Evaluation of collaborative integrated water management planning in Melbourne's growth regions

Lessons from the Upper Merri Creek sub-catchment and Western Growth Area

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Evaluation of collaborative integrated water management planning in Melbourne's growth regions: Lessons from the Upper Merri Creek sub-catchment and Western Growth Area
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Executive summary

The Integrated Water Management (IWM) 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, Western Water, City West Water and Melbourne Water have initiated and helped facilitate two IWM planning projects relating to the Upper Merri Creek sub-catchment and the Western Growth Area.

Both projects acknowledge that better outcomes can be delivered by working across organisational boundaries at functional planning scales relevant to water and urban growth. The Upper Merri Creek project was highly place-based, with activities built around a shared vision for the sub-catchment that was co-developed with a broad range of stakeholders. It was also deliberately undertaken as a pilot, in an attempt to develop a replicable model for IWM planning in both greenfield and infill sub-catchments. In contrast, the Western Growth master planning project is one of many projects being undertaken in the west, in prosecution of the strategic directions set by the Werribee IWM Forum. It is accordingly narrower in scope, focusing on developing integrated water servicing solutions to resolve regional servicing issues.

The CRC for Water Sensitive Cities was engaged by DELWP and Yarra Valley Water to evaluate these two projects. The evaluation focused on the effectiveness of collaborative efforts, which are crucial for successful IWM planning. Each case was individually assessed, based on interview and survey data. This analysis revealed a number of institutional, organisational and personal factors that supported or constrained efforts to collaborate. These are summarised in the table below.

	Upper Merri Creek	Western Growth Area
Enablers	• Authorising environment (e.g. Yarra IWM Forum, community mandate, organisational endorsement) • Water leadership to initiate the project and empower other stakeholders to be involved • Shared motivations, willingness and commitment of individual partners	• Authorising environment (e.g. Werribee IWM Forum) • Clear need identified (e.g. urgency statement) • Shared understanding of the problem developed • Shared values and commitment of individual partners • Flexible approach to planning • Skilled and appropriate facilitation
Collaboration challenges	• Clarity and consistency of project governance and scope • Consistency of participation (e.g. staff turnover) • Appropriateness of stakeholder representation • Management of collaboration dynamics (e.g. mediating contentious issues)	• Time commitments and competing priorities • Initial lack of alignment and understanding among participants • Lack of tools and guidance for collaborative IWM processes • Degree of relevancy for stakeholders
Implementation challenges	• Missed some opportunities for influence (e.g. completed precinct structure plans) • Limited planning tools to effect IWM outcomes • Risk averse organisational cultures	• Broader stakeholder engagement and support required • Potential policy, regulatory and funding barriers identified

A comparative analysis of case findings revealed several lessons for IWM planning projects. These lessons relate mostly to process design, and can be framed as principles that emphasise the need to:

1. **Scope the project**, by taking the time at the outset to explicitly define the parameters of the project—particularly the problem to be addressed, the geospatial scale of planning, project outputs and

implementation pathways—based on a shared understanding of the biophysical and institutional contexts for collaboration.

2. **Design the collaborative governance structure** deliberately in response to context, to ensure it is fit for purpose (that is, able to support the realisation of the defined project scope and aspirations), promotes equitable participation, and clearly establishes different roles and responsibilities, particularly relating to leadership and coordination.

3. **Collaborate effectively,** by choosing appropriate representatives to participate in the collaboration, enhancing the quality of interactions through dedicated trust and relational capacity building, and providing access to necessary data, tools and resources to undertake IWM planning.

4. **Authorise the collaboration,** by ensuring all partner organisations endorse the project and its outputs, and enable their representatives to meaningfully participate, as well as build widespread commitment to shared outcomes by capturing community and cultural values within project aspirations.

The two cases highlight the potential benefits that a more widespread approach to sub-catchment IWM planning in Victoria could deliver. Practitioners from state planning, local governments, water utilities and authorities came together in a workshop to explore *what* should sub-catchment IWM planning look like if it is to become more mainstream. Discussions reinforced a need for sub-catchment IWM planning, but stressed the importance of clearly distinguishing this scale of IWM planning from other scales of IWM planning and ensuring they are well-aligned to effectively deliver IWM outcomes across Victoria. Other attributes of sub-catchment IWM planning discussed related to:

- **purpose**, as an enabler of collaborative planning to deliver place-based outcomes
- **outputs**, that document an agreed integrated water servicing strategy and delivery arrangements
- **scale**, focusing on waterways and water systems to form a ‘sub-catchment’ rather than organisational or jurisdictional boundaries
- **who should be involved**, recognising IWM forum members as a starting point for engagement
- **support required**, to equip participants with the resources and tools to effectively undertake sub-catchment IWM planning
- **timing**, to ensure sub-catchment IWM planning is able to influence key decision making processes.

Context is expected to play a significant role in determining what sub-catchment IWM planning looks like in different sub-catchments, but some level of consistency is required to ensure broad IWM outcomes are delivered. The workshop identified a need to continue exploring *how* such planning could be more widely undertaken. A series of considerations for an additional workshop focused on the ‘how’ are proposed.

1 Introduction

1.1 Integrated water management planning at the sub-catchment scale

Melbourne's population is growing rapidly. *Plan Melbourne* estimates an additional 620,000 dwellings will be required to support this growth up until 2030. The *Water for Victoria* plan highlights that water is central to every community, powering our industries and economy, improving our quality of life and nurturing our natural environment. The plan also highlights that Victoria is becoming warmer and drier and that we need to plan for doing more with less, while ensuring the community has access to high quality and connected open space, local creeks are healthy, streets and parks remain a comfortable temperature on hot days, and future droughts do not compromise the local economy.

As part of *Water for Victoria*, the State Government has established a number of catchment-based collaborative forums to undertake integrated water management (IWM) planning. Across these IWM forums, a number of strategic outcomes have been agreed (Figure 1). The Yarra IWM Forum and Werribee IWM Forum contain major urban growth corridors expected to experience a population boom in the coming decade. Both forums have identified the need to develop new approaches to servicing growth areas if these long term strategic goals are to be achieved.

Current servicing approaches generally involve water utilities separately planning water, sewerage and drainage infrastructure on a precinct-by-precinct basis. Water is rarely a focal point for urban planning with most water-related objectives reflecting a narrow or partial view of the total water cycle. And the bulk of planning effort is typically focused on responding to local level development applications rather than being driven by strategic, place-based visions for resilient and liveable cities and towns.

Figure 1. IWM Forum strategic outcomes (Source: Department of Environment, Land, Water and Planning)

In seeking to address this issue, the IWM Forums for the Werribee and Yarra catchments have identified a need for more integrated water and urban planning at the corridor or 'sub-catchment' scale. This integrated approach is seen as necessary to link high level strategic goals to local or place-based outcomes. The corridor or sub-catchment scale provides a means of identifying particular servicing opportunities that would otherwise be too difficult to pursue, too costly to replicate and maintain, and generate very limited impact at smaller scales, such as recycled water schemes and connected creek corridors.

A number of forum participants including the Department of Environment, Land, Water and Planning (DELWP), Yarra Valley Water, Western Water and Melbourne Water have initiated and helped to facilitate the development of IWM plans for servicing the Upper Merri and Werribee growth corridors. The Cooperative Research Centre for Water Sensitive Cites (CRCWSC) was engaged by DELWP and Yarra Valley Water to evaluate these projects as part of a national research project, *Guiding integrated urban and water planning* (IRP3).

The evaluation focused on the effectiveness of collaborative efforts, which are crucial for successful IWM planning. This report presents the findings from the evaluation. It defines a range of process lessons and briefly explores the potential scope of more widespread collaborative IWM place-based planning.

1.2 Approach to evaluation

This evaluation focuses on 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.

These cases are similar in scale, approach and timeframes. Notably, both projects use functional rather than administrative geospatial scales as the basis of planning (e.g. sub-catchment and growth area), and acknowledge that better outcomes can be delivered by working across organisational boundaries. They involved a similar mix of stakeholders, such as local councils and water utilities, and commenced planning activities at a similar time, that is 2018/2019.

The cases are also quite distinctive. The Upper Merri project was highly place-based, with activities built around a shared vision for the sub-catchment that was co-developed with a broad range of stakeholders. The vision viewed water as an enabler of better urban outcomes, and the process therefore included a broader range of participants such as Traditional Owners. The Upper Merri project was also deliberately undertaken as a pilot, in an attempt to develop a replicable model for a highly participatory place-making approach to IWM planning activity in both greenfield and infill contexts.

In contrast, the Western Growth master planning project is one of many projects being undertaken in the Western Growth Area, and is accordingly narrower in scope, focusing on developing integrated water servicing solutions. The project drew its objectives from the strategic outcomes specified in the Werribee Strategic Directions Statement, which already had broad endorsement from the Werribee IWM Forum. Unlike the Upper Merri project, the Western Growth project was not designed as a pilot project; instead it focused on working through the unique regional issues and opportunities identified for the west. Notably, the rapid and vast urban growth, and existing irrigation districts (Bacchus Marsh and Werribee) face water security and water quality challenges. The soon-to-be-established irrigation district facilitated by the Western Irrigation Network will provide a major end use of alternative water. These districts and urban growth area, combined with the proximity of key reservoirs and infrastructure (Pykes Creek Reservoir, Merrimu Reservoir and treatment plant, Melton Reservoir, Melton Treatment Plant, Western Treatment Plant) underpin the opportunity and need for regional scale analysis.

A two-stage approach to evaluation was undertaken. The first stage (see section 1.2.1) involved assessing each case, based on interview and survey data. The second stage (see section 1.2.2) commenced with a comparative analysis of case findings to draw out process design principles for collaborative IWM planning. Ideal attributes and broader implications for Victoria were then explored through a workshop with practitioners.

1.2.1 Case analyses (stage 1)

The first stage assessed the effectiveness of each collaborative planning process. As both projects are not yet complete, the assessment provides a point-in-time snapshot of performance rather than an overall assessment of each project. We adopted a mixed methods approach to evaluation (Table 1). Interviews with core project participants were undertaken in August 2020. Each interview took place via video conferencing and lasted

between 30 and 60 minutes. Participants were asked about how the project was set up and what it sought to achieve, the factors that supported or constrained the collaboration, and the outcomes realised to date. In late August, an online evaluation survey was sent out to the wider project group. The survey, which was open for collection between 25 August and 10 September 2020, asked participants to reflect on the value of collaboration, the effectiveness of collaborative processes, the institutional context for planning activity and any outcomes from the collaboration.

Table 1. Number of participants involved in the evaluation interviews and online survey

Method	Upper Merri Creek IWM sub-catchment planning pilot project	Western Growth IWM master planning project
Interviews	n=8	n=8*
Online survey	n=12	n=16
*Eight participants were interviewed over seven interviews, with one interview involving two participants.		

A summary of the findings from each case can be found in sections 2 and 3. Each section begins by describing the details of each case, followed by a discussion of the enabling and constraining contexts for collaboration, as identified by interviewees and survey respondents. Illustrative quotes from participants have also been included.

1.2.2 Process principles (stage 2)

The second stage involved a comparative analysis of the two cases to generate a list of lessons for collaborative IWM planning. The lessons, framed as principles for designing collaborative IWM planning processes, are described in section 4. An online workshop was held on 11 December 2020 with a broad range of practitioners (n=25) from DELWP, Yarra Valley Water, Melbourne Water, Western Water, Victorian Planning Authority, City West Water, South East Water, Southern Rural Water, City of Casey and City of Melton. The aim of the workshop was to:

a) explore the need for place-based IWM planning at the corridor or sub-catchment scale to support IWM outcomes in Melbourne's greenfield and redevelopment areas

b) clarify the purpose and scope of such planning, based on lessons from the Upper Merri and Western Growth IWM planning experiences.

The workshop identified a number of 'attributes' for IWM planning in Victoria, and further areas of inquiry (see section 5).

2 Upper Merri Creek IWM sub-catchment planning pilot project

2.1 Project details

The Upper Merri Creek sub-catchment in Melbourne's northern growth corridor is expected to transform over the coming decades as the largely rural and natural landscape develops and becomes more urbanised. The area features highly valued creeks and waterways, diverse remnants of native vegetation, protected species such as the Growling Grass Frog, and sites of cultural significance. As the population in the area grows, with a projection of 372,000 people by 2031 compared with 196,000 in 2019, these valued features will come under threat from urbanisation and the ongoing effects of climate change.

Future urban development needs to account for a range of issues if it is to support sustainable, connected and climate resilient neighbourhoods. As the population expands, it will be necessary to ensure that the large volume of stormwater created (over 21 GL) is reused or managed effectively to protect waterways. Water supply and demand will also change over time, highlighting the importance of a more diversified and adaptive approach to servicing that can support high levels of efficiency, reliability and affordability. Similarly, additional wastewater loads will impose further constraints on sewer networks and treatment plants, creating new opportunities for sustainably managing waste and enhancing resource recovery.

Overall, there is greater recognition among stakeholders of the need to place water at the centre of urban design and development to create sustainable, productive, liveable and resilient places that communities want to live in. This requires a collaborative, place-making approach to planning and managing all water resources and infrastructure. Further project details can be found in the Water Services Association of Australia's (WSAA) '*Integrated water management: Principles and best practice for water utilities',* case studies 5a and 5b (WSAA, 2020).

2.1.1 Why collaborate?

The Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, Hume City Council, City of Whittlesea, Mitchell Shire Council, Yarra Valley Water, Melbourne Water and the Victorian Planning Authority recognised that a collaborative approach to managing all water resources is needed to address the challenges presented by urban growth, and deliver positive outcomes for local communities and the environment. This approach explicitly sought to support place-making, which encourages all agencies operating in a defined place to work together with Traditional Owners and evolving communities to address complex issues and produce the most mutually beneficial outcomes (Yarra Valley Water, 2020).

Under Yarra Valley Water's leadership, these stakeholders came together in 2018 to develop a shared, place-based integrated water management (IWM) plan for the Upper Merri Creek sub-catchment. It is anticipated that the pilot process will eventually lead to the development of a coordinated, consistent and proactive approach to water cycle management that can be implemented in other areas. The sub-catchment is used as the geographic basis of an IWM plan, because it provides a meaningful scale for maximising synergies between organisations, optimising the use of available water resources and creating opportunities for innovation.

The collaboration seeks to give effect to broader strategic directions in *Plan Melbourne 2017-2050* and *Water for Victoria*, as well as more specific catchment objectives articulated in the *Yarra Strategic Plan*, *Healthy Waterways Strategy*, and *Yarra Strategic Directions Statement*. By adopting an IWM approach to place-based planning, the pilot will help advance the following objectives:

- further water management towards water sensitive city outcomes
- support the water industry collaboratively and proactively plan for urban development

- generate appropriate responses to collectively defined issues at the sub-catchment scale
- facilitate the adoption of flexible and adaptive planning approaches that can deal with uncertainty and support longer term objectives
- ensure new infrastructure supports broader public objectives and is facilitated through cost sharing and equitable funding arrangements
- involve all stakeholders that influence water management, including Traditional Owners and local communities, in collaborative decision making processes.

2.1.2 Who was involved?

A partnership was established between the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, Hume City Council, City of Whittlesea, Mitchell Shire Council, Yarra Valley Water, Melbourne Water and the Victorian Planning Authority (see Table 2). A number of consultants were engaged as part of the pilot to support the partnership achieve its objectives.

Table 2. Stakeholders involved in the Upper Merri Creek integrated water management sub-catchment planning pilot project

Organisation	Driver for involvement	Role in process
Yarra Valley Water	Water utility concerned with providing safe, secure and reliable water supply and sanitation services to its customers	Project lead/coordinator, sponsor
Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation	Traditional Owners concerned with protecting and enhancing the integrity of the Upper Merri Creek	Partner, cultural flows assessor
Melbourne Water	Statutory authority primarily concerned with waterway health, drainage and flood management	Partner, sponsor
Hume City Council ***City of Whittlesea*** ***Mitchell Shire Council***	Local councils concerned with fostering liveable, sustainable, resilient, productive and connected local communities	Partners
Victorian Planning Authority	Planning authority concerned with planning new greenfields suburbs	Partner
Department of Environment, Land, Water and Planning	State government department seeking to deliver greater community value through collaborative integrated water management	Supporter
Alluvium, Capire, CRC for Water Sensitive Cities, E2designlab, Foundry	Consultants supporting innovative practices	Providing support services, e.g. community engagement

2.1.3 How was the collaboration structured?

The partnership adopted a two-tiered structure made up of a project steering committee and a technical working group. One representative from each partner organisation sits on the steering committee, while the working group involves members from partner organisations and consultants. Membership on the working group has changed over time, with consultants becoming less involved as the collaboration proceeded.

The collaboration was described as "*a formalised process*", involving structured forms of interactions such as workshops and regular meetings with minutes. A partnership statement has been drafted that will, once executed, document a commitment from all partners to collaboratively work on the Upper Merri Creek IWM plan. The

majority of survey respondents (70%) indicated that, to date, the collaborative planning process has been 'moderately successful' in achieving desired objectives.

2.2 Case discussion

The interviews and survey responses have highlighted a range of institutional factors that provided an enabling or constraining context for collaboration. Because this project was set up as a pilot to inform the development of a model process for undertaking sub-catchment IWM servicing schemes, it adopted a trial and error approach to activity. Participants and their organisations anticipated a range of learning opportunities as part this experience, many of which are reflected in the challenges interviewees described (synthesised below). These learnings have since informed IWM planning activities in two infill sub-catchments (Gardiners and Koonung creeks).

2.2.1 Enablers of collaboration

Supportive authorising environment

Several aspects of the authorising environment optimised conditions for collaboration. The Yarra IWM Forum, one of five collaborative IWM forums initiated by the State Government across Metropolitan Melbourne, originally identified the Upper Merri Creek IWM Plan pilot as a 'priority project'. The forum provided a crucial platform for project partners to come together—some for the first time—and collectively identify the need for the project. Its formality "*provided a mandate for the pilot*", particularly given chief executive/managing director level endorsement of the forums, which effectively translated into organisational commitment and support for the pilot.

"I'm not sure how the project partners would have met and defined the need for the Upper Merri IWM Plan without the forums."

"I don't believe the organisations would have continued supporting the collaborative process without the CEO endorsement to achieving the IWM indicators identified out of the DELWP forums."

Some participants also explicitly sought and received support for the project from senior leaders within their organisation. Early engagement with leaders on the tangible benefits of the project, coupled with the creation of regular reporting lines, raised and maintained the internal profile of the project. Similarly, formal endorsement of the project, by including it in organisational strategies (e.g. Melbourne Water's Business Plan) and/or financial commitments, created the necessary conditions for some individuals to effectively participate in the project.

Finally, the outcomes of community engagement have provided, according to some interviewees, a social licence to push the boundaries, explore different approaches to water management and take a more holistic approach to planning. Community values for the Upper Merri Creek emphasise that business-as-usual practices will not be sufficient. Instead, regenerative practices that favour natural management approaches and put water at the centre of urban design are preferred, and so sub-catchment planning should seek to give effect to those aspirations.

Leadership by the water sector

Leadership by Yarra Valley Water and Melbourne Water played an important role in initiating the collaboration. Through their championing, representatives were able to secure significant resources to undertake planning activities (e.g. community engagement) and empower Traditional Owners to effectively participate in the collaboration. In the past, Traditional Owners have had limited involvement in water servicing and management activities. This process sought to include the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation as

an "*equal partner*", to ensure they could have an "***equal say"*** in the delivery of water services. Approximately 70% of survey respondents agreed to some degree that the format of collaboration supported equitable participation.

Yarra Valley Water also provided the "*driving force*" for ongoing collaboration, particularly once they began to play an active leadership and project management role. Representatives brought "*positive energy*" and "*lots of passion*" to the collaboration, which helped sustain collaborative efforts in the longer term. Further, their efforts to "*bring everyone under the one banner*" and "*coalesce [their interests] into a single vision*" for the sub-catchment helped establish a clear collaborative advantage to be gained from working together.

Collaborative attitudes and shared motivations

The project was aided by the willingness and openness of partners to collectively tackle issues. Interviewees recognised collaboration was essential for identifying and working through all sub-catchment issues in a holistic way. Similarly, all survey respondents (100%) agreed it was important to set up a collaboration to achieve the project's objectives, and many felt the process undertaken created an environment in which 'the input of all stakeholders was genuinely sought and valued' and 'participants were able to discuss issues openly and honestly' (70% and 90% respectively expressed some level of agreement with these statements).

Interviewees and respondents recognised different partners bring different capacities and knowledge to the collaboration. For example, the Wurundjeri Woi Wurrung people contribute rich indigenous ecological knowledge, cultural connections and understandings of the Merri Creek and Yarra catchment to the IWM planning process, while councils have unique access to local communities, and provide valuable sources of local data and knowledge. Such inputs are necessary to generate complete and mutual understandings, which in turn help reveal linkages and synergies that maximise the benefits and outcomes for all.

> *"The water cycle spans several boundaries and authorities' jurisdiction. There is no way to effectively manage a sustainable water system without the consensus of all the stakeholders."*

Broad alignment among motivations and interests of partners also supported efforts to collaborate. Approximately 90% of survey respondents indicated they participated in the collaborative process in the hopes of facilitating 'better social, environmental, cultural and economic outcomes for how we collectively respond to development, climate change and emerging issues at a local scale'. There appears to be a "*genuinely shared*" commitment among partners *"to maximise whole of community benefit*" in the Upper Merri sub-catchment, and this common desire to deliver better place-based outcomes has provided a unifying focus for the collaboration. Further, the 'pilot' label and innovation agenda associated with the project (e.g. sub-catchment planning scale, assessing cultural flows in a metropolitan context) has served to enhance participation and excitement in the project, particularly as it seeks to inform the development of a replicable approach for collaborative IWM planning in other sub-catchments.

2.2.2 Collaboration challenges

Governance and project management

A key issue discussed by the majority of interviewees related to the governance of the collaboration. Interviewees felt that governance arrangements needed to be more clearly and fully defined from the outset, as well as more consistent over the life of the project.

"The governance was not consistent throughout the process. I suspect this created uncertainty and affected the levels of collaboration."

While a two-tiered, top-down structure made up of a project steering committee and working group was adopted, there was some uncertainty about the roles and functions of each tier, and the relationship between them. For example, some steering committee members indicated they were unsure at times what they, other partners and the working group were tasked with doing. This confusion filtered through to partner interactions, with a few interviewees reporting open-ended discussions that did not necessarily result in clear actions or resolutions. It was suggested that a more effective governance arrangement would have seen the steering committee functioning as a decision making body rather than a "*discussion forum*", and the working group empowered to work through issues itself and put recommendations and decisions to the steering committee. This would require a clearer delineation of individuals between the two tiers, and more seniority among steering committee members. Given the complexity of issues within the Upper Merri sub-catchment, one interviewee also felt that a single working group was not sufficient. Instead, multiple working groups tackling different issues was needed.

The issues with governance were attributed to two factors. The first relates to a perceived initial hesitation among partners to take on a leadership role. The strong desire for achieving equality among partners appeared to have inadvertently compromised project management, as 'project ownership' and 'project coordination' became conflated. This apprehension delayed the appointment of a project manager, and a lack of stability in this role led to further delays. Overall, interviewees highlighted the importance of securing a dedicated project manager early to lead the project, coordinate activities, bring all partners along and keep them informed. The latter task was particularly important once distinct work streams (e.g. cultural flows assessment, community engagement, water balance modelling) were established. One interviewee also suggested recruiting a manager who could focus solely on the project, rather than simply adding this responsibility onto an existing role.

The second related issue concerns the lack of an initial project plan or framework to structure collaborative activities. Without a detailed plan defining key objectives, activities and milestones, interviewees felt that the project scope often changed and progress was slow. Partners had limited clarity, direction or accountability to advance work in between meetings. Over time, this sometimes caused the collaboration to lose sight of broader objectives. According to some interviewees, there was a need—given the scale of the area being planned and the biophysical challenges it presents—to explicitly manage complexity and *"take a more structured approach to collaboration*". Multiple interviewees stressed the importance of taking the time upfront to figure out "*how we are going to pull this off*" by clearly articulating, through a "*live project plan*":

- the objectives, outputs and outcomes of the project
- the activities, resources and tools required
- the roles and responsibilities of each partner
- the frequency and purpose of partner interactions
- key milestones or decision points that the project should seek to influence
- a means of tracking project progress over time.

Other suggestions included (a) explicitly discussing the timing of the project before commencement to ensure partners have enough lead time to secure adequate project resourcing, and (b) matching the scope of the project to desired outcomes, recognising that projects seeking "*major step changes*" and policy reforms are more likely to require long term collaborations, with multiple stages of activity.

An unclear scope can also lead to confusion and disagreement over project outputs. For example, some interviewees felt the contents of the draft IWM plan did not meet their expectations in terms of its scope and/or the specifics of proposals they felt were not yet ready for agreement. Some people felt more work was needed to ensure all stakeholder perspectives were adequately reflected in the plan. Others also questioned whether the

plan was trying to do too much, in stipulating high-level strategy, implementation detail and planning reforms. There were some suggestions that this aspect of the collaboration could have been improved by clearly articulating "*what the outputs of the project would look like*", coupled with "*… expectation management and also getting all stakeholders on board, and most importantly keeping them updated*".

Participation and representation

While every effort was made to ensure unequal access to resources did not translate into unequal participation, it was difficult for some collaborators to maintain a consistent level of involvement. A few interviewees felt some partner organisations were not always present or visible throughout the collaborative planning process, and this fluctuating involvement may have affected the quality of their participation in the project. This issue was partly attributed to competing priorities, as well as time and resource constraints. Indeed, 50% of survey respondents identified this as one of the biggest challenges to participation. Even so, respondents and interviewees also emphasised the need and value of "*taking the time to identify and understand diverse perspectives*" on the complex range of issues and opportunities in the sub-catchment. This is particularly important for collaborations like this one that are "*seeking to change current paradigms*" and facilitate the adoption of "*different ways of doing things*". So collaboration design needs to balance sometimes conflicting considerations, such as the time that participants can realistically commit to such projects and the time needed to improve understandings and establish good relationships to facilitate effective collaboration.

The level of participation was also affected by staff turnover. The turnover of some partner representatives and project managers meant that these organisations came in and out of the collaboration, leading to stop–start progress and project delays. Handovers were complicated by (a) the range of issues within the Upper Merri sub-catchment, which presented "*a large learning curve*" for new representatives, and (b) the limited project documentation, which meant it took individuals some time before they could meaningfully contribute.

> *"Consistency is another issue, many people join and leave IWM projects after a while which impacts the project's progress."*

Regarding stakeholder representation, a few interviewees felt some organisations should have been involved much earlier or more actively in the partnership. For example, interviewees noted effective place-based planning relies on the Victorian Planning Authority and so their involvement from the very beginning of the project, combined with a clearer understanding of their needs, would have provided a stronger implementation perspective. Others suggested the Department of Environment, Land, Water and Planning (DELWP) could have been more involved in the collaboration, particularly given the identified need for policy reforms. One interviewee also thought DELWP might have been appropriately placed to take on a facilitation role, and help mediate discussions on contentious issues. Overall, it was recognised the complexity and scale of the project was such that involving all potential stakeholders would have been challenging. Instead, managing this complexity through targeted and timely engagements might have been a more effective engagement strategy.

Finally, a question was also raised about the appropriateness of stakeholder representatives. Some interviewees perceived a need for representatives from multiple teams or divisions within an organisation, given the myriad of issues under investigation and the importance of connecting aspirational, high level thinking with implementation and delivery considerations. Alternatively, these perspectives could have been captured through representatives that can operate as 'boundary spanners' and effectively engage with all relevant parts of an organisation about the project. Other interviewees and survey respondents commented on the need for representatives who possess sufficient authority to make decisions on behalf of their organisation, rather than needing to negotiate responses with senior managers after the fact, because this may diminish or contradict the outcomes sought by the collaboration.

"The individuals within that organisation attending should be the people that actually make the decisions, such as executive managers and the like."

Collaboration dynamics

Managing interactions between collaborators was identified as an area that required some improvement. A few interviewees and survey respondents questioned whether the different perspectives and interests of partners had been fully reconciled through the collaboration. It was felt narrow organisational stances sometimes made it difficult to generate alignment and work out how partners could support one another. This sometimes led to the build up of tension that appeared to be handled "*behind the scenes*" rather than directly. Some interviewees felt partners needed to be more willing to disclose "*pain points*" upfront so they could be dealt with transparently as part of a rigorous debate, which could be mediated by an appropriate facilitator like DELWP. These conflict management issues also highlight potential limits to the reach of "*inter-organisational trust*", and the need to expand existing circles of trust to support greater dialogue. Other issues related to the perspectives shared by representatives, and the need to clearly distinguish between personal and organisational perspectives.

"Establishing trusting relationships between organisations is essential for working through competing issues and fostering skills to have hard conversations."

2.2.3 Implementation challenges

The timeliness of the collaborative planning process has presented a number of challenges for implementation. The collaboration generally seeks to deliver better environmental, cultural and socioeconomic outcomes by changing how greenfield development occurs. Yet the pace of development in the sub-catchment appears to have exceeded the pace of planning undertaken by the collaboration, resulting in many "*missed opportunities*" for IWM. Interviewees identified the precinct structure planning process led by the Victorian Planning Authority as a "*major lever*" of influence, because it provides a way of embedding IWM requirements or directions in the master planning of growth areas. Yet many of these plans within the sub-catchment have been completed, with business-as-usual trajectories locked in for these areas. Some precinct structure planning (PSP) is currently underway but a few interviewees felt the collaboration is not sufficiently prepared to effectively influence these processes, further limiting its potential scope of impact.

"Insufficient time to collaborate and investigate due to the tight timeframes of the PSP process also means that we don't always have sufficient information to influence."

This appears to reflect a broader issue of temporal misalignment between urban and water planning processes, and the sometimes slow-moving and reactive nature of the water sector. Given that influencing development "*comes down to timing*", interviewees felt it was important to understand the different planning processes and timeframes of partner organisations upfront, to proactively identify key decision making points that the collaboration should be ready to influence. This requires thinking about implementation pathways from the outset of the collaboration, and ensuring a clear line of sight exists between visioning and implementation activities.

> *"I think temporal alignment between water and urban planning is a real barrier."*

More generally, interviewees highlighted the constraints imposed by existing planning frameworks and the limited mechanisms available to influence development. Some felt not all collaborators fully appreciated the scale of this challenge. Apart from PSPs, which have their limitations, only a few imperfect tools are available to effect IWM outcomes. For councils, these include planning amendments, incorporated documents, permit conditions and proactive one-on-one engagement with developers. This issue is further complicated by the disconnected and sometimes contradictory processes and requirements related to IWM across different organisations, which can be difficult to reconcile and influence.

Beyond legislative and regulatory settings, organisational and industry cultures can be a significant barrier to change. Indeed, survey respondents rated 'organisational capacity (skills and resources), commitment and willingness to implement solutions' as a slightly greater barrier to realising objectives than 'existing legislation, regulation, procedures and standards' (90% compared with 80%). Interviewees spoke of a "*fear*" and "*lack [of] confidence*" among some organisations to move away from the status quo and push beyond minimum standards. But they acknowledged the enormity of the challenge, given organisations operate within planning systems broadly geared towards streamlining development rather than facilitating better community outcomes.

> *"There are very few real legislative or regulatory barriers preventing IWM outcomes being implemented. The main barriers are organisational cultures and change management support."*

2.3 Outcomes

While the project is not yet complete, some outcomes are already evident and partners appear to be committed to ongoing collaboration (90% of survey respondents expressed some level of agreement with this statement). Interviewees and respondents have identified a range of new or improved skills, capacities and understandings as a result of the collaboration. For example, most respondents (60%) selected 'development of valuable relationships with other participants' as a key benefit of participation. These relationships have since led to new opportunities for collaboration. Other key outcomes include:

- better understanding of the drivers, constraints and activities of other organisations, including opportunities for mutual benefit
- greater appreciation of Traditional Owner values, knowledge and contributions
- demonstration of a cultural flows assessment in a metropolitan context
- better understanding of IWM planning, including the time and effort it requires, and the limitations of existing planning frameworks and instruments for realising IWM aspirations
- holistic thinking, through the exploration of a broad range of issues and solutions at a sub-catchment scale, as opposed to a jurisdictional or service-specific perspective
- translation of water sensitive city concepts into tangible products and services that stakeholders could understand and connect with
- tools and processes for engaging with future communities, including appropriate communication techniques and messages
- empowering some representatives to participate in planning activities, elevate certain issues and/or champion particular agendas within their organisation.

3 Western Growth IWM master planning project

3.1 Project details

3.1.1 Why collaborate?

The Werribee IWM Forum developed an urgency statement in May 2018 which highlighted that the population in the Werribee catchment is expected to more than double by 2050, putting substantial pressure on greenfield development in the region. The urgency statement also outlined the water cycle impacts including increased stormwater runoff, potable water supply demand, wastewater discharge and recycled water production. It also noted these challenges were forecast to be further exacerbated by climate change.

This rapid growth has significant impacts on a number of stakeholders in the catchment area relating to water management, urban development, and waterway health. In response to the urgency statement, several projects were scoped ranging from precinct to catchment scale. One of these projects was the Western Growth Integrated Water Management (IWM) Master Plan, to be developed through a collaborative IWM planning process. The aim of the Western Growth IWM Master Plan is to identify regional water servicing solutions that maximise social, environmental, and economic benefits for the Werribee catchment, and to meet the individual objectives of Western Growth Area stakeholders at an optimal cost.

The Werribee Strategic Directions Statement articulates seven strategic outcomes that are all integral to IWM, however it was decided the IWM Master Plan would initially focus on a subset of these strategic outcomes to clearly set the scope of the project and determine the stakeholders to involve. It was also believed that by narrowing the focus to a largely water resource remit, it could help expedite the initial phases of the planning process. These outcomes, framed as objectives, are:

- To ensure safe, secure and affordable water supplies for the Western Growth Area
- To ensure effective and affordable wastewater systems for the Western Growth Area
- To ensure healthy waterways within the Western Growth Area and a healthy Port Phillip Bay.

3.1.2 Who was involved?

Multiple organisations participated as collaborators in the Western Growth IWM Master Planning Project. The project lead and coordination role shifted across several organisations as project needs and activities changed. Western Water took on the initial project lead/coordination role and funded early consulting work. Melbourne Water took on the role of project lead in late 2019. Currently, the Department of Environment, Land, Water and Planning (DELWP) is coordinating and facilitating the project due to resourcing constraints.

Table 3. Stakeholders involved in the Western Growth IWM Master Planning Project

Organisation	Driver for involvement	Role in process
Melbourne Water	• Stormwater and catchment health • Community connection	The project lead/coordination role shifted across these three organisations as the project evolved.
Department of Environment, Land, Water and Planning (DELWP)	• State-wide IWM objectives and framework • Coordination of IWM forums	
Western Water	• Large portion of growth within service area • Significant impacts on potable water security and wastewater disposal	
City West Water	• Impacts on recycled water network	Collaborator

Southern Rural Water	• Ensure long term water security for customers	Collaborator
Melton Council	• Stormwater management • Liveability	Collaborator
Wyndham Council	• Stormwater management • Liveability	Collaborator
Moorabool Council	• Facing longer term growth challenges in the Bacchus Marsh region • Want to learn from Melton and Wyndham	Collaborator
Consultants	• N/A	Delivery of discrete pieces of work

3.1.3 How was the collaboration structured?

The collaborative activities varied depending on what was most useful and relevant to the group at different points in time. The group has been flexible and adaptable, adjusting their collaborative activities as needed. These activities included:

- meetings and workshops with the entire group to openly discuss issues, ideas and solutions. Early meetings and workshops focused on developing a shared understanding of the water issues in the catchment and determining what needs to be done. More recent discussions have focused on sharing knowledge and data to begin to develop solutions.
- data gathering and presentations from individual organisations back to the group
- regular administrative check-in meetings (15–30 minutes) to ensure activities are underway and to maintain momentum
- individual check-ins with the project manager (DELWP) to ensure activities and content are still relevant to individual organisations
- internal executive briefings
- briefings back to IWM forum.

3.2 Case discussion

To date, the Western Growth IWM Master Planning process has facilitated a shared understanding of water issues in the Werribee catchment, improved commitment for delivering positive outcomes, and strengthened relationships among the stakeholders involved. A number of social and institutional factors have enabled this process to achieve these outcomes so far, which are discussed in this section.

3.2.1 Enablers of collaboration

Clear need for action and scale of opportunity identified

The urgency statement developed by the Werribee IWM Forum clearly articulated the need for water infrastructure and servicing solutions to meet the significant growth and development pressures in the catchment. The urgency statement indicated the population in the region is projected to increase from 575,000 in 2013 to 1.35 million by 2050, leading to significant greenfield growth and increase in stormwater runoff, residential water demand, and recycled water production. The growth and demand projections indicated a clear need for action to deliver the objectives of multiple organisations as efficiently as possible.

The scale of the opportunity was obvious to stakeholder organisations. While the drivers for each organisation were unique, the opportunity to deliver catchment-wide outcomes through an IWM approach was recognised.

Further, a strong willingness to investigate IWM solutions was also evident at both the individual and organisational level.

> *"From each organisational viewpoint there are insurmountable problems in the catchment. By themselves they are very big problems. But when you put them together to possibly meet everyone's requirements in an integrated way…there's no way we could do this on our own."*

Commitment to shared values

The Werribee IWM Forum developed a Strategic Directions Statement that articulates seven strategic outcomes outlining high level aspirations relating to IWM in the catchment. These strategic outcomes have the endorsement of forum members, including senior executives of all organisations involved in IWM. This high level commitment for IWM outcomes gave the participants in the Western Growth IWM Master Planning Process the mandate to explore solutions to achieve these broad outcomes. The agreement on outcomes was already present, so participants could explore and develop solutions without having to debate or agree on what they were working towards.

This high level agreement was reinforced by the motivation and commitment of individuals to deliver catchment-wide outcomes. Almost three-quarters (73%) of survey respondents (n=16) indicated their main motivation for participating in this process is to facilitate better social, environmental, cultural and economic outcomes for the catchment in response to increasing development, climate change and other issues. This result indicates participants wanted to be involved, rather than feeling like they were required to attend. Coupled with this, 93% of survey respondents indicated a collaborative process was necessary to deliver these outcomes.

> *"Only through commitment, strong relationships, and understanding each other can we move forward together to achieve a good outcome."*

Allowed time to develop a shared understanding of the problem

Despite individual-level commitment to delivering broad catchment outcomes, initially there was not a common understanding of the catchment-scale IWM problems that needed to be addressed. This fact meant the group did not initially know the best approach to take to work out the most appropriate mix of water management solutions. The group invested time and resources to first develop a collective understanding of catchment-scale issues, by engaging a consultant and also developing internal capacity through knowledge and data sharing. While this took a lot of time in the beginning of the process, participants viewed it as being essential to fully understand the issues and decide on the best course of action to address them. Two-thirds (67%) of survey respondents said a shared understanding of the issues was one of the most important benefits of collaboration, which was the highest response of all the listed benefits.

> *"Organisations pulled together the data and information, presented it back to the group, which created the conversation to get better clarity on what the group needed, rather than relying on a consultant to figure it out. This created cohesion, talking it out made me understand more. The catchment is so complex."*

Authorising environment to participate and resource

Collaborative processes often require a large time commitment and financial investment from organisations. Having the support from organisational executives in the Werribee IWM Forum gave participants the mandate to spend the necessary time on collaborative activities and to empower them to participate. Commitment from the forum also provided some initial funding to support the process.

The survey responses indicate 80% of respondents agree the IWM forum provided governance structures to IWM planning; 87% agreed it provided access to financial and human support; and 80% agreed it formalised commitment to IWM. Only 46% agreed the IWM forum provided greater accountability through reporting mechanisms. Overall, 80% of respondents believe the collaborative planning process would have turned out differently if the IWM forums did not exist to provide the authorising environment.

"There is a need to report back on what is happening with this, which helps with the resourcing, and there is that element of being held to account. It makes it part of our day job and that managers are allowing us to spend time on it."

Flexible and adaptive approach to leadership, collaboration, and resourcing

While a clear need for action and an enabling authorising environment were present, participants needed to work together to shape the collaborative planning process for developing IWM servicing solutions, which at the start was unclear. The lack of clear methodology meant the group was more organic in deciding what activities to undertake and regularly invested time in having explicit discussions on the best way forward. This flexible, adaptable approach meant the collaboration activities were designed to suit the current needs and objectives.

"You could say this process evolved organically. The level of understanding of the problem increased. It has gone from people getting together and discussing what they could contribute, to getting more comfortable with each other as workshops went on."

The group also took a flexible approach to participant identification throughout the process. In most instances, organisations had a primary participant who attended the workshops and meetings, however the participation changed as the needs of the process changed. For example, more service planning engineers were brought into the conversation as the discussions became more focused on technical solution development.

Neutral and appropriate facilitation

The nature of IWM solutions means costs, risks and benefits are shared across multiple stakeholders and organisations, along with responsibility for implementation. Participants noted the importance of having a neutral or 'arm -length' facilitator and project manager to ensure the activities and outputs are not dominated by one individual or organisation. Several interviewees commented DELWP is an appropriate facilitator due to its connection with the state-wide IWM framework, linkages across other government departments, and lack of direct financial motivations for being involved. The facilitation role has been an important enabler to ensure the activities are not driven by a single organisation's objectives, and to maintain connection to catchment scale outcomes.

"Having a body like DELWP taking the facilitating and coordinating role and to know who to tap into across government…this is one of the biggest success factors of this project and crucial for ensuring momentum."

The overall approach to project management has been flexible and adaptable, recognising individual needs while maintaining connection to group objectives. This approach has ensured collaboration activities are meeting group needs while not overburdening individuals. For example, weekly 15–30 minute catch-ups have been implemented to maintain momentum, but if an individual is not needed or unable to attend, individual meetings are conducted. The dedication, motivation and enthusiasm of the project manager has created a flow-on effect to individual participants, ensuring they are valued and included appropriately.

"The role of the project manager was critical…his personal approach to collaboration (open, responsive, doing the background work, motivated, etc.) has been essential."

Knowledgeable, motivated, and committed individuals

A key enabler of the Western Growth IWM Master Planning Process was having the right individuals involved. Having the right people in the room meant they could have open and frank discussions, and they could collectively work towards solution development without being held back by personality conflicts or barriers. Key individual traits that were identified as important include:

- motivated, enthusiastic and committed to IWM outcomes
- knowledgeable about a diversity of topic areas
- open to flexibility and uncertainty
- able to take a catchment-scale mindset and understand objectives beyond their own
- able to make certain decisions on behalf of their organisation.

The presence of individuals with such traits enabled the group to have open and frank conversations that explored challenges while working towards a common solution. The conversations were not constrained by personal biases or issues. This was important in building relationships across the group and supporting commitment to shared outcomes.

"It has been really energising and satisfying working with the group. The people involved have been enabling, open, and willing to listen."

Almost every participant interviewed mentioned they enjoyed learning about different IWM drivers and objectives across the catchment, and that they appreciated the connections and networks formed from being involved in this process.

"The success is driven from everyone's contribution and everyone has a role to play. The dialogues are open and honest. Issues and ideas were discussed and shared."

3.2.2 Collaboration challenges

Time commitments and competing priorities for individuals

A significant amount of time is needed to deliver the objectives of the Western Growth IWM Master Planning Process, including time attending meetings and workshops, along with time spent collecting required knowledge and data. Almost three-quarters (73%) of survey respondents indicated the most significant challenge in participating in this process was the time and resources diverted away from other priorities or obligations. In a few instances, the key organisational contact changed roles and someone new was brought into the process. This delayed the project because significant time was required to ensure the new participant was brought up to speed and understood the objectives of the process.

> *"Some members were time limited, meaning some organisations weren't as well represented as they should have been."*

As mentioned above, one of the key enablers was recognising different individuals were needed at different points in time depending on the content. However sometimes this was not recognised early enough, and more time was expended bringing the new individuals up to speed.

Initial commitment of individuals

While all of the individuals involved in the process exhibited enabling characteristics (listed in the above section), in some cases it took time to build the necessary understanding, motivation and commitment to deliver catchment-wide outcomes. At the beginning of the process, not everyone had the same level of exposure to IWM and understanding of catchment-scale benefits. One survey respondent mentioned a significant challenge was the sharp learning curve for some parties involved. The collective understanding and commitment of the group was fostered through developing a shared understanding of the problem, which required openly sharing knowledge and data, and understanding individual and collective objectives and aspirations.

> *"A challenge for me has been allowing people the time to absorb and think about things, and to make links and connections. I have been on this journey from the start, but others have not."*

> *"Initially I was sceptical of the process, until I got a better understanding of how things work in the catchment."*

Lack of tools and guidance for collaborative IWM processes

While IWM is not a new concept, there are few examples of successful catchment-scale IWM planning processes, and therefore no guidance available on how to successfully deliver these processes. Because of this, a lot of time was spent discussing how to go about the process rather than actually delivering the planning process itself. In several interviews, participants expressed feeling frustrated early on when so much time was spent having these types of conversations rather than getting things done.

> *"There is no guidebook on how to do this…it was good that everyone was experienced [in IWM] but that meant we were battle weary. We spent a lot of time discussing and debating what to do, rather than just doing things, which becomes frustrating."*

Coupled with the lack of guidance is the lack of tools and software to make the necessary decisions. The innovative nature of catchment-scale IWM solution development means the necessary tools and software do not exist yet, making decision making more difficult and time consuming.

> *"This is a joint project and it hasn't been done before, it's sort of a novelty. Not everything is known."*

Degree of relevancy for stakeholders

It was sometimes challenging to ensure the content and discussions were relevant to all stakeholders. For example, while important stakeholders in the project, local councils sometimes found the content of discussions not always relevant to their particular issues. The nature of discussions has recently shifted to solution development and the conversations have become more technical with water servicing engineers being brought in. It is therefore a challenge to ensure local government representatives are involved at appropriate times without overburdening them.

> *"While the collaboration provided us with an opportunity to share our issues from a local government perspective, the project hasn't necessarily addressed our immediate needs. I can appreciate, however, that there are learnings and outputs that will influence future planning decisions."*

3.2.3 Implementation challenges

The early decision to focus the scope of the Western Growth IWM Master Plan on water servicing solutions meant only stakeholders responsible for water servicing infrastructure were included in the process. This decision helped narrow the scope of planning activity and solution development. Participants have recognised that going forward, broader stakeholder groups will need to be brought into the conversation (e.g. Traditional Owners, irrigators, and community members) to ensure solutions are shaped by their input and ultimately supported. Participants also identified the need to appropriately engage the Victorian Planning Authority to ensure the solutions are embedded in planning instruments. Additionally, engaging senior leadership (general manager level) was identified as a potential challenge as their support is needed to ensure organisational commitment moving forward.

When it comes to implementation, participants reflected on the potential for regulatory barriers to prevent implementation of solutions identified in the IWM Master Plan. It was noted that this is, however, challenging to ascertain while the solutions are still being developed. Most (80%) survey respondents noted existing legislation, regulation, procedures and standards would impact implementation to a great extent, with the remaining 20% indicating they would impact implementation somewhat. Existing organisational policies were also noted as a barrier to implementation, because not all long term IWM solutions are currently permitted under the current regulatory model.

"While these solutions are still on the table, they are not realistic unless policy changes."

Beyond policy and regulatory barriers, participants commented on the need to consider how the identified solution will be funded across organisations and delivered on the ground. One survey respondent summed up the issue by stating "*a pathway for resolving the key difficulties around funding and … investment*" still remained unclear.

"If the prize is big enough, well enough understood and tangibly useful to all parties then people easily find the courage to think and work differently."

3.3 Outcomes

While the project is still underway and the Western Growth IWM Master Plan is being developed, the process of collaboration has already led to positive outcomes for the region. Most (87%) survey respondents agree or strongly agree with the statement 'Participants are committed to ongoing collaboration' as a result of this collaborative process. Other outcomes delivered to date include:

- improved collective understanding of water issues and opportunities across the Werribee catchment
- better understanding of organisational responsibilities, expertise and operations across the Werribee catchment
- better understanding and alignment of diverse perspectives
- a clear strategy and approach for addressing key water and development challenges
- motivation and commitment to the collaborative process to deliver catchment-wide outcomes
- improved relationships across organisations involved, including sharing of knowledge and data
- better understanding of the elements needed for successful IWM planning processes to be implemented in other catchment or growth areas.

4 Principles for collaborative IWM planning processes

The commonalities and differences between the two cases presents a number of lessons for IWM planning projects. These lessons mainly relate to the design of such collaborative exercises, with a particular emphasis on process. The lessons, framed as principles, have been grouped under four themes:

1. **Scope the project**, by taking the time at the outset to explicitly define the parameters of the project—particularly the problem to be addressed, the geospatial scale of planning, project outputs and implementation pathways—based on a shared understanding of the biophysical and institutional contexts for collaboration.

2. **Design the collaborative governance structure** deliberately in response to context, to ensure it is fit for purpose (that is, able to support the realisation of the defined project scope and aspirations), promotes equitable participation, and clearly establishes different roles and responsibilities, particularly relating to leadership and coordination.

3. **Collaborate effectively,** by choosing appropriate representatives to participate in the collaboration, enhancing the quality of interactions through dedicated trust and relational capacity building, and providing access to necessary data, tools and resources to undertake IWM planning.

4. **Authorise the collaboration,** by ensuring all partner organisations endorse the project and its outputs, and enable their representatives to meaningfully participate, as well as build widespread commitment to shared outcomes by capturing community and cultural values within project aspirations.

The discussion in this section is organised according to these themes. Each principle is assigned a letter, and presented in a table with brief examples from each project (see Tables 4–7). The proposed principles are not intended to be considered in chronological order. Rather, they should be considered during the initial stages of the collaboration, and revisited as required throughout the collaboration. The lessons from these two cases have since informed the development of guidance for establishing cross-sectoral collaborations for integrated urban and water planning (see Malekpour et al., 2020).

4.1 Scope the project

The principles under this theme highlight the importance of taking the time to explicitly define the parameters of the project, based on a shared understanding of the biophysical and institutional contexts for collaboration.

An important first step in any collaborative process is to **collectively define the problem** (A) to be addressed. Such an exercise enables participants to identify and explore the issues of concern to all stakeholders involved, before prioritising what the project will seek to resolve. Through this process stakeholders gain a better understanding of how the system operates, enabling them to define and agree on shared project objectives and outcomes.

Problem definitions will vary depending on the **geographical boundaries set for the project** (B). Planning exercises can be undertaken at the catchment, corridor (or sub-catchment) or precinct scales. The optimal scale in each case will depend on the issues being explored. Larger areas, like the sub-catchment or growth area, provide an opportunity to address issues at a scale that is significant to landscape functions (e.g. movement of water) and urban development patterns (e.g. development fronts), which in turn require stakeholders to work across multiple jurisdictional and sectoral boundaries.

Clarifying project outputs (C) from the outset of the project is important to manage and align stakeholder expectations. In most cases, a key output will be a place-based plan that sets out the servicing solutions for an area, highlighting their spatial arrangement and relationship with urban form. It may also include mechanisms to support implementation, such as development contributions. For each project, the balance of strategic outcomes and specific implementation objectives, as well as water servicing and urban form considerations will vary. This balance needs to be negotiated among, and agreed to, by all participants to ensure the plan is supported and leads to successful outcomes.

Part of determining project outputs involves **considering implementation pathways from the very beginning** (D). This involves identifying key planning and decision making 'triggers' or opportunities that the project needs to be ready to influence in advance. It requires understanding relevant regulatory frameworks and planning processes that are underway or about to commence, so participants are able to align activities, both spatially and temporally, to maximise opportunities for influence.

All of these factors will influence the stakeholders that should be involved in the project, and when they should be engaged.

Table 4. Summary of principles associated with 'Scope the project' theme, with examples from Upper Merri and Western Growth

Principle	Upper Merri	Western Growth
A. Collective problem definition	Issues were explored in detail during the early stages of the project and documented in the *Upper Merri Creek sub-catchment issues paper*. They were also explored through subsequent community engagement and the cultural flows assessment.	Participants collectively defined organisational and collective challenges by sharing knowledge and data, and allowing time for robust discussions. Participants also defined the project output and how it will address these challenges.
B. Geo-spatial scale of planning	Sub-catchment area, spanning the jurisdictional boundaries of multiple organisations (councils, water and planning authorities).	Growth area, spanning the jurisdictional boundaries of multiple organisations that have complementary roles and responsibilities related to the water cycle. Broader regional considerations, related to irrigation districts, reservoirs and treatment plants, informed the scale of analysis.
C. Defining project outputs	Upper Merri IWM plan, but the nature of this plan was contested, with different participants understanding the scope and function of the plan differently.	Master Plan, identifying optimal mix of water servicing solutions for the Werribee catchment. The plan has been initially scoped narrowly to focus on servicing solutions only.
D. Implementation readiness	Opportunities for influence (e.g. upcoming PSPs) were not fully identified upfront, which may have led to some missed opportunities.	A parallel project was set up specifically to look at opportunities in PSPs. Potential regulatory and policy barriers to implementation have been identified by some collaborators but not yet explored.

4.2 Design the collaborative governance structure

The principles under this theme emphasise the importance of **deliberate and fit-for-purpose design of project governance arrangements** (E). From the outset of the project, appropriate governance structures need to be established with clear functions and responsibilities. The level of detail specified (e.g. mapping out each task) and formality (e.g. documented in a formal project agreement) will vary in each case. Some projects may favour a more flexible approach, with minimal detail and formality, while others may require greater certainty through detailed project plans and agreements. In some cases, formal governance structures may already exist that can

be used. Each project will need to find a balance between flexibility and certainty that is appropriate for their context.

Specifying leadership and coordination roles (F) early on in the project is a key aspect of governance design, helping to build and maintain collaborative momentum, and manage project activities and outputs. Leadership and coordination roles can be similar in scope and held by a single participant, or distinguished and distributed among multiple participants. Leaders draw participants together, help drive collaborative agendas and in some cases, take on greater responsibility relating to project outcomes. Coordinators, at a minimum, act as project managers to organise activities and ensure the project stays on track.

The governance design should also enable equitable participation, as capacities and resources among participants will vary. **Creating a level playing field** (G) may require resources to be allocated to some participants to ensure they can effectively collaborate.

Overall, **governance design needs to match the defined project scope** (H). Ambitious projects seeking to shift the status quo will require greater resources, organisational support and commitment, longer engagement processes and iterative planning activities.

Table 5. Summary of principles associated with 'Design the collaborative governance structure' theme, with examples from Upper Merri and Western Growth

Principle	Upper Merri	Western Growth
E. Project governance design	Two-tiered structure made up of a project steering committee and a technical working group, but there was some uncertainty about the roles and functions of each tier, and the relationship between them	The project used existing governance structures established through the IWM forums. A flexible and adaptable approach was adopted for the group, with arrangements and activities adjusted as needed.
F. Leadership and coordination roles	After some initial hesitation, Yarra Valley Water led and coordinated the project.	Organisations holding leadership and coordination roles have changed over time as the project evolved. DELWP is currently coordinating the project.
G. Supporting equitable participation	Collaboration sought to empower Traditional Owners by resourcing them to effectively participate as equal partners.	Not specifically discussed.
H. Matching governance design with scope	Project had multiple work streams, e.g. cultural flows assessment, community engagement, water balance modelling. Policy reforms identified are likely to require further investigation through separate work packages.	The master planning project is one of many parallel projects established to address the seven strategic outcomes articulated in the Strategic Directions Statement

4.3 Collaborate effectively

The principles under this theme emphasise the importance of choosing appropriate representatives to participate in the collaboration, enhancing the quality of interactions, and providing access to necessary data, tools and resources to undertake IWM planning.

Ideal organisational representatives (I) should possess the following traits:

- personally motivated, enthusiastic and committed to delivering better outcomes
- knowledgeable on a particular subject matter (depth), but able to see the bigger picture (breadth), e.g. able to take a catchment-scale mindset and expand their perspective beyond their organisational objectives and constraints

- appropriately positioned within their organisation to capture and communicate the range of interests held by different parts of their organisation, as well as make decisions and commit to actions on behalf of their organisation.

Individuals taking on a project management or coordination role need to be highly skilled and engaged, because they are critical to the success of a collaboration. Along with possessing the traits listed above, these individuals should be persistent in their approach, sensitive to the needs and paces of different participants, and able to provide neutral facilitation to help manage diverse perspectives and remove any perceptions of organisational bias.

The quality of interactions will depend on the level of trust and respect among participants. Processes that dedicate time and effort towards **building trust and relational capacity** (J) among participants, particularly during the early stages of the project, are key. This in turn will help create safe spaces for working through differing perspectives.

As these type of planning projects are likely to explore a complex range of issues over extended timeframes, it may be essential to develop a **strategic and targeted** (or staged) **approach to engagement** (K). This approach will help manage when and how different participants are brought into the collaboration. A flexible and adaptable approach to engagement can be useful where a project is constantly evolving, allowing different individuals to be brought in when needed. Such an approach needs to allocate adequate time to handovers and bringing new participants up to speed.

A collaboration is more likely to deliver desired outcomes where **participants have access to necessary data, tools and resources** (L) to undertake collaborative IWM planning. As a relatively new form of planning, very little guidance currently exists on how to best undertake such activities. Participants also need to openly share data from a range of sources, as well as jointly use planning tools able to organise, integrate and visualise multiple data sets to compare different scenarios and options.

Table 6. Summary of principles associated with 'Collaborate effectively' theme, with examples from Upper Merri and Western Growth

Principle	Upper Merri	Western Growth
I. Organisational representatives	Participants shared similar motivations and values. Representatives were not always able to capture the inputs of different parts of their organisation or make decisions on behalf of their organisation, with more seniority required on the steering committee.	Representatives were motivated and enthusiastic, committed to IWM outcomes, knowledgeable, flexible in approach, able to think strategically, and make certain decisions on behalf of their organisation. For some individuals, it took time to build the necessary understanding, motivation and commitment to deliver catchment-wide outcomes.
J. Trust and relational capacity	While inter-organisational relationships were strengthened through the process, it was felt more time and effort was needed to build safe spaces for interaction so contentious issues could be more openly discussed, supported by appropriate facilitation.	The organisations involved had existing relationships, which solidified as a result of the process. The robust and honest discussions led to improved trust across individuals. Relationship building was not an explicit project activity, but was considered important throughout the process.
K. Strategic and targeted engagement approach	Core group of collaborators established but staff turnover created issues with consistency. Work streams involved more targeted engagement with external stakeholders.	Flexible approach was adopted, bringing in different expertise when needed, e.g. service planning engineers were brought in when discussions became more focused on technical solution development.
L. Access to data, tools and resources	Broad stakeholder representation within the partnership provided access to different types of knowledge and data.	Lack of decision support tools and guidance for collaborative IWM planning was identified as a key issue.

4.4 Authorise the collaboration

The principles under this theme emphasise the importance of ensuring the project and individual participants involved are supported by the authorising environment.

This is particularly important during the early stages of the project to ensure all **organisations support the project and enable their representatives to meaningfully participate** (M). Such authorisation can be achieved when senior organisational leaders endorse the project, and/or the project is embedded in corporate strategies, which creates accountability for the project. Further, projects formally identified in strategic forums, like the IWM forums, provide an additional mandate for participation.

It is important to recognise that creating an enabling authorising environment takes time. Therefore**,** before commencing collaboration, participants should be given enough time to secure internal support and resources for the project.

An authorising environment can be strengthened through **widespread commitment to shared outcomes** (N). For example, capturing community and cultural values can help to build an enabling context for collective action and provide a social licence to push beyond the status quo.

Once the project has identified particular solutions or developed a plan, further engagement with organisational leaders and other implementation stakeholders should be undertaken to **authorise the outputs of the collaboration** (O) (e.g. senior executives endorse a plan, actions become formally embedded within organisational processes and planning instruments). This will be necessary to ensure participating organisations remain committed to advancing project outcomes.

Table 7. Summary of principles associated with 'Authorise the collaboration' theme, with examples from Upper Merri and Western Growth

Principle	Upper Merri	Western Growth
M. Initial authorising environment	Project endorsed by senior executives, embedded in corporate strategies and identified as a priority by the Yarra IWM Forum. All of these factors empowered representatives to effectively participate.	Project established through the Werribee IWM Forum. Support from senior executives in the forum gave participants the mandate to participate in collaborative activities.
N. Widespread commitment to shared outcomes	Community values for the Upper Merri Creek emphasise that business-as-usual practices will not be sufficient, providing project participants with a social licence to push for practices beyond business as usual.	Project objectives seek to give effect to the strategic outcomes identified in the Strategic Directions Statement, which already had broad endorsement from the Werribee IWM Forum.
O. Authorising project outputs	A formal partnership statement has been drafted that will, once executed, document a commitment from all partners to collaboratively work on the Upper Merri Creek IWM plan. Some participants expressed challenges in seeking organisational endorsement of the current draft of the plan.	Participants identified the need for further engagement with other stakeholder groups to ensure broad support for the solutions (e.g. Victorian Planning Authority). Additionally, engaging senior leaders will be necessary to ensure organisational commitment moving forward.

5 Implications for practice

Water planning in Victoria has historically been characterised by a siloed approach to water services (e.g. water supply, sewerage, drainage, waterways) and fragmented functions (e.g. policy, service delivery, regulation), spread across multiple organisations and levels of government. Despite the maturity of IWM concepts in Victoria, high-level state and regional policy directions struggle to be converted into place-based outcomes or requirements for urban development, suggesting a gap or missing planning scale. Previous case study research in Perth and Townsville has also identified a strategic gap in water systems planning, with a particular focus on the 'corridor scale' (see e.g. Smith et al., 2020; Tawfik et al., 2020).

The Upper Merri and Western Growth Area case studies highlight one promising approach for contextualising IWM at a meaningful scale to effectively guide urban development. The widespread adoption of IWM planning at the sub-catchment or corridor scale in Victoria could fill the identified gap in planning, and facilitate better development outcomes.

To test this idea further, a workshop was held with 25 practitioners from state planning, local governments, water utilities and authorities. They validated the need for sub-catchment IWM planning, and identified a few 'attributes' or considerations for IWM planning at the sub-catchment scale. These are summarised in section 5.1.

5.1 Scoping sub-catchment IWM planning

Purpose of sub-catchment IWM planning

Sub-catchment IWM planning should enable collaborative water systems planning that delivers better place-based outcomes. By focusing on 'places' rather than organisational or jurisdictional boundaries, different stakeholders can come together to align efforts around a shared vision, identify and attempt to resolve a broad range of issues in ways that optimise water system services and improve urban development outcomes.

In Victoria, water planning occurs at many levels. Recently established IWM forums are working towards developing IWM plans at the catchment scale. A number of local governments have developed IWM strategies for their local government area. And IWM planning is sometimes undertaken at the precinct or development scale. There is little formal definition of these planning scales in the Victorian water sector and little, if any, guidance on how planning should be undertaken.

So far, very few IWM plans at the sub-catchment or corridor scale have been prepared in Victoria and across Australia more broadly. The formal introduction of sub-catchment IWM plans in Victoria would add another layer of planning and so it would need, according to workshop participants, a clear and distinct purpose to justify its addition. This might require assessing other IWM planning scales to identify opportunities to streamline activity and maintain a clear line of sight between high level directions at the regional and catchment scales, all the way through to servicing plans at the precinct scale (something that was identified as important in the Townsville case study, see Tawfik et al., 2020). The purpose and relationships between different layers of IWM planning would need to be clearly articulated and communicated to stakeholders.

Outputs of sub-catchment IWM planning

This planning process should lead to a sub-catchment IWM plan that documents an agreed integrated water servicing strategy, including implementation arrangements. Ideally it should articulate a place-based vision that links regional and catchment scale objectives, Traditional Owner interests and community values. The vision should be used as a benchmark to evaluate a range of development scenarios and water servicing options.

Scale of sub-catchment IWM planning

A place-based approach to IWM planning requires opportunities to be examined and assessed in relation to a geospatial scale that is meaningful to ecological functions, infrastructure networks and stakeholder values. To encourage collaboration, the scale needs to be significant for decision making across multiple organisations, and not confined to a single organisational or jurisdictional boundary. Waterways offer an important focal point for collaborative planning activity, and the 'sub-catchment' scale in particular is considered to be more appropriate for delivering IWM outcomes than the precinct or development scale.

But the 'sub-catchment' scale should not be too prescriptive in its definition. Some sub-catchments associated with particular creek systems may be as large as catchments and require a further breakdown for IWM planning. In regional contexts, the sub-catchment scale may not be appropriate at all. Other scales that are more meaningful to local stakeholders may be a more useful focus for IWM planning. But while contextual factors may necessitate some differences in the scale of planning, there should be enough similarity in how sub-catchments are defined to ensure a consistent approach to planning.

Who should be involved in sub-catchment IWM planning?

Members of the IWM forums are ideally placed to participate in sub-catchment IWM planning. In bringing together a number of organisations with an interest in water cycle management—such as water utilities, local governments, Traditional Owners, catchment management authorities, DELWP and the Victorian Planning Authority—the forums have been able to seed and strengthen platforms for collaboration. These networks can be used to commence and facilitate sub-catchment IWM planning.

Contextual factors may require other stakeholders to be involved, so the mix of partnering organisations may look different for different sub-catchments. Similarly, not all stakeholders will need to be involved consistently throughout the planning process. Some may be engaged temporarily or for a particular purpose (e.g. community groups, developers).

Support required to undertake sub-catchment IWM planning

As 'sub-catchment IWM planning' is relatively new, there is a need for dedicated resources and tools to support such activities. Place-based data and information is an important input. A detailed contextual analysis can help to identify key stakeholders and their relationships, the existing state of biophysical systems and essential infrastructure, applicable policies and strategies that may affect desired outcomes, and parallel or upcoming planning processes that sub-catchment IWM planning should seek to influence.

Collecting and organising different data sets from multiple organisations can be a difficult and time consuming process, but a necessary input to a holistic understanding of a place. Integrated modelling tools that can combine data and allow for collective analysis are particularly important for sub-catchment IWM planning. Similarly, economic evaluation tools that can rigorously assess and compare different scenarios and options are critical. Participating organisations also need to contribute human and financial resources to enable these collaborative processes to deliver effective outputs.

Timing of sub-catchment IWM planning

The timing of planning was of particular concern to many workshop participants. Across Australia, not only are the jurisdictional areas of planning and water authorities disconnected, but the planning horizons for each sector are often different and sometimes out of sync (see Tawfik and Chesterfield, 2020). This has led to reactive servicing measures because water is considered late in the development cycle after urban layouts with standard servicing templates are set, or situations where infrastructure provision lags urban development.

To effectively guide on-ground outcomes, workshop participants agreed it is important to undertake sub-catchment IWM planning before key decisions are made, precinct structure plans are created or development has proceeded too far. This approach ensures desired IWM outcomes can be proactively embedded in key planning instruments before opportunities to influence implementation are locked out. But this will be particularly challenging to achieve in growth areas where many precinct structure plans are already in place and being implemented.

Development context (greenfield or infill) for sub-catchment IWM planning

The preceding discussion highlighted the importance of context in determining the scope of sub-catchment IWM planning, and suggests processes need to be able to adapt to different contextual conditions. The development context is another such factor that influences what sub-catchment IWM planning might look like.

Workshop participants generally agreed sub-catchment IWM planning should not be confined to greenfield growth areas only. Infill sub-catchment IWM planning is also necessary, particularly given the bulk of future growth in Melbourne is expected to be accommodated via infill. While infill sub-catchments involve a potentially more complex set of challenges than greenfield sub-catchments (e.g. constraints from existing assets, retrofitting costs, fragmentation of land ownership etc.), they also provide a significant opportunity to coordinate place-based IWM outcomes more efficiently and effectively for infill communities. The plans and other outputs of sub-catchment IWM planning processes, if appropriately embedded, will also equip water utilities and planning authorities with the necessary levers and tools to more meaningfully influence infill practices.

5.2 Next steps

At the conclusion of the workshop, not only was greater definition given to the possible scope of sub-catchment IWM planning, but participants also demonstrated a willingness to continue exploring *how* such planning could occur. An additional workshop was proposed to focus on 'how' sub-catchment scale IWM planning could be more widely undertaken in the future. The following questions are suggested for consideration during this workshop:

- *What opportunities exist to formalise sub-catchment IWM planning processes and outputs?* This may involve examining both water and urban planning processes to identify appropriate triggers for sub-catchment IWM planning, as well as suitable planning instruments to increase the status and recognition of water planning within urban planning processes.

- *What are the possible governance models for sub-catchment IWM planning and delivery?* This may involve assessing the strengths and weaknesses of different governance models (e.g. formal or informal, network or hierarchical structures), including identifying possible roles for different organisations and who should lead or coordinate activity at different stages.

- *How may context affect the way sub-catchment IWM planning is undertaken?* This may involve exploring the potential nuances that contextual factors (e.g. regional or metropolitan, greenfield or infill) may bring about in how sub-catchment IWM planning is undertaken.

- *What guidance and support is needed to facilitate effective sub-catchment IWM planning?* This should build on the items mentioned in section 5.1, and identify any other gaps in skills, resources, tools etc. as well as consider different options to address those gaps.

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