



Bridging the IWM funding and financing gap



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

Bridging the IWM funding and financing gap

The authors would like to thank representatives from state and local government, water utilities, regulators and private sector financiers who contributed to the project.

The project was commissioned and funded by the Victorian Government Department of Environment, Land, Water and Planning.

© 2021 Cooperative Research Centre for Water Sensitive Cities Ltd.

This work is copyright. Apart from any use permitted under the *Copyright Act 1968*, no part of it may be reproduced by any process without written permission from the publisher. Requests and inquiries concerning reproduction rights should be directed to the publisher.

Publisher

Cooperative Research Centre for Water Sensitive Cities
PO Box 8000
Monash University LPO
Clayton, VIC 3800

e. admin@crcwsc.org.au

w. www.watersensitivecities.org.au

Date of publication: September 2021

Disclaimer

The CRC for Water Sensitive Cities has endeavoured to ensure that all information in this publication is correct. It makes no warranty with regard to the accuracy of the information provided and will not be liable if the information is inaccurate, incomplete or out of date nor be liable for any direct or indirect damages arising from its use. The contents of this publication should not be used as a substitute for seeking independent professional advice.

Table of contents

At a glance	4
Context	4
About this guide	4
Business as usual cannot deliver services we need	7
New challenges need an integrated approach that delivers broader benefits	8
Victoria is a leader in IWM	9
IWM requires alignment	10
Funding and financing are impeding progress	11
It's important to distinguish funding from financing	13
Funding and financing that supports IWM	15
Step 1: Understand the operating context, the partners and the project	15
1.1 Define the broader contextual factors that will impact your funding and financing decision	15
1.2 Identify differing objectives of each partner	17
1.3 Clarify project specific benefits and costs	19
1.4 Clarify differing roles, responsibilities and constraints of each partner	21
1.5 Identify the project risks and how they should be allocated to each partner	22
Step 2: Identify a broad range of options	24
2.1 First secure funding	24
2.2 Then lock in finance	26
Step 3: Select preferred approach and develop an implementation plan	30
A final note on how to use this guide	32
Appendices	33
Appendix 1: Funding and financing plan summary table	34
Appendix 2: Funding options matrix—what to use, how and when?	35
Appendix 3: Financing options matrix—what to use, how and when?	41
References	48

At a glance

Context

Population growth, technological change and climate change all mean we need more infrastructure, including water infrastructure. Australia is one of the most urbanised countries in the world. Our cities accommodate over 80% of our population and generate more than 80% of our gross domestic product (GDP). Growing populations and bigger cities can drive our success as a knowledge-based economy, but currently, their ongoing productivity is at risk from ageing infrastructure and climate change impacts. Growing communities are demanding higher levels of services and amenity, which depends on timely, well-placed, efficient and resilient infrastructure that ensures liveability and sustainable water, energy and food resources. At the same time, essential services must be kept affordable and already high levels of debt must be managed.

Infrastructure investment is planned to accommodate this growth, but the [Global Infrastructure Outlook \(2020\)](#) forecasts a \$158 billion gap between current and needed Australian infrastructure investment. Further, the technologies and practices that have historically served cities well cannot address these complex modern challenges.

Integrated water management (IWM) is a way of addressing this gap in the water sector. Water sector organisations are pursuing IWM as a means of increasing the value generated from investment. Victoria is a leader in IWM with a range of policy priorities, guidelines, frameworks and processes driving collaborative planning and investment. These measures create an enabling environment that brings together a broader range of stakeholders to explore a bigger range of options relating to both *what* is possible and *how* it can be achieved. A key part of this process is to broaden business case analysis, beyond a traditional single asset/single entity approach, to consider whole-of-community outcomes using structural and non-structural solutions at a range of scales.

About this guide

This guide helps practitioners better understand and determine the appropriate funding mix and financing mix for IWM projects.

Importantly, funding and financing are distinct albeit related concepts:

- Funding is the revenue available to pay for infrastructure. It includes taxes, tariffs and transfers. More funding (e.g. through innovative collaborative arrangements) can mean more revenue to support more infrastructure.
- Financing merely relates to when infrastructure is paid for. It includes equity and debt. Financing affects the timing of infrastructure delivery (e.g. does a business levy a tariff to fund new infrastructure in five years time when sufficient funding has been collected to pay for it, or do they use debt to deliver the infrastructure now and use the five years of funding to repay the debt). It does not influence the ability to deliver more infrastructure, which makes it secondary to funding.

The guide builds on and complements [the Integrated Water Management Framework for Victoria](#) developed by the Department of Environment, Land, Water and Planning (DELWP). The framework provides [cost allocation](#) and other guidelines and tools to assist IWM planning and option. Appropriately, DELWP's framework is the starting point for assessing infrastructure options, because it identifies whether or not projects are viable. This question must be answered first. Optimal or innovative funding and financing approaches cannot magically make an unviable project worthwhile.

The next step is to decide who should pay, how and when. Often, viable IWM projects (even those with a supporting policy environment, capable and passionate advocates and a range of enabling tools and resources) are derailed by questions about who should pay, how and when. In other words, failure to secure project funding and financing is impeding worthwhile proposals.

This guide provides practical advice and a structured process to ensure project proponents:

1. Understand the funding and financing context and have clear objectives.
2. Consider a wide range of funding and financing options and their features, which can affect decisions.
3. Develop a context appropriate and implementable funding and financing plan.

“Early engagement with central agencies and decision makers is key—don’t wait until the business case is finalised to only then consider funding and financing issues.”

Victorian Department of Treasury and Finance

DELWP commissioned this guide to help the Victorian IWM Forum partner practitioners in the local government, water, private developer, state government and community sectors (including Traditional Owners) who design and collaborate on IWM projects.

The goal is not to create technical experts on funding and financing. Rather it is to give practitioners a working knowledge of concepts and frameworks, so that they can communicate with and critically evaluate the advice given by the technical experts. A water project manager will not be able to design a debt package. But they will be able to engage meaningfully with Treasury and Treasury Corporation of Victoria to co-design the appropriate debt package.

After explaining the context and need for change, the guide outlines a 3-step process to develop an appropriate financing and funding plan. To support practical application:

- Appendix 1 contains a template for summarising the proposed funding/financing approach (and which could be developed into a more detailed plan)
- Appendix 2 outlines funding alternatives and options
- Appendix 3 outlines financing alternatives and options.

The guide draws on the experience and knowledge of representatives from a range of sectors including state and local government, water utilities, regulators and private sector financiers. Where it’s relevant, we have attributed these issues and themes to particular sectors, without naming individuals. The guide also draws on relevant national and international reports and guides.

Better understanding the range of funding and financing options will not guarantee that every IWM project proceeds. But hopefully, it will lead to better discussions about the range of options, fewer surprises and an increased likelihood that project funding and financing can be put in place to ensure worthwhile projects can more easily secure the resources they need to provide lasting community value.

By providing structure for discussions, the guide aims to help deliver more efficient outcomes and reduce transaction costs. But, a guide cannot replace expert support. Practitioners are encouraged to use the guide to

become familiar with key concepts and the options available, and then talk to someone within the Victorian Government who can help with more detailed and technical considerations.

And of course, the usual rules of project design apply—engage early and engage often with experts, regulators, potential co-funders and other stakeholders. By their nature, IWM projects involve many complex relationships and there is no substitute for early and frequent engagement to navigate this complexity. Effective and early engagement will highlight potential red flags, which can either be addressed to keep the project alive or accepted as insurmountable. In this case, the project can be halted or different approaches considered without wasting too much time, effort and resources.

Business as usual cannot deliver services we need

Key points

- It is widely accepted that business-as-usual approaches to urban water management cannot adequately deliver our future water and city-shaping needs.
- Integrated water management (IWM) has widespread support, and can deliver economic, social and environmental benefits.
- An increasing range of IWM projects are proof of concept, but IWM is not yet a mainstream business-as-usual approach.
- Business as usual requires alignment across policy and practice, and current financing and funding arrangements create a gap in this alignment.

Australia is one of the most urbanised countries in the world. Our cities accommodate over 80% of our population and generate more than 80% of our GDP. Further, our population is expected to nearly double by 2066, with most of the growth taking place in cities.¹

Growing populations and bigger cities can drive our success as a knowledge-based economy, but currently, their ongoing productivity is at risk from ageing infrastructure, increasingly brittle built environments and climate change impacts. Growing communities are demanding higher levels of services and amenity, which depends on timely, well-placed, efficient and resilient infrastructure that ensures liveability and sustainable water, energy and food resources. But at the same time, economic constraints are tightening.

Infrastructure investment is planned to accommodate this growth. Projections suggest we need around \$500 billion in urban developments, to keep pace with Australia's rapidly growing population.² And we need another \$1.7 trillion of infrastructure investment over the next 20 years, including \$80 billion of urban water infrastructure.³

But infrastructure investment projections suggest a significant funding gap. The [Global Infrastructure Outlook \(2020\)](#) forecasts a \$158 billion gap between current and needed Australian infrastructure investment. Further, the technologies and practices that have historically served cities well cannot address these complex modern challenges.

So, within this context, how do we plan and deliver essential services that are reliable, safe and efficient, both day to day and in extreme events? How do we ensure our cities are connected while celebrating local social and environmental values and diversity?

¹ Australia's population is growing at 1.6% each year, and is expected to nearly double by 2066 (ABS 2018; ABS 2017).

² Based on National Housing Supply Council estimates (see NHSC 2010, p. xiii).

³ Over the past 7 years, approximately \$42 billion has been invested in urban water infrastructure (see BITRE 2019, Table 20), with projected annual expenditure of \$3.5–4.5 billion (see AMP Capital 2018).

New challenges need an integrated approach that delivers broader benefits

The concept of integrated water management (IWM) has emerged as a way of managing water services to maximise economic, social and environmental benefits. It draws on the view that the conventional approach to managing water—compartmentalising water supply, sewerage and stormwater services—produces conflicting and sometimes inefficient water management and liveability outcomes. This compartmentalisation is both physical (in terms of infrastructure) and institutional (in terms of responsibility for providing, operating and maintaining services).

As the name implies, IWM involves integrating the various water services, in terms of both the physical system, as well as the many people and organisations who create, maintain, and are served by urban water systems. Victoria's Department of Environment, Land, Water and Planning (DELWP) defines IWM as:

... a collaborative approach to planning that brings together organisations that influence all elements of the water cycle, including waterways and bays, wastewater management, alternative and potable water supply, stormwater management and water treatment. It considers environment, social and economic benefits. (DELWP 2017, p 6)

IWM depends on quality partnerships that support collaboration, align cultures and build consensus. Multi-stakeholder forums can bring people together to build these enduring partnerships.

Figure 1 shows the different solutions or combinations of solutions IWM can deliver.

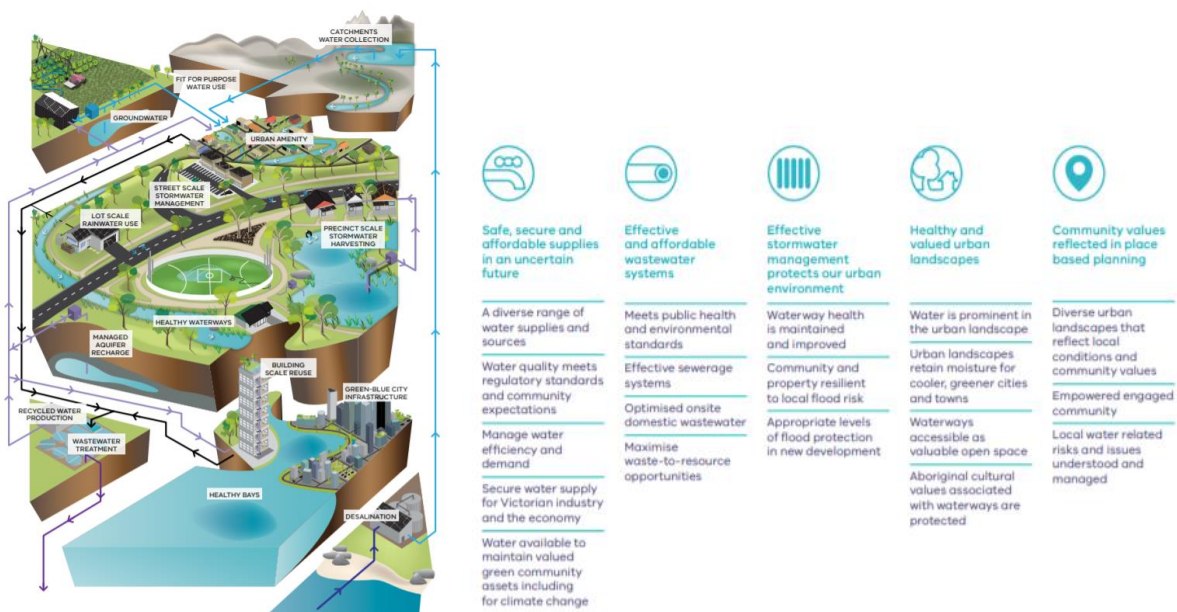


Figure 1: Options and outcomes from applying integrated water management

Source: DELWP 2017, pp 7–8.

Under an IWM approach, hybrid systems combine critical existing infrastructure with flexible decentralised local solutions. They merge conventional engineering with nature-based solutions. They can be integrated with urban systems for energy, waste, transport, housing and food. And they can be co-created with community and delivered through private–public or whole-of-government co-investment schemes. The results are fit-for-purpose urban services, and cool green places that also provide a host of broader liveability, ecological and community

health benefits. These flexible modular solutions can respond quickly to changing future circumstances and development timing and patterns. They are also efficient, effective and value driven. Changing the scale and scope of investments may create opportunities for innovative business models, which allow for more multi-sectoral and public–private partnerships.

Victoria is a leader in IWM

Victoria is a leader in implementing IWM practices, particularly in terms of policy and strategy development. Guidelines, capacity building and institutional structures such as the Victorian IWM Forums have been instrumental in unlocking the full potential of IWM. The CRC for Water Sensitive Cities (and its successor Water Sensitive Cities Australia) has worked with DELWP and Victorian water businesses to support this process.

This enabling policy environment has provided a catalyst for an increasing portfolio of proof-of-concept projects across the state. Each IWM Forum has outlined these priority projects in their [Strategic Directions Statements](#). Box 1 includes examples that have offered water businesses, local governments and communities a wider range of options that address a broader array of social, economic and environmental values.

Box 1: Examples of integrated water management in Victoria

Fishermans Bend, Australia's largest urban redevelopment site, is an example of a productive collaborative forum that created innovative, integrated water management (IWM) solutions. The co-design process brought together researchers, state and local government, and industry stakeholders to develop an integrated water management strategy.

A precinct-scale strategy of 'making water locally' centres around a water recycling plant to provide Class A recycled water. It includes multiple lines of defence to manage flooding, including planning and building controls, upgraded pipes and pumps capacity and water sensitive urban design elements such as linear green swales and parks. The plan also includes lot-scale features such as smart rainwater tanks and flood resilient design. An urban ecology strategy focuses on ecological values and ecosystem services in green corridors, public open space design and building design, to green, cool and naturalise Fishermans Bend.

The expected outcomes from the Fishermans Bend IWM strategy include increased biodiversity, improved health of downstream environments, and a diversified range of water sources that reduce water consumption and mitigate flooding issues. The design features are expected to reduce the precinct's water footprint by approximately 40% and reduce drainage capital expenditure by around 20%.

Significantly, IWM strategies and plans can be applied in regional and rural areas. The *Vision and Strategy for a Water Sensitive Bendigo* defines a water sensitive vision for Bendigo and outlines the broad steps that Bendigo should take to enable that transition. A defining feature of Bendigo's water sensitive vision is that it was co-created with industry and community including Traditional Owners.

Water Sensitive Bendigo—a cross-agency collaboration—has stewardship to drive Bendigo's transition. Its Water Sensitive Bendigo Implementation Plan outlines the immediate priority actions, as well as aspirational actions, which will be a foundation for future activities. The plan allows Bendigo to respond to, and prepare for, emerging water management challenges such as climate change and population growth, and facilitates innovative practices and management. Priority actions include Wanyarram Dhelk, a project to improve the water health of Bendigo Creek and its tributaries that combines Traditional ecological knowledge with contemporary design and technology.⁴

Sources: CRCWSC 2015; CRCWSC 2020.

⁴ For more IWM examples see <https://watersensitivecities.org.au/solutions/case-studies/>

IWM requires alignment

Across Australia and internationally, IWM principles are widely accepted, but their application at scale and as a business-as-usual activity has been impeded by gaps in policy and practice.

In particular, ensuring policies and strategies are implemented and deliver enduring value requires aligning interests across the project delivery process (Figure 2). While interrelated, each stage in the project delivery process often requires engaging different stakeholders and accessing different technical skills.

A breakdown in alignment at any stage of the project delivery process can see (and has seen) good ideas and important strategies not achieve their intended impact.

The primary determinant of whether a project proceeds should be whether it fulfils the policy objective, and the business case demonstrates the benefits outweigh the costs. For this reason, funding and financing appears towards the end of the process. Even so, the various steps can and should be developed in parallel. Funding and financing require enabling policy and regulation, impact option evaluation and business case development. That is, it would be a mistake to do detailed benefit–cost analysis and only at the end consider funding and financing.

Just as operational practicalities should be considered in strategy development, early consideration of funding and financing can help identify unclear legislative or regulatory accountabilities, and misaligned expectations. It can also help identify additional benefits and revenue streams (discussed below) that can be included in strategies, business cases and implementation plans. Resolving these issues can take time, so considering them at the end of the project development phase can lead to delays, loss of momentum or the project not proceeding.

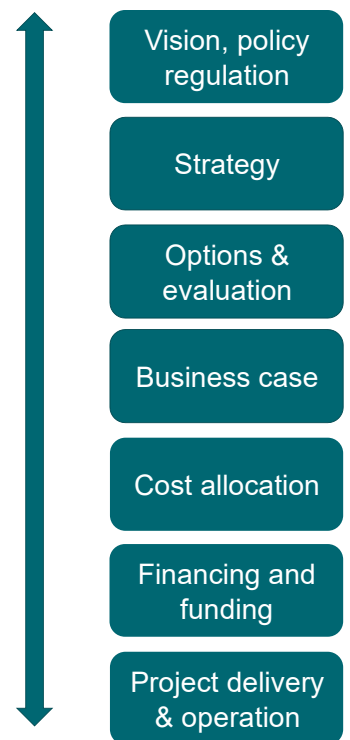


Figure 2: IWM project delivery process

Funding and financing are impeding progress

Existing DELWP (and other) guidelines explain processes needed for alignment. Consequently, this guide takes as given:

- a **collaborative process** has been adopted for high level strategy development and option identification (see [DELWP](#) cost allocation and [WSAA IWM](#) guidelines)
- the best-for-community outcome has been identified using a fit-for-purpose **benefit–cost analysis (BCA)** that includes all relevant costs and benefits and adjust for future uncertainties(see [INFFEWS guidelines](#) and [MIEG guidance](#)⁵)
- the **distribution** of cost, risks and benefits is understood across stakeholders, locations and time ([IUFM guidelines](#))
- **cost allocation** principle(s) (e.g. beneficiary pays, user pays, capacity to pay) are agreed (see DELWP cost allocation and WSAA IWM guidelines).

However, even when these elements are present, many projects do not proceed because they have not secured the necessary funding and financing (Figure 3).

Policy and technical support is available but an important gap remains

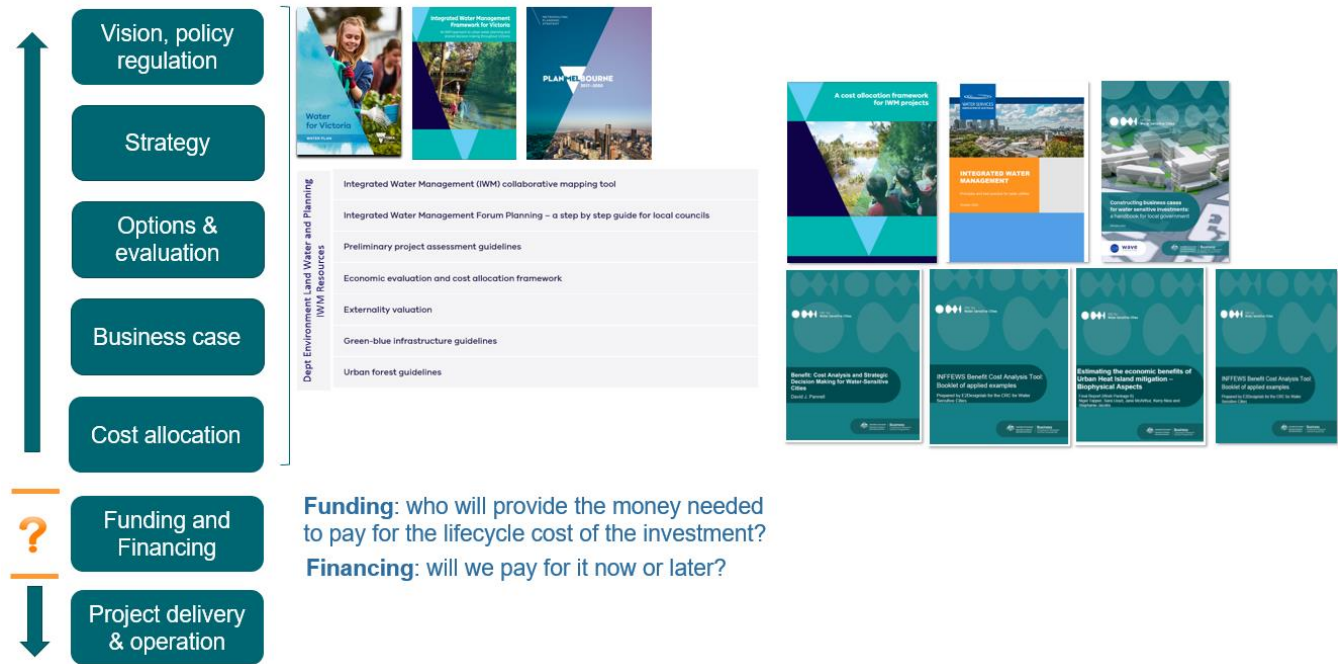


Figure 3: The funding and financing gap

⁵ Metropolitan water utilities supporting guidance for BCA includes: Social and Environmental Values Table (SEVT) a Melbourne-specific database of values for blue-green infrastructure based on the INFFEWS non-market values tools and user guidance, and factsheets on economic evaluation for potable and alternative water, greening of open space, waterways and the bay.

On the one hand, the following factors can constrain IWM funding and financing (based on consultation feedback and a review of available literature):

- IWM projects often have broader outcome-based objectives (e.g. improve liveability and amenity or maximise sustainability) which may be difficult to quantify and link to **clear regulatory obligations** compared with more conventional water sector investments that have a clear output requirement (e.g. water supply with a defined quality, pressure and reliability). Local governments are well placed to define local liveability objectives but face funding challenges when project objectives extend beyond their boundaries and in balancing competing objectives in a rate capped environment.
- **The broader objectives pursued by many IWM projects also result in costs** being up front and certain (e.g. asset construction) while the benefits (e.g. change climate adaptation) are in the future and uncertain.
- **Asset ownership** and responsibility for maintaining levels of service may be unclear or change over the assets life (e.g. developer contributed assets) impacting the distribution of risks, costs and benefits which in turn can reduce incentives for minimising lifecycle costs/risk, increase financing costs and reduce the capacity to secure sustainable funding.
- While the community overall may benefit from an IWM project, the **distribution** of costs, risks and benefits over time, locations and stakeholder groups may mean that some incur a larger share of the costs relative to the benefits they receive. For example, constructing a local sewage treatment plant will deliver benefits to the whole community but may have odour or amenity impacts for local residents. A river rehabilitation will increase the value of nearby properties more than those further away.
- IWM projects can have different cost, risk and reward profiles relative to conventional approaches which may impact financing opportunities. For example, **nature-based** solutions (e.g. wetlands, parks) are open systems that rely on natural processes compared with closed systems like water treatment plants that have a much higher level of operational control. Similarly, **non-structural** solutions like education campaigns and regulations rely on influencing behaviour rather than operating assets owned by the responsible authority. They may also have significant **public good** (i.e. available to all members of society and paid for collectively) **or merit good** (i.e. should be provided on the basis of need rather than ability and willingness to pay) elements making agreeing funding arrangements challenging.

On the other hand, the IWM process can bring together a wider range of stakeholders than a conventional approach, and identify a broader range of value streams. Further, the scalability of nature-based and non-structural solutions can be deployed and adapted as needed potentially reducing the lifecycle cost (and hence the amount of funding and finance needed) and unlock new and innovative funding and financing opportunities.

This guide seeks to leverage the strengths of IWM processes and projects together with an increased range of funding and financing options to help align the different elements of IWM project development. In doing so the guide helps to:

- give practical effect to the agreed cost allocation principle(s)
- secure the resources needed to deliver the actions recommended by a robust BCA, which has considered all costs and benefits (including those that cannot be quantified or monetised easily), and recognises the uncertainty about whether costs and benefits will be realised in the future
- achieve the outcomes identified in the relevant IWM strategy and policy context.

It's important to distinguish funding from financing

Funding and financing have important but different roles in enabling IWM outcomes, determining who should pay, how and when.

It is useful to distinguish between those who finance an investment and those who fund it. Financing relates to raising money upfront to pay for the design, construction and early operational phases of an infrastructure project (Poole et al. 2014). It can include debt, equity and a range of debt/equity hybrids. As Infrastructure Victoria noted:

Financing affects when we pay for our infrastructure. We can finance using our cash surpluses now, or by borrowing (which we pay for later). Debt is a financing tool, not a funding source. ([IV 2016, p 7](#))

In contrast, funding is how investment costs are repaid over time. It compensates those who provide the debt or equity capital for the project and supports project lifecycle costs, which include ongoing operation and maintenance, and capacity building.

There are three main sources of funding for water-related infrastructure:

- **Tariffs:** A source that comes from users paying for a specific service. For example, water companies charge for the quantity of water provided. Ideally, charges account for capital costs, wear and tear, maintenance and environmental impacts (Infrastructure Finance Working Group 2012).
- **Taxes:** A source that comes from the government—either through the general budget or a dedicated tax, to help pay for a service within its jurisdiction. For example, a municipal or state government may fund a department to provide flood management services.
- **Transfers:** A source that is not a tariff or a tax that comes from outside the organisation that is providing the service. For example, a state government or water utility may receive a grant from the federal government.

There are two main sources of financing:

- **Equity:** The most common source of financing is equity generated within the normal operations of the government or business. For example, accumulated profits or operating surpluses are sources of equity financing. Other sources of equity are less relevant for governments but do have some relevance for water utilities and developers. They include investments from new or existing owners with the expectation of a return on that investment in the form of dividends.
- **Debt:** The most common sources of debt used to finance IWM projects are loans from banks or bond investors made in exchange for interest and a promise of repaying the principal. The cost of debt to the borrowing government or business tends to be lower than the cost of equity. However, this must be balanced against the reduced flexibility (interest must be paid regardless of any negative shocks to a business whereas dividends can be waived) and practical limits on the amount of debt that can be used.

Some financing structures include aspects of debt and equity. For example, a government might make a concessional loan where the interest rate is lower than a more commercial rate, and the government waives interest payments if the asset does not generate the expected return.

“You need to get funding right before you consider financing—the financing approach and cost will depend on the ability to identify proven future cash flows and the associated risks around those cash flows.”

Treasury Corporation of Victoria

Consistently, industry feedback confirms finance is available for projects with a robust business case and a clear funding stream. Several organisations outlined a hierarchy of importance of project viability, then funding, then financing, although they are somewhat interrelated:

- A project must stack up on benefit–cost grounds independently of funding and financing considerations. A different approach to funding or financing cannot magically make a project viable.
- Funding has primacy over financing, with securing financing contingent on securing clear funding with a known risk profile.
- Funding availability (or lack of) will typically be a constraining factor for a project.

The guide aims to ensure an efficient process by making sure you have the right information and support. It recommends a three-step process to support water utilities, state and local governments, developers and community groups (including Traditional Owners) to navigate their way to an appropriate financing and funding plan.

Funding and financing that supports IWM

IWM projects bring together different organisations with different options and preferences for funding and financing. This section provides practical steps for practitioners as they assess funding and financing IWM investments. It includes examples to illustrate the concepts, but it is not definitive. It is a tool for local government, water utility, developer and state government practitioners to build their knowledge and guide discussion to a common understanding. But it is not a substitute for technical support from experts such as Treasury Corp Victoria, the Department of Treasury and Finance and DELWP. It is intended to facilitate, not negate, effective engagement and consultation.

The guide provides a simplified structure by grouping and categorising key concepts. This approach both oversimplifies things (because concepts do not always fit neatly into boxes), and overcomplicates them (because not all concepts are relevant for all cases). As the name suggests, it's a guide, so don't agonise over where a particular concept belongs.

The optimal funding mix and financing mix for an IWM project will be dictated by the confluence of:

1. Understanding the operating context, the partners and the project
2. Identifying and assessing the pros and cons of a broad range of options
3. Selecting a preferred way forward that is practical, implementable and aligned with project objectives.

Step 1: Understand the operating context, the partners and the project

Some of the information and analysis underpinning the IWM planning process is necessary to determine the optimal funding mix and financing mix. In particular, assessing funding and financing relies on an existing understanding of the following factors:

1.1 Define the broader contextual factors that will impact your funding and financing decision

1.1.1 *How does this assist funding and financing?*

Projects are not developed and delivered in a vacuum. A project's viability and the optimal funding and financing approach will be influenced by its broader context. This context is not static—it is subject to long term (generational) structural change. For projects with long asset lives, shorter term seasonal and cyclical changes may not drive the appropriate funding and financing approach as much, but should still be considered.

1.1.2 *Discussion starters*

Economic context

The economic context can affect *funding* in the long term, primarily through population growth and productivity trends. Regional economic differences can be particularly important—a densely populated, high income region is more likely to be able to support user charges; a sparsely populated and low income region may rely more on government transfers to support a project that provides the region with an equitable level of service. Smaller and regional communities face challenges such as smaller revenue bases, lack of alternative funding sources and dispersed communities. There may be opportunities to address these challenges through joint procurements, bundling projects and regional alliances. Economic context changes over time; for example creating or closing a key industry (e.g. car manufacturing) will materially impact funding choices. Shorter term economic trends such as the level of unemployment or inflation during cyclical upturns or downturns are less likely to affect the appropriate funding mix for a long life asset.

The economic context can affect *financing* via interest rates, foreign exchange rates and inflation on the cost of debt. For example, Australia's extended period of low inflation reduces the risks to lenders of locking in fixed interest rates, making them more attractive than variable rate options.⁶ Increased government debt (due to COVID-19 measures) might make debt more expensive. Or debt funding might become more attractive—Victoria's low level of debt by international standards attracts a very high credit quality relative to alternatives. As with funding, short term macroeconomic trends are less likely to affect the appropriate financing mix. Even so, the optimal financing mix can be altered (refinanced) in the short or long term, so long as the associated risks and transactions costs are understood and managed. For example, a very large project may be refinanced as it moves from construction to the less risky operational phase.

Technology context

Changes in technology can affect how infrastructure services are delivered and affect *funding* options across a range of sectors. For example, in-car readers opened up new possibilities for funding transport infrastructure—rather than relying on government transfers or basic usage charges limited to toll booths, road pricing options include dynamic pricing and/or network pricing. In the water sector, integrating new technology into IWM projects is offering additional revenue streams and funding sources. Examples include resource recovery from wastewater and data capture and information-based services (e.g. COVID-19 sampling). Improved understanding of stormwater flows and quality can provide a basis for tradeable water rights and environmental offsets. Combining improved technology and nature-based solutions is creating more liveable urban spaces and adding value to property developments, producing value capture opportunities. Smart meters open up opportunities for more time-of-use pricing which can help manage demand and so affect the size and type of investment. They can also help detect leaks across networks.

Technology can also affect *financing* by improving risk and operational management and reducing the amount and cost of finance. For example, linking flooding or irrigation aspects of an IWM project to real time Bureau of Meteorology weather forecasts may improve risk management that reduces the cost of finance or using pressure sewer technology may reduce or defer downstream investment in transfer or treatment capacity and decrease the total amount of finance needed. Smart meters generate deeper and more timely information on individual customer usage, potentially reducing revenue risk and improving financeability. However, the maturity and cost of technology as well as local capacity and cost to integrate the technology with existing systems and optimise new functionality are important considerations about whether the promised funding and financing benefits are realised.

Broader community context

Community perceptions about what is 'right' or 'fair' can be significant in discussions around who should pay for an IWM project. For example, the *funding* mix of a new water sensitive park might be affected by the distribution of benefits among local residents, downstream flood affected areas, the wider community, and current and future generations. Both the funding and *financing* mix of a new water project might be affected by community views about whether the private sector's role in providing or investing in water services is appropriate. Recent experience will also influence underlying perceptions of fairness. For example, recent droughts or floods, cost of living increases, and community appetite for sustainability initiatives may impact the relative attractiveness of different funding and financing options. In a very difficult economic climate, water utility customers may be less willing to pay for broader community health and amenity benefits but may still see providing these benefits as a fair use of government taxes.

Policy and regulatory context

Policy preferences and prohibitions can both increase or restrict funding and financing options. Examples include the 'cap' on local government rates, the definition and processes around water utility regulated prices, and government policy on private sector ownership of water-related assets. Regulators make decisions within the

⁶ Low inflation means low incentives for the Reserve Bank to increase interest rates (tighten monetary policy) to reduce the level of economic activity and reduce the rate of inflation.

powers and priorities set by government. Early engagement with government and regulators can reduce the potential for unexpected developments later on and build support for innovative approaches particularly where regulatory change or refinement is required.

Budgetary context

All entities—state government, local government, water corporations and private developers—have budget constraints. Therefore, the success or failure in securing funding or financing for a project reflects available budget capacity as much as the worthiness of the project. A strong project is a necessary but not sufficient condition. For example, an IWM project that ticks all of the business case boxes, delivers a positive outcome for the community and relies in full or in part on state government funding will be assessed against hospital projects that will deliver a positive community benefit and require government funding as well as road projects, housing projects etc. Each new dollar of funding can be spent only once.

Practitioners considering funding and financing options must be patient and persistent. For example, a good project may not secure the necessary state government funding because of lack of budget capacity and the existence of other priorities. However, practitioners can seek feedback on what gaps—if any—are in the analysis so that it becomes easier for decision makers to allocate funding next time. It is not uncommon for capital projects to be proposed for several years before funding is secured.

1.2 Identify differing objectives of each partner

1.2.1 How is it relevant to funding and financing?

When identifying and engaging with partners and stakeholders, it is important to identify their goals and aspirations for the project overall and how they inform funding and financing objectives in particular. These motivations affect how stakeholders value costs, benefits and risks, and influence the relative attractiveness of different funding and financing opportunities. These different objectives provide different insights to the project-wide benefit–cost analysis done as part of a business case.

If managed well, aligning project objectives can create opportunities to design more efficient funding and finance packages. As an example of how aligning objectives can influence the *funding* mix, consider the value capture opportunity associated with the positive impact of IWM projects on land valuation. A developer contribution makes a project viable which in turn increases the value of the adjacent privately-owned land, which in turn increases the value of the development. Without the developer contribution, the project is not viable. It doesn't proceed, so the land valuation doesn't benefit from the amenity of the project.

“Consultation on parties’ goals and their willingness to trade needs to consider what happens outside the room. We have identified an opportunity where another party would fund us to expand our information collection systems which might avoid their need to fund millions of dollars of infrastructure. While we have been able to convince our counterparts, they have not been able to convince their ultimate decision makers.”

Local government in Melbourne

Failing to understand and align project objectives between and within organisations can also result in competing actions or activities and cost shifting risks. And opportunities can be lost because project partners have not considered all the lines of influence. Sometimes, projects fail because while proponents have convinced partners, they have not considered others who can influence decisions. For example, a local government project manager might attend the project’s steering committee and see the logic in helping a water utility fund a wetlands upgrade. But can the project manager convince the chief financial officer or chief executive officer who may be the ultimate decision makers and not willing or able to engage in the project steering committee? Different stakeholders within and between organisations have different objectives and require different information to be able to support and prioritise the project.

Green bonds are an example of how partner objectives can influence the *financing* mix. In the past, green bonds were sometimes a way to lower the cost finance because

some sources of finance placed a premium on climate- or environmentally-positive projects and so were willing to accept a lower rate of return. In the current low interest rate environments, the cost advantage may be minimal but some project proponents may still pursue a green bond for broader policy or corporate social responsibility objectives.

1.2.2 Discussion starters

Each partner will have their own set of—probably multiple—funding and financing objectives, so consider a broad range of areas. Examples include:

- maximising return on investment (e.g. *funding*: a water business might seek to earn a higher profit margin on new unregulated commercial activity; *financing*: debt will be a cheaper source of financing than equity)
- changing behaviour (e.g. a project proponent might prefer a *funding* mix for a water project with a higher user pays tariff component. The cost to consumers better reflects actual use, potentially reducing the need for investment in new capacity but also introducing more volatility to water business income and dividends to government)
- ensuring equitable access (e.g. the *funding* mix for a water project may include a government transfer component to ensure equitable access by low income or at-risk customers. This would also enable prices reflect the ‘true’ cost with a transparent and separately funded discount, rebate or concession applied for low income or at-risk community members)
- recovering project lifecycle costs (e.g. ensuring *funding* for lifecycle costs is sufficient and accountability is assigned for maintaining levels of service over time particularly when an asset is constructed by one party and transferred to another)
- raising money quickly for a priority investment now (e.g. a water utility may not be able to *finance* the upgrade of a noncompliant dam or repair flood damage now using existing retained earnings, so has to borrow money)

- providing for a future event (e.g. a local government may seek developer *funding* for a water sensitive urban design asset which will enable sustainable development in their local government area)
- achieving corporate social responsibility or policy objectives (e.g. an environmental project might be *funded* by a developer who wishes to enhance their community reputation and brand; a publicly owned agency may choose a funding or financing option that is not least direct cost but advances broader economic, social or environmental policy commitments).

1.3 Clarify project specific benefits and costs

1.3.1 How is it relevant to funding and financing?

Related to differing objectives, the value of a project's benefits and costs will differ among partners (Figure 4). A shared understanding of who benefits from the project, how and when, as well as who bears the cost, can inform a better discussion about funding and financing; that is, who should pay, how and when?

Applying the INFFEWS BCA Tool to the Kunshan Forest Park in China identified the distribution of benefits among stakeholder organisations. This analysis provides helpful information when discussing how costs should be shared.

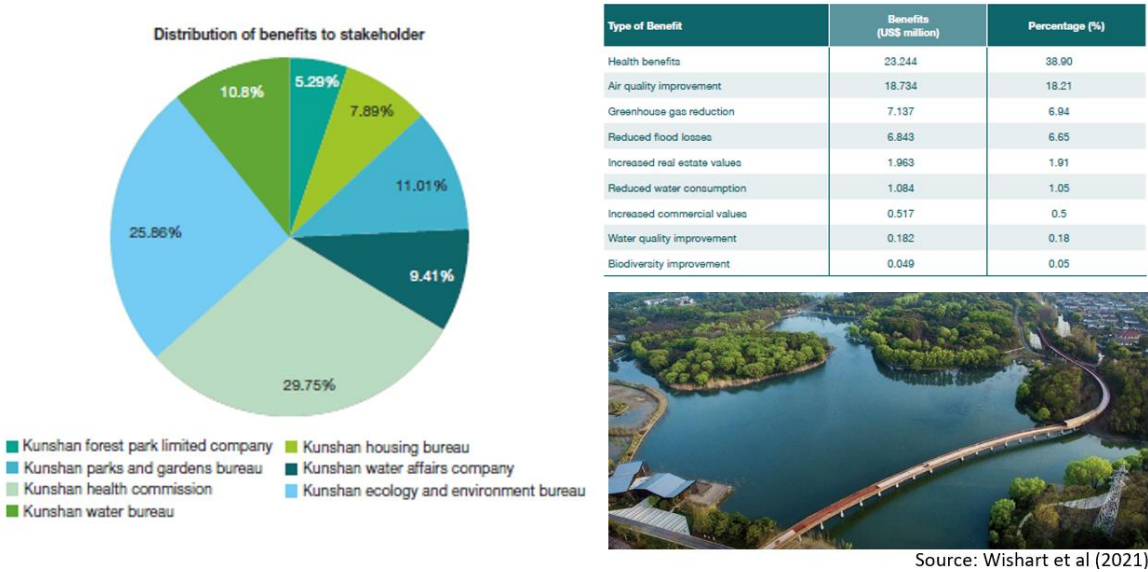


Figure 4: Considering the distribution of benefits and costs

Consistent with the DELWP cost allocation framework, this analysis should explicitly identify the extent to which costs and benefits accrue to partners including where legislative or regulator roles and responsibilities for project sponsorship, delivery, operation and asset ownership are unclear. Addressing such disconnects and ambiguities through agreements upfront that better align these interests can significantly improve the project's viability and likelihood of success.

As an example of how this can affect *funding*, a council may be considering a stormwater harvesting project that it would design, build, own, operate, fund and finance. A limited analysis recognises the project has benefit, but the return to the council does not justify the cost. However, a broader analysis might identify benefits for the local water utility through deferred system augmentation and the community through improved park irrigation, recreation and amenity. If a funding contribution from the water utility can be negotiated, perhaps supported by

local community groups through cash and in-kind contributions, the cost to the council could be reduced enough for the benefits to outweigh the costs and make the project viable.

There are also opportunities for partners to work together with *financing* solutions to align interests. For example, the water utility might be considering another worthwhile project. However, it has recently undertaken major investments, so does not have the capital to finance the project. It forecasts that after three years it will be able to finance the project through retained earnings (accumulated profits), so intends to do the project then. However, the state government considers the project to be a priority and accepts reduced dividend receipts for three years so the water authority can finance the project now.

1.3.2 Discussion starters

A threshold question is to identify any misalignment of costs, benefits, ownership and responsibilities among the partners and whether partners face any practical or in-principle barriers to funding or financing assets and projects they do not own. For example, current state government policy may preclude some *financing* options. Currently Victorian water utilities must access debt through Treasury Corp Victoria (TCV), which means they are guaranteed by the Treasurer. Conversely local governments do not typically have access to TCV debt. A local government may also face difficulties funding a water utility project that benefits residents in multiple local government jurisdictions.

Are the distributional impacts (costs, risks and benefits) of the best community solution understood? This question is covered in some detail in the Cooperative Research Centre for Water Sensitive Cities' [Investment Framework For Economics of Water Sensitive Cities](#). However, the following questions are particularly relevant here:

- Are the benefits public or private or a combination of both? This affects the *funding* mix because, in contrast to private goods, the benefits of a public good (such as a park) are both non-excludable and non-rivalrous and are more often funded through taxes and transferred, whereas tariffs are common for private goods. Water, sewerage and drainage services have varying degrees of public (e.g. public health) and private (e.g. a measured volume of water used in production processes) goods.
- Are there material differences in the distribution of social, economic and environment impacts between:
 - different scales (e.g. local vs catchment scale) with the bigger the scale the broader the range of beneficiaries the larger the potential sources of funding.
 - across different community groups (e.g. low income residents) that may have implications for capacity-to-pay considerations
 - time periods (e.g. should property owners pay for catchment-scale flood protection and climate adaptation measures now that may not deliver benefits for many years?).

1.4 Clarify differing roles, responsibilities and constraints of each partner

1.4.1 How is it relevant to funding and financing?

When identifying and engaging with partners and stakeholders, it is also important to understand their roles, responsibilities and constraints. As with goals, different roles, responsibilities and constraints affect how partners value costs, benefits and risks. It may be different from other partners, which can provide different insights to the project-wide benefit–cost analysis done as part of a business case. Again, these different valuations present opportunities to design more efficient funding and financing packages.

“There are many benefits to IWM but in practice it is a complex process. Clarity of governance—who are the relevant decision makers—needs to be identified up front where there are multiple parties facing multiple costs and multiple benefits.”

Infrastructure Victoria

The ability to secure *funding* requires clarity around who is responsible for the outcome, who is accountable for delivering it, who benefits, who is willing and able to pay, and who should be consulted and informed. For example, the Water Industry Regulatory Order 2014 defines which water utility services have their funding regulated via the Essential Services Commission (Victoria).

The ability to secure *financing* requires clarity around funding. For example, it will be easier and cheaper for a water utility to secure debt financing if the investment is clearly funded through a regulated asset stream, compared with a commercial investment involving funding from varied sources with various levels of commitment.

1.4.2 Discussion starters

Do you have a rigorous and systematic framework to identify and assign roles and responsibilities early in project development?

Do you understand how the different roles and responsibilities of individual partners can materially affect their willingness to provide funding and financing to a project and their preferred funding and financing solutions? For example, if a stormwater harvesting project provides non-potable water supply for a new property development, who is responsible for providing water (the supplier of last resort) if the scheme fails?

Collaborative planning needs accountable delivery. Of course, a large driver of IWM is to break down the siloed approach to roles and responsibilities. And there is ample opportunity for different parties to negotiate different funding and financing approaches that lead to better community outcomes and individual outcomes for the parties involved. However, do legislation, regulation or contractual agreements need to be changed to ensure agreements to perform beyond normal roles and responsibilities ‘stick’? For example, a local government may agree with a developer to provide flood mitigating wetlands. However, what happens if the developer doesn’t construct the wetlands as agreed, leaving the local government with an unfunded mandate? Such agreements can be time consuming, distracting and costly and so are not the answer in all cases. But they may be worth considering for assets with long lives, projects with considerable risk, and collaborations with new partners.

What do we want from each partner? For example, do we want private financiers to just provide the finance? Or can they also promote innovation and help ensure the project runs efficiently? Clear roles and responsibilities are essential to realise the potential benefits of these models. For example, the potential efficiency improvements offered by the private sector must be balanced with the maturity of the regulatory framework and political processes, the higher cost of private finance, and the potential for information asymmetries, higher transaction costs, and incomplete contracts (Poole et al. 2014). If contracts are designed properly, private investors have an incentive to execute an infrastructure project efficiently—it increases the likelihood that their investment is safe

and as profitable as expected. The challenge for project owners, and hence the public sector, is to design contracts that distribute risks and returns in an incentive-compatible way (Ehlers 2014).

What constraints does each project partner face? Are there legal or practical capacity constraints? For example, while there might be a willingness to provide *funding* to a project, a local government's capacity to contribute may be limited by rate caps. A private developer's capacity to contribute to *financing* a project might be limited by government policy which limits private sector ownership or financing for water projects. A government partner might be willing to support a good project, but *funding* is limited and there may be better water projects, road projects or health projects competing for the funds. Government provision of *financing* might be constrained by self-imposed debt caps.

Clear roles and responsibilities should inform asset ownership decisions. Key to ensuring a solution delivers value over its lifecycle is clear allocation of responsibility for levels of service, asset ownership, maintenance and disposal. Clarity is important for ensuring appropriate funding is available over time. Being vague can lead to significant surprises or loss of levels of service. It may also impact availability and the cost of finance.

An asset owner may be different to the party that's responsible for an outcome or a risk. For example, a private sector partner may build, own and operate a recycled water treatment plant on behalf of a water utility that is accountable for financing and funding the supply of recycled water to customers.

1.5 Identify the project risks and how they should be allocated to each partner

1.5.1 How does this assist funding and financing?

A project's appropriate funding and financing approach is heavily influenced by project risks—the kinds of risks and who is responsible for managing them and wearing the consequences of them. Project risks include construction risks and operating risks. Construction risk is the probability that an asset will be built on time and on budget. For example, constructing a water distribution network on a greenfield site has a relatively low construction risk; constructing a water recycling plant using state of the art technology on a brownfield site would be more risky. Operating risk is the probability that an asset can be operated at the expected level for the expected running cost and generate the expected revenue over its life. For example, mitigating flood via a number of retarding basins may have lower operating risk than a new levy on a geological fault line. Generally, the higher the project risk, the more likely the optimal finance solution will be skewed towards equity; the lower the risk, the more likely it will be skewed towards debt.

Different *funding* mixes are also subject to different risk profiles. For example, funding from taxation and transfers is less risky (i.e. less volatile) than funding from user charges (which are subject to more uncertainty on volume and price). Funding that supports natural monopoly operations—such as regulated wholesale water provision—is lower risk than funding that supports more speculative operations such as property development. A funding source's level of risk in turn directly affects the cost of *financing*. For example, debt that is serviced by (i.e. interest and principal is paid from) low risk regulated access charges for wholesale water provision will be relatively cheap. Debt that is serviced by the returns of property development will be more expensive and so the project may need to be financed by more equity and less debt.

1.5.2 Discussion starters

Does each party understand the project's risks and how it may impact them differently in light of their roles and responsibilities? What is their risk appetite? For example, governments are likely to have a lower appetite for the risk that projects fail to deliver environmental outcomes than private sector developers and so may be willing to pay more.

Have risks and the sharing of risks been discussed up front with potential impact and response measures agreed by all parties to ensure no surprises? For example, if adverse weather events increase the cost of construction, which party or parties are responsible for providing the extra *funding*? If there is no extra funding, how can the

project be re-scoped and how will this re-scoping affect all partners? As another example, a purely volumetric tariff may support water use efficiency. But, when determining the appropriate *financing* mix, consideration needs to be given to the risk that the volume response is greater than expected. In this case, the project generates fewer funds, which in turn results in lower than expected shareholder returns or even difficulty servicing debt in wet years.

Are risks being managed or minimised? Risk management is the process of identifying and treating risks in a cost effective way. Risk minimisation is the process of trying to eradicate the exposure from risks. The goal should be to ensure the party best placed to manage a risk is the party responsible for that risk. A mismatch (i.e. a party is responsible for risks it is not well placed to control the likelihood of occurring and/or absorb the impact of the risky event) will increase the cost of *financing*. For example, a financier is well placed to manage the risk of changes in interest rates or exchange rates and the impact that has on the cost of financing a water recycling plant; a builder is best placed to manage the risk of changes in the cost of concrete; the water provider is best placed to manage the risk of recycled water meeting the agreed quality standards; and governments are best placed to manage the risk of changes in law that require higher (or lower) quality standards. The water provider may adopt an approach of minimising risk and seek to shift the risk to the financier. The financier may accept this risk, but because they are not well placed to manage it, they will require a higher return (i.e. they will charge a higher interest rate).

Step 2: Identify a broad range of options

A very broad range of funding and financing options is available, with an almost limitless number of combinations. As noted above, funding has primacy, with financing contingent on clear funding streams with a known risk profile. Funding availability (or lack of) will typically be a constraining factor for a project; currently, industry feedback suggests financing availability is unlikely to be a constraint in Victoria once funding is secured.

“There is no shortage of private sector capacity for financing IWM projects. The constraint seems to be around clarity on the source of funding. Financiers must be able to understand how their debt is going to be serviced and what risks surround that funding stream.”

Private sector financier

2.1 First secure funding

Figure 5 presents a simplified taxonomy of funding sources for IWM projects. Appendix 2 contains a more detailed matrix, including descriptions, examples, discussion of when they should be used, and a list of risks and things to consider. The list is not exhaustive and should be used as a guide.



Figure 5: Funding sources for IWM projects

2.1.1 How does this help funding and financing

IWM projects can unlock a broader range of benefits that can draw in additional funding sources. So, it is possible the right funding mix can make a previously unviable project viable. For example, a wetland investment that benefits society might not be viable without funding such as capturing some of the value created for

developers/property owners. Importantly, even in this case, the primary focus is on the net benefit to the community. The appropriate funding mix to make the project viable is a secondary consideration.

An entity's current funding mix is typically a good starting point for understanding their preferred funding mix. Most project partners will be mature entities and while unique, their funding mix will reflect their operating context, risk appetite and established approval processes and implementation systems. For example:

- The state government's funding mix is heavily skewed towards taxes (e.g. payroll taxes, stamp duties etc. accounted for almost 35% of the state's \$68 billion revenue in 2019-20). This mix reflects both its ability to levy taxes on its population and the appropriateness of taxes to fund goods and services with a high degree of public benefit (i.e. they are made available to and benefit all members of society). At the same time, this funding mix relies heavily on transfers from the Commonwealth Government (which account for almost half of Victoria's revenue). This result reflects federal–state financial relations—the Commonwealth has access to the largest sources of tax revenue (e.g. income tax, company tax, and goods and services tax) while states have high spending responsibilities (e.g. health, education etc.). User charges account for about 10% of the state's funding mix, reflecting the appropriateness of levying tariffs to fund goods and services where the benefits are more concentrated. Other funding reflects dividends from subsidiaries such as water companies and interest earned. [Environmental contributions](#) collected through water bills are another form of state government funding. Tranche 4 (spanning 1 July 2016 to 30 June 2020) collected \$537.1 million and funded a range of [activities](#) supporting delivery of the Victorian Government's Water for Victoria Policy.
- Similarly, broad based taxes (i.e. rates and charges) are the main source of funding for local governments, with some transfers and user charges. For example, taxes accounted for roughly 55% of the City of Melbourne's almost \$560 million revenue in 2019-20. User fees and fines accounted for about 22% of revenue, followed by transfers from Commonwealth and state governments and developers (15%). Smaller regional councils might rely more on transfers (e.g. roughly 35% of Strathbogie Shire's \$33 million revenue in 2019-20 was from transfers).
- Regulated tariffs are the primary source of funding for water utilities. Once approved, regulated tariffs provide a funding stream for a defined period with a known risk profile. An asset's inclusion in the regulated asset base and an appropriate weighted cost of capital provide confidence that finance can be serviced. Water utility feedback highlights the advantages of securing funding through regulated services. The Essential Services Commission (Victoria) advises clearly separating unregulated activities from regulated activities, from both an accounting and service provision perspective.
- Private property developers cannot levy taxes and typically receive trivial transfer amounts. Their revenue comes almost entirely from commercial market activities.

2.1.2 Discussion starters

While a good starting point, a partner's existing funding base is not necessarily the optimal funding base for every project, particularly given IWM projects may not be business-as-usual activities. So a broad range of options should be considered within what's possible (e.g. there is no point considering tax options for a private developer). The pros and cons of each type of funding outlined in Appendix 2 should be considered when deciding on the appropriate funding mix for a particular project.

Further, not considering alternatives stifles innovative solutions. Value capture in particular is a new source of funding that many governments are considering and which may improve the viability of some projects. For example, a new train station will provide benefits to local residents and will be reflected in high property values. Property values will also increase from an IWM project providing higher levels of flood protection and improved amenity. Taxes, user charges (e.g. a flat rate or property value-based charge) or developer contributions can be an effective means of capturing some of the value so that beneficiaries contribute to the cost. A common

challenge with value capture is quantifying the level of benefits and the boundary for beneficiaries. Flood mapping and understanding flood damage costs can increase opportunities to apply value capture to some IWM projects.

A landowner may modify their property in response to a local recycled water scheme—such as a golf course investing in works to use the recycled water. The water scheme has increased the value of the property and the business and so it may be appropriate for the golf course to contribute. Indeed, it may be in the interests of the golf course to contribute if the project will not go ahead due to lack of funding. Conversely, there may be negative benefits (i.e. costs) that need to be compensated for. For example, homeowners located near the new recycled water plant may incur extra costs to manage negative externalities such as noise or amenity impacts from scheme treatment or pumping assets. These costs are real and not considering them may mean a project fails to achieve its objectives (e.g. recycled water scheme connections) or see active resistance to the project. Transfers from beneficiaries or polluters to those negatively impacted to mitigate externalities or encourage certain actions (e.g. grants or rebates) may be a legitimate part of project funding to ensure its success.

A collaborative IWM planning process is key to identifying and quantifying a broader range of benefits, and unlocking opportunities for funding from third parties (such as private sector businesses, insurance companies investing to reduce the risk of claims, philanthropy etc.). Indeed, the willingness of third parties to commit funding is a tangible sign of the value they place on the project and can help secure government funding. State government interviewees noted co-investment is viewed favourably when allocating scarce funding.

Government may top up other identified funding sources to address funding gaps associated with public good outcomes (e.g. protecting environment assets for future generations), equity considerations (e.g. capacity to pay) or events outside normal operations (e.g. extreme weather events).

A key factor in considering options is the ability to implement the proposed funding mix. Legal and practical constraints were discussed above.

2.2 Then lock in finance

While financing often means different things for public and private entities, several general principles apply:

- Equity is built up over time from profits/surplus from operations or provided via an external transfer (injection) of resources.
- Debt is usually cheaper than equity.
- Debt must be repaid (serviced) within the agreed terms.
- Higher project risk or less secure funding increases the cost of debt.
- High debt—at a project, organisational or state level—can increase the cost of finance.

Figure 6 presents a simplified taxonomy of financing sources for IWM projects. Appendix 3 contains a more detailed matrix, including descriptions, examples, discussion of when they should be used, and a list of risks and things to consider. As with funding, the list is not exhaustive and should be used as a guide.

But unlike funding, changes to the financing mix are unlikely to make previously unviable projects viable. Funding is the revenue that pays for infrastructure—more funding (e.g. from identifying additional revenue stream or beneficiaries willing to contribute additional amounts) can support more infrastructure. In contrast, financing merely affects when we pay for infrastructure. The following simplified, hypothetical illustrates the difference. A \$1 billion project can be financed by collecting a special \$100 million tax for 10 years, which will deliver the asset in

10 years. Alternatively, it can be financed by borrowing \$1 billion to deliver the asset now; the debt is repaid over 10 years by levying a special \$100 million in tax. In both cases, \$1 billion in funding is available (generated through the 10-year special tax). Financing merely altered the timing of asset delivery.

2.1.1 How does this help funding and financing

While secondary to funding, financing must still be considered. Governments and businesses should focus on the right mix of financing that delivers the lowest cost within risk tolerances (referred to as balance sheet management).

Debt must be repaid. More debt increases the risk of not being able to make repayments (default). The higher the ratio of debt to assets available to help repay the debt (gearing), the higher the risk of default. Default has significant reputational, operational and financial consequences for public and private entities. The optimal level of debt for an organisation/government reflects the balance between accessing lower cost debt and the risk of default. An organisation with low debt levels relative to the optimal level (sometimes referred to as a 'lazy balance sheet') has a lower risk of not being able to service its debt, but is also arguably paying more than needed to finance its investment.

Each project impacts the organisation's overall level of debt. Publicly owned entities add to the overall level of state debt. High levels of debt (and risk) can reduce an organisation's or government's credit rating, which increases the cost of borrowing. Borrowing limits are often set to ensure publicly owned entities and the state overall maintain acceptable levels of debt. The difference between the current and capped level of total debt may limit a project's access to debt.

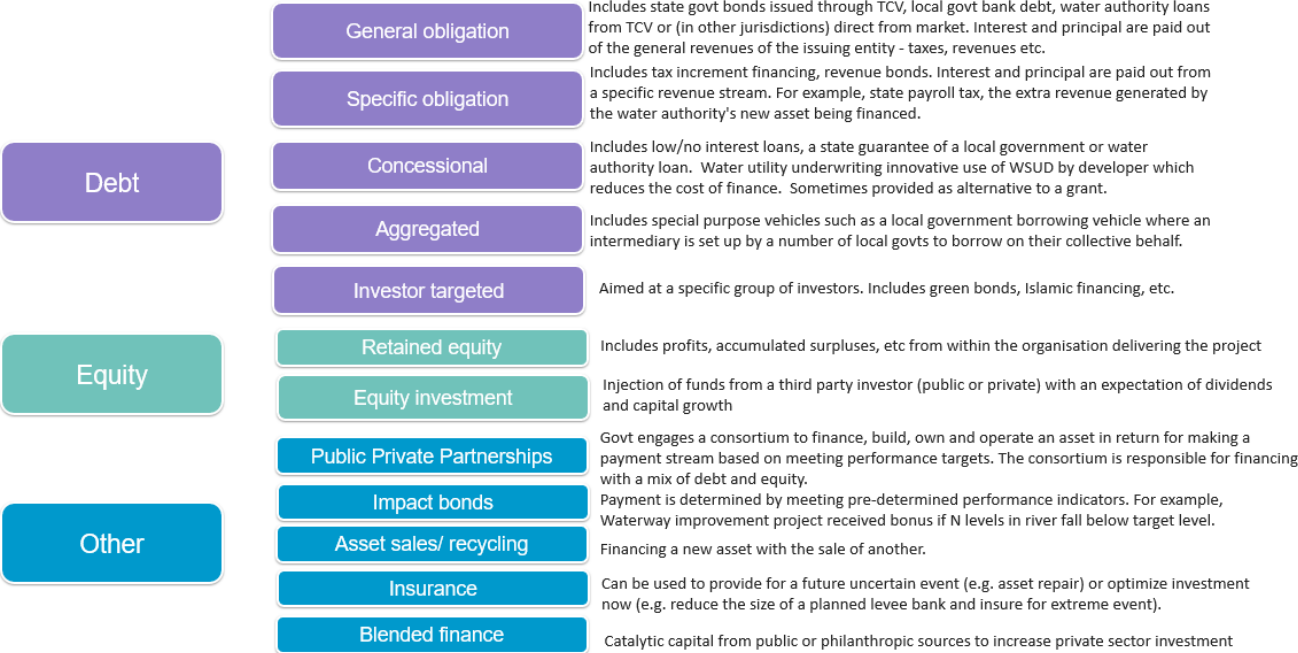


Figure 6: Financing sources for IWM projects

As with funding, an entity's current financing mix will typically be a good starting point for understanding their optimal project financing mix. Indeed, some use a weighted average cost of capital (WACC) as a hurdle rate of return for new projects, where the weights reflect target or actual gearing levels.⁷ Most project partners will be mature entities and while unique, their financing mix will reflect their operating context and management. For example:

- Concepts of debt and equity can be difficult for governments. For a private corporation, 'equity' involves actual ownership of the business. This is not the case for governments. Unlike equity owners of a business, voters are not entitled to any dividend stream. Nor can creditors easily seize a government's assets to meet their debt obligations. However, government surpluses are analogous to a corporate's profit and so can be considered a source of equity funding. While there can be benefits to governments using debt financing—such as bringing forward infrastructure spending and smoothing spending over the economic cycle—there are also costs—such as the interest costs and reputational risks/voter perception of increasing debt for future generations. Therefore, governments carefully manage their level of debt. Victoria's general government net debt was less than 10% of gross state product in June 2020 (representing about 65% of annual revenue), which is quite low compared with international peers. Rating agencies like Standard & Poor's and Moody's assess the credit worthiness of Victoria's debt, accounting for its operating environment. Standard & Poor's rates Victoria's debt at AA, the third highest level on its 22 point global scale. Reflecting this credit strength, Victoria has good access to global credit markets at cheap rates, so its debt is almost entirely in the form of low interest, fairly simple bonds.
- In Australia, local governments tend to finance less of their operations using debt than state governments. This is because the services local governments provide typically do not require as much infrastructure investment (limited to areas such as local roads, buildings such as libraries, and public spaces). In contrast, state governments are responsible for capital intensive services such as health (hospitals), education (schools) and transport (major road and rail). For example, the City of Port Phillip's net debt is less than 5% of revenue. Like the state, local government debt tends to be fairly straightforward. And it tends to raise debt via bank facilities rather than on international debt markets. because its debt needs are smaller.
- Private sector businesses have a stronger incentive than governments to use debt over equity. It is cheaper to pay a \$5 million interest charge from before tax income on a \$100 million loan than an \$8 million dividend from after-tax profit on \$100 million of shares. Regulated water businesses tend to operate in a relatively low risk environment and so their *financing* mix tends to be skewed towards cheaper debt (i.e. more highly geared). A land developer operates in a higher risk operating environment, so its financing mix will be more dominated by equity (i.e. lowly geared). This is because debt providers will be more cautious that the land developer will be able to generate the funding to repay the loan through higher risk property transactions and so will expect the owners of the property developer to provide more financing (equity) to mitigate this risk.
- As corporatised government owned entities, water business seek to adopt an optimal level of gearing that reflects the nature and risk of their activities. The Essential Services Commission (Victoria) has previously used a benchmark level of gearing (as measured by net debt divided by regulatory asset value) of less than 70% as one of several indicators of financial viability when setting water utility regulated prices.⁸

⁷ This practice is acceptable if the project represents a typical or average project.

⁸ Essential Services Commission (Victoria) 2014 (<https://www.esc.vic.gov.au/sites/default/files/documents/fc51a414-9fef-4ff3-812b-8c9772016bcc.pdf>).

2.2.2 Discussion starters

Again, while a good starting point, a partner's existing financing base may not necessarily be the optimal financing base for every project. So, a broad range of options should be considered within what's possible (e.g. there is no point considering a government raising equity by issuing ordinary shares). The pros and cons of each type of funding outlined in Appendix 3 should be considered when deciding on the appropriate funding mix for a particular project.

- Each project will have its unique set of circumstances. For example, it can be appropriate for a water business to finance a regulated asset upgrade via debt, but differences in risks/returns, regulatory frameworks and objectives may mean it is more appropriate to finance a commercial land development joint venture through equity (retained earnings).
- Further, not considering alternatives stifles innovative solutions. For example, public-private partnerships (PPPs) have provided opportunities to make government risk management more efficient, while delivering private sector expertise and innovation to design, construction, operation and whole-of-life maintenance. The financiers of the Victorian Comprehensive Cancer Centre PPP deliberately increased construction costs through higher quality, better design and innovation on the expectation that lower whole-of-life maintenance and operation costs will pay off over the life of the project.

Collaboration on financing can also reduce the risk and the cost of finance, and increase the range of options. For example, the Municipal Association of Victoria worked with a number of Victorian local governments to negotiate better terms for their collective borrowing. These sorts of collaborations can increase project size, diversify project risk and increase negotiating power, open up new financing options and reduce financing costs

Another option is parties providing contingent support. For example, the Victorian Government provides finance support to water utilities by undertaking their corporate treasury functions. In other words, Barwon Water does not access debt markets directly. Rather, it borrows from TCV which manages a whole-of-government portfolio and borrows from the markets on behalf of all of its clients. Barwon Water debt financing is cheaper than if it borrowed in its own name. (Because TCV is guaranteed by the state, it can access debt at cheaper rates because investors regard government debt as being less risky than water utility debt. Also, TCV benefits from the economies of scale and portfolio advantages of managing a large debt portfolio, compared with the case where its clients issue separately.)

Insurance has been included in the list of financing options because it can be a means of determining when and how beneficiaries pay for a future uncertain event. For example, a local government could invest in works to address a 1 in 100 year flooding event now, it can wait and finance its response to the event when it occurs, or it can obtain insurance to cover for some or all of its recovery costs and pay over time. Some large organisations may self-insure some risks with funds (equity) set aside to address uncertain outcomes as they occur. To the extent an IWM project reduces risks, it can reduce the total cost of risk management and insurance. Insurers have also been identified as a potential source of funds for IWM projects when these projects improve overall risk management.

Step 3: Select preferred approach and develop an implementation plan

The final step brings together the existing business case analysis, the analysis of the operating environment conducted in step 1 and the options analysis of funding and financing in step 2, to identify preferred option(s) that are practical and implementable.

It is again worth stressing that considering funding and financing is not an exact science. Indeed, the whole IWM project process is not an exact science. Practitioners should use guides like this one flexibly and review assumptions and look for alternatives often. These guidelines will not make an unviable project viable, but the discipline of looking at a problem from different perspectives as outlined in the guide can help ensure a viable project is not unnecessarily abandoned.

Appendix 1 provides a handy checklist for combining these steps.

How does this assist funding and financing?

Practicality is the key to identifying a preferred solution. There is no point designing a ‘first best’ innovative solution that theoretically delivers the most efficient outcome if it is too difficult, costly or impractical to implement.

“Some funding and financing solutions are clearly not appropriate in the Australian case and for some specific assets.”

Discussion starters

Infrastructure Victoria

In most cases, *funding* based on aligning payment for the asset with the beneficiaries of the asset is the primary funding objective. A key feature of IWM projects is that the benefits do not always align with asset ownership, which if not managed properly can result in viable projects not going ahead. For example, an upstream council may have responsibility for a water sensitive urban design asset that delivers mainly downstream benefits. This situation may raise the need for a transfer between the parties, or for parties to take a whole-of-catchment perspective and see this project as one of several jointly funded projects delivering value to the whole catchment (and its manager) or even the whole state.

A range of strategic objectives are possible and sometimes tradeoffs are needed. For example, the efficiency gains of having beneficiaries pay must be balanced against whether that is equitable and/or whether they have the capacity to pay. It is also important to be clear and understand the risks and costs of pursuing these objectives. For example, should water tariffs more accurately reflect the cost of using a marginal litre of water or should consumers have affordable and reliable access to a certain level of usage? Sometimes, it's important to address objectives separately; for example, a concession scheme can be used to ensure low income customers have affordable water bills while the usage-based component of the bill encourages efficient water use.

In most cases, minimising *financing* costs relative to the level of risk is the primary financing objective. Good risk management benefits the project overall and is essential for securing finance at reasonable cost. The finance decision is about allocating risks to the parties best able to manage them. Doing so reduces the cost of finance and improves the efficiency and viability of a project. However, it is very unlikely the finance mix will make an unviable project viable.

Other strategic objectives are possible (e.g. pursuing a green bond to support government or corporate sustainability or social outcomes) but it is important to be clear and understand the associated risks and costs. For example, in the current low interest environment, green finance sources have a limited cost advantage so the reason for choosing this option should be clear.

Consider the following factors when comparing 'first best' and 'second best' options:

- **Complexity.** For example, the 'first best' conceptual funding solution for a state government sponsored major IWM project may be levying a special land tax. However, designing and implementing this funding scheme will be complex. Similarly, a polluter pays charge for nitrogen discharges to a waterway might create an incentive to reduce pollution, but to be effective it must be underpinned by deep understanding of local conditions and supported by appropriate measurement, education and billing arrangements. In both cases, a simpler 'second best' option may be a more appropriate solution particularly in the short term or as a transition measure. A short term, less complex, second best approach also could be coupled with a pilot project that builds technical understanding and stakeholder acceptance as part longer term more sophisticated approach (e.g. introducing a low nitrogen charge as a pilot, with appropriate information and support, to polluters above a certain threshold or in a defined hot spot area. Over time the charge could be refined, increased and more widely applied).
- **Stakeholder considerations.** For example, the land tax option above may attract public criticism from those whose primary place of residence was previously exempt from the tax particularly where this is done without appropriate consultation, justification and transitional arrangements. Similarly, stakeholder engagement in relation introducing a nitrogen charge will be essential to ensure the design is effective and the implementation is fair particularly where changing behavior (e.g. changing production processes or contractual arrangements) is difficult in the short run.
- **Technical capacity.** For example, introducing a new tariff structure (e.g. a property value based charge) may ensure beneficiaries pay in proportion to the benefits they receive but may also be very expensive to administer and maintain and may add revenue risk because the organisation may not currently have the required expertise, information or billing system capability. Pooling of expertise either formally (e.g. joint ventures or MoUs) and informally (e.g. communities of practice) across organisations on shared issues (e.g. demand forecasting, tariff and bill design) is a common way of optimizing available technical capacity, reducing risk and disseminating better practice, particularly for small or publicly owned entities.
- **Scale.** Is funding and financing being considered at the most efficient and effective scale? Should projects be considered individually (e.g. if they are very large, complex or have significant strategic/risk implications) or as part of a broader program. Grouping projects under an overarching strategy and customer/regulatory requirement is particularly important for regulated water business but an integrated program can also reduce the overall funding requirement. Grouping projects can also achieve a scale where more the costs and complexity of more sophisticated 'first best' funding and financing mechanisms (e.g. public-private partnerships) are justified. Consultation with finance experts also suggests that it is often easier and lower cost to finance one large group of projects through lower transactions costs and where diversification across a portfolio of projects can reduce risk. Regional local governments or water authorities may collaborate and seek joint funding for a group of similar IWM projects initiatives.
- **Authorising environment.** For example, private sector equity, asset recycling or PPPs may all be an effective way to finance water sector investment, but may not be consistent with government policy. In this case the IWM practitioners must either work within existing constraints or collaborate with others to build the evidence base and support for reform.⁹

⁹ CRCWSC Think Tank papers on [Utilities of the Future](#) and hybrid solutions for [Transformative Cities](#) provide advice for both scenarios.

A final note on how to use this guide

The steps outlined in this guide aim to ensure objectives are clear and a broad range of options can be considered against a shared set of objectives and a common understanding of contextual factors. The guide provides a structured process and a menu of options, rather than a prescriptive approach.

An almost infinite number of funding and financing options can be available to project proponents. There is little point agonising over which ‘box’ a type of financing belongs in—indeed hybrids and variations are common. Plus, funding and financing can overlap—for example, asset sales have funding and financing characteristics. Also, a specific project may have overlapping layers of funding and financing for different players:

- A water corporation might finance a flood mitigation scheme through a mix of retained earnings, borrowing money from TCV, and an equity injection from the state government owner.
- The state government might fund its equity injection via broad based taxes and savings from reduced spending on another environmental initiative.
- TCV might source the financing of its loan to the water corporation by drawing on its existing general obligation bond portfolio and via green bond.

We encourage project proponents to see the categorisations as illustrative; they are instructive but not absolute. They are intended to help start conversations and explore options with greater confidence.

As a final observation, the principles and approach to IWM discussed in this guide can be applied to a broader range of infrastructure needs. The Department of Premier and Cabinet, the Department of Treasury and Finance and Infrastructure Victoria all supported the IWM principles.

“The principle of multiple parties identifying multiple costs and benefits and the opportunity to make transfer payments to allow for this could extend beyond water projects to a more place-based approach to infrastructure. For example, consider the water and road needs and how they are related.”

Infrastructure Victoria

“Integrated water management is a subset of broader precinct planning. Treasury would like line agencies to go further and consider a fully integrated (precinct) approach. A precinct approach is conducive to unlocking co-investment from third parties.”

Victorian Department of Treasury and Finance

Appendices

Appendix 1: Funding and financing plan summary table

Use this table to summarise the key elements of your funding and financing plan.

Project review	
What are the project objectives?	
Why is this project the best solution and how was it identified?	
Who are the partners with an interest in the project?	
What are the key project risks and who will manage those risks?	
Project context	
What are the broader and industry specific operating environment issues that will impact the project?	
How are the objectives of each partner the same/different?	
How are lifecycle benefits and costs shared between different stakeholders, locations over time?	
Funding	
What are the funding objectives?	
What is the cost sharing principle (beneficiary, polluter, capacity, a combination of these)?	
What funding options have been considered?	
Are there any free riders or benefits that can be monetised?	
Describe preferred funding options	
This is the preferred funding option because...	
Implementation will be efficient, practical and fair because...	
Financing	
What are the financing objectives?	
What financing options have been considered?	
Describe preferred financing options	
This is the preferred financing option because...	
Implementation will be efficient, practical and fair because...	

Appendix 2: Funding options matrix—what to use, how and when?

Tariffs				
Type of funding	What is it ...	Examples include ...	Good for ...	Be mindful of ...
Usage charges	Consumer pays based on their level of consumption or use of the service	<p>Variable component of water bills based on usage</p> <p>Trade waste charges for large industrial customers based on discharge load or concentration</p> <p>Toll road charge based on sections used</p> <p>Peak/off peak charges for electricity based on time of use</p>	<p>Sending price signal to incentivise:</p> <ul style="list-style-type: none"> -Efficient resource and asset investment and use where prices reflect marginal costs (e.g. Melbourne Water wholesale trade waste charges) -Reduced use through penalty pricing (e.g. inclining block water charges or stormwater charges based on impervious area, NSW trade waste charges) -Increased use (e.g. declining block water charges or free water allowances) -Time shifted use (e.g. peak pricing) to better distribute demand, lower peak demand, and lower the need for investment <p>Excludable services (i.e. not a public good) where there is an observable and measurable link between costs and benefits</p>	<p>Degree to which operating and investment costs vary with use</p> <p>Is usage data accurate and confidence in forecast future use high</p> <p>Can be administratively expensive to implement and administer if complex and/or small</p> <p>Transition plan is important—a strong focus on efficiency can lead to price shocks or affordability concerns.</p> <p>Capacity to pay, inelastic demand, infrequent or inaccurate billing may constrain ability to send meaningful price signals or recover costs</p> <p>Price signal should be part of a wider behaviour change program (incl. education, marketing, rebates, etc.)</p> <p>Avoiding prices double counting or unintended consequences associated with different elements of the water cycle (e.g. lower water use increasing sewage concentrations and treatment costs)</p>

36 | Bridging the IWM funding and financing gap

<p>Access charges</p>	<p>A fixed amount paid for access to the service (or network)</p>	<p>Fixed charge on water bill Electricity network charges Melbourne Water drainage and waterways charge Parks Victoria fixed charges</p>	<p>Ensuring costs recovery for availability, reliability and long term security of essential network services (e.g. water supply, electricity grid, telco network) Low cost to introduce and administer is a high priority Cost recovery (rather than behaviour change) is the priority Services have some public good or externality element Data quality on usage is poor Costs are unresponsive to level of use Customers receive a uniform level of service</p>	<p>May not be set or maintained at full cost recovery level Process for setting prices critical where significant monopoly or public good elements are present May lead to inefficient use (e.g. asset sized for peak demand resulting in periods of underutilisation)</p>
<p>Developer charges and offsets</p>	<p>Developer contributes to the incremental cost or benefit of expanding a network or reducing the additional impact of their connection</p>	<p>Developer (cash or asset) contributions for water, sewerage and drainage services Nitrogen offset charges levied on new developments by Kingston and Melbourne City Councils and Melbourne Water Native vegetation offsets</p>	<p>Ensuring developers who benefit from the expansion of the network also contribute to the cost of that expansion Capital intensive structural infrastructure solutions Offsets can encourage more efficient management of the impacts of a development e.g. enabling a reduction in environmental values in one area to be offset by an increase in values elsewhere System expansion and new customers impose a material cost and generate material benefits. Can send a price signal about the economic cost of development in different locations (e.g. flood prone areas)</p>	<p>Funds collected upfront may not be available when maintenance renewal needed (even is included in the net present value) Future costs should be known with confidence to establish a fair price Capacity to pay may be an issue and below cost prices can incentivise undesirable investment</p>
<p>Additional value streams</p>	<p>Additional benefits and value adding activities generated by regulated IWM investment</p>	<p>Charges for biogas or electricity from sewerage treatment plant upgrade</p>	<p>Projects yield multiple benefits that can be commercialised Additional service offerings are close to existing organisational expertise or new</p>	<p>Risks associated with offering new services or participating in new markets outside traditional core business</p>

		<p>Lease payments for access to new recycled water treatment plant buffer zone for horticultural activities</p> <p>Property development on remediated land or where flood protection has been reduced</p>	<p>expertise can be acquired (e.g. joint venture, consultants, recruitment)</p> <p>Increasing income and strengthening overall business case</p>	<p>Views of economic regulator about the appropriate treatment of associated costs, revenue, risks and returns</p>
--	--	---	--	--

Taxes				
Type of funding	What is it ...	Examples include ...	Good for ...	Be mindful of ...
Value capture	Taxes and charges imposed on property owners near new piece of infrastructure (e.g. railway, transport hub, flood protection works)	Melbourne Metro tunnel development levy	<p>Ensuring those who benefit from an investment contribute to its cost when the investment benefits a relatively narrow set of asset owners, they can be readily identified, and the value impact can be rigorously measured</p> <p>Most useful when the asset owner benefits from increased value even if they are not a large user of the asset (compared with a user charge which is more effective if they are a user)</p>	<p>Practical application can be challenging (e.g. identifying boundary and level of benefits)</p> <p>Increased value does not always generate increased revenue and so property owners may face difficulty in paying (e.g. the property owner will not realise the increased value until they sell the property—perhaps in 10 or 20 years)</p> <p>Becomes increasingly complex and collects less net funding if there are asset owners who suffer a loss in value that may need to be compensated</p>
Broad based taxes	<p>Taxes that go into consolidated revenue</p> <p>Property taxes charged by state, city or municipal governments</p> <p>Levied on a broad catchment (e.g. all income earners, all consumers)</p>	Federal income tax, company tax, goods and services tax; state payroll tax, stamp duty etc.	<p>Public goods and services delivering widespread non-excludable benefits</p> <p>Can be efficient and non-distortionary (low rate, broadly based)</p> <p>Can be applied to address equity objectives (e.g. progressive income tax or tax paid proportional to property value)</p>	<p>Administration and implementation costs</p> <p>Measures to manage capacity to pay issues</p> <p>Tax base may not align with beneficiaries or polluters</p> <p>Intergenerational equity may be an issue (e.g. short term increase)</p>

			<p>Seeking a stable revenue stream (revenue collection based on economy-wide conditions rather than the use of a specific asset)</p> <p>Responding to uncertain extreme events that have regional or national implications and very high costs</p>	<p>in taxes to fund long-lived assets and long term benefits)</p> <p>Adequacy of existing tax base given other calls on the revenue</p> <p>Adverse consequences from changes to broad based taxes (incentive to work, incentive to move to other jurisdictions, incentive to avoid tax etc.)</p>
Specific purpose taxes	<p>A specific tax where the revenue raised is hypothecated to expenditure on a defined purpose</p> <p>This approach differs from the classical method which draws all government spending from a consolidated fund</p>	<p>Temporary Flood and Cyclone Reconstruction Levy applied for the 2011-12 financial year</p> <p>The Fire Services Property Levy collected by local councils via rates notice</p>	<p>Raising funds for a high profile, large scale event that usually has high community visibility and support such as drought or bushfire response</p> <p>Linked to an infrequent, well defined and time bounded investment or expenditure</p> <p>Public goods delivering widespread non-excludable benefits e.g. disaster response</p>	<p>A short term measure becoming a long term tax</p> <p>Administration can be costly particularly if complex</p> <p>Tax base may not align with beneficiaries or polluters</p> <p>Intergenerational equity may be an issue (e.g. short term increase in taxes to fund long-lived assets and long term benefits)</p> <p>A mismatch between collection and spending needs can occur. While true of all sources of funding (as it is never possible to perfectly forecast collection) it can be a significant problem for specific purpose taxes (and charges) because they are typically legally limited in how they can be spent. As a consequence, over-collection can result in inefficient spending, or under-collection can result in funding shortfalls.</p>
Tax concessions	<p>Reductions in tax payable</p> <p>Creating incentives for defined actions or outcomes</p>	R&D tax concessions	Can encourage desired behaviour	Can lead to unanticipated outcomes if not well designed

and deductions	Support for defined groups of people or types of businesses		Can encourage co-investment increasing the return on government expenditure	Involve costs to establish and administer Government not historically good at 'picking winners'
----------------	---	--	---	--

Transfers				
Type of funding	What is it ...	Examples include ...	Good for ...	Be mindful of...
Government grants	Payment (cash or in-kind) from government to another party (including another level of government, private citizen or business or community group) for a specific purpose without expectation of repayment	<p>Investment in large flood protection works delivering national benefits or where flooding rivers cross provincial boundaries.</p> <p>Support to roll out a nationally consistent river monitoring or flood warning system</p> <p>Emergency response to extreme events (e.g. drought, bushfire, flood)</p> <p>DELWP Aboriginal Water Grants program</p> <p>Showerhead exchange programs</p> <p>Healthy Rivers Incentive Program</p>	<p>Supporting local actions that have large scale benefits</p> <p>Government funder may not be the asset owner but has a real or publicly perceived responsibility for outcomes</p> <p>Investment may be particularly large and/or lumpy or uncertain and so the asset owner will be unable to fund otherwise (e.g. a small rural water corporation)</p> <p>Addressing instances where there is a significant mismatch between those who collect the revenue and those who have responsibility for the investment (e.g. GST revenue and government service delivery)—vertical fiscal imbalance</p> <p>Ensuring a consistent minimum level of service in different locations—horizontal equity</p>	<p>Increased confusion regarding responsibility and accountability (party providing funding may want increased control over how it is spent)</p> <p>Can reduce efficiency by skewing investment decisions (e.g. asset owner may not be able to secure funding for preferred investment but may get funding for second- or third-best investment)</p>
Costs transferred to the private sector	Instead of government funded action, the government introduces a regulation, law or enforceable requirement	<p>Local government or planning authority regulation in relation to building construction standards</p> <p>Requirements for on-site treatment of industrial waste rather than discharge to sewer</p>	<p>Addressing market failure e.g. where private actions may impose externalities for others</p> <p>Where regulation is more cost effective and efficient than taxation or charging, and action by private sector represents</p>	<p>Inefficient cost shifting</p> <p>Implementation cost and unintended consequences of regulation</p>

40 | Bridging the IWM funding and financing gap

	resulting in additional costs to private sector entity		least community cost response e.g. building homes with higher commercial development floor levels has a lower cost than constructing a large levee	
Costs transferred to community	Instead of government funded action, the government introduces a regulation, law, enforceable requirement resulting in additional costs to households and community groups	Community contributing time and effort to constructing and maintaining parks or shared community assets	Can encourage active community engagement and action from those who may receive most of the benefits Most useful where 'in-kind' contributions are just as—or almost as—effective as cash contributions (e.g. citizens are able to come together and do it themselves)	May not lead to the most efficient, effective or fair allocation of costs if not well designed. Safety and capacity building should also be considered in design May lead to community resistance if not well designed and communicated or cognisant of community capacity to pay
Transfers from other programs	Savings identified through budget process	Remaining within overall budget cap	The planned expenditure is higher priority than existing items	Unintended consequences and opportunity cost of cancelled programs Efficiency and equity consequences of where the savings come from (e.g. geographical—Goulburn Valley vs Gippsland; within portfolio—flood protection vs native species protection; within government—flood protection vs more teachers etc.)

Appendix 3: Financing options matrix—what to use, how and when?

Debt				
Type of financing ...	What is it ...	Examples ...	Good for ...	Be mindful of ...
General obligation	Debt is raised by a government or business (an 'issuer') at terms and conditions determined by the market Debt is serviced using general revenue	Treasury Corp Victoria 10-year bond; TCV 90-day note; bank debt	Usually the cheapest form of debt with the fewest strings attached (covenants) If an issuer is willing to provide security (i.e. bank can take ownership of and sell an asset if debt service is not timely) it may reduce the cost of debt further	Bonds typically require very large debt portfolio to be efficient (\$50 million plus) Banks can require covenants which restrict government/business flexibility (e.g. failure to keep debt below a certain level, or to keep surpluses or profitability above a certain level can enable the bank to call in debt repayment early)
Specific obligation	Securitize (legally isolate) a portion of government revenue or business revenue (e.g. debt is serviced exclusively by the government's payroll tax)	Not used in Australia, but 'revenue bonds' are a large part of the US municipal debt market	Hypothetically could alter the risk/reward balance: <ul style="list-style-type: none"> • Could reduce the cost of debt to the issuer by giving the lender access to low risk revenue streams (e.g. payroll tax is less volatile than total government revenue) • Could enable issuer to reduce risk by offloading the risk from more highly volatile revenue (and hence increase cost) on general obligation debt by stripping out high risk revenue streams (e.g. transaction tax like stamp duty) 	Likely to be a zero sum game—reducing the cost of specific obligation debt by pledging against payroll tax should be offset by higher cost of general obligation debt because it is being serviced by riskier revenue (all revenue except payroll tax in this example) In aggregate, the same amount of debt is being serviced by the same amount of revenue; it is just split into different buckets

42 | Bridging the IWM funding and financing gap

Project finance	Debt is raised to fund a specific asset and the debt is serviced exclusively using the revenue generated by that asset—if revenue is not enough the debt holders do not get paid in full, and they do not have any recourse to the issuer’s other revenue or assets	Infigen Energy’s Bodangora wind farm Public–private partnerships are a special kind of project finance (discussed more below)	Often used by corporates to fund large and often risky infrastructure projects to protect the rest of the business against failure of the business. It is used a lot in the mining and infrastructure sectors. It is less used by governments (except for public private partnerships discussed below)	Will most likely be a more expensive cost of debt than general obligation debt (depending on the credit quality of the business relative to the project) Large and legally complex and so transaction costs are high Complexity increases the chance that the business does not fully understand its risks Debt can be refinanced once project moves from riskier construction phase to less risky operational phase
Concessional	Debt is provided at terms more favourable than normal market rates. This can be in the form of direct support (e.g. borrowing at an interest rate lower than could be accessed on the open market) or indirect support (e.g. accessing market debt but benefiting from a third party guarantee from another level of government).	Commonwealth Drought Concessional Loan Scheme Commonwealth–State Housing Agreement Loan Northern Australia Infrastructure Facility	A low cost way of providing support for an investment that is desirable from a policy perspective. For example, a loan may be preferable for the entity providing support than a grant; a loan guarantee may never be called and so in this case there is no actual financial outlay by the guarantor.	Can lead to competitive neutrality complications if the funding is used to support commercial operations of a state-owned enterprise Reduces flexibility—entity providing support will probably want some degree of control on how the debt is used and some ongoing oversight In some cases, access to the concessional rate may be linked to undertaking specified actions, performance levels or outcomes Although guarantees may get the liability ‘off balance sheet’, investors and auditors are increasingly aware of this behaviour so it should not be a primary driver

<p>Aggregated</p>	<p>A central borrowing authority borrows money and on-lends to participating entities</p>	<p>Treasury Corp Victoria Municipal Association Victoria's Local Government Financing Vehicle</p>	<p>Enables smaller entities to benefit from economies of scale. For example, a rural water authority will get a lower cost of debt borrowing from TCV than accessing markets directly Enables even small entities to reduce risk by spreading debt maturity across a number of years rather than being concentrated Can reduce risk through a portfolio effect and hence cost of debt—e.g. the credit quality of debt backed by a number of local governments will be better than debt backed by a single local government Enables centralisation of risks associated with debt management</p>	<p>Can be legally complex and costly to establish Depending on the vehicle, participating entities can be liable for the debts of other participating authorities (e.g. if a council is unable to meet its contribution to the borrowing authority debt service, the other participating entities may need to support the shortfall)</p>
<p>Investor targeted</p>	<p>Debt is structured in a way to access a specific type of investor</p>	<p>Green bonds, such as Victoria's 2021 \$300 million 1.75% 5-year bond Islamic Financing (sukuk)</p>	<p>Accessing a group of investors that might not otherwise lend to an issuer could reduce the cost of debt, especially if there is an altruistic benefit (e.g. an investor may accept lower than market terms if the proceeds are used for 'green' purposes</p>	<p>There will be a cost relative to general obligation bonds from extra compliance (e.g., auditing to ensure the funds are used for the purposes stipulated) and lower liquidity By definition, it reduces the flexibility over how the financing is applied</p>

Equity				
Type of financing ...	What is it ...	Examples ...	Good for ...	Be mindful of ...
Retained earnings	Investment is financed through normal operating cashflow surpluses (profit for corporates, surpluses for governments)	In fiscal 2018-19, the Victorian General Government sector generated cash from operations of \$7.1 billion which was available to finance infrastructure spending	Provides the most flexibility as the funds are generated from business-as-usual operations and can be invested in the normal course of business without the extra risks associated with debt or equity injections	Good for business-as-usual investment but struggles to cover unusually large investment need—particularly for a smaller corporates
Equity injection	Corporation's owner (e.g. state government) makes an investment in the corporation to facilitate a capital investment and in return the owner expects to make a return on that investment in the form of a dividend if the corporation remains profitable. This is in contrast to a grant where there is no expectation of return and a loan where the investor's debt must be serviced (i.e. interest paid) regardless of profitability.	In 2018-19, the Commonwealth Government made a \$195 million equity investment in Australian Rail Track Corp to support Inland Rail and \$96 million to support the Adelaide to Tarcoola re-railing project.	Most appropriate where there is a high degree of risk associated with the investment (and so debt would be deemed too risky)	Equity injection must be funded by the parent. For a government parent this is likely to require going through a full budget process where the investment is assessed in competition with other calls on government funds (i.e. is the priority this investment or a competing program to support the environment, health or education). Therefore, it may not receive financing even if a viable investment because the government determines there is a higher priority elsewhere requiring financing. Typically put through the formal annual budget process and so may not be timely. Equity is a more expensive source of finance than debt—an investor making an equity investment will expect a higher return (dividend) than an investor making a loan (interest).

Other				
Type of financing ...	What is it ...	Examples ...	Good for ...	Be mindful of ...
Public-private partnerships	A special kind of project finance. The government contracts the private sector to design, build, finance and maintain infrastructure and provide services. Payment is based on the services delivered and conditional on meeting performance standards. PPPs always have a clear and enforceable risk allocation.	\$77.6 million Barwon Water Biosolids Management project, \$11 billion Metro Tunnel project, \$946 million Royal Children's Hospital project Victorian desalination plant	Facilitates private sector innovation in asset design, delivery and maintenance Allocates risk to the party best placed to manage it (e.g. private sector absorbs most construction cost overruns) Provides budget certainty for construction and operating phase	Large and complex transactions to establish and monitor, resulting in high transaction costs Offloading risk to private sector comes at a higher cost of finance compared with general obligation bonds Allocating risk to party best placed to manage it is efficient; minimising government risk is not PPPs work well when outputs and level of service can be well defined and innovation needed
Social/environmental impact bonds	Private investors finance a social project, with their return determined by performance against key performance indicators	Compass Leaving Care's \$14.2 million project, developed by Anglicare Victoria and VincentCare as part of the Victorian Government's Partnerships Addressing Disadvantage initiative. The project provides young people leaving care with housing and specialist support to help them make a successful transition to adult life and prevent youth homelessness. Private investors receive a return of 3.5% for the first three years then a return based on housing, health and justice outcomes and ultimately asset sales.	Brings private sector expertise, innovation and discipline to the provision of public services with complex and long term goals Focuses government policy on outcomes rather than outputs or inputs	Still in their infancy/pilot phase and so risks and operational issues not yet fully understood by government sponsors, community operators or private investors By their nature, outcomes will be difficult to measure and set at appropriate levels
Asset sales/recycling	A form of equity financing—an entity may have funds tied up in an asset which is deemed no longer core and the asset could be more	The Victorian Government sold a 50-year lease on the Port of Melbourne to a private sector consortium in 2016 for \$9.7 billion. The	In an environment of limited capital, asset sales ensure that scarce resources are used for their most efficient means. This can lead to	Private sector purchasers of the asset will be motivated to maximise profit and so the regulatory environment must support a government's broader aims.

	<p>efficiently utilised by someone else. Governments and businesses can sell such assets and use the proceeds to finance other investments.</p>	<p>proceeds were used to finance level crossings and regional infrastructure.</p> <p>Governments and government owned businesses often have large land holdings and sell these to private players rather than 'landbanking'</p>	<p>better service outcomes through innovation, lower cost through efficiency and/or competition, and expansion through new sources of capital.</p>	<p>Decisions to sell must be made with a view to the very long term. For example, what might be excess land in a remote peri-urban area today may be a good location for a school in a rapidly developing area in 20 years. May be policy or legal prohibitions on some sales (e.g. Victorian Constitution prohibits sale of state owned water utilities)</p>
<p>Insurance</p>	<p>To avoid 'over-investing', an option is to insure against events rather than build an asset to avoid the event (i.e. rather than pay a lender interest to finance an asset, pay an insurer a premium to accept the risk that an event will happen)</p>	<p>Rather than build flood mitigation assets to avoid the damage caused by a '1 in 100' flood event, a water corporation could insure against the event by ensuring any payout is adequate to cover the damage cost</p>	<p>Can be an efficient way of managing risk—building a large asset that may never be used is an inefficient use of capital; insurers are in the business of accepting, managing and spreading risk</p>	<p>Insurance payouts typically have a large deductible that must be funded at short notice in an emergency It is important to understand any exclusions or carve-outs that will reduce the cost of the insurance but may not provide adequate cover or could lead to undue time delay in receiving payment In an emergency, there is a risk that the insurer may not have the ability to pay (e.g. in 2001 Australia's second largest insurer, HIH Insurance, went in to liquidation with losses of more than \$5 billion) While insurance might be currently affordable and efficient, there is a risk that a specific type of insurance will become prohibitively costly or even unavailable in the future</p>

<p>Blended finance</p>	<p>Hybrid instruments including 'debt with equity-like characteristics' and 'equity with debt-like characteristics'</p>	<p>Not often used in Australian public finance, but hypothetical examples include:</p> <ul style="list-style-type: none"> • senior debt—debt payments are first made to this senior debt, then general obligation debt is serviced with whatever is left over and so the cost of debt will be lower than general obligation debt • subordinated debt—debt payments are made to senior debt, then any left is paid to general obligation debt, then any left over services subordinated debt and so it will have a higher cost than general obligation debt • preference share—debt is serviced first, then any leftover pays a dividend to preference shareholders, with ordinary shareholders receiving what is left 	<p>Increasing the investor pool by stratifying the source of financing into different risk-return buckets. Some investors will want lowest risk and accept lowest return. Some may be willing to take on higher risk in exchange for higher return.</p>	<p>Difficult to design equity-like characteristics for a government or government owned entity</p>
------------------------	---	--	---	--

References

- ABS (Australian Bureau of Statistics) 2018a. *Australian demographic statistics*, Cat. no. 3101.0, Canberra: Australian Government.
- ABS (Australian Bureau of Statistics) 2018b. *Population projections, Australia, 2017 (base)–2066*, Cat. no. 3222.0, Canberra: Australian Government.
- Aither 2017. *Urban water pricing reform: National urban water pricing standards and implementation pathway*. Melbourne: Aither.
- AMP Capital 2018. [How private savings can rehydrate Australia's parched water infrastructure](#). Insights paper. Sydney: AMP Capital.
- AWA (Australian Water Association) 2017. *Alternative models for financing water infrastructure: Water security for all Australians*. Discussion paper. Sydney: AWA.
- BCA (Business Council of Australia) 2013. *Securing investment in Australia's future: Infrastructure funding and financing*. Melbourne: BCA.
- BITRE (Bureau of Infrastructure and Transport Research Economics) 2019. [Australian infrastructure statistics—Yearbook 2018](#). Canberra: Department of Infrastructure Regional Development and Cities.
- Browder G, Ozment S, Rehberger Bescos I, Gartner T and Lange GM 2019. *Integrating green and gray: Creating next generation infrastructure*. Washington, DC: World Bank and World Resources Institute, 2019.
- CRCWSC (Cooperative Research Centre for Water Sensitive Cities) 2015. *Ideas for Fishermans Bend*. Melbourne: CRCWSC.
- CRCWSC (Cooperative Research Centre for Water Sensitive Cities) 2020. *Wanyarram Dhelk—Bendigo Creek Restoration*. Melbourne: CRCWSC.
- Department of Environment, Land, Water and Planning 2017. *Integrated Water Management Framework for Victoria*. Melbourne: DELWP.
- Ehlers T 2014. *Understanding the challenges for infrastructure finance*. Working paper no. 454. Basel, Switzerland: Bank for International Settlements. Available from <https://ssrn.com/abstract=2494992>
- Essential Services Commission (Victoria) 2014. *Assessing the financial viability of Victorian water businesses: summary of views and proposed new indicator*. Melbourne: ESCV. Available from <https://www.esc.vic.gov.au/sites/default/files/documents/fc51a414-9fef-4ff3-812b-8c9772016bcc.pdf>
- Global Infrastructure Outlook 2020. *You are viewing investment forecasts for Australia*. Available from: <https://outlook.gihub.org/countries/Australia> (viewed 24 February 2021).
- Infrastructure Finance Working Group 2012. *Infrastructure finance and funding reform*. Sydney: Infrastructure Australia.
- Infrastructure Victoria 2016. *Funding and financing: draft additional information paper*. Melbourne: IV.

- Irwin TC 2007. *Government guarantees: Allocating and valuing risk in privately financed infrastructure projects*. Washington DC: World Bank.
- Jha JK, Bloch R and Lamond J 2012. *Cities and flooding: A guide to integrated urban flood risk management for the 21st Century*. Washington, DC: World Bank.
- Liang X 2018. 'Integrated economic and financial analysis of China's Sponge City Program for water-resilient urban development', *Sustainability*, vol. 10, p 699.
- Lloyd's 2012. Lloyd's global underinsurance report, London: Lloyd's. Available from <https://www.lloyds.com/news-and-risk-insight/risk-reports/library/understanding-risk/global-underinsurance-report>.
- NHSC (National Housing Supply Council) 2010. [National Housing Supply Council: Second State of Supply Report](#). Canberra: Australian Government, p xiii.
- OECD (Organisation for Economic Cooperation and Development) 2008. *Public-private partnerships: In pursuit of risk sharing and value for money*. Paris: OECD Publishing. Available from https://www.oecd-ilibrary.org/governance/public-private-partnerships_9789264046733-en.
- OECD 2015. *Disaster risk financing: A global survey of practices and challenges*. Paris: OECD Publishing. Available from <https://www.oecd.org/daf/fin/insurance/OECD-Disaster-Risk-Financing-a-global-survey-of-practices-and-challenges.pdf>.
- PC (Productivity Commission) 2021. *National water reform draft report*. Canberra: Australian Government.
- Poole E, Toohey C and Harris P 2014. 'Public infrastructure: A framework for decision making', in RBA 2014, *Financial flows and infrastructure financing*. Sydney: Australian Government, pp 97–135.
- Water Services Association of Australia 2020. *Integrated water management: principles and best practice for water utilities*. Melbourne: WSAA.
- Wishart M, Wong, T, Furmage B, Xiawei L, Pannell D and Wang J 2021. *Valuing the benefits of nature-based solutions: a manual for integrated urban flood management in China*. Washington DC: World Bank.
- White E 2011. *Flood insurance: Lessons from the private markets*. Washington DC: Global Facility for Disaster Reduction and Recovery.
- World Bank 2017. *Implementing nature-based flood protection: Principles and implementation guidance*. Washington, DC: World Bank.



Cooperative Research Centre for Water Sensitive Cities



Level 1, 8 Scenic Boulevard
Monash University
Clayton VIC 3800



info@crwsc.org.au



www.watersensitivecities.org.au