seeks to support practitioners advance water sensitive aspirations through urban development processes.

This document provides an overview of the project and its outcomes, beginning with a brief summary of the need for research in this area, the research approach taken by the project, the key elements of the framework, and a description of project outputs. Suggestions for future areas of research inquiry are provided at the end. The document is intended to support readers in understanding and navigating the full breadth of materials produced by the project.

Need for this research project

The governance and management of urban development in most cities is guided by a multi-layered web of instruments, developed and implemented by a broad range of policy, planning, regulatory and service delivery organisations. Systems, actors and decision-making processes are typically geared towards streamlining and efficiency, leading to highly standardised approaches to infrastructure provision, urban layout and built form (e.g. Ruming & Gurran, 2014; Webb et al., 2018). Practice change, such as the shifts needed to mainstream water sensitive urban development, can be extremely hard to achieve in this environment.

Water sensitive urban development refers to urban expansion (through greenfield development) and intensification (through infill redevelopment) that incorporates sustainability and liveability principles, with a particular focus on water as a key enabler. Successful implementation requires adoption of a holistic view of the urban water cycle and services, and consideration of environmental impacts on the larger ecosystem and catchment (Sharma et al., 2012). Water sensitive urban developments are a critical building block for 'water sensitive cities', that is, cities which support sustainable, resilient, liveable and productive communities.

While a broad range of water sensitive principles are espoused in many existing strategies and policies, and well supported in the academic literature, they largely remain a niche innovation in practice (Marlow et al., 2013; Brodnik et al., 2017). Yet urban planning, if appropriately harnessed, has the potential to facilitate widespread and consistent place-based, water sensitive urban development outcomes. Planning systems govern every aspect of urban development, from establishing the future aspirations of a place, through to stringent regulations on the type, location, phasing and design of different land uses and infrastructure (Hurlimann & Wilson, 2018). But bridging the gap between promise and reality requires more explicit integration of urban and water planning. This begins with acknowledging and addressing the broad range of institutional barriers to water sensitive urban development that have been well-documented in the academic literature (see examples in Table 1).

Table 1. Institutional barriers to water sensitive urban development, organised by broad types of integrated planning activity with some illustrative examples (based on Moser & Ekstrom, 2010; Productivity Commission, 2020; Hurlimann & Wilson, 2018; Webb et al., 2018; Furlong et al., 2019; Sharma et al., 2012; Hussey & Kay, 2015; da Cruz et al., 2019; O'Flynn, 2013).

Barriers to cross- sectoral	Examples
collaboration	 Different professional backgrounds, institutions, languages and cultures of water practitioners and urban planners Resource and expertise constraints that prevent effective participation Institutions reinforce current modes of doing that do not encourage meaningful collaboration or innovation, e.g. government siloes, lack of formal processes requiring collaboration between statutory land and water planners, public accountability systems focused on individual organisational performance rather than joint outcomes, risk averse cultures Limited history of cooperation among key stakeholders Lack of shared understandings of the problem Lack of agreement on the purpose, goals, outcomes or measures of success for the collaboration Task is not appropriately scoped to justify collaboration Lack of individual leaders or 'champions' able to initiate concerted action within and across organisations Lack of political or senior management endorsement for collaboration

planning investigations	 Limited authority and/or skill in leading investigative process, e.g. investigators unable to draw out interdependencies between urban form and water servicing options Limitations on data (e.g. lack of adequate information on asset conditions, natural hazards and risks, population projections etc.) and modelling capabilities Inability to identify and agree on the goals of the investigation Inability to identify and agree on the range of performance criteria or standards, such as level of service provision, waterway health or stormwater quality targets, thermal comfort etc. Inability to develop and agree on a range of scenarios and options that meet identified goals and criteria, e.g. differing stakeholder perspectives on distributed vs end-of-catchment treatments make it difficult to agree on appropriate stormwater quality solutions Limited or distributed control over solutions being explored, e.g. water utility has limited control over urban form, local government has limited control over water servicing options, arbitrary policy ban in place that prevents consideration of some servicing options such as treated recycled wastewater to augment potable water supplies Limited control over the planning process, e.g. the urban development process has proceeded too far, making it difficult to advance alternative urban form and water servicing solutions
evaluations	 Limited agreement on goals, criteria, and options, e.g. different perspectives on option feasibility Limited agreement on assessment approach, e.g. net community benefit versus least cost Availability and credibility of methods to assess and compare options, e.g. lack of rigorous and transparent guidance around holistic economic evaluation processes capable of assessing costs and benefits across the entire water cycle Availability/accessibility/useability of credible data/information to assess options, e.g. non-market values, externalities, life-cycle costs/benefits
implementation	 Cross-cutting outcomes constrained by institutional fragmentation (e.g. stormwater planned and managed separately to water supply and wastewater, separate national guidelines for recycled and drinking water) and unclear or overlapping organisational responsibilities (e.g. roles of water utilities, state and local governments in enhancing urban amenity are not clearly defined) Overlapping, ambiguous or contradictory legislative requirements that impose additional transaction costs and administrative hurdles, such as public health and environmental management standards Limited scope of water-related requirements, e.g. inadequate regulation of diffuse source pollution, lack of stormwater controls for small-scale redevelopment Conflicting, inconsistent or unclear policy directions, e.g. ambiguous objectives for urban amenity Inadequate funding and financing mechanisms, e.g. cost sharing made difficult by separation of responsibilities across multiple agencies, government subsidies mask deficiencies with business cases, insufficient developer contributions lead to limited investment in green-blue infrastructure Lack of incentives for developers to pursue best practice, e.g. no discounts given for development headworks charges and/or ongoing water/sewerage rates when demand for centralised services is reduced Insufficient public and/or political support, e.g. short-term political goals at odds with long-term planning agenda, private interests derail pursuit of 'public good' outcomes Efficiency and streamlining agenda discourages the imposition of additional requirements as authorities are unwilling to increase 'red tape' Implementation arrangements are not well-considered, e.g. lack of ongoing collaboration, inadequate enforcement, lack of ongoing monitoring and evaluation Practice gap between what is designed, what is built and how it operates

Barriers can manifest at many different points throughout the planning and urban development process. For example, as a project is being set up, key stakeholders may not share the same vision. Or planning may have progressed too far, resulting in a fixed urban form that makes it difficult to consider different water servicing approaches. When it comes to implementation, existing planning controls and economic decision-making tools may impose further restrictions on the scope of options under consideration. And even if all these hurdles have been overcome, a lack of conformity to industry standards at the engineering design stage may lead to the abandonment of desired outcomes and a reversion back to business-as-usual practices.

This project seeks to support practitioners to anticipate some of these challenges and create a more enabling environment for change. It proposes a simple planning framework, supported by a series of principles and considerations to guide a more holistic and place-based approach to planning that more proactively integrates water considerations into the urban development process.

In practice, urban and water planning are commonly undertaken as spatially and temporally distinct processes (Hurlimann & Wilson, 2018). This scalar disconnect means that all too often the interlinkages between urban and water systems are not fully recognised, leading to suboptimal environmental and social outcomes (Carter et al., 2005). The policy aspirations for sustainable, liveable and resilient communities, viewed in relation to the complexity of current development challenges suggests that planning systems must be able to better adapt to change and uncertainty, which can only be achieved if integration underpins planning practice as a guiding principle (Eggenberger & Partidário, 2000; Stead & Meijers, 2009). This requires "close collaboration between statutory land planners and water planners at the right scales and at the right times to influence decision-making" (Productivity Commission 2020, p. 3).

Therefore, practitioners attempting to bridge urban and water planning require anticipatory and adaptive decisionmaking processes and tools that enable interdisciplinary explorations of water sensitive urban development solutions (Gober et al., 2016). The outputs of the research project *Guiding Integrated Urban and Water Planning* outlined in this document aim to support practitioners as they design and implement collaborative, contextsensitive and integrated approaches to planning, through a framework and principles that are informed by academic and case study research.

Research approach

The research project sought to address the need for practical ways to realise water sensitive urban development aspirations in different contexts through two broad types of activity.

Activity 1: Framework development

The research project began with the development of an initial *Integrated Urban and Water Planning Framework*, made up of five phases and an underlying matrix that outlined different levels of practices (Chesterfield et al., 2019). It was developed through practitioner insights and a desktop review of national and international planning practices. The latter focused on water and urban (spatial, land use) planning, but also examined principles and frameworks related to the integration of urban and energy or transport planning.

Stakeholder engagement occurred throughout the project to test and refine different aspects of the framework. It involved one-on-one meetings and interviews, group-based workshops and the establishment of a national, industry-based project steering committee to provide ongoing input and feedback into the project. This, along with emerging insights from case studies (see next section), informed more targeted explorations of the academic literature, with a particular focus on collaborative governance and planning integration.

Activity 2: Action research

Differences in planning, development and water contexts, and a recognition that planning systems do not always operate the way they are portrayed on paper, led to a detailed exploration of four real-world cases across Australia (see summary in Table 2). An action research model was adopted, whereby researchers worked with government and industry practitioners in a collaborative context to investigate place-based issues and opportunities to improve water sensitive development practices. These rich case study insights were then used to inform the development of different aspects of the framework.

Case (location)	Development context	Water context	Key collaborators	Research methods
Brabham, Perth (Western Australia)	220 hectare greenfield development in Perth's northeast corridor. Opportunities to minimise the importation of fill and demonstrate alternative lightweight housing options.	Shallow groundwater environment. Opportunity for alternative non-potable supply for public open space irrigation	Department of Communities (land owner), Peet Brabham Pty Ltd (developer), Department of Water and Environmental Regulation (groundwater regulator), City of Swan (local government), CRCWSC	4 workshops 3 rounds of interviews (23 in total) Online survey (14 respondents)
Townsville (Queensland)	Greenfield growth in a regional centre, located within the dry tropics. Opportunity to improve urban liveability and ecosystem health through water sensitive urban design.	Water security, drought and flood cycles, urban greening and urban heat, waterway health and coastal management. Opportunities for alternative water supplies and green infrastructure.	Townsville City Council and CRCWSC	15 interviews 2 workshops
Salisbury (South Australia)	Infill development in Adelaide's north. Opportunities to deliver higher quality and more diverse infill housing.	Increasing demand on existing water infrastructure. Dry urban environment. Opportunities to reduce urban heat and water demand through green, connected corridors, and alternative water use.	City of Salisbury and CRCWSC	7 interviews 1 workshop

Table 2. Case studies explored in the research project, Guiding Integrated Urban and Water Planning

Upper Merri Creek sub- catchment and Western Growth Area, Melbourne (Victoria)	Greenfield growth corridors in Melbourne's north and west. Opportunity to support place-making by harnessing water as an enabler of broader social, cultural,	Rapid population growth placing increasing development pressure on existing water infrastructure and the natural environment. Opportunities to reduce	Upper Merri: Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, three local governments (Hume, Whittlesea and Mitchell	15 interviews Online survey (28 respondents) 1 workshop
	outcomes for urban communities	pollution, increase green space and avoid costly large- scale augmentation options through integrated water management.	(water utility), Melbourne Water (water authority), and the Victorian Planning Authority	
			Western Growth: Department of Environment, Land, Water and Planning (state agency), Melbourne Water	
			(water authority), water utilities (Western Water, City West Water, Southern Rural Water), three local governments (Melton, Wyndham and Moorabool)	

The framework

The planning framework described in this document and related material seeks to help practitioners set up and carry out an integrated urban and water planning activity that deliberately advances water sensitive outcomes throughout the urban development process.

Foundational principles

The framework adopts a principles approach, seeking to guide practitioners in designing context-sensitive roadmaps or pathways, rather than prescribe a definitive, one-size-fits-all approach to integrated urban and water planning. This ensures the framework's applicability in different development and planning contexts.

Indeed, *context awareness* is a key principle underpinning the framework. The design and implementation of meaningful interventions requires a thorough understanding of the unique needs and opportunities within a particular place. But this inquiry should not be confined to the site or precinct under investigation; a place should also be understood within its broader catchment and regional context. This requires a *multi-scale perspective* that considers how other scales, such as metropolitan or state, may affect local or place-based outcomes.

This emphasis on context suggests a need to recognise **varying** '*levels of practice*' across the framework's five planning activities, from conventional practices to highly advanced practices. Each framework 'application' will look different, depending on the nature of aspirations. More ambitious projects are likely to exhibit higher degrees of interactivity, interdependency, comprehensiveness, formality, scale and resourcing of planning activities.

Framework principles

- 1. Enable contextual awareness
- 2. Adopt a multi-scale perspective
- 3. Recognise varying levels of practice
- 4. Focus on actors as influential change agents
- 5. Emphasise iterative process design, leading to different entry points

The framework considers actors (individuals, organisations and communities) to be central to each planning activity. As *influential change agents*, their actions and interactions can affect societal transition pathways and the rules (formal and informal) that govern urban development and water servicing (Brown et al., 2013). In particular, it is the connections developed between actors to advance shared goals through various forms of collaboration that provide the foundation of the overall framework.

Following the establishment of a fit-for-purpose collaboration (activity 1), the framework guides actors to holistically investigate their development context (activity 2), collectively develop a place-based vision and set of development scenarios (activity 3), analyse different scenarios and underpinning servicing options (activity 4), and identify the planning instruments, governance mechanisms and other interventions required to facilitate implementation (activity 5).

The activities are distinct but interrelated, represented sequentially but unlikely to occur in a strictly linear fashion. *Activities will involve iteration* and may overlap, potentially creating different entry points for integrated urban and water planning.

Overall, the framework represents a deliberative approach to urban and water planning that integrates typically siloed planning activities at key decision-making junctures to facilitate better urban development outcomes. This *focus on process* is reflected in the following descriptions of each planning activity.

Planning activities

The framework emphasises five key planning activities (Figure 1).



Figure 1. A conceptual representation of the framework and the five interrelated planning activities for advancing water sensitive outcomes through the urban development process.

1. Establish a fit-for-purpose collaboration

Collaborative governance involves bringing together relevant stakeholders from different sectors and disciplines to advance a shared agenda or goal that is otherwise impossible to achieve alone. This activity is foundational, providing the forum(s) for carrying out the activities described in all other planning activities.

The form of the collaboration will depend upon the place-based driver/s or need/s for collaboration, the interests and influence of different stakeholders, and the enabling or constraining features of the particular context under investigation (Malekpour, et al., 2020). It may involve, for example, informal networks that connect individuals across organisational divides, or formal bridging organisations that link different actors across scales and levels of planning.

The agreed upon structure and scope of collaboration is likely to evolve as planning advances, or as drivers and conditions change over time. The evolution may involve, for example, engaging with different actors as the collaboration shifts from planning to implementation. Accordingly, adopting a flexible approach is key to the durability and success of the collaboration.

2. Investigate the development context

Contextual analysis is a key data and informational input for all other planning activities. It involves a thorough investigation of the particular attributes of a place, in both a bio-physical and socio-institutional sense, in order to identify distinct local opportunities and challenges. This in turn provides the foundation upon which a place-based vision can be built.

The diagnosis of any place should involve understanding how natural and built systems came to be within a landscape and how they perform, as this is critical to changing the way we plan and design our urban environments (Bertram et al., 2017). Similarly, understanding the enabling and constraining effects of existing planning instruments and governance arrangements is key to anticipating potential development outcomes. Accordingly, any contextual analysis should involve a stocktake of applicable planning instruments, and an assessment of how they may influence desired outcomes.

3. Create a place-based vision and set of development scenarios

Bringing key stakeholders together to develop a shared vision for a place can help to align aspirations and provide a mechanism for building collective momentum towards its realisation. The vision also serves as a guidepost for the preparation of more specific development scenarios.

Each scenario paints a picture of a possible development pathway, based on collectively defined performance criteria and the interplay of different drivers, such as population and employment growth, as well as current or alternative policy settings (Schremmer et al., 2011). These factors determine the mix and spatial configuration of land uses, open space and street networks, urban densities, and built form and landscape typologies.

Adding a water sensitive lens to this exercise enables concurrent thinking about water services and urban form, and supports the placement of water at the centre of planning and design in order to improve development outcomes. This creates opportunities to reimagine the uses and functions of traditional infrastructure and other elements of the urban environment.

4. Analyse development scenarios and servicing options

This activity involves iterative processes of testing and refining in order to identify the ideal development scenario and set of servicing options that optimises performance, feasibility and costs across all desired outcomes. Comparing a baseline scenario with more aspirational scenarios can help reveal stakeholder preferences and support the continued refinement of scenarios and servicing options. Before commencing analysis, collaborators should discuss and agree on the approach to evaluation they will adopt to ensure processes yield outcomes in which they can be confident.

Aside from technical feasibility, scenarios and options need to be economically viable. Making the best selections for a particular place will depend on rigorous and transparent benefit-cost analyses of alternative scenarios and options. To address the fragmentation of water cycle and urban amenity responsibilities, assessments need to be a collaborative undertaking and focused on net community benefits rather than individual organisational outcomes. Practitioners also need to consider the benefits and costs of later stages in the project lifecycle, such as ongoing operation and maintenance, as well as risk sharing and implementation arrangements. This will ultimately provide a stronger basis for the preparation of a compelling business case.

5. Facilitate implementation

Embedding the optimised development scenario and servicing options within policies and plans, funding and financing, and service delivery arrangements is key to facilitating the on-ground delivery of water sensitive outcomes. Understanding how existing planning instruments affect the realisation of desired outcomes is a key input for this activity. This will support practitioners to design and implement a range of interventions that can harness likely enablers and remove, reduce or work around expected obstacles.

Many implementation interventions are likely to involve the formal creation of planning instruments. Coherently designed instruments are more likely to facilitate water sensitive city outcomes (Tawfik & Chesterfield, 2020). In designing planning instruments, practitioners should consider the *type* and *quality* of instruments. Less formal measures, such as strategic engagement, knowledge sharing, trials etc. should also be considered as part of the suite of interventions. They can generate quick wins or extend the influence of other interventions.

Later project stages are likely to involve a range of different actors in, for example, design and construction, ownership and operation of assets, land and water management etc. So it is essential that some form of collaboration continues beyond project planning and decision-making to ensure the realisation of desired outcomes on the ground. This requires consideration of appropriate governance arrangements at the outset, to minimise issues during implementation, as well as ongoing monitoring to address emerging issues as they arise.

Project outputs

The outputs of this project have taken different forms to address the needs and interests of different audiences:

- A. **Concepts and discussion papers** that articulate foundational aspects of our framework and seek to contribute to practice change and policy debates.
- B. A **Framework and principles** that provide high-level process guidance for practitioners seeking to undertake integrated urban and water planning.
- C. **Case study reports** that provide a detailed analysis of the issues and opportunities affecting planning, water servicing and urban development in different Australian contexts (Perth, Townsville, Adelaide and Melbourne).

A description of the outputs under each of these categories, along with links to publications, are provided in this section.

A. Concepts and discussion

The concepts and discussion papers explore two key themes of the project, collaborative governance and planning integration. Each paper is summarised below.





Designing cross-sectoral collaborations for integrated urban and water planning, describes four key considerations in the design of collaborative governance arrangements for integrated planning:

- 1. Why collaborate
- 2. What is the scope of the collaboration
- 3. Who should be involved in the collaboration
- 4. How to structure the collaboration

Practitioners within the urban planning and water servicing sectors can use this guidance to diagnose existing collaborations or help establish new, fit-for-purpose collaboration structures.

Report available here.

Facilitating water sensitive urban development through planning integration: a discussion paper, which unpacks planning integration concepts and principles in the context of water sensitive cities. It highlights two key aspects of integration that practitioners should consider when seeking to advance water sensitive outcomes:

- 1. The *type and quality of planning instruments* (described as 'substantive integration'). The paper highlights the importance of coherent planning instruments and describes four key attributes that can improve the design of instruments.
- 2. Well-designed instruments are not enough; practitioners also need to consider *the way actors work together* to make decisions and implement planning instruments (described as 'procedural integration'). The paper describes different approaches to improve coordination among multiple organisations.

Practitioners such as planners, policy makers, legislators and anyone with an interest in governance can draw on these insights to help formulate new planning instruments and identify possible improvements to governance arrangements.

Report available here.

B. Framework and principles



Practitioners seeking to advance a particular agenda, goal or aspiration related to water sensitive urban development need to be able to negotiate complexity and find ways to integrate water and urban planning. The framework and accompanying principles aim to guide practitioners elevate water considerations in urban planning.

The framework recognises that practitioners are more likely to achieve success where they can:

- Diagnose how their context may influence (constrain, enable or otherwise) the pursuit of desired outcomes
- Design and implement context-appropriate collaborative planning processes and structures that engage relevant actors in defining a place-based vision, and developing and analysing different development scenarios and servicing options
- Identify planning and governance interventions to facilitate the implementation of desired development and servicing outcomes.

The guidance expands on the five planning activities that make up the framework, and provides examples of relevant Australian practice throughout.

Report available here.

C. Case studies

Learnings from the four case studies undertaken as part of this research project were documented in case reports. The purpose of each case is summarised below, organised by region.

Brabham, Western Australia

The Department of Communities, Peet and the CRCWSC hosted an '<u>Ideas for Brabham</u>' workshop in June 2018, where participants explored different opportunities to advance innovative development approaches that combine water management and urban design to create sustainable and liveable communities in shallow groundwater environments. It was subsequently recognised that some of the ideas generated will challenge existing planning processes, so further collaboration was necessary to understand these implications. Accordingly, the Brabham Action Learning Partnership was established in March 2019 between the CRCWSC and the Department of Communities, the Department of Water and Environmental Regulation, and Peet. The collaborative partnership sought to explore the opportunity presented by the Brabham site to influence and navigate planning approvals processes to, in particular, implement innovative integrated water solutions for Brabham, as well as more broadly across the north-east growth corridor. The research outcomes were documented in two reports.



Enabling water sensitive urban development: planning and governance opportunities for Perth, which contends that the current WA planning and policy system comprehensively articulates a wide range of water-related goals, but some issues exist in implementation. After describing some of these constraints, the report explores 11 opportunities for system-wide change to support water sensitive urban development outcomes in the north-east growth corridor.

Report available here.



Brabham Action Learning Partnership: Case report, which describes the case methodology and research outcomes, focusing specifically on the Brabham development. The report summarises the technical and process constraints to innovation for Brabham, the short-term and long-term implementation pathways for the proposed subsoil drainage water solution, and shares lessons for setting up and maintaining multi-stakeholder collaborations.

Report available here.

Townsville, Queensland

After the establishment of a <u>Water Sensitive Townsville vision</u> in 2017, Townsville City Council recognised that in order to advance this agenda, further attention needed to be given to institutional arrangements, particularly planning and service delivery functions, which can pose a barrier to innovative practices and alternative servicing approaches. Accordingly, the Townsville Action Learning Partnership was established in July 2019 between the CRCWSC and Townsville City Council. The collaborative partnership sought to explore (a) tangible ideas of what water sensitive greenfield development in Townsville could look like, and (b) the institutional challenges and opportunities related to governance and implementation. The research outcomes were documented in two reports.



Enabling water sensitive greenfield development in Townsville

examines the institutional arrangements at the state and local levels that can impede water sensitive urban development practices. Our analysis proposes a multi-pronged program of intervention for Townsville that spans across strategic leadership at the state and local levels, urban planning at the local level via the Townsville City Plan, and Council functions at the operational level. It identifies 14 opportunities to strengthen Townsville's planning and governance systems to advance its water sensitive agenda.

Report available here.



Ideas for Townsville: Greening the public realm in a dry tropics city explores a range of ideas to redefine what good urban development in Townsville could look like, when considered with water management in mind. The ideas are conceptual, and seek to demonstrate the range of development and infrastructure possibilities that can be achieved through an integrated approach to water and urban planning.

Report available here.

Salisbury, South Australia

The case study explored the extent to which the new South Australian planning system facilitates the implementation of proposed water sensitive infill typologies, focusing on a precinct in Salisbury East. This suburban area in northern Adelaide is undergoing urban regeneration, driven by the *City of Salisbury City Plan 2030*. The case work builds upon the outcomes of the CRCWSC's Integrated Research Project 4, *Water sensitive outcomes for infill developments*, which tested how water sensitive design typologies and water servicing variables can improve the performance of the urban precinct in terms of liveability, water security and resilience. The research undertaken by *Guiding Integrated Urban and Water Planning* sought to unpack the broader governance and institutional factors that may enable or constrain the delivery of high quality infill housing and a greener and more connected public realm. The research outcomes were documented in the following report.



Planning for water sensitive infill development: case study of Salisbury East precinct examines the South Australian policy and planning context in light of recent planning reforms. The analysis suggests that while the new Planning and Design Code broadly appears to enable the proposed precinct outcomes for Salisbury East, additional measures will be required to address the limitations of some planning requirements, as well as implementation issues related to industry capacity and governance.

Report available here.

Integrated Water Management planning in Melbourne's growth corridors, Victoria

The Integrated Water Management Forums established for the Werribee and Yarra catchments within Greater Melbourne identified a need for more integrated water and urban planning at the corridor or 'sub-catchment' scale, to better link high level strategic goals and local or place-based outcomes. A number of forum participants including the Department of Environment, Land, Water and Planning (DELWP), Yarra Valley Water and Melbourne Water have initiated and helped facilitate the development of Integrated Water Management (IWM) plans for servicing the Upper Merri Creek sub-catchment and Western Growth Area. The CRCWSC was engaged by DELWP and Yarra Valley Water to undertake an evaluation of these two projects. The evaluation focused on

the effectiveness of collaborative efforts, which are crucial for successful IWM planning. The report described below presents the findings from the evaluation.



Evaluation of collaborative integrated water management planning in Melbourne's growth regions, documents the evaluation findings of two recent examples of collaborative IWM planning in Melbourne's growth corridors: the Upper Merri Creek IWM sub-catchment planning pilot project, and the Western Growth IWM master planning project. Each case was individually assessed, based on interview and survey data. Then a comparative analysis of case findings was undertaken to draw out process design principles for collaborative IWM planning. The principles were organised under four key themes:

- 1. Scope the project to clearly define its parameters
- 2. *Design* the collaborative governance structure in response to context
- 3. Collaborate effectively by creating spaces for quality interactions
- 4. Authorise the collaboration by building shared commitment.

Report available here.

Suggestions for future research

The project has sought to answer the research question, "How can different types of urban development be deliberately guided, at a range of planning scales, to achieve water sensitive outcomes?" by focusing on:

- the way in which actors can come together to plan, investigate, evaluate and implement a water sensitive agenda for urban development
- planning integration principles to guide practitioners design more integrative planning pathways that are appropriate for their context.

The project also explored this question in specific places by undertaking detailed case studies to explore the particular challenges and opportunities for enabling more water sensitive forms of urban development.

All of this research informed a conceptual framework that is designed to support practitioners in undertaking integrated urban and water planning to facilitate better urban development outcomes.

However, the project has only begun to understand how practitioners can operationalise integrated urban and water planning. Further research can help to:

- capture learnings from 'end-to-end' applications of the framework in practice—from the establishment of a
 collaboration through to the implementation of desired outcomes in planning and governance
 arrangements—in order to further develop and refine the framework
- draw on the learnings from framework applications to generate a continuum of practice that describes different levels of integrated urban and water planning practices
- identify and evaluate different governance models for undertaking integrated urban and water planning that involve, for example, different structures (e.g. hierarchical, network), lead organisations and formality or status
- explore options to formalise integrated urban and water planning through, for example, the development
 of model provisions that embed best practice in water sensitive urban development
- investigate the particular challenges and opportunities for integrating urban and water planning within the infill development context, as fewer tools and capacities exist to guide more water sensitive infill development practices
- develop additional support resources that address identified gaps in skills, capacity and tools, such as
 process guidance and models for integrated scenario planning and servicing investigations.

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