City Planning
Prioritisation

Interactive document
with clickable content

Stantec

ARUP

Melbourne Water
Enhancing Life and Liveability

Melbourne is predicted to be a city of **9 million** people by 2056

To remain one of the world's most liveable cities we will need to embrace the challenges of urbanisation, climate change, rapid digitisation, evolving customer expectations, a changing economy and increased uncertainty.

Seeking to develop insight into innovative and holistic whole-of-city planning, Melbourne Water commissioned a study of exemplar cities.
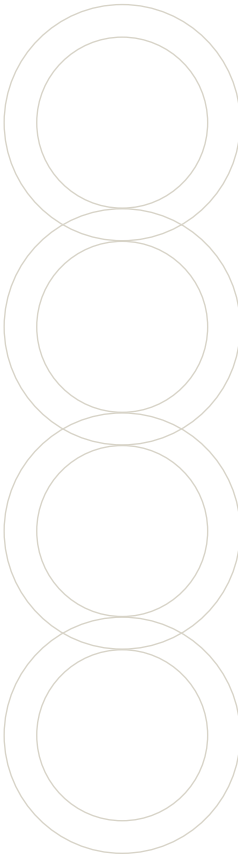
Case examples from selected cities have highlighted the key lessons for creating shared value outcomes, based on a suite of enablers which form the overall approach.

Melbourne Water
Enhancing Life and Liveability

Background

Water is integral to the lives of people every day. Melbourne Water's challenge is to build on its legacy and strengthen partnerships for the sustainable development of Melbourne in order to know and deliver services the community needs now, and for future generations.

PURPOSE

This report will help Melbourne Water and partners to identify potential strategies and enablers that consider the role of water and could facilitate whole-of-system collaborative planning and priorities alignment for multiple benefits for Melbourne.

	POPULATION	POPULATION GROWTH	AREA	DRIVERS	CATALYSTS	AGENCIES	JOINT VENTURES	PROCESSES
COPENHAGEN	0.6M	0.7%	86 km²	**Climate impacts** Flooding and sea level rise **Other** Growth, aging infrastructure	Harbour clean up Swimmable	HOFOR (Utility) City of Copenhagen	Cloudburst Management Plan Regional River catchment planning (9 municipalities and 9 utilities)	Forums Coordination groups Information sharing
BOSTON	0.7M	0.5%	125 km²	**Climate impacts** Sea level rise, flooding, urban heat, storm surges, combined sewer overflows (CSO)	1980's harbour clean up CSO overflows	Boston Water & Sewer Commission Massachusetts Water Resources Authority City of Boston	Climate Change Task Force Groundwater Trust	State Environmental Review Process Project based engagement
SAN FRANCISCO	0.9M	0.4%	121 km²	**Climate impacts** Sea level rise, flooding, CSO overflows, cloudbursts (extreme rainfall events) **Other** Redevelopment, growth, water shortages	Earthquakes Forest fires Extreme heat	SF Public Utilities Commission City of San Francisco	Lifelines Council Joint Benefits Authority Better Streets Plan	Facilitation by SFPUC Informal relationship-based conflict resolution Envista (planning GIS)
MADRID	6.6M	0.5%	604 km²	**Climate impacts** Water scarcity, urban heat, flooding	Transparency of government proceedings	Canal de Isabel II Utility Madrid City Council Ministry of Environment Ministry of Health	Madrid Nuevo Norte re-development Promoter funded projects (usually private)	PGOU (General Plan for Urban Planning)
NEW YORK CITY	8.6M	0.5%	790 km²	**Climate impacts** Sea level rise, flooding, urban heat, cloudbursts, combined sewer overflows	Water supply and harbour clean up Hurricane Sandy	Department of Environmental Protection City of New York	Climate Change Task Force Green Infrastructure Program Energy utilities share cost or fund initiatives Green infrastructure grants and incentives	Shared vulnerability assessments Project-based engagement International collaboration Green Infrastructure plan
LONDON	8.9M	1.0%	1,595 km²	**Climate impacts** Drought, sea level rise, flooding, demand management	Ofwat resilience funding	Thames Water Affinity Water Department of Energy and Environment Ofwat, Greater London Authority	Regional Water Planning groups Water Regulators' Alliance for Progressing Infrastructure Development (RAPID)	Forums Plan consultations Data sharing

Melbourne Water
Enhancing Life and Liveability

COPENHAGEN

Transparency and sharing

	Priorities alignment	Working together	Sharing knowledge	Co-funding
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Transparency and sharing

Coordination groups between the City and Utility with topic specific forums provide transparent and consistent processes and a safe space for engagement, consultation and coordination among stakeholders, with all information publicly available. Engagement starts from the very beginning of project creation.

All Utilities and Departments are required to socialise future plans early in the coordination group forums and publish plans as soon as they are developed.

This also ensures reservations on important pieces of land can be made early. Formal partnerships are developed, using signed partnership agreements similar to an MOU. These provide a basis for consistent collaboration in good faith. All information is made publicly available.

Modelling of stormwater, flooding and other impacts is undertaken collaboratively. The utility conducts and maintains all the modelling and shares the outputs with the City, developers and consultants.

AGENCIES

HOFOR

City of Copenhagen

Melbourne Water
Enhancing Life and Liveability

COPENHAGEN

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟡	
Water sensitive urban design		🔵		🟠
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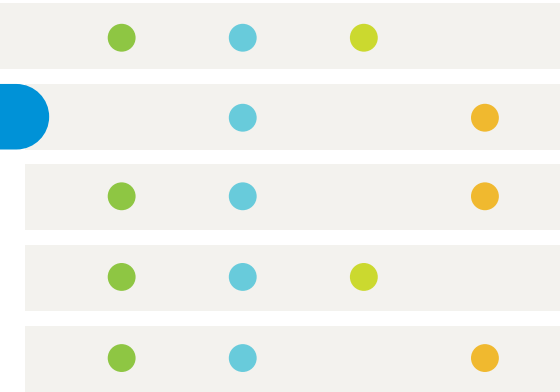
Water sensitive urban design

The approach to water in Copenhagen has changed in the last 10 years – the Utility and the City have brought water into the centre of the city.

Previously, the city was centred around an industry-heavy port. In the last 10 years, industry has been moved out and the city has been centred around the waterfront, transforming the liveability. Water pollution is taken seriously and expressed in strict regulation.

10 YEAR

City transformation – bringing the water to the centre of the city

Copenhagen is completely built up, therefore there are no greenfield projects. Brownfield developments are very common, transforming old industrial areas or breweries into new apartments and living precincts,

with water sensitive projects at the centre of it. Urban engagement is prioritised to try and create a community.

In new developments, water is often at the centre, with Utility, City and developers working collaboratively. Considerations include how to retain stormwater runoff and focussing the developments around water sensitive urban design. Developers pay for establishing sewer and water in the area and then hand over to the utility for a fee.

AGENCIES

HOFOR

City of Copenhagen

Melbourne Water
Enhancing Life and Liveability

COPENHAGEN

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟡	
		🔵		🟠
Watershed clean-up	🟢	🔵		🟠
	🟢	🔵	🟡	
	🟢	🔵		🟠

Watershed clean-up

The City collaborates with the Utility to reduce overflows into the harbour. Currently, 90% of the drainage infrastructure are CSOs. The City and Utility are trying to find ways to take the load off the sewer and retain stormwater. Historically, CSOs discharged into the harbour and industrial pollution made it unsuitable for swimming.

Over the last 15 years, the City and Utility have collaborated to expand wastewater treatment plants, address pollutant issues, progress water quality management, store overflows and close down many CSOs.

Now, the harbour is swimmable and there are new initiatives including 'green harbour buses' that will pilot in 2020.

There is a flooding issue with a major stream that crosses across 9 municipalities and 9 utilities. Copenhagen originally had ideas on how to address the issues downstream; however, this was making the other regions nervous. Therefore, the City and Utility are working collaboratively with these other municipalities and utilities now to analyse potential solutions across the entire stream.

Major stream flooding issue across
9 municipalities and utilities

AGENCIES

HOFOR

City of Copenhagen

Melbourne Water
Enhancing Life and Liveability

Priorities alignment	Working together	Sharing knowledge	Co-funding
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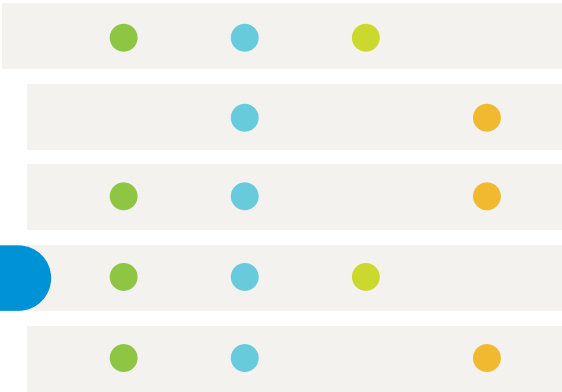
Shared priorities

Shared priorities

The City sets targets for the Utility through sectoral plans, including the wastewater management plan. This plan is developed in collaboration and creates a framework for the utility. Overall targets are set however the utility has freedom to choose how to deliver on them.

Development companies often fund large infrastructure projects and are therefore involved in the engagement from project inception. Negotiation with development companies is perceived as more difficult as 'money talks.'

The planning process provides a platform where the developers, Utility and City can negotiate and find a compromise solution.

The City is also in the process of working to implement a storms surge management plan to protect the city against projected storm surges that can damage to the city. This work is coordinated with the Utility, surrounding municipalities, the national government and the harbour company.
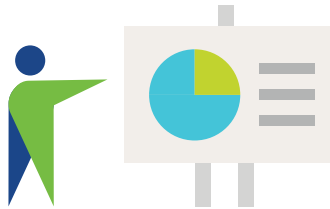
Set targets with the freedom to choose how to deliver on them

AGENCIES

HOFOR

City of Copenhagen

Melbourne Water
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COPENHAGEN

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	●	●	●	
		●		●
	●	●		●
	●	●	●	
Shared costs and benefits	●	●		●

Shared costs and benefits

The City and Utility have formed a joint venture to use public spaces to manage 'Cloud Bursts'. The initiative identifies and develops large public spaces (e.g. bike parking, parks, skate parks) as temporary flood storage.

The City and Utility have collaborated for the last 5-10 years to optimise the use of resources and reduce leakage across the city.

New specific projects and initiatives, such as the cloudbursts projects, are cost shared by the City and Utility. The Utility staff time is funded by rates.

The Utility, City and developers worked together on an underground Metro project which required moving a large sewer line under one of the most heavily populated parts of Copenhagen achieving a cost-effective solution.

The Roads Department and the Utility work together to maintain roads and coordinate pipe and road maintenance.

Large public spaces developed as temporary flood storage

AGENCIES

HOFOR

City of Copenhagen

Melbourne Water
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State environmental review process

Priorities alignment	Working together	Sharing knowledge	Co-funding
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State Environmental Review Process

The State's Office of Energy and Environmental Affairs leads this early impact review and mediation process, triggered by review thresholds, where projects are likely, directly or indirectly, to cause damage to the environment.

Departments and agencies are engaged at the scoping level. There is a disclosure process and a forum where issues can surface and get circulated. Issues then go through a resolution process through the life of the project. A series of informal conversations also occur at the local and political levels.

Once issues have been formally surfaced, everyone works together to solve them and find shared solutions and synergies. The view is that everyone has their own problems, but it is important and cost effective to solve the problems together. If necessary, unresolved issues move up the chain of command and ultimately the mayor steps in.

AGENCIES

Boston Water & Sewer Commission (BWSC)

Massachusetts Water Resources Authority (MWRA)

Boston City (Departments of transport, energy, public health, parks)

Melbourne Water
Enhancing Life and Liveability

	Priorities alignment	Working together	Sharing knowledge	Co-funding
		🔵		
Climate change task force	🟢	🔵		
	🟢	🔵	🟢	
	🔵	🟢		🟡
	🔵	🟢		🟡

Climate Change Task Force

One of the key overarching drivers for regional cooperation is climate change. Drinking water, stormwater and flooding have become a high priority for investment even overtaking transport.

The Mayor has formed a Climate Change Task Force, where research, planning and projects are undertaken collaboratively, across agencies. This includes transport water, energy, planning, public health, parks and more.
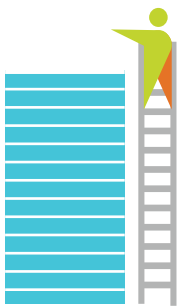
The main purpose is for regional planning and the use of the same base maps, parameters and assumptions. As part of this, BWSC are investigating sea level rise and the impacts on the stormwater network.

As sea level rises, the hydraulic grade line will hold stormwater in outfalls back. BWSC are working with Boston Parks to determine where stormwater can be stored.

Other climate change impacts are investigated by different departments, for example the Public Health department is responsible for investigating Heat Island Effect and is supported by the Parks Department.

Each department has their own focus for climate change, but facilitates the outcomes for the focus collaboratively, bringing together city agencies to work together.

AGENCIES

Boston Water & Sewer Commission (BWSC)

Massachusetts Water Resources Authority (MWRA)

Boston City (Departments of transport, energy, public health, parks)

Melbourne Water
Enhancing Life and Liveability

BOSTON

	Priorities alignment	Working together	Sharing knowledge	Co-funding
		●		
	●	●		
Watershed clean-up/groundwater	●	●	●	
	●	●	●	
		●	●	●
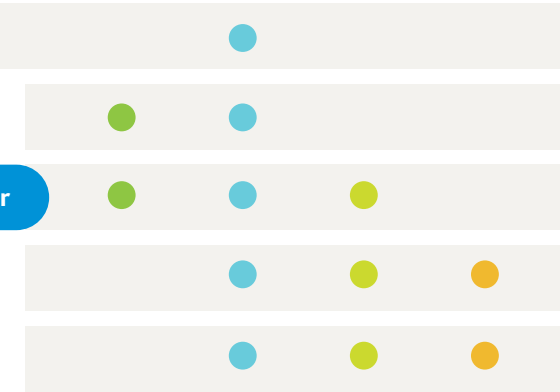
Watershed clean-up/groundwater

The Charles River is a 129 km long river which travels through 23 cities and towns before it reaches the Atlantic Ocean at Boston. There are stormwater quality and quantity issues which lead to the pollution of the Charles River. MWRA and several communities have already undertaken significant CSO reduction projects.

The 1980s harbour clean up resulted in the building of a secondary treatment plant, disconnections from the CSO's and CSO overflow retention. CSO overflows were reduced significantly and the harbour was cleaned up.

129km

length of Charles River through 23 Cities

A trading system for performance-based stormwater management promotes waterways clean-up upstream and pollution source control.

The next step for improving the river condition is the implementation of green infrastructure to manage stormwater pollution and improve amenity.

Historically there has been excessive extraction of groundwater due to sump pumps in building basements. A groundwater trust has been formed which is a coalition of the city, state and agencies to develop a holistic strategy to approach the groundwater issues. Live mapping of groundwater levels has been developed so if there is a significant and sudden change the problem can be identified immediately.

AGENCIES

Boston Water & Sewer Commission (BWSC)

Massachusetts Water Resources Authority (MWRA)

Boston City (Departments of transport, energy, public health, parks)

Melbourne Water
Enhancing Life and Liveability

BOSTON

	Priorities alignment	Working together	Sharing knowledge	Co-funding
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Green infrastructure/WSUD

Green infrastructure/WSUD

BWSC are working on developing green infrastructure solutions to address the phosphorus loading problems, retain stormwater and address stormwater quality. Green infrastructure projects and tree planting initiatives will be implemented along the Charles river. It is proposed that BWSC will pay for the Green Infrastructure and the Public Health Department and Parks Department will pay for the trees.

Discussions identified that BWSC had an issue with flooding and that the Parks department had an issue with phosphorus deficits. To solve both problems, wetlands are being created at a large park area in Boston's city centre which will shift phosphorous as well as store and treat stormwater.

BWSC are working with five schools around Boston to develop green infrastructure features (including wetlands) at the schools (paid for by BWSC).

Creating Green infrastructure features at **5 schools**

They have been working with the schools' education departments as well to develop a stormwater-based curriculum and other education programs. The BWSC maintains the wetlands for the first three years then the schools take over.

AGENCIES

Boston Water & Sewer Commission (BWSC)

Massachusetts Water Resources Authority (MWRA)

Boston City (Departments of transport, energy, public health, parks)

Melbourne Water
Enhancing Life and Liveability

	Priorities alignment	Working together	Sharing knowledge	Co-funding
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Shared costs and benefits		●	●	●

Shared costs and benefits

BWSC work together with the city streets department to coordinate repaving of streets and pipe repairs. Additionally, the Boston Planning and Development Agency publishes plans for development and the BWSC will proactively repair pipes in preparation for development.

Cost sharing is common on projects with shared benefits, with arrangements depending on the project, maintenance and ownership structures. Each project has clear ownership boundaries and the relevant agency pays for their sections.

Whoever owns the project leverages it to resolve other existing projects or issues. New projects are used as an opportunity to remediate old projects too. Large highway projects are used to fix issues in the entire corridor. If a new pipe is being built, it is used as an opportunity to improve the road conditions. Improvements like this are then cost shared.

These overarching problems are identified in the environmental review process and are leveraged to solve problems together, cost share and build relationships.

Currently, Green Infrastructure is paid for by the developer, sometimes by the Commission and sometimes by the transportation agency.

There are discussions regarding a stormwater fee based on impervious areas as a possible way forward. This would impact landowners with large impervious areas and the transportation department. Transportation department would be able to waive their fee if green infrastructure is built into projects.

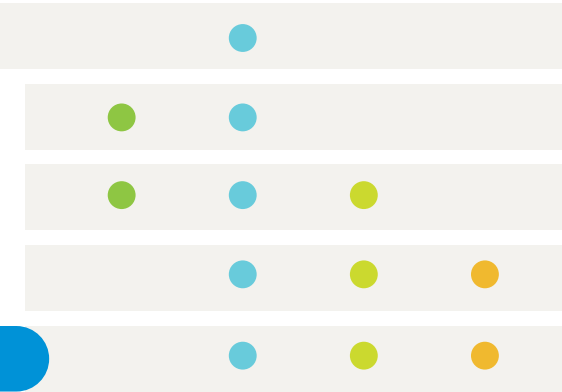### AGENCIES

Boston Water & Sewer Commission (BWSC)

Massachusetts Water Resources Authority (MWRA)

Boston City (Departments of transport, energy, public health, parks)

Melbourne Water
Enhancing Life and Liveability

SAN FRANCISCO

Lifelines Council

Priorities alignment	Working together	Sharing knowledge	Co-funding
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Lifelines Council

The Lifelines Council (LC) was established by utilities in San Francisco in response to major disasters in order to develop and improve collaboration across the city, understand inter-system dependencies to enhance planning, restoration and reconstruction, share information and establish coordination processes.

The LC is a combination of 30 service providers including communication, electric power, liquid fuel, natural gas, transportation

30

Lifelines Council service providers

(airports, highways, ports, rail and transit), water, and wastewater. The LC undertakes 'Cascading Impacts' interdependency studies to model and understand the impact of natural disasters and utility emergencies and how this impacts each service provider

individually and together. This enables utilities to prepare for these events collaboratively and identify vulnerabilities in their system.

Water has become a priority for the city departments but also the public. Water shortages have meant significant water saving measures and fires and flooding have encouraged more resilient infrastructure development and collaboration.

AGENCIES

SF Public Utilities Commission (SFPUC)

Environmental groups and the Public

City of San Francisco

State government: Water Resources, Dam Safety and Public Health

Melbourne Water
Enhancing Life and Liveability

SAN FRANCISCO

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟡	
	🟢	🔵	🟡	🟠
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		🔵		🟠
	🟢	🔵	🟡	🟠

Joint Benefits Authority

Joint Benefits Authority

The challenges that cities are facing with climate change are growing more intense storms with inland flooding, sea level rise along the edges of our coastal cities, as well as health impacts from heat island effect and poor air quality. These often impact our most vulnerable and underserved communities. In addition to these urban challenges, there are numerous governance and financing challenges that cities are struggling with in delivering affordable, equitable, and quality public services. This includes the siloed efforts of city departments and the rising cost of construction, due to labour shortages and rising material costs,

as well as lack of secure dollars for ongoing maintenance, which is particularly challenging for landscape infrastructure and urban forestry. These are large and widespread problems that will require collaborative solutions.

The SFPUC is collaborating with the World Resources Institute and Encourage Capital to design and pilot the Joint Benefits Authority (JBA) in San Francisco. The JBA is a new mechanism to help cities jointly plan, finance, deliver and operate public infrastructure in partnership with the community. In the JBA model, agencies come together into

one team that looks at the neighbourhood challenges holistically to align investments and capture increased benefits.

The JBA will develop transformational projects that capture co-benefits of natural stormwater infrastructure projects while addressing climate change and improving neighbourhood liveability, clean air and water, flood resilience, ecological health and urban greening. JBA will pilot financing for integrated public infrastructure such as multi-agency advance capital planning for integrated project delivery and cooperative financing mechanisms.

AGENCIES

SF Public Utilities Commission (SFPUC)

City of San Francisco

Stakeholder Partners and the Public

Melbourne Water
Enhancing Life and Liveability

SAN FRANCISCO

	Priorities alignment	Working together	Sharing knowledge	Co-funding
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Watershed clean-up

Watershed clean-up

There has been a large wastewater program campaign (USD$6 billion) to upgrade the stormwater and sewer and address the CSO related issues. This has also become a large public program, with buses advertising the program. There is also a public task force that meets with the city and stakeholders.

The Sewer System Improvement Program funds green infrastructure projects to slow down or reduce the amount of stormwater entering the system.

USD$6b

Wastewater program campaign to upgrade stormwater and sewer

The Stormwater Management Program develops environmentally green policies and projects for people to reduce overloading of the sewer system with stormwater, reuse stormwater for non-drinking uses, and to green the City.

Green infrastructure has become popular across the city however there are challenges regarding maintenance and ownership.

AGENCIES

SF Public Utilities Commission (SFPUC)

Environmental groups and the Public

City of San Francisco

State government: Water Resources, Dam Safety and Public Health

Melbourne Water
Enhancing Life and Liveability

SAN FRANCISCO

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟢	
	🟢	🔵	🟢	🟠
	🟢	🔵		🟠
Green infrastructure		🔵		🟠
	🟢	🔵	🟢	🟠

Green infrastructure

There have been several projects to better manage stormwater quantity and quality, including green roofs and green infrastructure in laneways, implemented by collaboration across agencies.

SFPUC is funded by water rates for water, sewer and stormwater services. SFPUC is in the process of introducing a stormwater tax based on impervious area to fund stormwater management and green infrastructure.

The Adopt-a-Drain program engages citizens who pledge to keep a drain clear of debris during the wet season.

Green infrastructure has become popular across the city however there are challenges regarding maintenance and ownership.

AGENCIES

SF Public Utilities Commission (SFPUC)

Environmental groups and the Public

City of San Francisco

State government: Water Resources, Dam Safety and Public Health

Melbourne Water
Enhancing Life and Liveability

SAN FRANCISCO
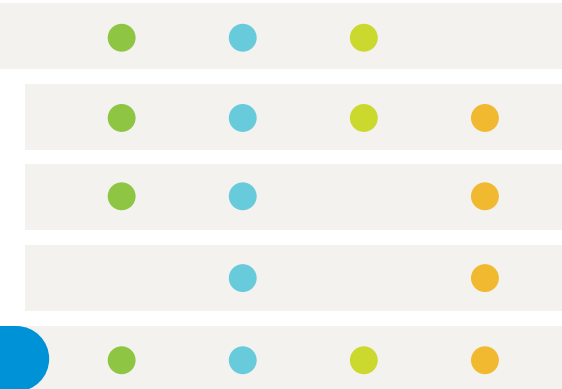
	Priorities alignment	Working together	Sharing knowledge	Co-funding
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Better Streets	●	●	●	●

Better Streets

The Better Streets Plan, launched in 2011, was an initiative to establish a more coordinated effort across agencies, particularly around streets and the public realm. The idea was to develop a placed-base approach. Better Streets Plan is funded by the planning department with other departments contributing in-kind time.

As part of this, a program 'Envista' was developed which is a GIS based planning and coordination tool. City agencies enter planned and designed scheduled projects into the system so that the departments can see overlap or shift schedules to align projects, such as an intersection improvement with a paving project.

📍 GIS based planning and coordination tool

AGENCIES

SF Public Utilities Commission (SFPUC)

Environmental groups and the Public

City of San Francisco

State government: Water Resources, Dam Safety and Public Health

Melbourne Water
Enhancing Life and Liveability

MADRID

	Priorities alignment	Working together	Sharing knowledge	Co-funding
Water and climate change	🟢	🔵		
	🟢	🔵	🟢	🟡
	🟢	🔵	🟢	
	🟢		🟢	
	🟢	🔵		🟡

Water and climate change

Water security is a high priority as water scarcity is common in Spain. Heat waves, flooding and storm activity are also increasing issues. Stakeholders engage with water issues from the beginning of the planning process.

In city planning the most important issue is to assure water demand for citizens, the rest of the areas regarding water planning remains in the background. In practise priorities change and the level of priority can become lower than what it should be, in particular for environmental water.

Water security is a high priority

The main driver for water planning inside the Madrid City Council is the Environmental Department, which promotes initiatives and drives the main water projects. It is involved in coordinating water cycle projects, including water sensitive urban design initiatives.

Melbourne Water
Enhancing Life and Liveability

MADRID

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵		
Decide Madrid	🟢	🔵	🟡	🟠
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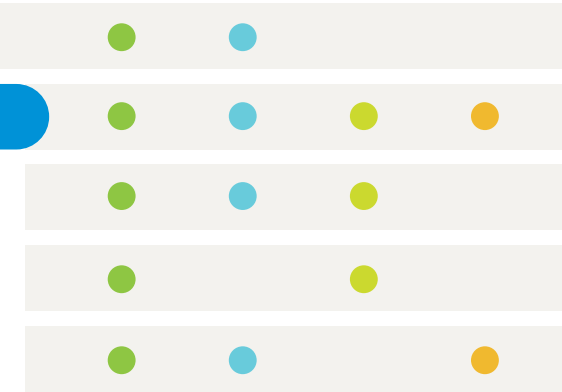
Decide Madrid

Following years of decline in public confidence in local government and in the midst of austerity and corruption scandals in Spain, Madrid City Council designed and launched the Decide Madrid platform in 2015.

Decide Madrid aims to ensure transparency of government proceedings in the city of Madrid and to widen public participation in Council decision-making and spending processes.

The website allows Madrid's citizens to engage with the local government in four ways:

Participatory budgeting – citizens can make spending proposals for projects in the city up to a budget of €100 million; the overall budget is divided into €70 million for district projects and €30 million for city-wide projects.

Proposals – citizens can shape government actions by directly proposing and supporting ideas for new legislation (that fall within the jurisdiction of the city council).

Consultations – Madrid City Council gives citizens the opportunity to provide opinions about and vote on council proceedings.

Debate – a platform for deliberation which doesn't lead to direct decision making but gives the City access to public opinion.

Melbourne Water
Enhancing Life and Liveability

MADRID

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵		
	🟢	🔵	🟢	🟡
PGOU	🟢	🔵	🟢	
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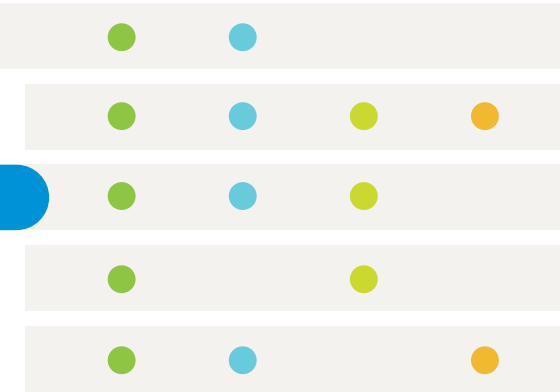
PGOU (General Plan for Urban Planning)

The general framework for water planning in Madrid City is the PGOU, currently being updated. This General Plan sets rules for city planning for 10 years. Partial Plans (other urban planning instrument for urbanising areas in the city) give long-term rules and recommendations.

The Department leading the specific project makes decisions, prioritises and addresses the objectives.

Funding for projects vary depending on the nature of the project. Normally, the Promotor (usually a Private entity) funds the project. In other cases, there are European subsidies and municipal/local funding that help fund the project and collaboration between agencies.

There is a formal process known as Administrative Contract. Citizens can participate only when the project is shown as part of a 'Public Engagement period'.

The project is available for public participation for a period of 20 days. However, public participation is scarce.

Conflicts are very common in the process of planning across departments. Usually, the Department leading the project takes the power, makes decisions and drives the advance of the project.

AGENCIES

Canal de Isabel II

Ministry of Environment

Ministry of Health

Madrid City Council

Melbourne Water
Enhancing Life and Liveability

MADRID

Priorities alignment	Working together	Sharing knowledge	Co-funding
●	●		
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●	●		●

Common frameworks and tools

Common frameworks and tools

The City and Water utility have previously not measured or registered results however are creating tools for monitoring results of water projects.

The Madrid city council has developed a basic guide for the design of sustainable stormwater management systems in green areas and other open spaces, Guía Básica de diseño de sistemas de gestión sostenible de aguas pluviales en zonas verdes y otros espacios libres.

Educational programs include:

Sustainable Travel Accreditation and Recognition for Schools (STARS) – a pan-EU behaviour change programme that delivers a modal shift in the number of school pupils cycling to and from school in nine EU cities.

Educar hoy por un Madrid más sostenible (Educating today for a more sustainable Madrid) – since 2005, more than 850 centres, with more than 400 teachers and 13,000 school groups, have participated in the program.

In 2012 the Network of Environmentally Sustainable Centres was launched.

Hábitat Madrid – program of environmental activities for citizens, such as community gardens, organic waste collection, etc.

850 centres | **400** teachers | **13k** school groups

AGENCIES

Canal de Isabel II

Ministry of Environment

Ministry of Health

Madrid City Council

Melbourne Water
Enhancing Life and Liveability

MADRID

	Priorities alignment	Working together	Sharing knowledge	Co-funding
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	🟢	🔵	🟢	🟠
	🟢	🔵	🟢	
	🟢		🟢	
Madrid Nuevo Norte/Sur de Madrid	🟢	🔵		🟠

Madrid Nuevo Norte/Sur de Madrid

Madrid Nuevo Norte (MNN) is one of the largest-scale urban renewal and place-making initiatives in Europe to date. The ambitious project seeks to close the gap between the city's two northern districts, by renovation of Chamartín Station. The current void of the rail tracks near the station will be replaced by a large central park, with the site connected by a 3 km long green corridor to El Pardo Forest enabling biodiversity and amenity.

MNN aims to become a benchmark for sustainable management of water resources, linking urban infrastructures with the water cycle, planning efficient and sustainable use of water, and maximising self-sufficiency with water catchment, savings and efficiency-related initiatives. These measures include seeking the maximum permeability of the street surface and reusing rainwater for watering green areas.

Veolia Water Technologies launched the first industrial scale phosphorous recovery plant (struvite) in Spain for Canal de Isabel II. The facility at Sur de Madrid WWTP produces up to 2 tons per day of struvite from wastewater, for use as fertilizer, providing environmental, technical and economic advantages towards a circular economy.

AGENCIES

Canal de Isabel II

Ministry of Environment

Ministry of Health

Madrid City Council

Melbourne Water
Enhancing Life and Liveability

Collaboration processes

Priorities alignment	Working together	Sharing knowledge	Co-funding
	● (blue)	● (green)	
● (green)	● (blue)	● (green)	
● (green)	● (blue)		● (orange)
	● (blue)		● (orange)
● (green)	● (blue)	● (green)	● (orange)

Collaboration processes

NYC is engaging with international partners (Copenhagen and Amsterdam) to share learnings and pilot projects. This has brought city agencies together to see what innovation is possible and how it was achieved and prompted practical discussions on how ideas can be transferred locally.

DEP and New York City's wider City Government and other utilities, as well as property owners collaborate on projects. Historically, DEP has used MOU processes to work closely with other agencies, the public, environmental groups, schools and 'friends of' groups to co-deliver and co-maintain projects. They have also worked with non-profit organisations to cost share green infrastructure retrofits at schools.

There are often a lot of conversations and discussions held informally. Issues and conflicts are generally resolved through stakeholder engagement and interagency discussions. In the case when issues cannot be resolved, a higher authority will step in to make the decision.

AGENCIES

Department of Environmental Protection (DEP)

City of New York

Melbourne Water
Enhancing Life and Liveability

Climate Change Task Force

Priorities alignment	Working together	Sharing knowledge	Co-funding
	🔵	🟢	
🟢	🔵	🟢	
🟢	🔵		🟠
	🔵		🟠
🟢	🔵	🟢	🟠
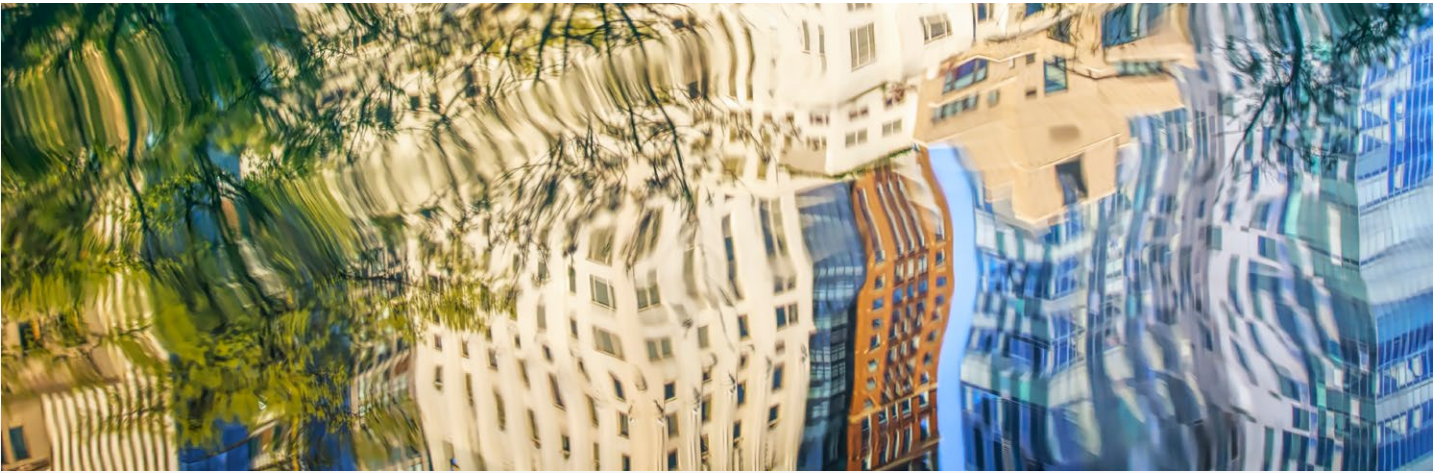
Climate Change Task Force

There are already significant challenges from climate change in New York. After Hurricane Sandy, there is greater interest in flooding and how to design drainage infrastructure for its management. DEP uses an Integrated Water Management approach to address these challenges.

The Climate Change Task Force, convened by the Mayor's Office, conducts vulnerability and risk assessments to help innovate individual agencies' response and assets' planning.

DEP and city agencies work with other sectors to understand how different impacts affect different utilities, where the touch points are and how they impact each other.

Bureaucratic processes are challenging, and DEP faces challenges in the conflicting priorities across agencies and how to push projects that are not driven by regulatory requirements.

After Hurricane Sandy, interest in flooding increased

AGENCIES

Department of Environmental Protection (DEP)

City of New York

Melbourne Water
Enhancing Life and Liveability

NEW YORK CITY

	Priorities alignment	Working together	Sharing knowledge	Co-funding
		🔵	🟢	
	🟢	🔵	🟢	
Water supply and harbour clean up	🟢	🔵		🟠
		🔵		🟠
	🟢	🔵	🟢	🟠

Water supply and harbour clean up

DEP drives Integrated Water Management to tie initiatives that are of a high priority to the wider public to lower priority initiatives, such as tying large scale wastewater projects to water conservation, green infrastructure and reuse.

DEP is working collaboratively with customers to help manage CSO events. Real time text alerts are sent to the community when rain levels are high and treatment plants are at capacity to inform people to reduce water use and wastewater flows. DEP will be developing an app for this cutting edge, behaviour change project.

DEP has worked with farmers and through land acquisition to develop a portfolio of practices to protect water supply. This has been done in lesser developed areas. The result has been a reduction in the amount of treatment required.

Bluebelt program: this watershed protection program has been undertaken collaboratively with other agencies as well as environmental groups to acquire vacant properties and restore land for wetlands and drainage.

Bluebelt program
restores land for
wetlands and drainage

AGENCIES

Department of Environmental Protection (DEP)

City of New York

Melbourne Water
Enhancing Life and Liveability

Priorities alignment	Working together	Sharing knowledge	Co-funding
	🔵	🟢	
🟢	🔵	🟢	
🟢	🔵		🟠
🟢	🔵		🟠
🟢	🔵	🟢	🟠

Green infrastructure

Green infrastructure

In the last 10-15 years, major capital projects (tanks and tunnels) have been proposed in New York to address Clean Water Act compliance. The City led by DEP, has worked on innovative green infrastructure projects and programs to defer capital infrastructure. Integrated planning and green infrastructure (GI) provided added benefits including carbon and flood reduction and increased amenity.

The City established a Green Infrastructure Plan and Program to support green infrastructure in capital projects. Through this Program, DEP has established partnerships with multiple agencies to implement green infrastructure projects. The primary goal of the Program is to reduce combined sewer overflows (CSO) into New York Harbour, with distributed projects also bringing co-benefits of increased urban greening, heat island reduction and improved biodiversity through habitat creation.

For example, the Department of Education, on behalf of DEP, is coordinating with 16 schools in 2019/2020 to construct green infrastructure, leading to water quality improvement and co-benefits for the community.

Department of Transportation incorporated green infrastructure into its Street Design Manual and several of its traffic calming measures and other enhancements. Department of Parks and Recreation pioneered the Greenstreets program and has designed enhancements to store stormwater in roadway greening projects and into playground features.

Multiple instruments are used: new building laws and funding (revolving funds from grants, partnerships with private owners for innovative projects, including rooftop gardens).

AGENCIES

Department of Environmental Protection (DEP)

City of New York

Melbourne Water
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NEW YORK CITY

	Priorities alignment	Working together	Sharing knowledge	Co-funding
		🔵	🟢	
	🟢	🔵	🟢	
	🟢	🔵		🟡
		🔵		🟡
Shared costs and benefits	🟢	🔵	🟢	🟡

Shared costs and benefits

Informal conversations with other bureaus is common practice to understand agencies' bottom line and goals and try to identify synergies to achieve shared benefits.

DEP is working closely with the energy utilities to reduce energy use on high demand days and cost share the initiatives.

Funded by the natural gas company, DEP is working on projects to recover and treat gas from treatment plants. This is then reintroduced into the grid.

DEP is undertaking innovative research, quantifying the energy and greenhouse gas savings that result from green infrastructure and water conservation. This contributes to the overall greenhouse gas reduction of the city. It is mainly focussed on their own assets (e.g. treatment plants). This is done collaboratively with the city departments and energy portfolio who are co funding the research and water conservation programs.

DEP drives Integrated Water Management to tie initiatives that are of a high priority to the wider public to lower priority initiatives, such as tying large scale wastewater projects to water conservation, green infrastructure and reuse.

AGENCIES

Department of Environmental Protection (DEP)

City of New York

Melbourne Water

Enhancing Life and Liveability

LONDON

	Priorities alignment	Working together	Sharing knowledge	Co-funding
Ofwat	🟢	🔵	🟢	🟠
	🟢	🔵	🟢	🟠
	🟢	🔵	🟢	🟠
	🟢	🔵		
	🟢	🔵	🟢	🟠

Ofwat

The water sector regulator (Ofwat) has allocated up to £450m funding to 8 water companies to undertake feasibility and planning studies on 15 strategic water supply schemes in the next 5 years to improve long term water security and resilience. Of this £450m, Thames have been allocated £179m and Affinity £83m – these are 'draft determination' proposals and will be confirmed in mid-December when the 'final determinations' are published.

This funding is the 'big ticket' in town for water supply resilience for the South East of England and is over and above the 'business as usual' funding which will also be confirmed in mid-December.

As part of the Ofwat resilience studies, Regional Water Planning groups in England & Wales have been formed. These groups are encouraging innovation and including things like green infrastructure as options to solve supply-demand balance issues.

Conflicting priorities are largely dealt with through collaboration and sharing a single overarching objective – best value resilience for all parties. If a situation cannot be resolved, then the regulatory mechanisms and mandatory planning processes take over.

AGENCIES

Thames Water

Affinity Water

Department of Energy and Environment

Ofwat

Environment Agency

Melbourne Water
Enhancing Life and Liveability

	Priorities alignment	Working together	Sharing knowledge	Co-funding
	●	●	●	●
Water Resources South East	●	●	●	●
	●	●	●	●
	●	●		
	●	●	●	●

Water Resources South East (WRSE)

Regional Water Planning groups in England & Wales bring multiple utilities together to deliver multi-sector water resources resilience plans. The most established group is WRSE.

WRSE is an alliance of 6 water companies which cover the south east region of England (including London). Historically a regional strategy has been developed that ignores company boundaries. WRSE planning considers a range of future scenarios and identifies

6 water companies

the preferred infrastructure and demand management solutions that will meet the water deficit in each. WRSE has supported the development of a regional water grid, enabling the transfer of 1 billion litres per day between and within companies.

WRSE has the remit by August 2022 to publish a Regional Water Supply Plan. WRSE has to deliver a multi-sector water resources resilience plan (not just a water company plan) and stakeholder engagement is a key theme. Engagement steps include: gather feedback on existing resilience; share information and collaboratively determine existing resilience levels; complete policy work to capture all considerations; develop a regional plan in consultation with stakeholders.
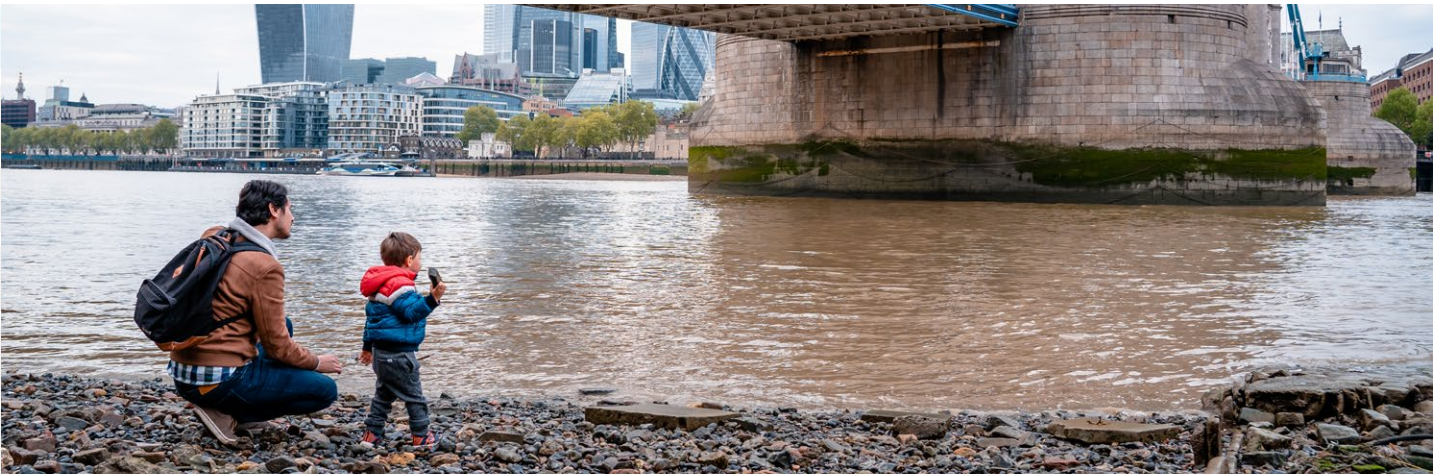
AGENCIES

Thames Water

Affinity Water

Department of Energy and Environment

Ofwat

Environment Agency

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	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟡	🟠
	🟢	🔵	🟡	🟠
RAPID	🟢	🔵	🟡	🟠
	🟢	🔵		
	🟢	🔵	🟡	🟠

Water Regulators' Alliance for Progressing Infrastructure Development (RAPID)

RAPID is a new cross regulatory unit, focused on facilitating timely and coordinated development of large-scale water resources infrastructure schemes.

Plans are subject to formal stakeholder forums and consultations as well as work on customer preferences. A series of deliberative forums is used so competing issues can be resolved.

This uses facilitation and an open, ethical based regulation type approach.

Data is shared for scenario planning and demand management across agencies.

AGENCIES

Thames Water

Affinity Water

Department of Energy and Environment

Ofwat

Environment Agency

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	Priorities alignment	Working together	Sharing knowledge	Co-funding
	●	●	●	●
	●	●	●	●
	●	●	●	●
Policy Task and Finish Group	●	●		
	●	●	●	●

Policy Task and Finish Group

Currently, there is a range of top down policies, which are not aligned. Therefore, a Policy Task and Finish Group has been set up, which brings all government and regulators together to resolve policy gaps and inconsistencies.

In the environmental evaluation framework, water is given a high priority. Resilience and climate change are two of the key areas for the Policy Task and Finish Group, with representatives drawn from the range of entities looking after water and environmental matters:

32 London boroughs

- 32 boroughs in London
- two departments of Greater London Authority (GLA)
- the water authority Thames Water
- the Environment Agency
- industry associations, river trusts, community bodies and more

By working towards a common understanding of risk and issues, there is now a much more uniform appreciation of the role and criticality of water in urban planning.

In major infrastructure assets (e.g. HS2, Britain's proposed high-speed rail) water is one of the first criteria that are looked at due to the spatial dependency of water infrastructure.

AGENCIES

Thames Water

Affinity Water

Department of Energy and Environment

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Environment Agency

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	Priorities alignment	Working together	Sharing knowledge	Co-funding
	🟢	🔵	🟢	🟠
	🟢	🔵	🟢	🟠
	🟢	🔵	🟢	🟠
	🟢	🔵		
Integrated water management	🟢	🔵	🟢	🟠

Integrated water management

In large growth areas, London requires collaboratively developed Integrated Water Management strategies.

Severe weather variability is worsening with climate change. Significant temperature increases are already being felt. There are initiatives to develop flood resilience strategies. Green and grey infrastructure projects are used to reduce loading on combined sewer and stormwater outfalls in London.

Understanding climate risk and resilience issues contribute to a more uniform appreciation of water planning and criticality for Greater London.

Ofwat funds key topics of interest, such as Extreme Drought – this includes the long-standing proposal for a large reservoir which Thames Water and Affinity Water will be jointly pursuing. The resilience funding is additional to 'business as usual' funding from ratepayers.

AGENCIES

Thames Water

Affinity Water

Department of Energy and Environment

Ofwat

Environment Agency

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Enablers for Integrated Planning

Enablers are processes or tools that can facilitate or encourage integrated and holistic city planning. The enablers presented here were identified based on practices observed in the case studies cities.

These are grouped into four themes as summarised at right, with each enabler explained in further detail in the following pages. Each enabler is numbered sequentially according to the theme; for example, enabler 2.3 fits within theme 2 and is the third enabler under the theme.

THEME 1
Priorities alignment

Climate change

Climate impacts are a unifying trigger and often associated with a future city vision.

Engage early, engage wide

Success entails engagement across sectors.

Common ground and priorities

Stakeholders need to have a common understanding of whole of city issues and challenges.

Alignment of system and local planning

Integrated planning is facilitated by intentional policy based on whole of system planning.

THEME 2
Working together

Policy support

Exemplar cities maintain focus on addressing policy gaps to create an enabling environment.

Cross-sectoral collaboration

Collaboration provides cost efficiencies and shared benefits.

Joint ventures

Joint Venture arrangements are developed for new cross-departmental or cross-sectoral initiatives.

THEME 3
Sharing knowledge

Common planning frameworks and tools

Integrated planning is facilitated by common knowledge platforms, models, GIS and expertise shared among stakeholders.

Sharing learnings

Exemplar cities routinely share learnings to more quickly gain knowledge and understanding.

THEME 4
Co-funding

Clear rules for co-funding

Clarity and transparency in co-funding rules and arrangements is key in integrated planning.

Funding models

Innovative funding approaches support fully integrated water management.

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(1.1)

Climate change

Climate impacts are a unifying trigger.

Vulnerability to climate impacts is a powerful driver to identify city wide needs and catalyse collaboration and integrated planning.

Climate impacts and extreme events (drought, flood, sea level rise, heat, etc) affects all services – hence their impacts are key to defining city planning needs along with other planning drivers (transport needs, population growth, pollution management, etc).

Whole of city vulnerability assessment is a first key step to understand city impacts, impact on services and to identify needs for consideration into agencies plans and priorities.

Agencies and stakeholders are brought together to assess vulnerability, define impacts to their services and how they might affect each other's plans.

Water issues are an essential feature in climate impacts and urban planning for all services (including transport planning). IWM may not be the priority outcome but is often an essential tool to manage the impacts for resilience and sustainability.

"Water can flow in different ways – climate change has raised awareness of the importance of getting agencies working together with water related issue."

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Engage early, engage wide

Success entails engagement across sectors.

Stakeholders are brought together and encouraged to consider city wide issues (climate and others) and how to address them through the planning process. Early engagement is key.

A broad range of agencies are engaged: water, transport/roads, urban planning, health, electricity, development, environment, education, parks, developers, community, private investors, academia and often multiple government levels (municipal, regional, State, Federal).

A formal body or cross-agency body for risk assessment and interdependencies analysis from a whole of system perspective operates under the coordination of a central city authority or a purpose-specific body/task force.

Some cities pursue international collaboration for lessons sharing and learning exchange. Both formal and informal processes are adopted to foster on-going engagement in planning and implementation.

"Engagement is difficult but worthwhile. The more you can share and be open, the better it is."

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1.2

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1.3

Common ground and priorities

Stakeholders need to have a common understanding of whole of city issues and challenges.

Vulnerability assessments are a useful instrument for creating common ground. Priorities are set considering resilience from a whole of city perspective: climate impacts of flooding, sea level rise, heat and water security, as well as other drivers such as urban growth, CSOs, drought, high intensity events and disasters.

As objectives and priorities for each agency are identified, an intentional effort is made to identify and consider potential synergies with other stakeholders in solving problems, including common interests in planning initiatives that could generate multiple benefits.

Both formal and informal processes are used (e.g. MOUs and frequent interagency discussions). Agencies align their priorities and objectives to address city wide needs, discussing implications across services. Whilst agencies have different drivers, their direction is aligned because of common gain or an overarching mandate set for the city.

"Everybody has their own priorities and lenses they are looking through – we need to be open to looking at it from their angle. You have a problem, I have a problem – can we work together to get a better solution for all our problems? Let's work together."

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1.4

Alignment of system and local planning

Integrated planning is facilitated by intentional policy based on whole of system planning.

Transition from whole of city assessment to local implementation requires a clear overarching objective (e.g. Best value resilience for all parties – London) and directions to enable alignment of planning and outcomes from regional to local scale (e.g. a city identity around water-Copenhagen).

A process for coordinated data sharing, and planning based on common evidence is another key feature in exemplar cities. Mapping inter-system dependencies works to enhance planning, restoration and reconstruction, share information and establish collaborative response processes.

It is key that stakeholders are brought together to build relationships, solve problems and conflicts and explore shared cost-effective solutions that address multiple needs at local and political levels.

At the same time clear delineation of roles, boundaries and responsibilities for each stakeholders' roles and responsibilities is required.

Whilst policy and/or regulatory support is often needed to facilitate integrated delivery of outcomes at various levels with flexibility for collaboration, transparency and reduced bureaucracy.

"It's all down to people, the approach you take to stakeholders is critical – being understood to be honest, credible and trustworthy is essential along with real empathy and taking the time to listen to their points of view and concerns."

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2.1

Policy support

Exemplar cities maintain focus on addressing policy gaps to create an enabling environment.

New mechanisms (such as joint ventures) have been implemented across stakeholders to facilitate and enable collaborative planning and implementation.

Transparency is key: all cities have formal and transparent processes that engage agencies and stakeholders from early stages of a project lifecycle.

Formal processes often have an overarching entity responsible for coordination and dispute resolution.

Exemplary cities also rely on informal relationships and quid-pro-quo arrangements between departments and agencies to enable implementation.

Mapping inter-system dependencies works to enhance planning, restoration and reconstruction, share information and establish collaborative response processes.

But more importantly, policy and regulatory support are essential to enable collaborative and innovative holistic planning to be realised.

"The creation of a separate entity that is responsible for ensuring all of the City stakeholder objectives are achieved will enable larger scale projects that capture co-benefits, while removing overlapping services by each agency and allowing shared costs for efficiency."

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2.2

Cross-sectoral collaboration

Collaboration provides cost efficiencies and shared benefits.

Collaborative planning is characterised by transparent, formal and informal processes for stakeholder engagement, and information sharing widely with stakeholders and community.

Engagement is initiated from project creation.

Collaboration adopts different formats commensurate with scope and relevance.

Formal and informal coordination across departments is used to undertake common tasks as part of usual activities, driven mainly by cost-efficiencies such as the sharing of maintenance schedules.

A range of instruments have been adopted to enable collaborative implementation, e.g. MOU, regular planning meetings, reciprocity arrangements.

New and innovative collaborative projects involving multiple stakeholders have adopted formal joint venture arrangements to enable implementation with clarity of roles, responsibilities and governance.

"It really takes time to build up understanding and collaboration especially when different disciplines have to work together – there are different ways of thinking and planning – if you want to change the way things are working it takes time."

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2.3 Joint ventures

Joint Venture arrangements are developed for new cross-departmental or cross-sectoral initiatives.

Responsibilities are clearly defined with a specific lead agency responsible for the project and collaboration from other agencies.

Alignment and synergies are discussed in all collaborations, made clear and shared with wider stakeholders.

Some joint ventures are from whole of city impact perspective (often in disaster driven cities e.g. Lifelines Council (San Francisco)) and others have a defined scope e.g. Climate Change Task force (Boston and NYC), Cloudburst Joint Venture (Copenhagen), Regional Water Planning Groups.

Clear processes for different stages of engagement and project planning are established as well as a dispute resolution process.

"The key lessons are shared ownership of the challenge, if possible within the context of the wider global challenge. Once we established a shared objective with common agreed evidence we now have a really well aligned stakeholder base which is definitely more supporting and encouraging than challenging"

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Common planning frameworks and tools

3.1

Shared frameworks and tools enable effective collaboration.

The creation of common knowledge platforms to serve as basis for collaborative planning and capacity building is a common feature. This enables sharing of expertise and/or resources without duplication.

New data is created and shared as a common instrument for use by all agencies.

This enables a common planning framework and improves coordination in planning using a common data source.

The type of knowledge sharing instruments included: vulnerability assessments, risk assessment and hotspot GIS maps, agencies' plans, common models and assumptions.

"It is important to engage early with information interaction and then work within a regional framework."

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3.2

Sharing learnings

Exemplar cities routinely share learnings to more quickly gain knowledge and understanding.

Some cities have established formal relationships with other cities to share experiences and learnings. In some cases, the relationship is developed through a network such as Water Sensitive Cities, Resilient Cities, Sister City networks and other similar initiatives.

Cities with similar problems can accelerate solutions, including identification of more cost-effective approaches. Cities may also benefit from insight into other cities' challenges, making them more prepared for issues that may have not yet emerged in their own locality.

Transfer of knowledge goes beyond project focused learning to capability enhancement and capacity building, through partnering, staff exchanges and exposure of new perspectives.

"As much as you can, connect to the bigger issues and the regulatory requirements. It is important to do demonstration projects and showcase specific projects, as well as learn from what others are doing and form international partnerships."

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4.1

Clear rules for co-funding

Clarity and transparency in co-funding rules and arrangements is key in integrated planning.

Co-funding is complex and there are multiple models across projects, departments and cities, but clear boundaries have been set for agencies regarding what they are willing to fund regarding their roles and responsibilities during the life stages of any project.

Collaborative planning is typically undertaken using in-kind staff time.

Implementation of collaborative projects is usually funded by agencies' own funding mechanisms (mainly rates and often regulated revenue).

New initiatives or new knowledge creation are often funded by special instruments or bespoke co-funding arrangements between agencies.

"It is important to look for benefits of the other stakeholders and then find joint benefits and synergies."

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Co-funding

4.2

Funding models

Innovative funding approaches support fully integrated water management.

A mix of funding models are in place:

- Established traditional funding models
- Innovative cost sharing for joint ventures
- Grants; and
- Special funding instruments
  (taxes, private sector contribution, development contributions)

Specific initiatives are often funded by special instruments or bespoke co-funding arrangements between agencies.

Currently, green and sustainable finance is emerging as a potential funding source.

"Innovation is at the heart of our work, we simply cannot achieve our planning objectives using traditional approaches. We lead a club project approach when possible, so all stakeholders, with a stake, have the opportunity to set, monitor, steer and assess innovation projects. This helps financially, avoids duplication and increases support."

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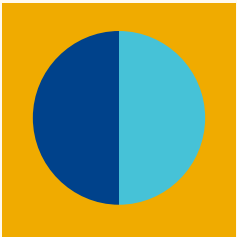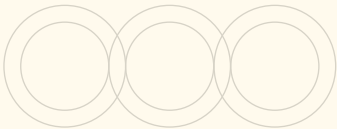**Melbourne Water**
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Collaboration provides synergies through multi-functional and more efficient solutions.

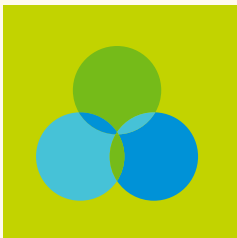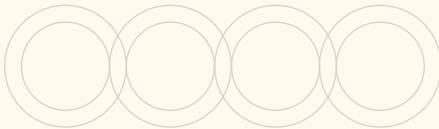Successful collaboration is supported by the following **6 key lessons:**

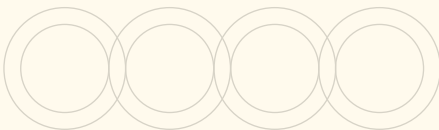Click here to learn about the Enablers for Integrated Planning

Intentional policy for whole of system planning

Identifying common drivers and objectives

Sharing knowledge, learnings, plans, maps, tools and models

Formal and informal forums and collaborative planning, including cross-sectoral

Finding solutions that benefit all parties
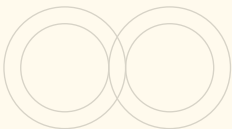
Partnering, including cross-sectoral

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Synergy

through common understanding,
shared value, joint implementation,
shared learnings

The cities' learnings were combined into a framework
approach of best practices in holistic collaborative planning
and priorities assessment, with suggestions of enablers.
These could be applied to help other cities towards
integrated planning.

**Common planning approach
derived from case studies**

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Approach

	STEP 1	STEP 2	STEP 3	STEP 4
Integrated planning process	Based on city objectives, identify common threats/opportunities	Assess impact on institutional drivers and objectives	Examine potential strategies – find common elements	Collaboration and/or assigned issues
	Joint formal vulnerability assessment	Shared data, tools, information, models, learnings	Interagency working group and/or task-specific collaboration	Co-funding
	Assess role of water to city objectives (including climate/resilience)	Common city and/or catchment models and base maps, shared plans for planning	Multi-stakeholder engagement	Lead agency or joint implementation
				Reciprocal arrangements at relevant scales
Formal and informal coordination	Forums, working groups with guiding central coordinating agency	Forums, working groups with guiding central coordinating agency	Synergies and outcomes define lead agency responsibilities, with flexibility for collaborative delivery	MOU, JV, or led by main entity
	Multi-sector and cross-sectoral assessment of city vulnerability			
	Define city planning outcomes/objectives			
Policy and governance	Coordination of the assessment	Review and alignment of urban planning policy for whole of system outcomes	Policy alignment	Funding arrangements
	Intentional policy for whole of system planning	Develop enabling policy based on objectives (including cross-sectoral)	Integration of water into city planning	New fit-for-purpose funding platforms
	Coordination by an overarching lead agency (e.g. City)		Review and alignment of city and local planning policy	
			Address policy and regulation gaps and develop fit-for-purpose models based on city objectives	

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Current application – Template

	STEP 1	STEP 2	STEP 3	STEP 4
Integrated planning process	Based on city objectives, identify common threats/opportunities	Assess impact on institutional drivers and objectives	Examine potential strategies – find common elements	Collaboration and/or assigned issues
	Joint formal vulnerability assessment Assess role of water to city objectives (including climate/resilience)	Shared data, tools, information, models, learnings Common city and/or catchment models and base maps, shared plans for planning	Interagency working group and/or task-specific collaboration Multi-stakeholder engagement	Co-funding Lead agency or joint implementation Reciprocal arrangements at relevant scales
Formal and informal coordination	Forums, working groups with guiding central coordinating agency Multi-sector and cross-sectoral assessment of city vulnerability Define city planning outcomes/objectives	Forums, working groups with guiding central coordinating agency	Synergies and outcomes define lead agency responsibilities, with flexibility for collaborative delivery	MOU, JV, or led by main entity
Policy and governance	Coordination of the assessment Intentional policy for whole of system planning Coordination by an overarching lead agency (e.g. City)	Review and alignment of urban planning policy for whole of system outcomes Develop enabling policy based on objectives (including x-sectoral)	Policy alignment Integration of water into city planning Review and alignment of city and local planning policy Address policy and regulation gaps and develop fit-for-purpose models based on city objectives	Funding arrangements New fit-for-purpose funding platforms

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Suggestions for Melbourne
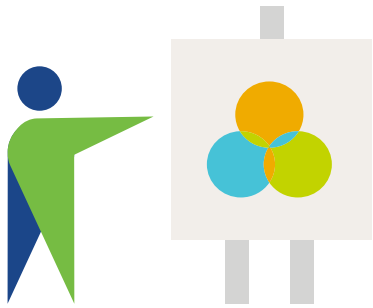
Formal process for early engagement and review

Climate Change Task Force – research, models, data, projects

GIS based platform for current and planned projects and work

Multi-agency forums for specific issues such as urban heat, storm surge – can work within IWM Forum framework

Industry hack-a-thons to solve complex issues

Coordinate with PTV, VicRoads on road and pipe maintenance

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