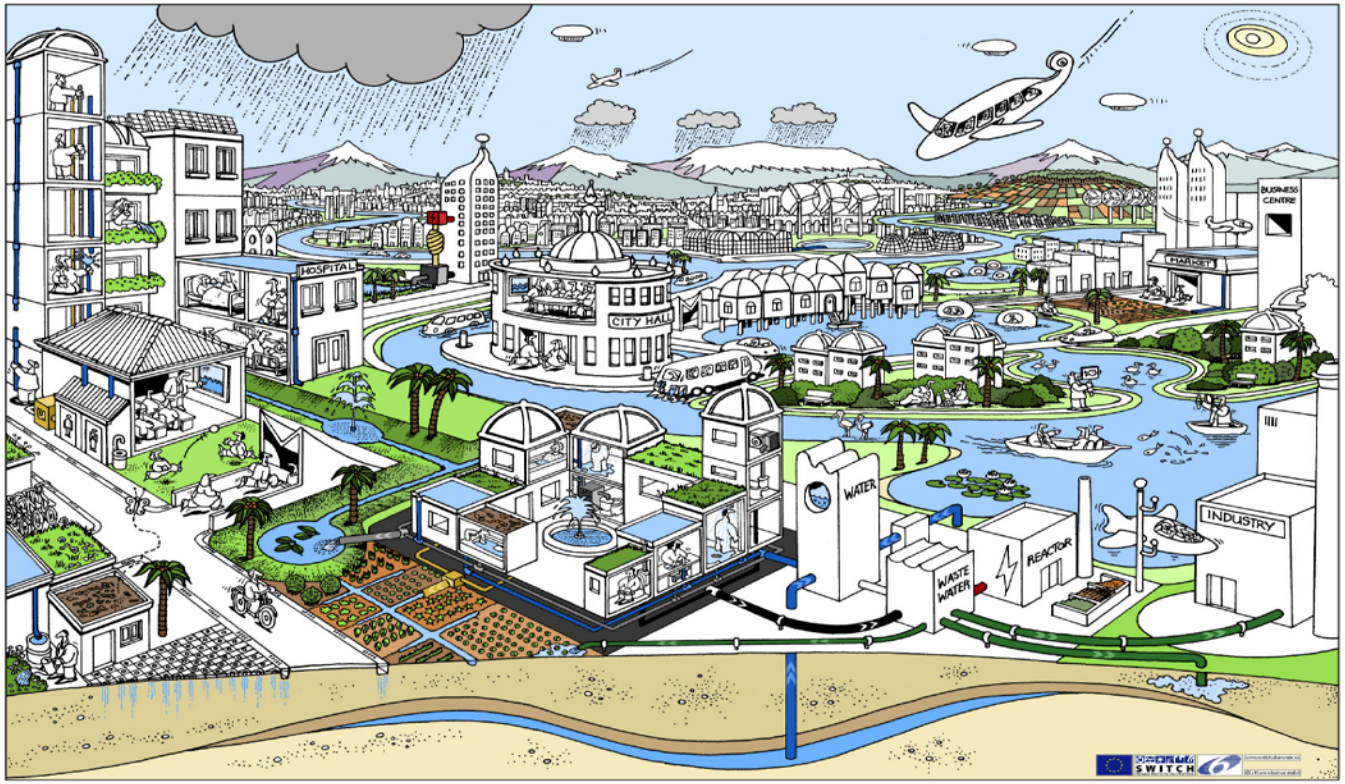
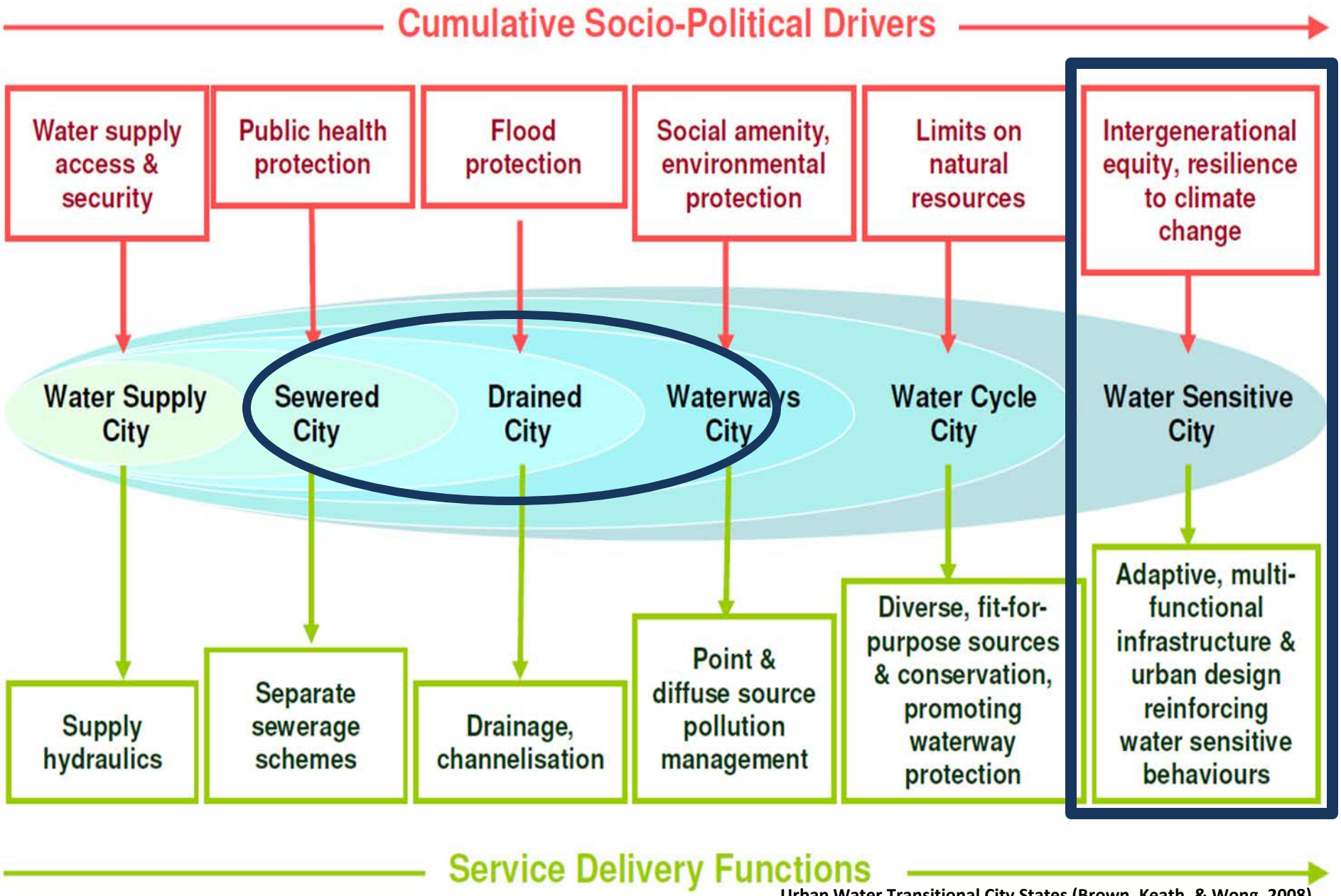
Transitioning to Integrated Water Management



Water Resilient Cities:
Climate Change, Infrastructure, the Economies, and Governance in the Great Lakes Basin
21 April 2016

Carol Howe
ForEvaSolutions

Water Management Continuum



Urban Water Transitional City States (Brown, Keath, & Wong, 2008)

Integrated Water Management

Has many names:

- Regenerative infrastructure
- Integrated water resource
- management (IWRM)
- Water sensitive design
- Water sensitive cities
- Total water cycle management
- Integrated resource planning
- Whole water

One Water

And many visions:

- Cities as water supply catchments
- Cities as sponges
- Cities as carbon sinks
- Cities as blue-green networks
- Cities as vertical forests

Integration for One Water

- Across technologies - hybrid systems of grey and green infrastructure
- Across the water cycle – water, wastewater, stormwater and natural systems
- Across social, environmental and economic disciplines
- Across scales – household to city-wide

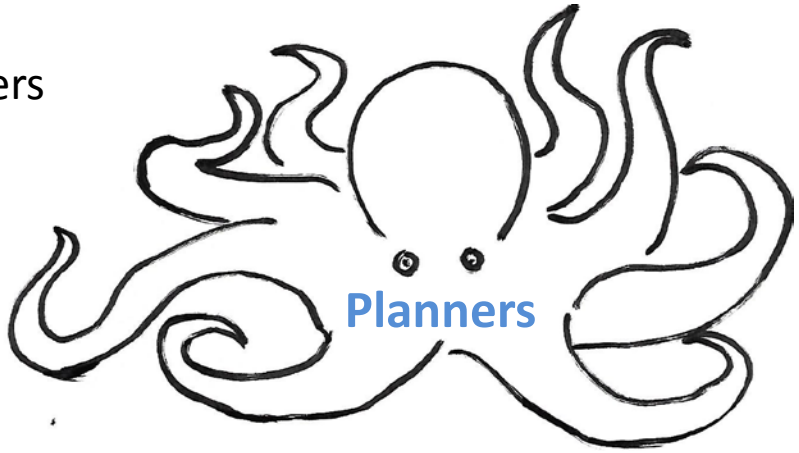
Across institutions – linking urban planning with water, energy, transport, buildings and more

Goals for One Water

- Better living conditions for all
- Healthier communities
- Increased biodiversity
- Improved air and water quality
- Reduced urban footprint
- Citizen enpowerment

Resilient and sustainable systems - reduced impacts from floods and droughts

Who might be involved?



Architects

Parks Departments

Waste managers

Water utilities

Economic Development

Landscape Architects

Energy providers

Building Trades

Roads & Traffic Departments

Local and City officials

Health Departments

Agriculture/Extension Services

Developers

Environmental Regulators

Citizens

NGOs

Insurance Agencies

Banks

Fire Departments

Green infrastructure and Decentralization

Innovative BMPs for Site Plans

- Alternative Turnarounds
- Conservation Easements
- Development Districts
- Eliminating Curbs and Gutters
- Green Parking
- Green Roofs
- Infrastructure Planning
- Low Impact Development
- (LID) and Other Green Design Strategies
- Narrower Residential Streets
- Open Space Design
- Protection of Natural Features
- Redevelopment
- Riparian/Forested Buffer
- Street Design and Patterns
- Urban Forestry

Infiltration

- Grassed Swales
- Infiltration Basin
- Infiltration Trench
- Permeable Interlocking Concrete Pavement
- Pervious Concrete Pavement
- Porous Asphalt Pavement

Filtration

- Bioretention (Rain Gardens)
- Catch Basin Inserts
- Sand and Organic Filters
- Vegetated Filter Strip

Retention/Detention

- Dry Detention Ponds
- In-Line Storage
- On-Lot Treatment
- Stormwater Wetland
- Wet Ponds

https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#post

Focus Areas to Enable Change

What is Institutional Transitioning?

Hard

- Organizational structures
- Departments
- Committees
- Laws
- Regulations
- Taxes & Subsidies

Soft

- Social relations
- Informal networks
- Administrative routines
- Professional cultures
- Social worlds

Leadership

Rebranding to Reflect Changing Roles

- Provide the forum to break down silos
- Create a unified strategic vision
- Create regional leadership committees
- Unify branding
- Encourage innovation

One Water LA

Vision Statement

One Water LA is a collaborative approach to develop an integrated framework for managing the City's watersheds, water resources, and water facilities in an environmentally, economically and socially beneficial manner. One Water LA will lead to smarter land use practices, healthier watersheds, greater reliability of our water and wastewater systems, increased efficiency and operation of our utilities, enhanced livable communities, resilience against climate change, and protection of public health.

Collaborative Planning

- Siloed planning
- Lack of flexibility
- Lack of holistic planning tools & funding to support integration
- Politics

Pittsburgh's 3 Rivers Wet Weather facilitated the co-ordination of actions across 83 municipalities including cost sharing and regionalization.

Cincinnati's Project Groundwork fostered collaborative data sharing between Cincinati MSD, the county, EPA and local universities for evaluation of the performance of green infrastructure, saving taxpayers ~$200M.

Plan Together

- Create 'Learning Alliances'
- Coordinate large data sets and cross organization information – cloud storage
- Provide GIS and visualization tools
- Measure indirect benefits and benchmark overall progress

STAR Sustainability Community Rating System

Built Environment	Climate & Energy	Economy & Jobs	Education, Arts & Community	Equity & Empowerment	Health & Safety	Natural Systems
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health & Health System	Invasive Species
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Prevention & Response	Natural Resource Protection
Housing Affordability	Industrial Sector Resource Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality
Infill & Redevelopment	Resource Efficient Buildings	Targeted Industry Development	Social & Cultural Diversity	Human Services	Indoor Air Quality	Water in the Environment
Public Spaces	Resource Efficient Public Infrastructure	Workforce Readiness		Poverty Prevention & Alleviation	Natural & Human Hazards	Working Lands
Transportation Choices	Waste Minimization				Safe Communities	

Culture, Knowledge & Capacity

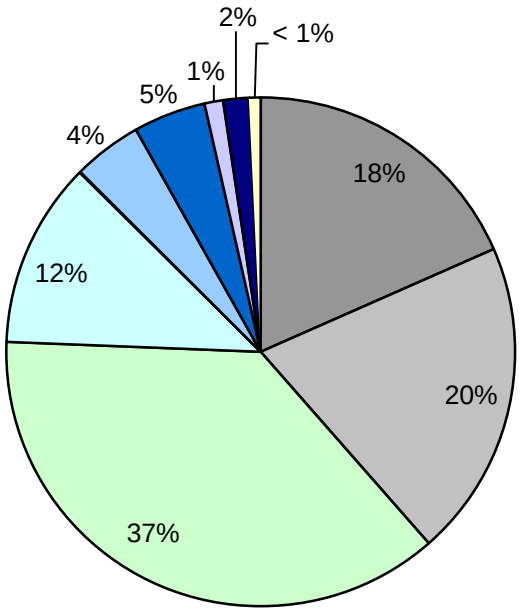
- Organizational resistance, conservatism + inertia
- Lack of incentives + champions
- No time to 'think outside box'
- Disciplinary imbalances

State of Minnesota revised their Revolving Water Fund criteria and priority ranking system to appropriately weight the value of decentralized systems. To do this and then build the local capacity to implement the new system, they and EPA entered into statewide capacity building for local administrators.

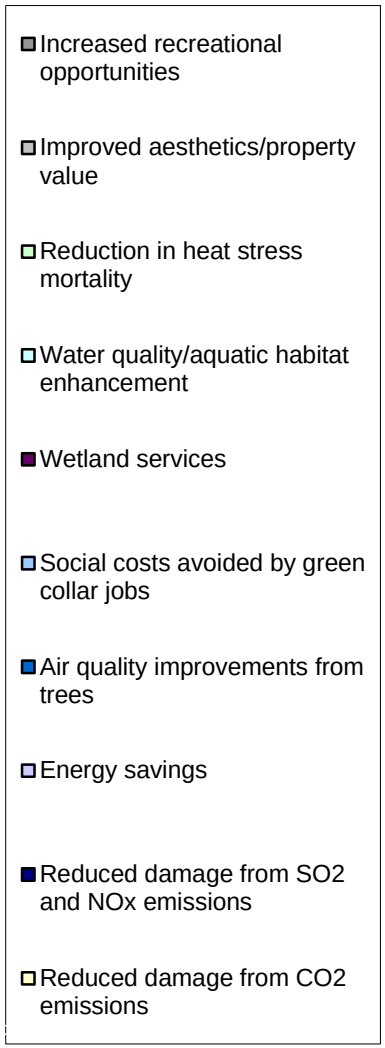
Melbourne Water conducted an internal role analysis that showed that the organization relied on a small number of key individuals to further IWM outcomes and that this posed significant risk to the organization. Based on this, they moved to broaden this internal capacity.

Economics

- Use Triple Bottom Line processes including non-monetary benefits
- Develop incentive programs such as rebates and credits
- Incorporate stormwater management into property taxes or separate utilities
- Encourage public-private partnerships



Philadelphia
Shares of City-wide present value benefits of key CSO options
Cumulative through 2049



Prepared for the Philadelphia Water Department by Abt Environmental Research (formerly Stratus Consulting) through a subcontract with Camp, Dresser, and McKee (CDM).

Legislation


Solaire Building Rooftop – New York

Battery Park City Authority required every property to meet strict sustainability criteria and has continued to tighten guidelines including 100% water recycling and annual accounting for water and energy savings.

Policy

- Develop or build on existing guidelines and rating schemes

Regulations

- Streamline permitting processes
- Develop or adopt model ordinances and codes

San Francisco PUC streamlined the permitting process of on-site, non-potable water systems bringing together water, public health and building inspectors

San Francisco's City Ordinance Streamlines Permitting Process

Water Department	Public Health Department	Building Department
Review onsite non-potable water supplies & demands	Issue water quality & monitoring requirements	Conduct plumbing plan check and issue plumbing permit
Administer citywide project tracking	Review and approve non-potable engineering report	Inspect and approve system installations
Provide technical support & outreach to developers	Issue permit to operate onsite systems	
Provide financial incentives to developers	Review water quality reporting	

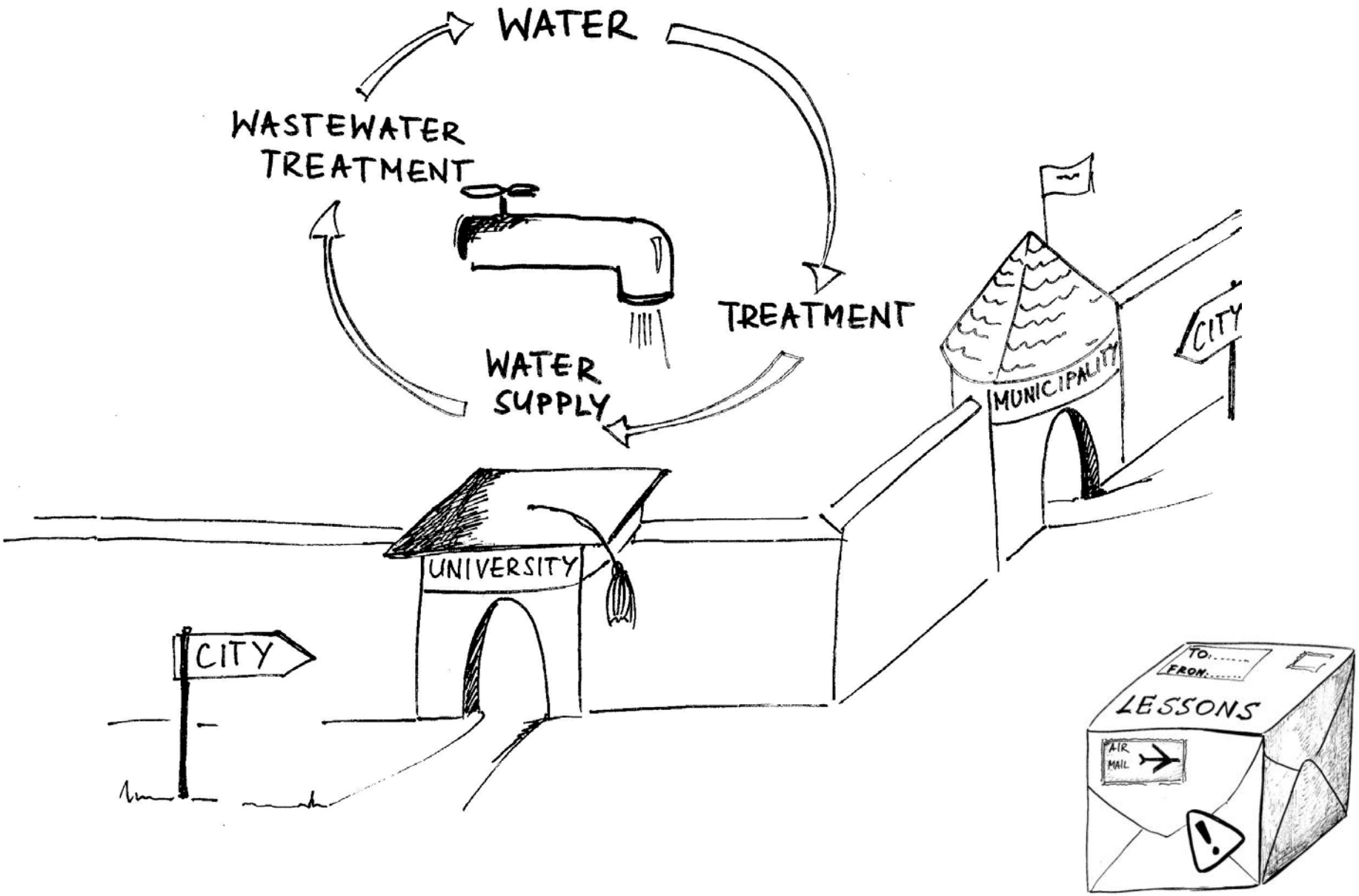
Engagement

- Joint demos have power – seeing is believing
- Empower customers and citizens
- Embed engagement in planning – interactive design workshops, public outreach and education
- Learn to speak differently – consider your audience
- Get savvy with outreach technology

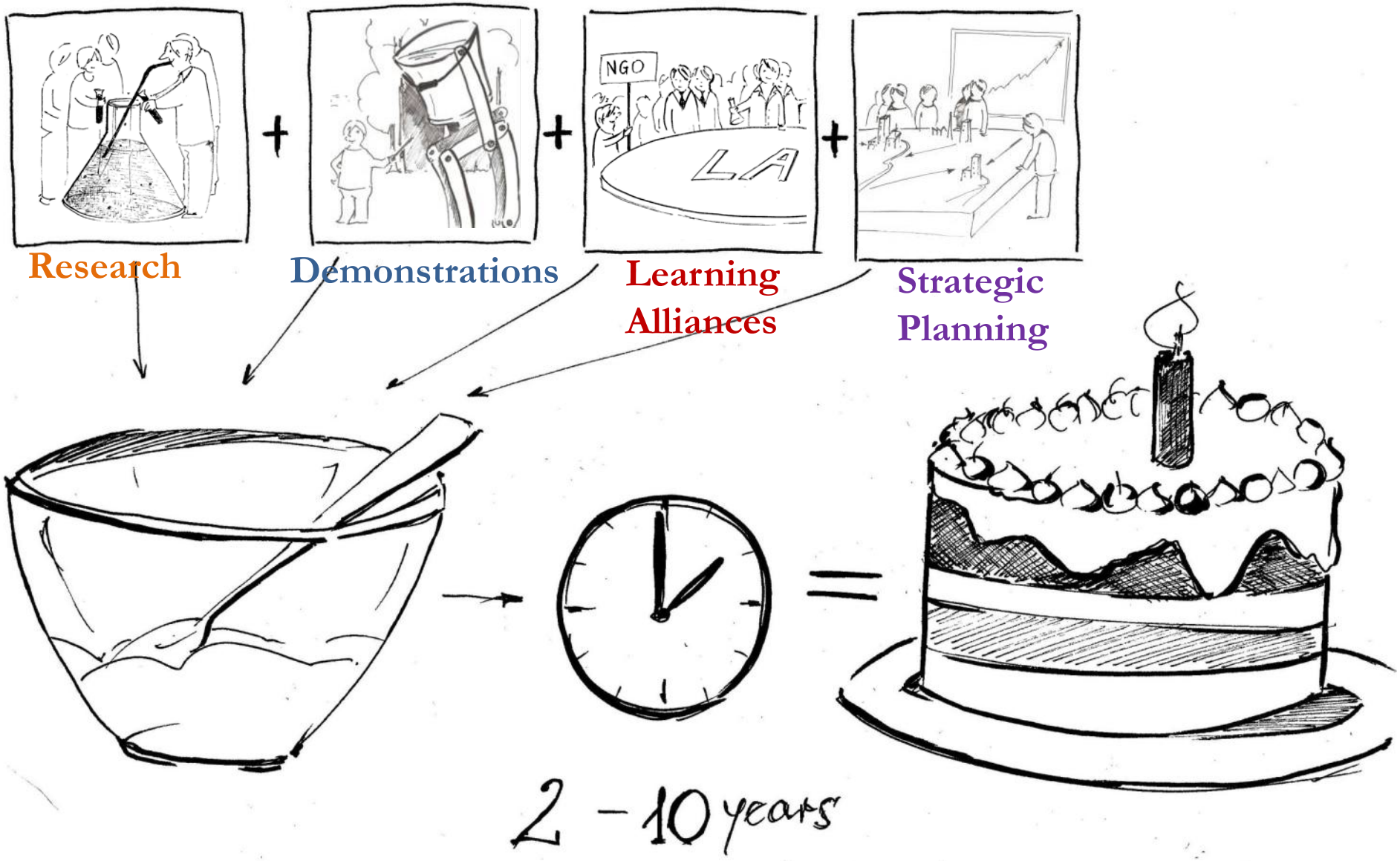
Local Raingardens

PWSA Charette Process

Integration Begins with Current Issues



Stir in the Right Ingredients



Combining activities was at the heart of the logic of SWITCH

End Result - More Liveable and Resilient Cities