WSC TRANSITION TOOLS MANUAL
VERSION 1

**Prepared by
Water Sensitive Cities
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WSC Transition Tools Manual Version 1

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ABBREVIATIONS

CRCWSC	Cooperative Research Centre for Water Sensitive Cities
MAT	Management Actions Tool
TDF	Transition Dynamics Framework
WSC	Water Sensitive Cities

GLOSSARY

Accredited provider	A person who has completed training in the use of a Water Sensitive Transition Tool module and is endorsed to use that tool. Providers can be accredited for one or more modules. Accreditation is both a capacity building and a quality assurance program. The accreditation process is managed by Water Sensitive Cities Australia. Find out more by contacting admin@crcwsc.org.au
Enabling factor	A catalyst for change in a water sensitive city transition. Enabling factors operate by influencing the formal and informal ways of implementing a new practice, and can accelerate changes that are already underway. The Transition Dynamics Framework has 6 enabling factors: • champions • platforms for connecting • knowledge • projects and applications • tools and instruments – administrative • tools and instruments – practice.
Enabling strategy	An action or activity that progresses or reinforces an enabling factor. Enabling strategies are used to deliberately and sequentially build up enabling factors to guide the adoption of new practices or to prevent slipping back to old practice.
Practice change	Practices refer to what practitioners do 'on-ground' and how they do it, e.g. the way they design infrastructure. Practice change refers to the introduction of a new practice to replace an existing way of doing things.
Transition strategy	A strategic framework for city-wide action to enable a transition towards a water sensitive future. It defines a vision of a water sensitive future for a city, and outlines the broad steps that will be taken across the range of people and organisations that need to work collaboratively to implement agreed enabling strategies.

1. INTRODUCTION

1.1 PURPOSE AND USE OF THIS MANUAL

This manual provides guidance on using modules 3 and 4 of the water sensitive cities (WSC) Transition Tools developed by the Cooperative Research Centre for Water Sensitive Cities (CRCWSC): the Transition Dynamics Framework (TDF) and the Management Actions Tool (MAT).

The TDF and MAT help cities assess their transition progress, develop actions to advance a transition, and monitor and model the likely impacts of those actions. Practitioners can use these WSC Transition Tools to guide decision making and action development in real-world contexts, while still being rooted in well-established transition research.

1.2 GUIDING WSC TRANSITIONS

There is emerging consensus among city stakeholders about the critical role of water for liveability, productivity, sustainability and resilience. Decision makers, policymakers and practitioners face the challenge of determining how to most effectively shape and service our cities to achieve these outcomes.

It is clear significant shifts in cultures, structures and practices are needed for water sensitive approaches to become mainstream. A number of CRCWSC research projects examined processes of transition to better understand how water sector stakeholders can deliberately drive change towards their water sensitive city vision. This research led to the development of frameworks and practical tools that support city stakeholders to:

1. understand their current water system performance
2. articulate a shared vision and establish a narrative for change
3. understand existing barriers and enablers for achieving their vision
4. operationalise an action plan to drive transition
5. implement their priority actions.

These Transition Tools are packaged into 5 modules (Figure 1.1 and Box 1.1). The modules can be applied in different combinations depending on a city's local context and needs. Collectively, they help stakeholders understand, articulate and operationalise their journey towards a water sensitive city. Most of the modules involve participatory processes that encourage participants to learn from each other as they consider their system's transition needs, set out future aspirations, prioritise actions and build capacity for implementation.

1.3 WHAT THIS MANUAL COVERS

This manual explains how to apply the **TDF** (module 3) and introduces the **MAT** (module 4). Currently, we have released a beta version of the MAT for testing.

Guidance for applying the WSC Index (module 1) has been developed separately and is not covered here. We do not provide prescriptive guidance on envisioning processes (module 2), because there are many creative ways to support vision development.[1] Similarly, implementation support must be tailored to context and does not need prescriptive guidance (module 5).

Chapter 2 of this manual provides an overview of the theories that underpin the TDF and MAT and detail their purpose. Chapter 3 explains how to conduct analysis using the TDF. It first presents the TDF as an analytical tool to map the transition phase and provides step-by-step guidance on how to undertake transition analysis, using the TDF software. Chapter 4 describes the MAT and how it can be used to link WSC Index results with TDF assessments, model the impacts of actions and build a database of actions. The chapter provides step-by-step guidance on using the MAT, based on the current beta version. These instructions will be updated as the tool is refined.

The target audience for this manual is accredited WSC Index providers, who already understand how to apply the WSC Index and wish to provide additional practical and strategic guidance for decision makers to realise their WSC aspirations.

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1 For example, see Rogers and Gunn 2015.

MODULE 1 **UNDERSTANDING THE SYSTEM**

MODULE 2 **ENVISIONING AND NARRATIVE BUILDING**

MODULE 3 **TRANSITION PLANNING**
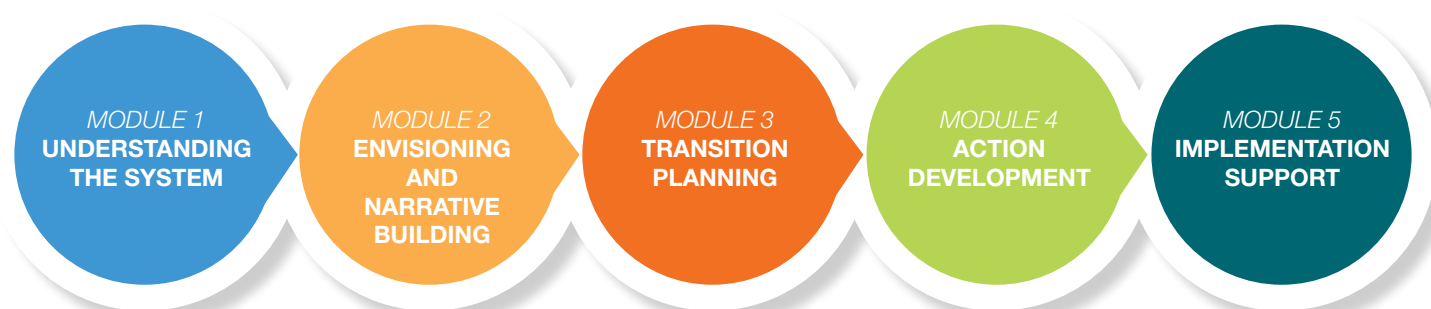
MODULE 4 **ACTION DEVELOPMENT**

MODULE 5 **IMPLEMENTATION SUPPORT**

Figure 1.1 Transition Tools helping and guiding cities towards realising their water sensitive city vision

Box 1.1 Transition Tools modules and activities

MODULE 1

UNDERSTANDING THE SYSTEM

MODULE 1 ESTABLISHES A COMMON KNOWLEDGE BASE AMONG STAKEHOLDERS AND IS A USEFUL STARTING POINT FOR A CITY EMBARKING ON A WATER SENSITIVE TRANSITION JOURNEY.

WHAT Benchmarking current water sensitive performance using the CRCWSC's Water Sensitive Cities Index (WSC Index).

BENEFIT Application of the *WSC Index* is effective in bringing stakeholders together, generating momentum and familiarising stakeholders with water sensitive city concepts.

HOW 1x full day workshop to apply the *WSC Index* to the local area. Analysis and report write-up.

PRODUCT Benchmarking report detailing the *WSC Index* scores for its 7 goals and 34 indicators, highlighting areas of strength and weakness.

MODULE 2

ENVISIONING AND NARRATIVE BUILDING

MODULE 2 GETS STAKEHOLDERS THINKING CREATIVELY AND BEYOND THE BOUNDARIES OF CURRENT WATER SYSTEM PRACTICE TO ESTABLISH SHARED TRANSFORMATIVE WATER ASPIRATIONS.

WHAT Development of a local water story and shared 50-year water sensitive city vision.

BENEFIT Articulating a shared water sensitive city vision helps align stakeholders, generate commitment for and guide coordinated action towards a common goal. When exploring future aspirations, it is helpful to first look to the past to understand the unique parts of a city's water identity, as well as learn from drivers and patterns of change and how the system has responded.

HOW 1x full day workshop with creative envisioning and water story activities. Analysis and report write-up.

PRODUCT Visioning report detailing a high-level vision with supporting text and a local historical water story.

MODULE 3

TRANSITION PLANNING

MODULE 3 DEVELOPS THE PATHWAYS THAT LINK A FUTURE WATER SENSITIVE CITY VISION WITH CURRENT WATER SYSTEM PRACTICE AS A FRAMEWORK FOR DESIGNING STRATEGIC TRANSITION ACTION.

WHAT Analysis of a city's current transition barriers and enablers using the CRCWSC's *Transition Dynamics Framework* to identify priority strategies for advancing the transition to water sensitive practices.

BENEFIT Application of the *Transition Dynamics Framework* emphasises the need to focus on building up the enabling environment for the successful transition to new practice. It helps build the capability of practitioners to implement these enabling strategies while also providing a framework for monitoring transition progress.

HOW 1x full day workshop. Analysis and report write-up.

PRODUCT Report detailing a *Transition Dynamics Framework* analysis for the range of practice changes that need to occur for the water sensitive city vision to be achieved, along with recommended transition strategies.

MODULE 4

ACTION DEVELOPMENT

MODULE 4 BUILDS DIRECTLY ON THE OUTPUTS OF PREVIOUS MODULES TO PROVIDE CITY STAKEHOLDERS WITH THE BASIS FOR OPERATIONALISING AN ACTION PLAN THAT WILL DRIVE THE CITY'S WATER SENSITIVE TRANSITION.

WHAT Development of specific actions for implementing transition strategies and improving WSC Index scores, and prioritising them in the context of existing or upcoming local opportunities.

BENEFIT Development of actions is a necessary step in linking the vision and transition strategies to on-ground practice, and prioritising these actions is essential to harness limited resources for maximum impact.

HOW 2x full day workshops. Analysis and report write-up.

PRODUCT A report outlining an action plan that sets out specific actions relating to transition strategies, and identifies local opportunities for implementation. The report also includes guidance for coordinating and guiding implementation of actions.

MODULE 5

IMPLEMENTATION SUPPORT

MODULE 5 IS DESIGNED TO BE UNDERTAKEN AT THE END OF THE PROCESS TO SUPPORT STAKEHOLDERS AS THEY IMPLEMENT THEIR PRIORITISED TRANSITION ACTIONS.

WHAT Tailored capacity-building and knowledge-sharing activities (e.g. workshops, seminars, training sessions).

BENEFIT Application of the *WSC Index* is effective in bringing stakeholders together, generating momentum and familiarising stakeholders with water sensitive city concepts

HOW Context-specific

PRODUCT Strategic advice, capacity-building activities and knowledge resources relevant to the local context

2. CONCEPTUAL BACKGROUND BEHIND THE TRANSITION TOOLS

2.1 URBAN WATER TRANSITIONS

Research with the Australian water sector highlights the urgent need to transition cities and towns from conventional solutions towards the vision of water sensitive cities (Wong et al., 2020). The Urban Water Transitions Framework (Figure 2.1) illustrates how *service delivery functions* of water systems evolve over time in response to changing *socio-political drivers.*

The 6 embedded city-states in Figure 2.1 reflect cities' increasing resilience, liveability and sustainability aspirations. The envisioned ideal state is the *Water Sensitive City*, which has integrated, multi-scale and adaptive infrastructure and institutions to meet multiple social and ecological service functions, including social amenity, environmental protection, resource security, equity and resilience.
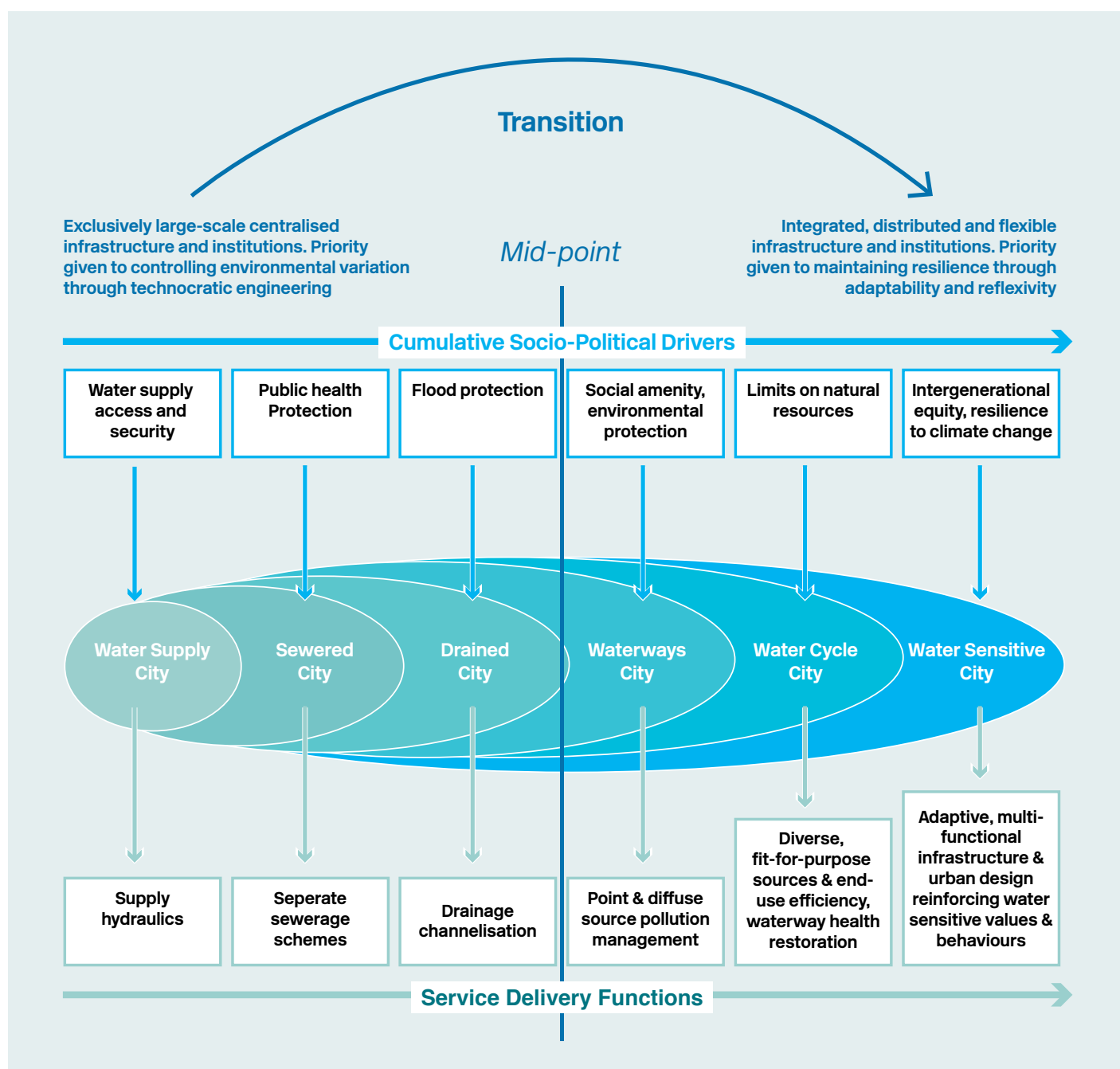

Figure 2.1 Urban Water Transitions Framework (adapted from (Brown et al., 2009)

Importantly, urban water transitions are not just confined to implementing new physical infrastructures or technologies. Managing new water systems also requires active collaboration of stakeholders from multiple disciplines and sectors. Changing the public perceptions, promoting water literacy among the broader communities, facilitating indigenous co-governance, and increasing public–private partnerships are crucial factors to achieve the water sensitive city vision. Managing these socio-institutional conditions helps overcome transition barriers and foster key enablers (Brown and Farrelly, 2009)

2.2 URBAN WATER AS A COMPLEX SYSTEM

The urban water systems described above are 'complex systems', comprising multiple interdependent biophysical and socio-institutional elements, e.g. infrastructure, technologies, services, regulations, management modes, technical routines, social expectations, etc. The connections between these elements are shaped by relationships and feedback mechanisms. For example, changes in water sector regulations can influence how infrastructure is planned and delivered. These complex systems are open-ended and more dynamic. Because change is a constant, learning and adaptiveness are crucial in designing interventions within complex systems (Dunn et al., 2016).

In contrast, conventional urban water systems are mostly managed as 'complicated systems' – closed systems where it is possible to control and measure inputs, outputs and their causal relationships. These closed conventional urban water systems use prediction and control to design interventions (Dunn et al., 2016). As water systems evolve in response to changing and diverse societal objectives, they become more like 'complex systems' where there is no single way (control or lever) to govern their operation.

Balancing multiple societal objectives is a key consideration for the water sector, but it has not been part of the existing routines—which historically have focused on managing water services as separate entities and in isolation from other sectors (e.g. city planning, energy, waste, food, etc.). Collaboration across disciplines and silos is critical for solving these complex challenges (Brown et al., 2015), but this requires continuous learning and tools for managing the transitions. Next, we discuss transition theories and tools that help to guide complex system transitions.

2.3 A TRANSITION THEORY FOR COMPLEX URBAN WATER SYSTEMS

The development of the **Transition Dynamics Framework (TDF)** and the **Management Actions Tool (MAT)** drew extensively on *sustainability transitions* theories that describe change in complex systems. Sustainability transitions show how multi-dimensional changes unfold in a non-linear fashion across many decades (Geels and Kemp, 2007). Transitions are ***multi-dimensional*** because socio-technical systems have multiple elements, including technologies, norms, industry standards, user preferences, markets, policies and regulations. This means sustainability transitions cannot be achieved by promoting new technologies alone. Transitions also require changes in rules, relationships and routines that hold unsustainable systems in place.

Social, legal, organisational and political commitments can create inertia within a socio-technical system. This inertia often leads to ***technological lock-in***. Lock-in happens when unsustainable technologies continue to be used, resisting change and innovations (Walker, 2000). To overcome lock-in, stakeholders must unpack the commitments that continue to be made to retain those outdated technological solutions. This reiterates the importance of viewing transitions as a multi-dimensional process involving not just biophysical but also socio-institutional elements.

Sustainability transitions have 4 phases following the ***S-curve*** from Rotmans et al. (2001):

1. *Pre-development* is when no changes to the status quo can be detected in practice, but important foundations for change are laid.

2. *Take off* is when momentum for change builds and hits a turning point, with system shifts becoming more noticeable.

3. *Acceleration* is when changes across multiple dimensions are accumulated, resulting in a self-reinforcing dynamic. In this phase, we also see collective learning and a wider diffusion and embedding of innovations.

4. *Stabilisation* is when a new equilibrium is reached and operating at large. The system shift also slows down (Figure 2.2).

Another important foundation of sustainability transitions is the role of **multiple stakeholders**. Transitions typically involve governments, industry, academia, civil society and households. Research shows each plays a different role in changing the system, including *frontrunners, connectors, topplers* and *supporters* (de Haan and Rotmans, 2018)*.* Research on Melbourne's urban water transition shows the critical role of *frontrunners* (also called *champions)* in the early transition phases, including within the scientific community, water authority and private sector (Brown et al., 2013). As more and more stakeholders enrol, transition networks expand to involve a wider range of scientific disciplines, executing agencies, policy supporters and political champions.

While transition can be uncertain and unpredictable, researchers have developed frameworks to steer this process. One of the most widely used is the **Transition Management** approach, which

brings diverse stakeholders together to understand a transition problem, create a shared vision, develop pathways and mobilise actors to implement projects and learn through monitoring and evaluation. Transition management has been widely used in Europe to guide policy processes for sustainability transitions. In essence, transition management recognises that influencing and steering changes requires stakeholders to be deliberate in forming coalitions and driving collective activities toward a shared vision.

The CRCWSC took important insights from the sustainability transition theories discussed above and adapted these into the more practical WSC Transition Tools.
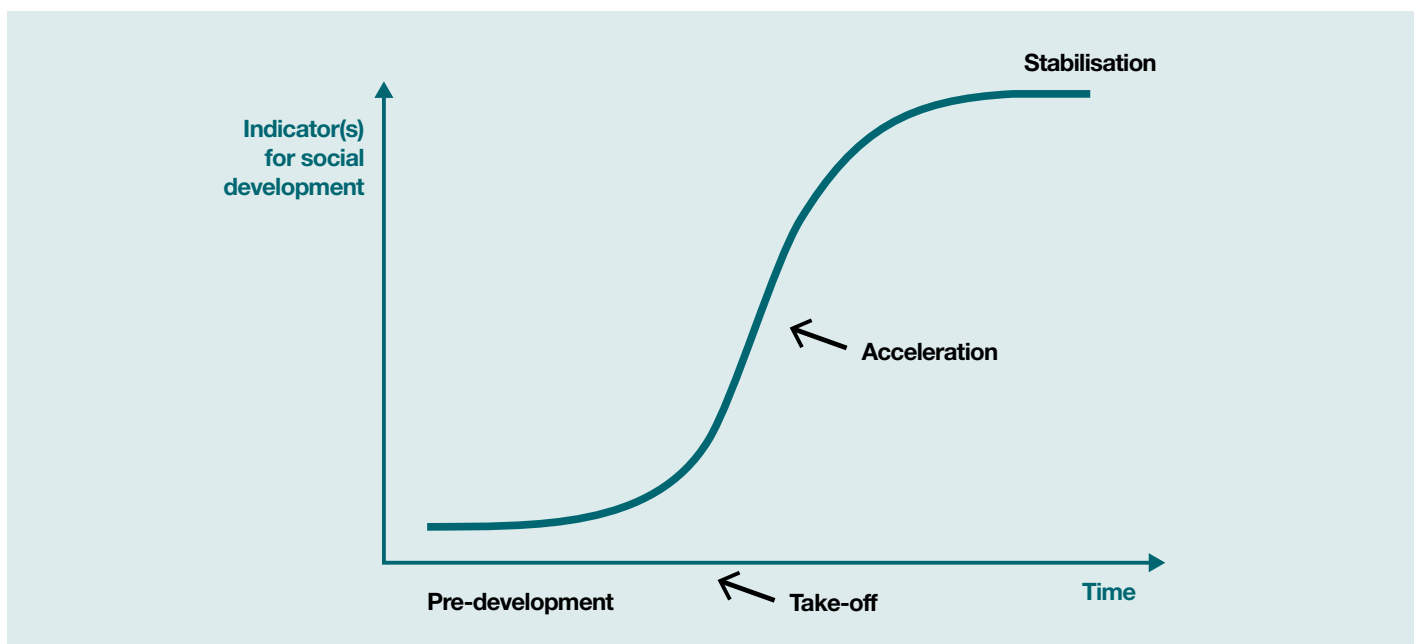

Figure 2.2 The 4 phases of transition (Rotmans et al., 2001)

2.4 OVERVIEW OF THE WSC INDEX, TDF AND MAT

Three of the 5 WSC Transition Tools modules have an associated tool. This section introduces these tools and their analytical frameworks.

WATER SENSITIVE CITIES INDEX

The WSC Index (module 1) is used to assess the overall urban water system performance of a city. The WSC Index manual can be accessed here.

The WSC Index is a benchmarking tool for mapping a city's current urban water management performance against 34 indicators characterising a water sensitive city. The 34 indicators relate to 7 goals of a water sensitive city (Figure 2.3). Each indicator is scored on a 1–5 rating scale in a collaborative workshop process. An accredited facilitator then enters the data into the web-based tool that displays the results and enables comparison with results from other cities.

Benchmarking a city's current water sensitive city performance is a first step in becoming water sensitive and therefore the first module of the WSC Transition Tools. This benchmarking helps to guide coordinated action among stakeholders by putting them on the same page. With the WSC Index, city stakeholders will gain:

- a shared understanding of how their city is managing water today

- greater insight into the outcomes from being a water sensitive city and the types of solutions needed

- a better understanding of local strengths and weaknesses as a useful starting point for the rest of the transition planning process and accelerating their transition to a water sensitive city.

More detailed information on the WSC Index is available here.

Figure 2.3 7 water sensitive cities goals

TRANSITION DYNAMICS FRAMEWORK (TDF)

We know system transitions are not easy. Many barriers impede shifts, particularly when new technologies and practices challenge the understanding, expectations and methods of prevailing approaches. To move entrenched water management systems in new directions, it is essential to understand and consider the social and institutional dynamics along with the technical aspects that underlie a city's transition.

Achieving new practice on the ground requires significant changes across the structures, cultures and practices of urban and water system planning, design, management, engagement and decision making. These changes are likely to happen over a long timeframe, as new practices become established and old ones are retired. Research shows transition can take more than 50 years to reach the stabilisation phase where new practices become mainstreamed. The challenge and opportunity is to accelerate this change.

Our research shows water sensitive transitions unfold over 6 phases: *issue emergence, issue definition, shared understanding and issue agreement, knowledge dissemination, policy and practice diffusion, and embedding new practice* (Figure 2.4)*.* These phases are based on the *S-curve* introduced earlier (Figure 2.1).

The transition begins when specific issues concerning unsustainable practices emerge among a small group of stakeholders. This seed of change grows in prominence as more actions are implemented to develop new practices, and diffuse and embed these alternatives into everyday practice.

In the **issue emergence** phase, a particular problem is identified (e.g. single objective water systems), followed by the **issue definition** phase, in which a cause of that problem is identified (e.g. siloed water services). The **shared understanding and issue agreement** phase is characterised by a common understanding of—and agreement on—the problem, its causes and its consequences. Solutions are not yet agreed on, but the need for action is acknowledged. In the next phases—**knowledge dissemination** and **policy and practice diffusion**—there is a greater agreement among a broad number of stakeholders around appropriate solutions. The final transition phase, **embedding new practice**, involves making the new practice mainstream.

The TDF is both a framework and a tool to help make sense of these transition phases. It has been synthesised from a longitudinal empirical research of the urban water transition in Melbourne, Australia (Brown et al., 2018). The TDF has been applied in several other contexts across Australia and internationally. These applications provide evidence that the framework is robust and transferable between cities. It is a proven framework, which helps cities identify which current transition phase they are in, and how to advance to the next phase.

The TDF introduces 6 enabling factors that drive change. These enabling factors are *champions, platforms for connecting, knowledge, projects and applications* and *practical implementation guidance (technical* and *administrative)* (Table 2.1).

The specific focus of each enabling factor varies across the 6 different transition phases discussed earlier. For instance, champions grow from being individual activists to connected and influential personal networks, and ultimately to major organisations leading and promoting change across multi-stakeholder networks. These enabling factors work together to reinforce shifts in the social and institutional enabling conditions for change. This highlights the need to understand both formal and informal dimensions of change, e.g. policies, regulations and standards alone will not be sufficient for transition. A focus on leadership, culture and connections is also needed.

The TDF combines the 6 phases of transition and the 6 enabling factors into a matrix. A 'simple' and 'full' matrix are provided below. The simple matrix (Table 2.2) provides a quick overview that is useful for presenting findings, while the full matrix (Table 2.3) provides a more detailed description to help interpret and analyse transition data.

Figure 2.4 The 6 transition phases (Brown et al., 2016)

TABLE 2.1 WHAT COULD ENABLING FACTORS LOOK LIKE?

Champions	Key networks of individuals and organisations. Early issue activists working on specific change-related projects—reflecting their expertise—within their own organisations. Later on, these individuals can expand their networks and enrol other actors, such as senior executives, local politicians or formal government leaders to increase their influence. In the later stages of transition, organisations themselves may become champions, leading sector-wide change.
Platforms for connecting	(Semi) Formalised organisations, structures and processes for coordination and alignment. In the early phase, may include shadow and informal networks, which have bridging, connecting and coordinating functions across science, policy and industry. Typically, these platforms are not yet established in the issue emergence phase and will become more formalised as the transition advances.
Knowledge	Research, science and contextualised knowledge. This refers to both fundamental science and more applied, field-based and practical knowledge that goes beyond the laboratory and is gained through experience. In the early phase, scientific investigations help uncover root causes or impacts of particular issues. Through partnerships across science, policy and industry, knowledge gets translated to inform practical problem solving, scalability of solutions, capacity building, and monitoring and evaluation.
Projects and applications	Experiments, demonstrations and focus projects. They are closely linked with knowledge translation, whereby scientific prototypes, proofs-of-concept, demonstration projects or other larger-scale experiments allow practitioners and industry partners to gather evidence and build capacity and experience. As transition stabilises, these projects will become more common and standardised.
Technical implementation guidance	Tools and guidance for solution design and implementation. This includes evidence-based practical guidelines and tools that support solution design and implementation. Early in the transition, guidance is likely to be more generic in nature (e.g. project reports, design templates). Later, guidance for tailoring solutions has developed, as well as tools to support standardisation of practice.
Administrative implementation guidance	Administrative instruments including policy, planning and regulation. This may start with informal exploration in a particular local jurisdiction, evolving into a range of administrative measures such as subsidies, offset schemes, commercial incentives and regulatory exemptions. Instruments will become more and more refined and standardised because of ongoing experiments, research and consensus building activities.

TABLE 2.2 SIMPLE TDF MATRIX

Transition phase	Champions	Platforms for connecting	Knowledge	Transition phase	Implementation guidance	
					Technical	**Administrative**
1. Issue emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A	N/A
2. Issue definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	Data and evidence collected	N/A
3. Shared understanding and issue agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance	Administrative instruments explored
4. Knowledge dissemination	Influential champions	Building broad support	Solutions advanced	Solutions demonstrated at scale	Refined practical guidance and design tools	Early policy and performance standards
5. Policy and practice diffusion	Organisational champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Implementation guidance and guidance for other sectors	Refined policy and standards, early regulation
6. Embedding new practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive / standardised design and implementation guidance	Comprehensive policy and regulation

TABLE 2.3 FULL DESCRIPTIONS OF TDF MATRIX

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Implementation guidance	
					Technical	**Administrative**
	Key networks of individuals and organisations	(Semi) Formalised organisations, structures and processes for coordination and alignment	Research, science and contextualised knowledge	Experiments, demonstrations and focus projects	Tools and guidance for solution design and implementation	Administrative instruments including policy, planning and regulation
1. Issue emergence	Issue activists (from community or industry) champion the issue.	N/A	Science or local experience identifies there is an issue.	Studies (conducted locally or elsewhere) exist that have high profile in the local context.	N/A	N/A
2. Issue definition	Individual champions (from science, industry or community) define the issue from their own perspective, providing greater clarity about why it's important.	Early connections between champions emerge, through which the need for better coordination to profile the issue is identified.	Science explains the specific causes and impacts of the issue.	Solution options are experimented with.	Knowledge and data on the issue is captured in reports and databases to inform the development of potential solution ideas.	N/A
3. Shared understanding and issue agreement	Champions connect with each other to propose ideas for specific solutions and initiate solution development that addresses the issue.	Mechanisms exist that aim to develop a collective voice that speaks with clarity about the issue and advocates potential solutions.	Collaboration across science and industry develops basic solutions.	Solutions are tested in the field and evaluated for performance, feasibility and community acceptance.	Preliminary practical guidance on the solutions exist in the form of generic templates and guiding principles for implementation.	Administrative instruments are explored by a champion group and are a) informal or b) being tested by individual jurisdictions if at a city scale (e.g. planning frameworks and amendments).
4. Knowledge dissemination	Champions have a common position and are engaging with policy actors to advance and make way for solutions to be reflected in policy and practice.	Mechanisms exist that aim to broadcast consistent messages to build broad support and develop pathways for implementing solutions.	Collaboration across science and industry advances the solutions through validation, refinement and generalisation.	Significant solution demonstrations exist that include a learning agenda.	Refined practical guidance exists that is aimed at practitioners (e.g. engineering guidelines) and translated from research. Basic modelling and simulation tools exist.	Administrative instruments are beginning to be implemented and explored by other organisations/ sectors. The practice change is recognised in policy, early regulation and preliminary performance standards.

TABLE 2.3 FULL DESCRIPTIONS OF TDF MATRIX *(CONT.)*

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Implementation guidance	
					Technical	Administrative
5. Policy and practice diffusion	Organisational champions lead multi-stakeholder networks in becoming aligned and starting to embed the solutions in policy and practice.	Mechanisms exist that aim to expand the community of practice focused on implementing solutions to address the issue and building stakeholder support for the solutions.	Solutions are translated into simplified packages for broad application with accompanying capacity building activities.	Widespread industry-led adoption of new practices leads to organisational learning and adaptation.	Refined practical guidance, informed by case study learnings, including guidance on how to support the implementation of solutions (e.g. maintenance, financing). Practical guidance is translated to other sectors.	Administrative instruments are refined and formalised as the practice undergoes further refinement.
6. Embedding new practice	Stakeholders are implementing practices that are aligned across sectors to deliver the solutions.	Mechanisms exist that aim to develop and embed the systems and processes that enable ongoing and consistent implementation of the practice across the sector.	Science focuses on reflection, monitoring, evaluation. New questions and directions emerge.	Implementation is being standardised and refined.	Comprehensive design and implementation guidance for conventional solution application (including standardised templates) is informed by case studies. Guidance exists for other sectors and for other innovative applications that lead to new research questions.	A comprehensive policy and regulatory framework (e.g. legislation, regulatory standards, oversight, measurement, reporting, accountability) begins to achieve consistent sector-wide governance and application of the practice.

Analysing a city's transition using the TDF prompts stakeholders to think about how the different enablers and transition phases interact in a city. This helps them develop priorities at organisational and city scales, and to avoid a narrow focus on a particular phase or an individual enabling factor. When used in this strategic way, the TDF can help city stakeholders identify pathways for accelerating their city's transition, as well as be alert to the risk of slipping back in their transition and to identify the building blocks required to reduce that risk. For instance, in complex systems change, we typically see enabling factors being established in a pattern from top left to bottom right (Figure 2.5) as champions and networks drive activity to build up the knowledge base, on-ground action and implementation guidance. The 'N/A' for phases 1 and 2 indicates those enabling factors are not necessary early in the transition.

Using the TDF, city stakeholders and practitioners can:

- **Make sense of the current social and institutional conditions.** Stakeholders diagnose the presence or absence of factors that would enable further transition progress and develop a shared understanding of strategic priorities for change.

- **Have confidence in navigating complex system change.** It is easy for stakeholders to become overwhelmed in the face of the radical and rapid shifts that may be needed to transition from deeply embedded practices to new approaches. The TDF provides stakeholders with a practical 'roadmap' that offers directional guidance while not oversimplifying the complexity of the transition.

- **Prioritise strategies and actions.** Stakeholders identify a comprehensive set of actions and enabling strategies that will be effective for their particular phase of change. This activity helps to shape a strategic plan with a short-, medium- and long-term outlook.

- **Be strategic and opportunistic in fostering an enabling environment**. Stakeholders develop a shared understanding of the strategic direction that needs to be collectively pursued. This understanding helps them to seek out and respond to opportunities that will build up critical enabling factors over time.

- **Build capabilities to implement enabling strategies.** Engagement with the TDF and each other in associated discussions supports the awareness and development of practitioner knowledge, skills and networks to progress the city's water sensitive transition.

- **Monitor transition progress over time.** The TDF provides a framework for monitoring and tracking changes in enabling conditions over time. This activity is important because outcome measures and widespread on-ground changes may not be observable in the earlier phases, but we still need to be able to evaluate and adapt transition strategies and actions.

Chapter 3 explains how to use the TDF in practice and provides step-by-step instructions on how to use the TDF software.

MANAGEMENT ACTIONS TOOL (MAT)

The MAT provides city stakeholders with an action plan to drive the city's water sensitive transition.

The main purposes of this tool are to:

1. inform development of management actions that will most effectively advance a city's WSC transition

2. support organisational tracking and reporting of progress

3. share data to support city-to-city learning.

Transition phase	Champions	Platforms for connecting	Knowledge	Transition phase	Implementation guidance	
					Technical	Administrative
1. Issue emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A	N/A
2. Issue definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	Data and evidence collected	N/A
3. Shared understanding and issue agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance	Administrative instruments explored
4. Knowledge dissemination	Influential champions	Building broad support	Solutions advanced	Solutions demonstrated at scale	Refined practical guidance and design tools	Early policy and performance standards
5. Policy and practice diffusion	Organisational champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Implementation guidance and guidance for other sectors	Refined policy and standards, early regulation
6. Embedding new practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive / standardised design and implementation guidance	Comprehensive policy and regulation

Figure 2.5 A typical pattern of enabling factors

Practitioners can also use the MAT to:

1. set WSC targets and specific goal areas to improve

2. analyse current WSC Index ratings with reference to targets set

3. view descriptions of WSC Index ratings to inform action planning

4. review and link TDF assessments relating to WSC Index ratings

5. define management actions to improve WSC Index ratings

6. model the impacts of identified actions on WSC Index ratings

7. bundle management actions into groups to form action plans.

The MAT provides most value when it supports collaborative processes involving multiple city stakeholders and when it is used in conjunction with the other modules in the Transition Tools to

link the results of WSC Index benchmarking (module 1), visioning (module 2) and transition planning (module 3) to *on-ground actions* (module 4) (see Figure 2.6).

As actions are implemented in different cities over time, regular monitoring of the outcomes can provide information on individual cities' progress and impact. And as more and more cities use the MAT, a database of city actions will grow. This database can be mined and the data analysed to provide insights about what actions are being implemented in cities around the world and how effective these actions are at improving benchmark scores. This information will provide valuable reference points and inspirations for other places facing similar challenges, creating a basis for city-to-city learning.

A beta version of the web-based MAT is currently available and being tested; feedback from this testing will be used to improve the tool over time.

Chapter 4 explains how to use the MAT in practice and provides step-by-step instructions on how to use the MAT software.
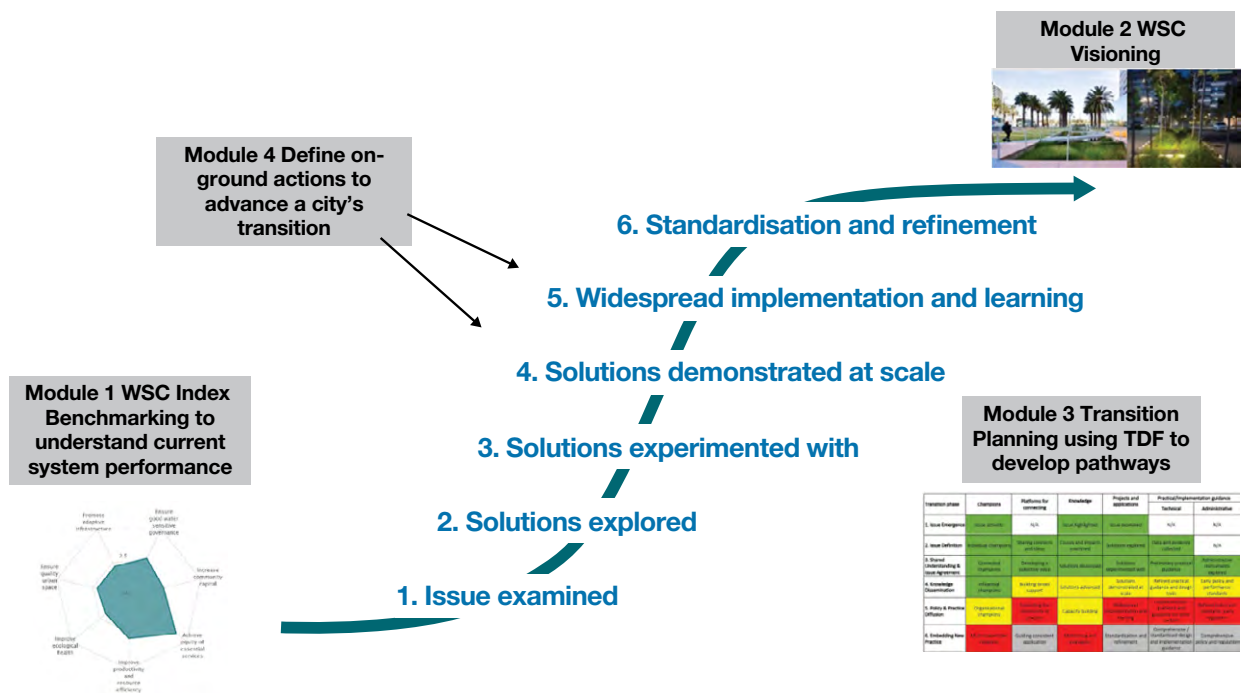
Figure 2.6 Linking actions with current system performance, transition phase, and vision

3. PERFORMING AN ASSESSMENT USING THE TRANSITION DYNAMICS FRAMEWORK

3.1 HOW TO DO A TRANSITION DYNAMICS FRAMEWORK (TDF) ASSESSMENT

The TDF assesses the presence or absence of enabling factors as an indicator of each transition phase and provides a checklist of the factors that should be deliberately and sequentially built up to accelerate change. Figure 3.1 shows the step-by-step analysis process which is explained in more detail below.

We recommend conducting a TDF assessment every 1–2 years to evaluate transition progress and refine the strategies being pursued.

First, define the **issues.** The TDF assessment can focus on an area of concern. Discussing the issues orients participants towards the underlying problems that prevent them from achieving their vision. The WSC Index results provide a good starting point for identifying priority issues, e.g. by focusing on low scoring goals or indicators.

A TDF traffic light assessment is performed for each issue; and because a city may have multiple issues of concern, stakeholders must conduct multiple TDF assessments.

Second, once the issues are identified, the associated **practice change(s)** can be defined. Practice is what people do on-ground, resulting in outcomes, such as changing the way infrastructure is designed. Defining the practice change shifts the focus from problems to potential solutions that are within organisational control or power to change.

Practice change is shaped by informal and formal structures and cultures. The third step is to assess the **enabling factors** needed for the specific practice change to occur (Figure 3.2). This analysis step directly connects the practice change to each of the TDF enabling factors. Engaging and empowering communities for self-determination is one example of practice change. This practice change can increase several indicators under Goal 2 of the WSC Index. For this practice change to become established, enabling factors that must be present include formal policy changes that make community engagement a requirement, projects that involve communities, and knowledge and training to grow capabilities of water professionals.

The enabling factors are assessed as present or absent for each transition phase (i.e. for each practice change in a city) using a qualitative 'traffic light assessment' The traffic lights document whether enabling factors are fully present (green), in development and at risk of regressing (yellow) or totally absent (red) (Figure 3.3).

Step 1 - Define issue
The traffic light assessment is undertaken for one single issue. More typically there are a range of issues that need to be tackled. For this, an individual TDF assessment is undertaken for each issue. Issues can be biophysical or socio-institutional, e.g. poor ecological health outcomes, low community engagement. The issues can be identified from low scoring WSC Index ratings. If cities are yet to be benchmarked, they can be identified through a workshop designed to identify priority issues

Step 2 - Define practice change(s)
This step is important to ensure there is clarity and focus in the way the evidence collection and analysis is scoped and framed. It involves careful consideration and articulation of what specifically must change for the issue to be overcome. For example, old practice of low community engagement may be replaced with new practice of empowering community. Establishing this new practice will require enabling factors.

Step 3 - Gather evidence
Evidence needs to be documented to support the qualitative assessment of the presence or absence of enabling factors. An example of evidence synthesis is shown in Table 3.1. Evidence can be gathered using a variety of methods, including desktop research, interviews, focus group discussions and participatory workshop. Decisions on the most appropriate data collection method depends on the resources and time available, and whether the TDF is being used as a tool within a broader process.

Step 4 - Assess traffic light colour
This step is done by using the descriptions of each enabling factor in the full TDF matrix (Table 2.3) and examining the evidence collected to make an informed judgement on whether the enabling factor is fully present (green), fully absent (red) or somewhere in between (yellow). Document a short justification for the assessment to support the narrative of the city's transition progress, and to maintain a clear record for transparency and monitoring in future assessments.

Step 5 - Identify priorities and develop strategies
Once the traffic light results are generated, identify the cells in the TDF matrix that need priority attention. Our advice is to first focus on cells that are yellow, developing strategies that lock in the enabling factors that are at risk of sliding backwards, while looking ahead to the next row of red cells that need to be worked on. Experience from other cities can be drawn on to inform the development of these strategies. Strategies should be context specific, clearly defined, justifiable, supported by stakeholders and implementable within specific timeframes. They should be documented in a form that enables collective agreement and can be used to track progress and inform decision-making.

Figure 3.1 Methodological steps for undertaking a TDF assessment

Figure 3.2 Enabling factors needed to establish new practice

Figure 3.3 Traffic light assessment method

The assessment itself is based on expert or stakeholder judgement, using evidence collected for the analysis (Table 3.1).

The traffic light assessment results are recorded in the TDF matrix by colour coding the relevant cells. This traffic light assessment might show that progression along each transition phase is uneven for each enabling factor. For example, a city may be in phase 4 for champions and platforms for connecting but only phase 3 for the other factors. This pattern is typical of many cities.

The final step is to develop **enabling strategies** for the city. Once the traffic light results are generated, workshop participants can identify the cells in the TDF matrix that need priority attention. Our advice is to first focus on cells that are yellow, developing strategies that lock in the enabling factors that are at risk of sliding backwards, while looking ahead to the next row of red cells that need to be worked on. Experience from other cities can be drawn on to develop these enabling strategies. Enabling strategies should be context specific, clearly defined, justifiable, supported by stakeholders and implementable within specific timeframes. They should be documented in a form that enables collective agreement and can be used to track progress and inform decision making.

CASE STUDY

Table 3.2 provides an example of a traffic light assessment for the hypothetical 'City A'. The issue of concern is poor ecological health outcomes, and practice change may include reducing pollution of aquatic ecosystems, establishing environmental flow regimes or managing remnant habitat areas in cities. The TDF assessment indicates where enabling factors that promote new practices for better ecological health outcome are absent and present. While factors across phases 1 to 3 are all present, only influential champions are present in phase 4. There are some factors in development in phase 5, such as organisational champions and early capacity building program. These are assessed as 'yellow' because they are not fully present. This means there is a risk that this practice change may be eroded over time. Meanwhile, the remaining factors across phases 5 and 6 are all absent.

With this TDF result, City A can define strategies to advance its overall transition by focusing on the yellow cells as a first priority. City A may want to develop platforms for connecting, to help broaden support for new solutions and expand the community of practice. Strategies that develop knowledge to advance new solutions and demonstrate solutions at scale could also be useful.

TABLE 3.1 EXAMPLE EVIDENCE TO JUSTIFY TDF ASSESSMENT

Champions	Platforms for connecting	Knowledge	Projects and applications	Implementation guidance	
				Technical	Administrative
• Key networks of individuals formed • Individual (and organisational) champions exist but not yet a collective voice • Not yet influencing regulation	• (Semi) Formalised organisations, structures and processes for coordination and alignment • Specific projects	• Research, science & contextualised knowledge • Good understanding of ecological issues – existing ecological monitoring programs (wetland vegetation, water quality, macroinvertebrate) • Early capacity building program	• Multiple experiments, demonstrations and focus projects at local level • Groundwater replenishment scheme • Mainly local solutions, site specific	• Preliminary practice tools for water sensitive urban design (WSUD) implementation	• WSUD exists in state and local government policies, but not always implemented/ effective • Some legislative, policy and regulatory tools

COLLECTING DATA FOR A TDF ANALYSIS

The TDF is designed to be used in 2 primary ways:

1. as an analytical tool to systematically assess a city's transition progress, identify priorities for action and develop corresponding strategies

2. as a collaborative tool to facilitate dialogue and reflection among stakeholders, leading to shared understanding of a collective transition agenda and common mental model of the transition process.

While the first use focuses on producing a comprehensive suite of enabling strategies as an output, the second shows how the TDF can be used to guide stakeholders' conversations. While both uses will involve facilitated dialogues and reflections, the second use may not involve in-depth traffic light assessment. In this second case, the TDF can be used as a discussion tool in a participatory process to build a shared mental model of change, to understand how change unfolds and how participants can collectively drive change.

For both uses, facilitated workshops are the preferred dialogue process. Workshops are interactive and serve more purpose than data gathering, such as to build capacity among participants to understand the nature of transitions in complex systems and to develop a shared understanding of strategic direction among the group. Techniques such as world café workshops and sticky dot voting are examples of suitable workshop processes.

Other data collection methods to inform TDF assessments include:

• interviews with stakeholders to understand local contexts and gather knowledge

• gathering and review of secondary data, e.g. technical and organisational documents or policies.

The choices of data collection methods depend on city context and project resourcing.

TABLE 3.2 CITY A'S TRAFFIC LIGHT ASSESSMENT FOR POOR ECOLOGICAL HEALTH OUTCOMES

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Implementation guidance	
					Technical	Administrative
1. Issue emergence	Issue activists	N/A	Issue highlighted	Issue examined	N/A	N/A
2. Issue definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	Data and evidence collected	N/A
3. Shared Understanding and issue agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance	Administrative instruments explored
4. Knowledge dissemination	Influential champions	Building broad support	Solutions advanced	Solutions demonstrated at scale	Refined practical guidance and design tools	Early policy and performance standards
5. Policy and practice diffusion	Organisational champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Implementation guidance and guidance for other sectors	Refined policy and standards, early regulation
6. Embedding new practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive / standardised design and implementation guidance	Comprehensive policy and regulation

PRACTICAL GUIDANCE FOR A TDF WORKSHOP

Facilitators may find the following tips useful when designing and delivering a TDF analysis workshop:

- Experience shows it is better to use the simplified TDF matrix in a workshop process, rather than the full matrix (Figure 3.4). While the audience does not necessarily need to know the full details of the TDF matrix, it is useful to introduce the concepts at a high level.

- A workshop discussion should *focus on drawing out individual views and evidence rather than trying to settle on an actual rating during the workshop*. The purpose of the workshop discussion is to collect sufficient evidence to complete the full matrix assessment post-workshop. It is important to collect sufficient data and insights across the full range of enabling factors to be able to make a judgement about the presence/absence of the enabling factors.

- It is possible to *combine multiple data collection methods*, including free-flowing discussions during workshops, in-depth interviews and/or secondary data collection. During free-flowing discussions, it is important to ask open ended-questions (e.g. who are the champions and what makes them a champion?).

- Workshop facilitators should *ask probing questions and be flexible in terms of guiding and allowing the conversations* to flow from one enabling factor to another in a less structured, but more illuminating, way. Prompts and guiding questions may be pre-prepared based on desktop research. This will involve asking questions that not only clarify *whether* a particular enabling factor is present or absent, but also gather evidence (i.e. examples) to justify such an assessment. For example, questions can be asked about who the champions are, what these champions have done or what support the champions have received/provided.

- Workshop participants may want to go straight to discussions identifying strategies to accelerate transition. While it is natural for people to focus on solutions, it is important to spend sufficient time building collective understanding of the issue. These discussions need to be facilitated by outlining a clear workshop agenda that reassures stakeholders that time will be given to developing solutions.

- Share the analysis results with participants for validation. This feedback helps to refine the traffic light assessments. It may be useful to allow time for follow-up discussions with individuals where there are concerns or disagreements about specific aspects of the assessment.

- Each workshop should have a *dedicated note taker to assist with data and evidence gathering.* We suggest briefing note takers on the TDF framework so they can produce clear and meaningful notes.

- The WSC Index workshop process can help collect data for the TDF assessment. *During Index workshops, time can be set aside to introduce the simplified TDF diagrams to prompt discussions on enabling factors.* The Index workshops are suitable for this purpose because, after the benchmarking process, participants find it easy to think about what's missing in terms of moving the Index forward, which provides an opportunity to discuss enabling factors. If combining the Index benchmarking and TDF data collection, consider:

  - allowing more workshop time for these discussions

  - dividing workshop participants into smaller groups to discuss individual enabling factors

  - structuring discussions or group exercises around a specific practice change or issue

  - undertaking a pre-workshop assessment (e.g. using stakeholder interviews) so that workshop discussion can focus on areas with data gaps or divergent opinions.

Water sensitive city transitions
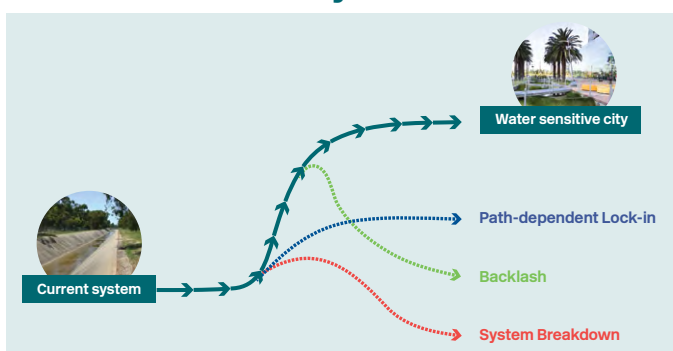
Water sensitive city transitions

Figure 3.4 Simplified TDF diagrams for use in workshops

3.2   USING THE TDF SOFTWARE

An online version of the TDF tool is available to accredited users at https://www.enablingtransitions.org/. Users can register interest with Water Sensitive Cities Australia at admin@crcwsc.org.au to create an account. City clients may also have access to a project view of the TDF tool.

The software provides users with an interface and step-by-step guidance on how to input evidence and perform a traffic light assessment. It is preloaded with *suggested lists of actions* that users can use or adapt for a specific project. These preloaded actions are drawn from previous TDF projects. Actions from each new project are added to this database to create a library of

potential actions. The software allows users to develop, update and save TDF assessments as individual projects, generate reports of the TDF results and related strategies, and create project records for future reference and monitoring.

The following steps explain how to use the online TDF tool:

STEP 1. CREATE YOUR PROJECT

Once logged in, create a new project by clicking on the **'+'** sign to add your project name, e.g. **'City A'**. Click on the Indicator Set '**CRCWSC**' button, and then click the **'CREATE'** button. The project is usually a place i.e. city. Each project typically contains multiple issues, practice changes and TDF assessments.
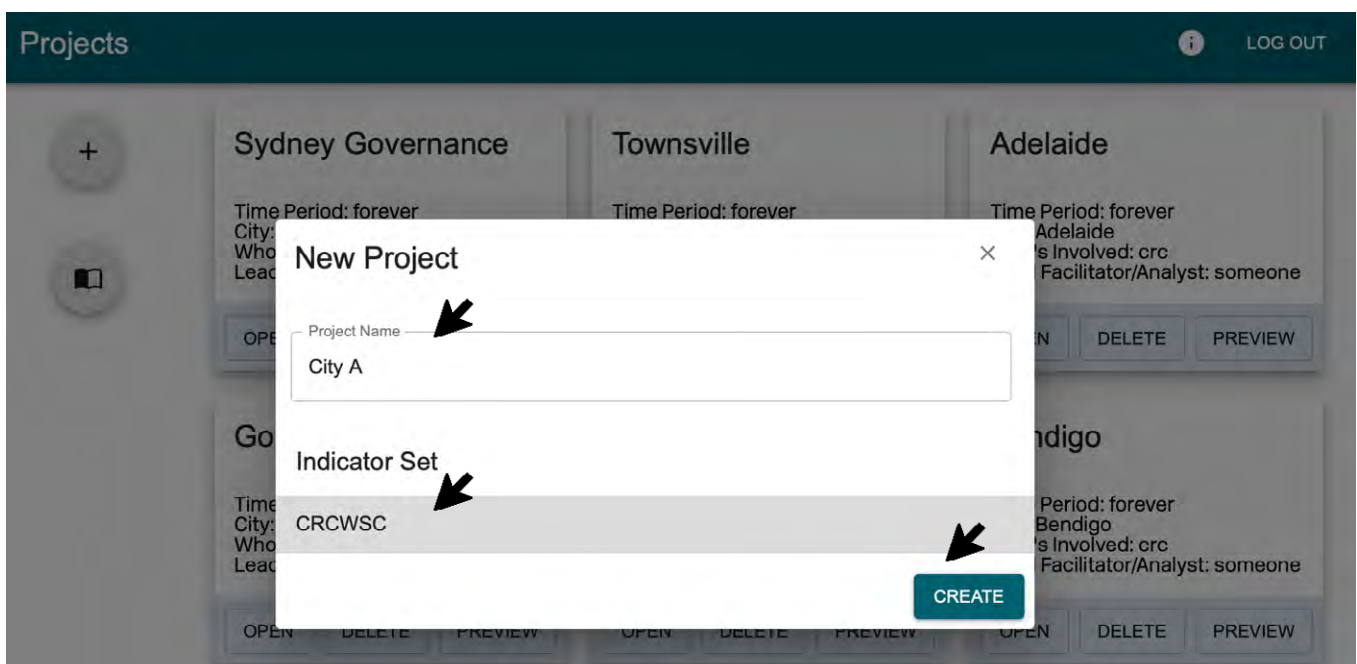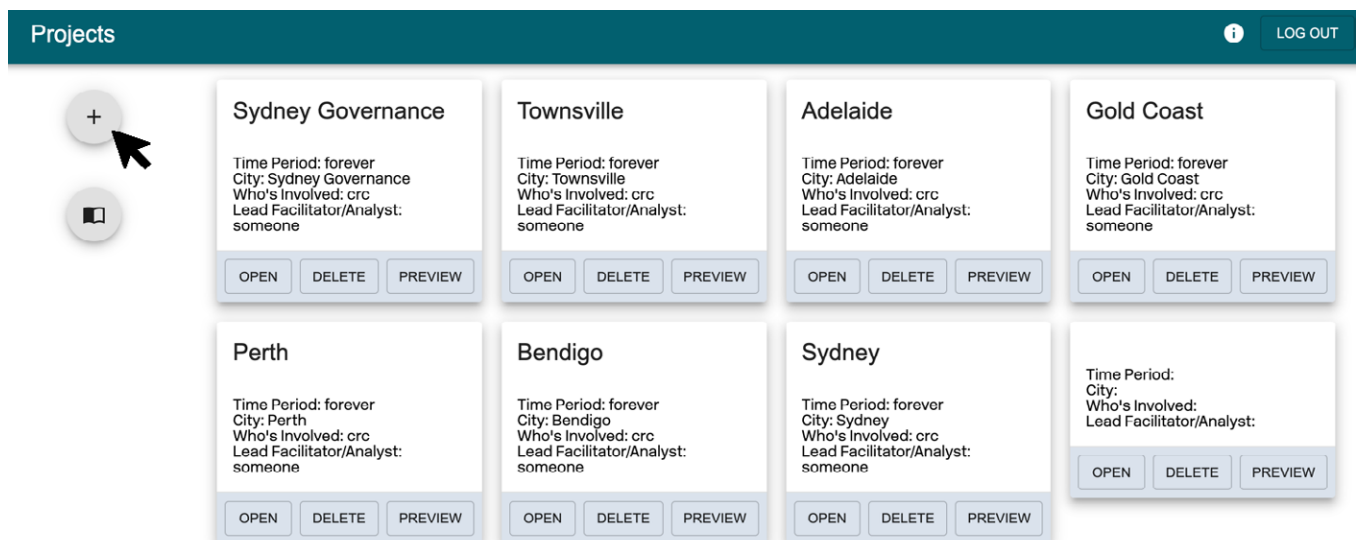
STEP 2. ADD YOUR PROJECT DETAILS

Open your project by clicking on the **'OPEN'** button below your project box.

This will bring you to the project landing page. Here, you can customise the **project details** by clicking on the '**OPEN**' icon next to the project name:

- time period – this can be the period during which the transition planning and implementation periods are set to take place (e.g. 5 years from 2020 to 2025)

- city name – e.g. City A

- who's involved – the list of key stakeholders who are participating in the assessment process

- lead facilitator/analyst – e.g. Jane Doe.

Click **'CONFIRM'** when finished.

STEP 3. DEFINE YOUR ISSUE

Begin the assessment by clicking on the '**+**' sign.
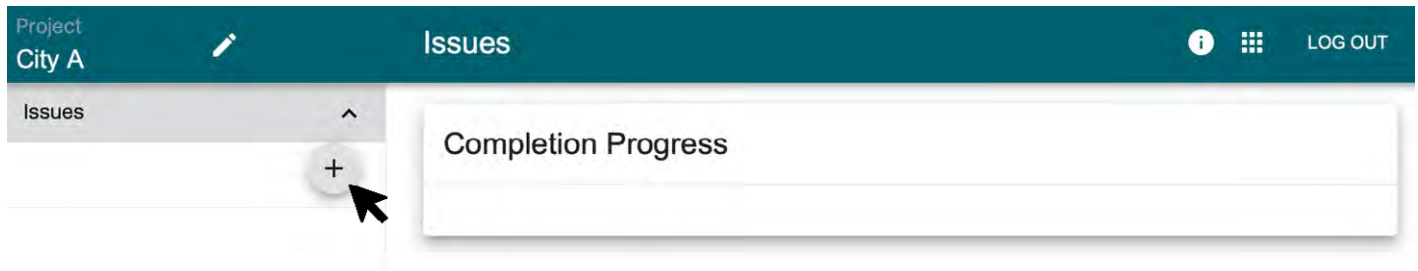
You can enter an issue name and description in the pop-up box.

OR

You can select an issue from the **predefined templates** on the right-hand side. These templates are based on CRCWSC research and analysis of the goals and indicators in the WSC Index.

Once the issue is defined, click '**NEXT'**. You can repeat this step to enter more issues. Each issue will require its own TDF assessment.

STEP 4. DEFINE PRACTICE CHANGE

Click on the **ISSUE** name to bring up the **PRACTICE CHANGE** page. In this example the issue is 'Low community engagement'. Each issue must be linked with practice change(s). (Defining and linking issues and practice change was discussed in section 3.1.)

To add the practice change, click on the **'+'** sign on the top right-hand corner of the **PRACTICE CHANGE** box.

Enter the practice change name and the description of the practice change in the pop-up box. That is, describe the practice that needs to be established to fully address the issue.

If you selected the predefined issue in Step 3, the practice change will be prepopulated. You will see the issue summary, which you can link with a practice change. You can link the issue with more than one practice change by repeating Step 3.

On this page, you can also click on the **'SELECT'** button to link the practice change with the WSC indicators—this is important if you want your strategies and actions to relate to both TDF and WSC Index results.

If you selected the prepopulated practice change, the tool will automatically present a list of linked WSC indicators. You can edit or customise the suggested indicators. You can also leave this blank if you do not wish to link the indicators to the practice change.

If you didn't select the prepopulated practice change, you can select indicators from the pop-up box. Click on the drop down menu to select the indicators you want to link with the practice change (e.g. 'Connection with water' is ticked in the example below).

Click '**CONFIRM'** when finished. This will take you back to the previous pop-up box where the indicators are now linked. Click '**CREATE'** to complete this step.

STEP 5. GATHER EVIDENCE AND STEP 6. ASSESS TRAFFIC LIGHT COLOUR

Go back to the main issue page by clicking on the issue name.

Here you will see the '**COMPLETION PROGRESS**' bar.

Click on the '**SELECT**' button which takes you to a blank TDF page. You are now ready to use the tool to assess progress towards the new practice you just defined. If you have defined more than one practice change in Step 4, you must repeat the following process to perform the traffic light assessment for all relevant practice changes.

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue emergence	Issue activists ⊕		Issue highlighted ⊕	Issue examined ⊕	
2. Issue definition	Individual champions ⊕	Sharing concerns and ideas ⊕	Causes and impacts examined ⊕	Solutions explored ⊕	
3. Shared understanding and issue agreement	Connected champions ⊕	Developing a collective voice ⊕	Solutions developed ⊕	Solutions experimented with ⊕	Preliminary practical guidance ⊕
4. Knowledge dissemination	Influential champions ⊕	Building broad support: ⊕	Solutions advanced ⊕	Solutions demonstrated at scale ⊕	Refined guidance and early policy ⊕
5. Policy and practice diffusion	Organisational champions ⊕	Expanding the community of practice ⊕	Capacity building ⊕	Widespread implementation and learning ⊕	Early regulation and targets ⊕
6. Embedding new practice	Multi-stakeholder networks ⊕	Guiding consistent application ⊕	Monitoring and evaluation ⊕	Standardisation and refinement ⊕	Comprehensive policy and regulation ⊕
Justifications	click to set	click to set	click to set	click to set	click to set

For each cell (e.g. '**ISSUE ACTIVISTS**'), click on the **'+'** sign to bring up the colour indicator selection box to indicate whether the enabling factor is *Present, Not fully present* or *Not present.* You can choose whether to enter details of the evidence and **justification** in the box for each cell (below the colour indicator).

Alternatively, you can add the overall justification for the full column of each enabling factor type by clicking the '**CLICK TO SET**' cell at the bottom of the column. In the pop-up box (e.g. for **CHAMPIONS**), you can enter the details of the justification.

Having specific evidence to justify each cell is preferred, but it is not always necessary or possible.

Click '**SAVE'** when you are finished.

Repeat this process for the rest of the enabling factors so that the matrix is fully colour coded.

Justifications for Champions

Overall:

type justifications in here

Enter more full details of the evidence and justification

CANCEL   SAVE

	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation
6. Embedding new practice	➕	➕	➕	➕	➕
Justifications	click to set	click to set	click to set	click to set	click to set

STEP 7. DEVELOP STRATEGIES

Once the traffic light assessment is completed, you can define **enabling strategies**.

Click on the '**3 ACTION'** button, which will bring you to the next landing page. Here, you can add a **new strategy** and link it with the enabling factors it will influence. Strategies are typically defined for issues where progress is lacking, (i.e. for yellow and red boxes). You may choose to prioritise addressing yellow boxes in the short term, to lock in positive enabling conditions that are at risk of regression.

Click on the '**+'** sign next to '**NEW ENABLING STRATEGY',** which brings up a blank **'Edit strategy'** box.

Click any **enabling factors** you expect the strategy to work on (e.g. 'Building broad support' in the example below—the issue has a green border when selected). This links the strategy with the matrix.

You can link more than one factor to the strategy.

Clicking on an enabling factor will also bring up prepopulated **templates** of strategies. You can formulate your own strategy, or click on the template and adapt this accordingly.

Repeat this process for the rest of the factors you wish to focus on, so that you develop a list of priority enabling strategies for the practice change.

Repeat Steps 4–7 for the remaining issues that you entered in Step 3. Once this is completed, you will have the full TDF assessment results.

3.3   INSIGHTS AND REPORTING

Reporting on the TDF results can focus on drawing the following insights:

- documenting priorities i.e. enabling factors that are assessed as yellow

- providing detailed individual strategies that address those priorities

- reviewing those individual strategies and creating strategies that can tackle multiple enabling factors

- developing suggestions for low transition areas (factors assessed as red)

- reflecting on the green areas (good enabling factors) and how they may be further reinforced.

Facilitators may find it useful to refer to past CRCWSC Transition Strategies to see how TDF results can be interpreted and presented to stakeholders. These transition strategies can be found here.

TDF tool reporting functions will be available in future version of the tool to support project documentation.

4. DEVELOPING ACTIONS USING THE MANAGEMENT ACTIONS TOOL

4.1 HOW TO USE THE MANAGEMENT ACTIONS TOOL (MAT)

The MAT can be linked with the other modules in the WSC transition tools in various ways. There are 5 use cases (Figure 4.1).

The **first use** is the most comprehensive and systematic, when a city has undergone WSC benchmarking to understand current system performance, a visioning workshop and TDF assessment before developing actions for improving its performance. In this case, the actions developed will be well-informed by detailed knowledge of the current performance gaps. The actions can also be linked and supported by enabling strategies through the TDF assessment. The actions will also directly contribute to a context-specific and place-based vision.

The **second use** is like the first, except the city has not undergone a TDF assessment. In this case, the actions will be linked with the WSC Index results and the place-based vision. While this approach is still useful to identify actions that can improve the Index results, one possible drawback of not having done the TDF assessment is that the actions might not be supported by strategies that create enabling conditions for change. Care must be taken that the actions being developed are not too narrowly focused on biophysical or technological solutions alone.

The **third use** involves linking the WSC Index results with the actions module, without connections to the other modules. Like the second use, this approach is still a useful way for identifying actions but it is important that actions do not address only the biophysical aspects of performance. It is helpful to communicate to stakeholders the value of linking actions with the other modules, so this use can be considered a pathway for more comprehensive envisioning and transition planning.

The **fourth use** involves visioning and TDF assessment but does not include the WSC Index benchmarking. This approach can still identify strategic enabling actions. However, it produces only limited information for defining implementable on-ground actions to improve a particular indicator. It could be considered as an entryway for adding benchmarking as part of the transition planning process.

The **fifth use** links the vision with actions. This approach is the least comprehensive of all the uses and may result in commitments for high-level actions to realise the vision. But the lack of diagnostic detail on current performance and transition progress means the actions identified may not be the most effective, targeted or transformative. Therefore, it is best used to showcase what the MAT can do but with clear intention of complementing actions development with a more comprehensive approach to transition planning.

1. | Module 1 WSC Index Benchmarking | → | Module 2 WSC Visioning | → | Module 3 Transition Planning | → | Module 4 Define on-ground actions |

2. | Module 1 WSC Index Benchmarking | → | Module 2 WSC Visioning | → | Module 4 Define on-ground actions |

3. | Module 1 WSC Index Benchmarking | → | Module 4 Define on-ground actions |

4. | Module 2 WSC Visioning | → | Module 3 Transition Planning | → | Module 4 Define on-ground actions |

5. | Module 2 WSC Visioning | → | Module 4 Define on-ground actions |

1. Full transition planning process – workshops and analysis
2. Benchmarking and visioning workshop – development of action plan by consultant
3. Benchmarking workshop – development of action plan by consultant
4. Visioning workshop – TDF analysis
5. Visioning workshop – development of action plan

Figure 4.1 Management Actions Tool use cases

PROCESS FOR DEVELOPING ACTIONS

This section outlines how the MAT can link actions with the WSC Index results, WSC vision and TDF assessment. Using the tool in this way means a city has data from the other modules and corresponding reports and assessment outputs.

The MAT can be used in a desktop review, or as part of stakeholder workshops to develop specific actions addressing priorities that emerged from other WSC modules. We recommend using participatory processes to build buy in and commitment from stakeholders who will be responsible for implementing the actions that are developed.

Comprehensive actions development typically requires 2 workshops, as well as post-workshop analysis and reporting.

The process for developing actions can be designed in many ways and we do not intend to be prescriptive. Rather, we set out a possible approach that uses the MAT in a workshop setting.

Workshop 1

Open the workshop by **setting the scene**. Present the results and insights from the WSC Index benchmarking results and the shared vision for the city. This establishes the **current city-state** (e.g. Drained city; see Figure 2.1) and the WSC issues.

Next, **set a target city-state**. The target refers to the goal area scores in the WSC Index. This target setting will be informed by the shared vision for the city (module 2) and by default will be the next city state on the Urban Water Transitions Framework (Figure 2.1). Alternatively, city stakeholders may elect to leapfrog directly to a water sensitive city state. This target setting will identify which WSC Index goals and indicators need to be improved.

Then **develop actions** to lift the rating of the selected indicators. In workshop groups across the 7 WSC Index goals, brainstorm actions that will increase the rating score. Participants could be assigned randomly or intentionally to a group based on their knowledge, organisational affiliations or interests. Take care to ensure there's a good distribution of expertise, disciplines and organisational background across the workshop groups.

Facilitators should guide the workshop participants to define specific and measurable actions. Participants should include as much detail as possible—what problem the action will solve, who will implement it, where it will be implemented, when it will be implemented, why is it important and how much it will cost. It is also important that participants discuss the tangible and intangible impacts of these actions, and that these reflections are documented. In this way, developing actions provides a structured basis for monitoring and evaluating performance.

The output from this stage will be a long list of potential actions across up to 34 WSC Index indicators. These actions will be refined and prioritised in workshop 2.

Workshop 2

Once the workshop 1 process is complete, the facilitators can synthesise the actions, and then present back to the participants at workshop 2 to ensure their input was captured accurately. Our aim is for facilitators to use the software tool to easily capture and document the actions.

The first workshop activity is to **link each action** identified in workshop 1 to the practice changes and enabling strategies developed in the TDF assessment (module 4). This is a process of cross-referencing and validation, and encourages workshop participants to refine each action. This linking can be done in several ways. For example, workshop participants could develop visual mud maps of connections and/or matrices that identify the intersections between individual action and practice changes. Regardless, this exercise should aim to link each action to at least one TDF practice change.

Next, **assess the likely impact of each action** on WSC Index rating scores (indicators and goals). Aim to document the likely Index rating as well as the short- and longer-term outcomes that support the enabling strategies. These impact assessments can be framed as a hypothesis to reflect the uncertainty associated with the actions.

Over time, the database of actions will expand to include data on the outcomes of those actions and evidence of impacts. Until this database is built up, city stakeholders should make expert judgements on the likely improvements in WSC Index scores based on their knowledge of the WSC Index ratings, transition theories and understanding of the local contexts.

Finally, prioritise and bundle the **high priority actions into logical themes and groups**. World café style techniques that assign groups to different topics are well suited to this exercise. Sticky dot style voting exercises are useful to prioritise actions.

The online MAT will be critical to the success of these processes because it can quickly visualise targets and impacts of potential actions.

The outputs of these workshops are action plans that specifically link actions to WSC Index results, WSC vision and prioritised TDF enabling strategies. Reports could be organised by vision theme, or by WSC Index results. Workshop facilitators may find it useful to refer to past CRCWSC reports of action development which can be found here.

4.2 USING THE MAT SOFTWARE

An online version of the MAT is being developed and tested; it is available at https://www-ma.enablingtransitions.org/project/411/city. MAT accreditation includes training in this manual as well as the MAT software. For access, accredited users can register their interest with Water Sensitive Cities Australia at admin@crcwsc.org.au to create an account.

The following steps explain how to use the online MAT:

STEP 1. SELECT A CITY

Select a city from the list of cities for which Index benchmarking has been done.

Because not all cities shown have undertaken TDF assessments, you can link the TDF assessment on a case-by-case basis on the following page.

In this example, we select 'Perth'.

Once the city is selected, click on the **'+'** sign to add a new project. The project is usually a place i.e. a city. It can also be a specific vision for a place, e.g. City A's WSC transition.

STEP 2. SET TARGETS

Once you've added the project, you'll proceed to this landing page to enter data.

Click on **'TARGET'** to **set the specific target** that the city wants to achieve. The software includes 10 standardised target options (i.e. Water Supply City, Sewered City, Drained City, Waterway

City, Water Cycle City, Water Sensitive City, Sustainable, Resilient, Liveable and Productive). The city-state targets (e.g. Water Supply City, Water Sensitive City etc.) correspond with the urban water transitions framework (Figure 2.1), while the outcomes targets (e.g. Sustainable, Resilient, etc.) map relevant WSC Index indicators to these themes.

STEP 3. ANALYSE CURRENT PERFORMANCE AND ENABLING CONDITIONS

Once a target is selected, the next step is to **analyse current performance and enabling conditions** relating to the target that has been set.

Click on the next option, **'ANALYSIS'**.

The left-hand side of the box shows a diagram of the current city performance (shaded green area) overlaid with the target. In the example below, the **'Water Sensitive City'** target is shown as the red dotted outline. The red dotted outline changes depending on the target you choose.

The right-hand side displays the TDF issues. Click on the **'MATRIX'** button to bring up the traffic light assessments for each issue. You can review the city's current performance and presence of enabling conditions before going into action development.
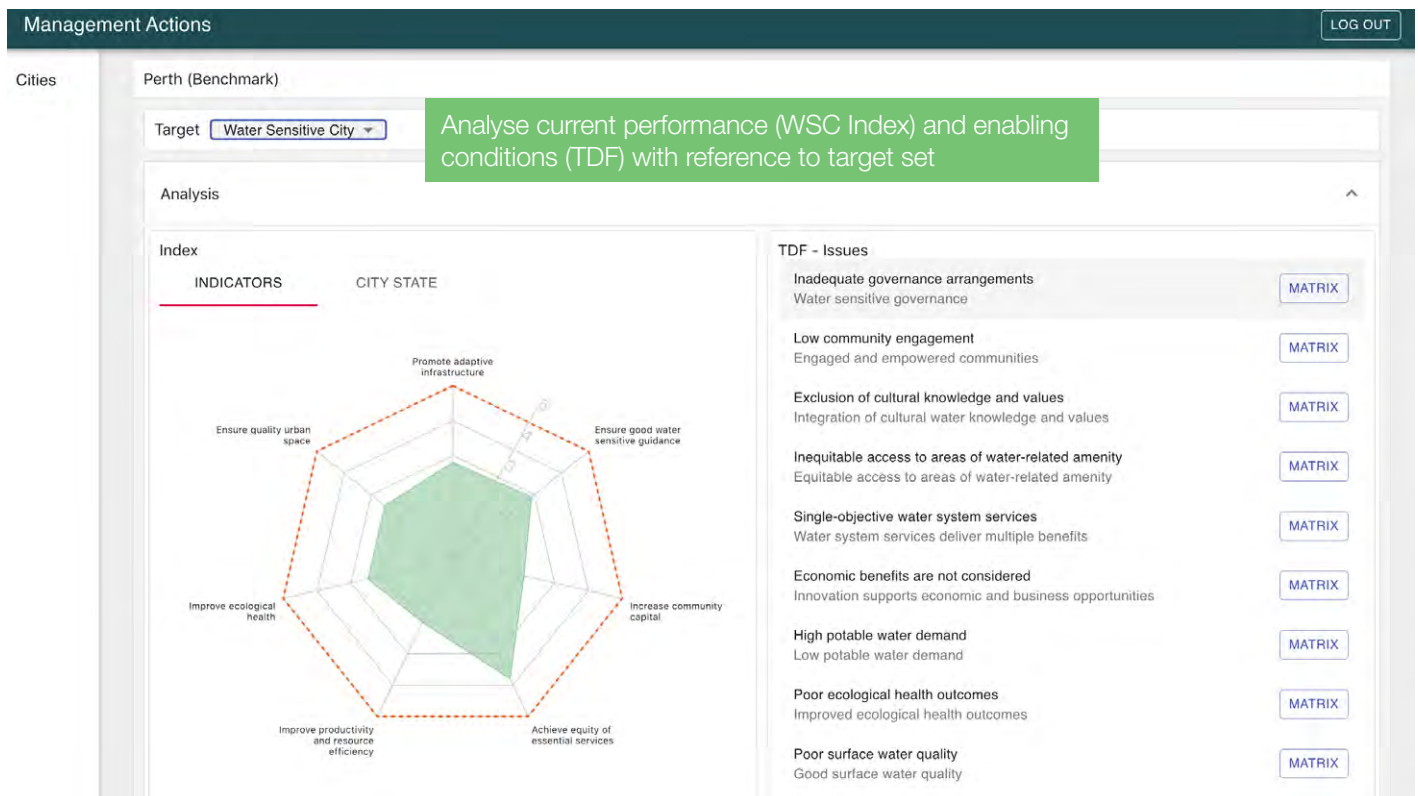
STEP 4. SET WSC INDEX GOALS AND INDICATORS

This step allows you to click and choose the specific goal and indicators that you want to create actions for.

Click on the next option, **'WSC INDEX GOALS AND INDICATORS'**.

Select the indicators and then click on the **'CREATE ACTION'** button. In this example, we create actions for 'Increase community capital' (Goal 2) by ticking indicators 2.1 (Water literacy) and 2.2 (Connection with water).

STEP 5. DEFINE MANAGEMENT ACTIONS

This step allows you to define management actions to address each indicator.

Click on the option **'MANAGEMENT ACTIONS'**. Here, you can enter your 'Action name', 'Description', 'Detailed description' and 'Justification', as shown below. The 'Description' box will be shared to the public database, but the 'Detailed description' will not be publicly accessible.

In this step, you can also link the action with the enabling strategies. You can manually model the impact of the action. For example, the action of 'Social research to understand community values' will increase the scores on indicators 2.1 (Water literacy) and 2.2 (Connection with water). The increased values are shown in green.

Connected TDF Enabling Strategies

Invest in social science to clarify why Perth has low community capital
Engaged and empowered communities
Perth

+

| 1. Ensure good water sensitive governance | 2.9 |

2. Increase comm

Model how action will increase WSC indicator scores

2.1. Water literacy	− 2.0 +
2.2. Connection with water	− 2.5 +
2.3. Shared ownership, management and responsibility of water assets	− 2.0 +
2.4. Community preparedness and response to extreme events	− 2.0 +
2.5. Indigenous involvement in water plan	− 2.5 +

SAVE

You can also link the action with TDF enabling strategies.

First, click on the '**+**' sign. In the pop-up box, select the TDF practice change that is relevant to that action. In this example, the action is connected with 'Low community engagement' and the enabling strategies of 'Invest in social science to clarify why Perth has low community capital'.

Linking the enabling strategies with action progresses the traffic light assessment, e.g. from yellow to green, which will be shown in the next step.

The TDF practice changes and enabling strategies are inputs from the full TDF assessment process (see sections 3.1 and 3.2). If the city has not undertaken the TDF assessment process, the software will not have this data input and the TDF cannot be modelled in this step.

STEP 6. MODEL IMPACT

Modelling impact allows you to estimate how the action will increase the WSC indicator scores and the TDF. Currently, action modelling is done manually through facilitated workshops with participants. In the future, as the database becomes more established, an automated modelling of the impacts may be possible.

Tick one or more actions to see the changes in index scores that are shown in the spider diagram. In this example, there is a slight change in the scores when comparing the dotted blue line (initial performance) with the shaded green area (performance after actions). Importantly, the diagram shows the maximum impact when 2 or more actions are influencing the same indicator, not the additive impact.
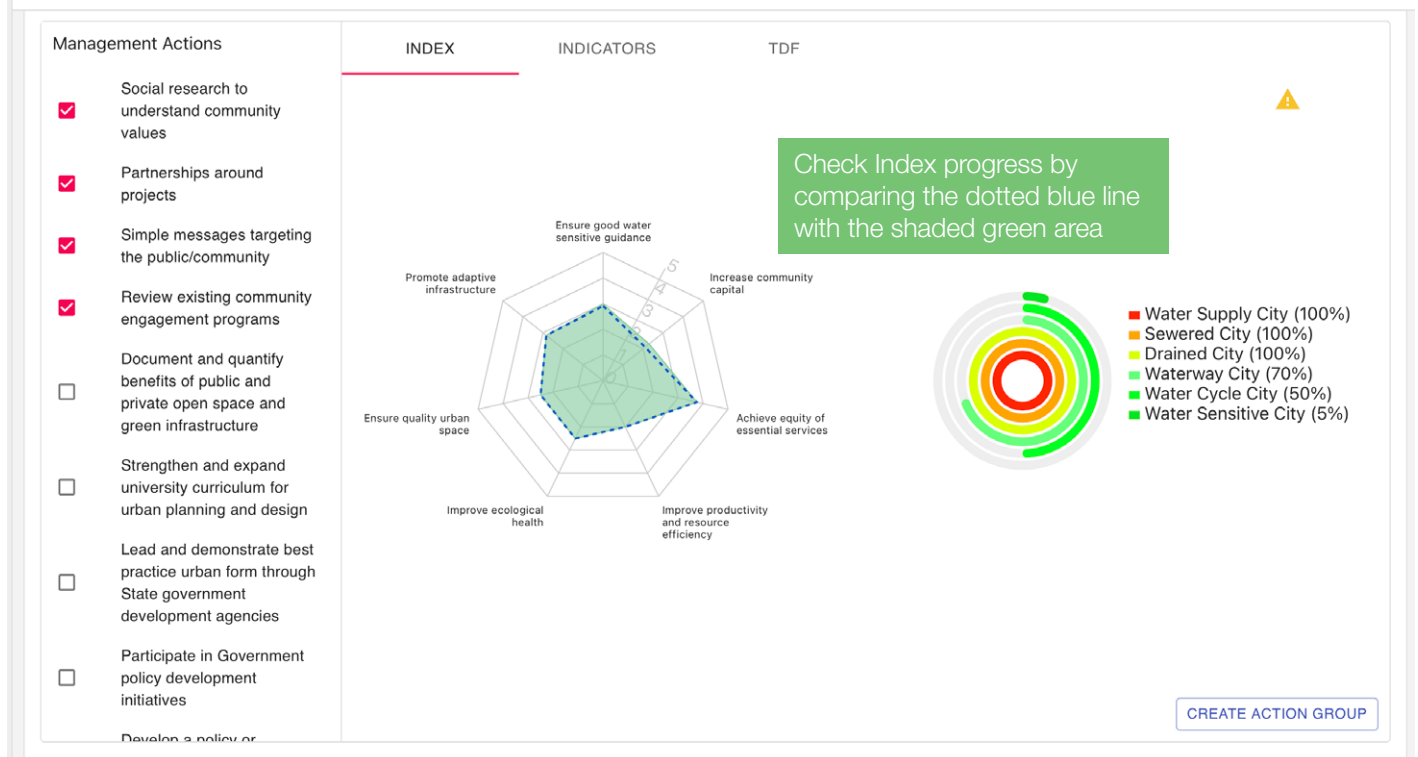
For more details, click on the **'INDICATORS'** tab to see the scores per indicator. The increased score is shown per indicator in green text. The numbers in brackets are the initial performance scores.

You can also check the TDF progress by clicking on the **'TDF'** tab. The actions have progressed the TDF assessment by creating enabling factors (i.e. green cells) for 'Issue definition' and 'Shared understanding and issue agreement'. The proposed actions have turned the enabling factors from yellow to green.

Perth (Benchmark)

Model Impact

Management Actions

INDEX | INDICATORS | TDF

Cost: 300000

More details on increased scores per indicator

- [x] Social research to understand community values
- [x] Partnerships around projects
- [x] Simple messages targeting the public/community
- [x] Review existing community engagement programs
- [ ] Document and quantify benefits of public and private open space and green infrastructure
- [ ] Strengthen and expand university curriculum for urban planning and design

1. Ensure good water sensitive governance	3.0 (2.9)
1.1. Knowledge, skills and organisational capacity	3.0
1.2. Water is key element in city planning and design	3.0
1.3. Cross-sector institutional arrangements and processes	3.5 (3.0)
1.4. Public engagement, participation and transparency	2.4
1.5. Leadership, long-term vision and commitment	4.0
1.6. Water resourcing and funding to deliver broad societal value	3.0
1.7. Equitable representation of perspectives	2.0

2. Increase community capital	2.3 (2.1)
2.1. Water literacy	2.5 (2.0)
2.2. Connection with water	2.5 (2.0)
2.3. Shared ownership, management and responsibility of water assets	2.0
2.4. Community preparedness and response to extreme events	2.0
2.5. Indigenous involvement in water plan	2.5

Perth (Benchmark)

Model Impact

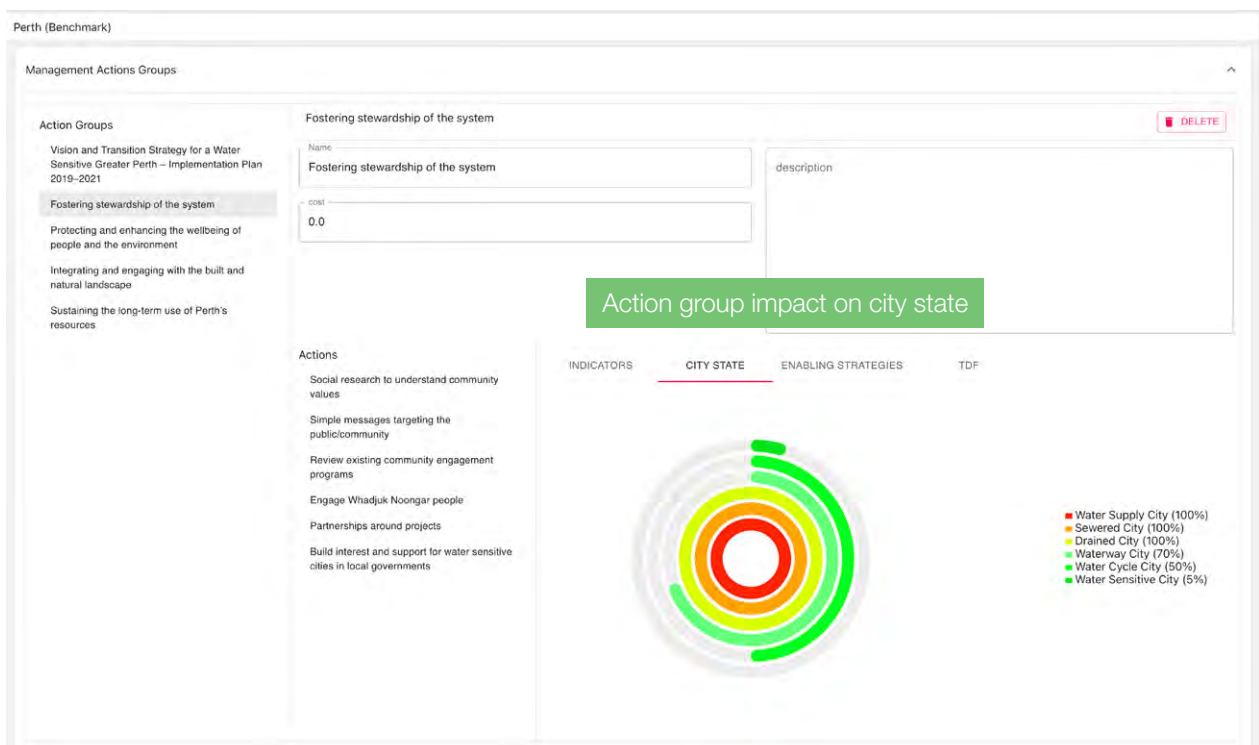Management Actions

INDEX | INDICATORS | TDF

- [x] Social research to understand community values
- [x] Partnerships around projects
- [x] Simple messages targeting the public/community
- [x] Review existing community engagement programs
- [ ] Document and quantify benefits of public and private open space and green infrastructure
- [ ] Strengthen and expand university curriculum for urban planning and design
- [ ] Lead and demonstrate best practice urban form through State government development agencies

1. Issue emergence

2. Issue definition

3. Shared understanding and issue agreement

4. Knowledge dissemination

5. Policy and practice diffusion

6. Embedding new practice

Check TDF progress

2. Increase community capital

1. Ensure good water sensitive governance

STEP 7. BUNDLE INDIVIDUAL ACTIONS INTO GROUPS

Bundling individual actions into groups allows you to model their collective impact.

Tick multiple actions (as per Step 6 above) and then click on the **'CREATE ACTION GROUP'** button. In the pop-up box, enter a 'Group name' for those actions, e.g. 'Fostering stewardship of the system'. You can also add more descriptions about the action group, such as who will be responsible, when it will undertaken, how it will be undertaken, etc. There is also a cost box where you can enter and propose a cost estimate for the action group.

Once the actions are bundled, an overview is available under the **'MANAGEMENT ACTION GROUPS'** tab. For example, the 'Fostering stewardship of the program' overview lists the actions and shows the modelling results, in terms of the WSC spider diagram (**'INDICATORS'** tab), city-state, enabling strategies and TDF.

4.3 REPORTING

Reporting functions will be available in future versions of the tool.
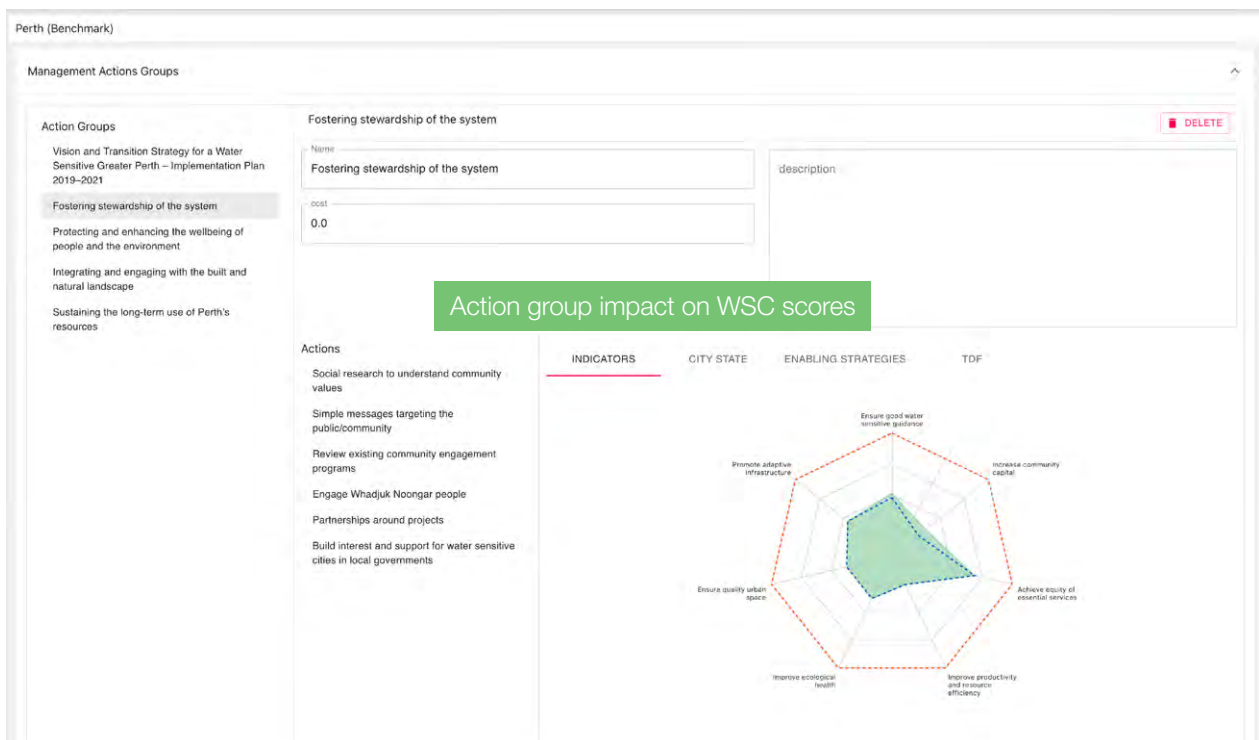
Perth (Benchmark)

Management Actions Groups ^

Action Groups

Vision and Transition Strategy for a Water Sensitive Greater Perth – Implementation Plan 2019–2021

Fostering stewardship of the system

Protecting and enhancing the wellbeing of people and the environment

Integrating and engaging with the built and natural landscape

Sustaining the long-term use of Perth's resources

Fostering stewardship of the system

🗑 DELETE

Name
Fostering stewardship of the system

description

cost
0.0

Action group impact on enabling strategies

Actions

Social research to understand community values

Simple messages targeting the public/community

Review existing community engagement programs

Engage Whadjuk Noongar people

Partnerships around projects

Build interest and support for water sensitive cities in local governments

| INDICATORS | CITY STATE | **ENABLING STRATEGIES** | TDF |

Expand existing champion networks to integrate a greater diversity of perspectives and extend the focus of platforms for collaboration to consider governance and engagement solutions

Implement trials and demonstrations of governance solutions for achieving Perth's vision of water stewardship

Invest in social science to clarify why Perth has low community capital

Advance platforms for champions to gain clarity around the issue of low community capital and explore potential solutions

Support champions inside and outside the water sector to advocate for greater community and Traditional Owner involvement in water planning and decision-making

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Perth (Benchmark)

Management Actions Groups ^

Action Groups

Vision and Transition Strategy for a Water Sensitive Greater Perth – Implementation Plan 2019–2021

Fostering stewardship of the system

Protecting and enhancing the wellbeing of people and the environment

Integrating and engaging with the built and natural landscape

Sustaining the long-term use of Perth's resources

Fostering stewardship of the system

🗑 DELETE

Name
Fostering stewardship of the system

description

cost
0.0

Action group impact on TDF

Actions

Social research to understand community values

Simple messages targeting the public/community

Review existing community engagement programs

Engage Whadjuk Noongar people

Partnerships around projects

Build interest and support for water sensitive cities in local governments

| INDICATORS | CITY STATE | ENABLING STRATEGIES | TDF |

1. Issue emergence

2. Issue definition

3. Shared understanding and issue agreement

4. Knowledge dissemination

5. Policy and practice diffusion

6. Embedding new practice

2. Increase community capital

1. Ensure good water sensitive governance

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