



شركة مياه الشرب
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لمياه الشرب والصرف الصحي



وزارة مرافق مياه الشرب والصرف الصحي
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Recent Trends in Water Utility Management

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Outline

- **Water and Wastewater Utilities Management: Challenges and Pressures**
- **Industry Reaction: Recent Trends in Water Utility Management**
 - Effective Utility Management
 - Total Management Planning
 - Total Water Cycle Management
 - Governance-Sustainability Models
- **Conclusions**
- **Sources of information**



1. Population growth and urbanization
2. Rising cost of service delivery
3. Deterioration of infrastructure
4. Increasingly stringent regulatory requirements
5. Security related issues



1. New technologies and automation
2. IT security related issues
3. Globalization and economic development
4. Governance, privatization and private sector participation
5. Climate change



1. Changes in the public behavior
2. Changes in workforce structure and demands
3. National water resources related issues
4. Shortage in finance.



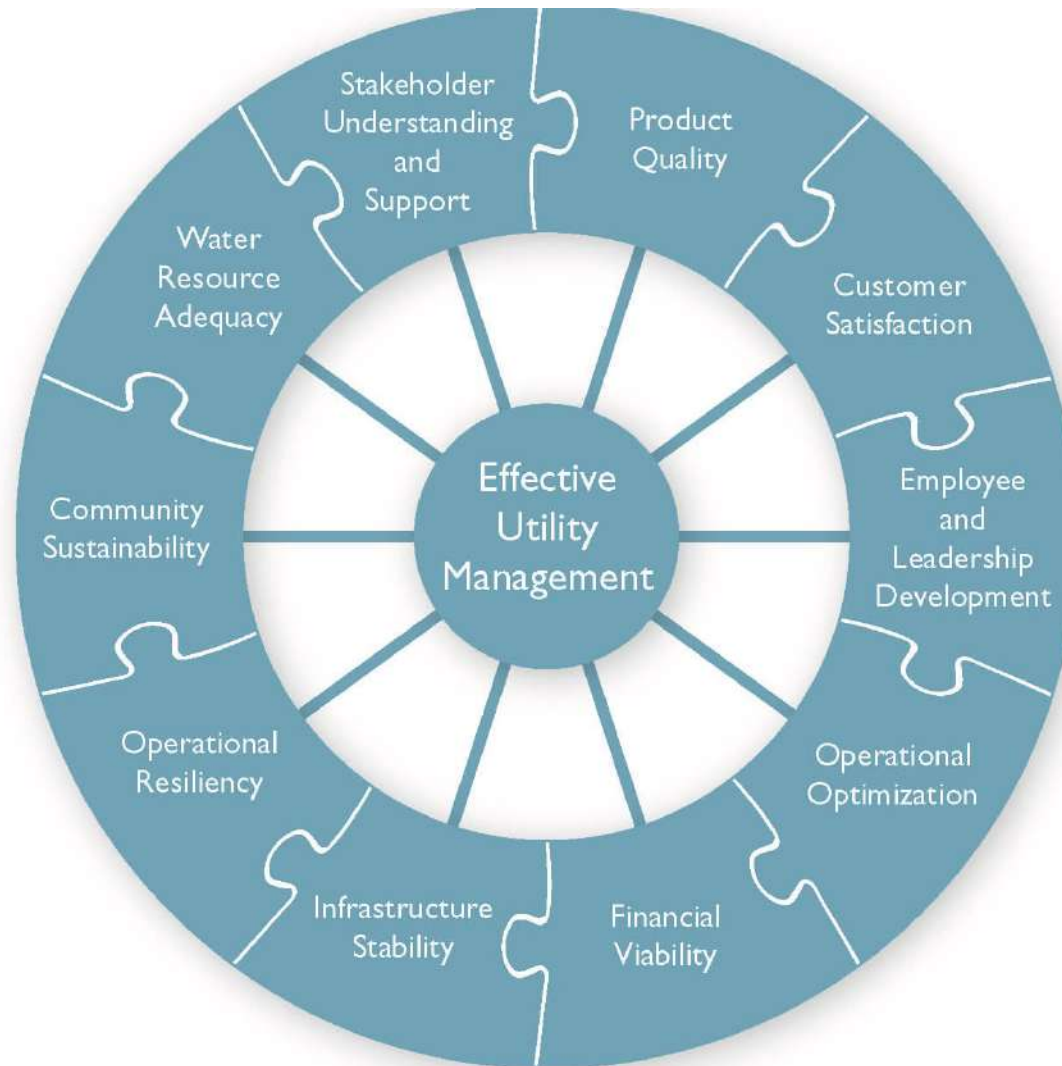
- Effective Utility Management (EUM)
- Total Management Planning (TMP)
- Total Water Cycle Management
- Governance-Sustainability Models



- EPA and six water and wastewater associations initiative in 2007
- Based on Ten Attributes of Effectively Managed Water Sector Utilities and Five Keys to Management Success



Ten Attributes of Effectively Managed Water Sector Utilities





| No | Attribute |
|----|---|
| 1 | <p>Product Quality</p> <p>Produces potable water, treated effluent, and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs.</p> |
| 2 | <p>Customer Satisfaction</p> <p>Provides reliable, responsive, and affordable services in line with explicit, customer-accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies.</p> |
| 3 | <p>Employee and Leadership Development</p> <p>Recruits and retains a workforce that is competent, motivated, adaptive, and safe-working. Establishes a participatory, collaborative organization dedicated to continual learning and improvement. Ensures employee institutional knowledge is retained and improved upon over time.</p> |
| 4 | <p>Operational Optimization</p> <p>Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. Minimizes resource use, loss, and impacts from day-to-day operations. Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements</p> |
| 5 | <p>Financial Viability</p> <p>Understands the full life-cycle cost of the utility and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates—consistent with community expectations and acceptability—adequate to recover costs.</p> |



| No | Attribute |
|----|--|
| 6 | <p>Infrastructure Stability</p> <p>Understands the condition of and costs associated with critical infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk . Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.</p> |
| 7 | <p>Operational Resiliency</p> <p>Ensures utility leadership and staff work together to anticipate and avoid problems. Proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals.</p> |
| 8 | <p>Community Sustainability</p> <p>Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources. Explicitly considers a variety of pollution prevention, watershed, and source water protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability.</p> |
| 9 | <p>Water Resource Adequacy</p> <p>Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education. Explicitly considers its role in water availability and manages operations to provide for long-term aquifer and surface water sustainability.</p> |
| 10 | <p>Stakeholder Understanding and Support</p> <p>Builds the and support from oversight bodies, community and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them.</p> |



| Title | Description |
|--|--|
| <p>1. leadership</p> | <ul style="list-style-type: none"> • Refers to both individuals who can be effective champions for improvement and to teams that provide day-to-day management continuity and direction • Leadership has an important function in establishing communications with utility stakeholders and customers • Leadership is responsible for establishing a culture that embraces positive change and strives for continual improvement |
| <p>2. Strategic Business Planning</p> | <ul style="list-style-type: none"> • Strategic planning is an important tool for achieving balance and cohesion across the ten attributes • A Strategic Plan provides a framework for decision making <ul style="list-style-type: none"> • Assessing current conditions, strengths and weaknesses • Assessing underlying causes and effects • Establishing vision, objectives and strategies |
| <p>3. Organizational Approaches</p> | <p>Organization is key to success of management improvement efforts Requires the active engagement of employees in achieving improvement targets. Linked with the effectiveness of the change management processes</p> |



| Title | Description |
|--|---|
| 4. Measurement | <ul style="list-style-type: none"> • A measurement system is essential to manage using key performance indicators • It should be based on well-defined decision framework assuring that results are evaluated, communicated and responded to in a timely manner |
| 5. Continual Improvement Management Framework | <ul style="list-style-type: none"> • It is a complete comprehensive management system (plan-do-check-act framework) • It is enhanced by using gap analysis, establishment of standard operating procedures, internal trend analysis and external benchmarking, best practice review and continual improvement tools |



Developed and applied in Australia Water and Wastewater Service Providers (WSP's),

A TMP is designed to :

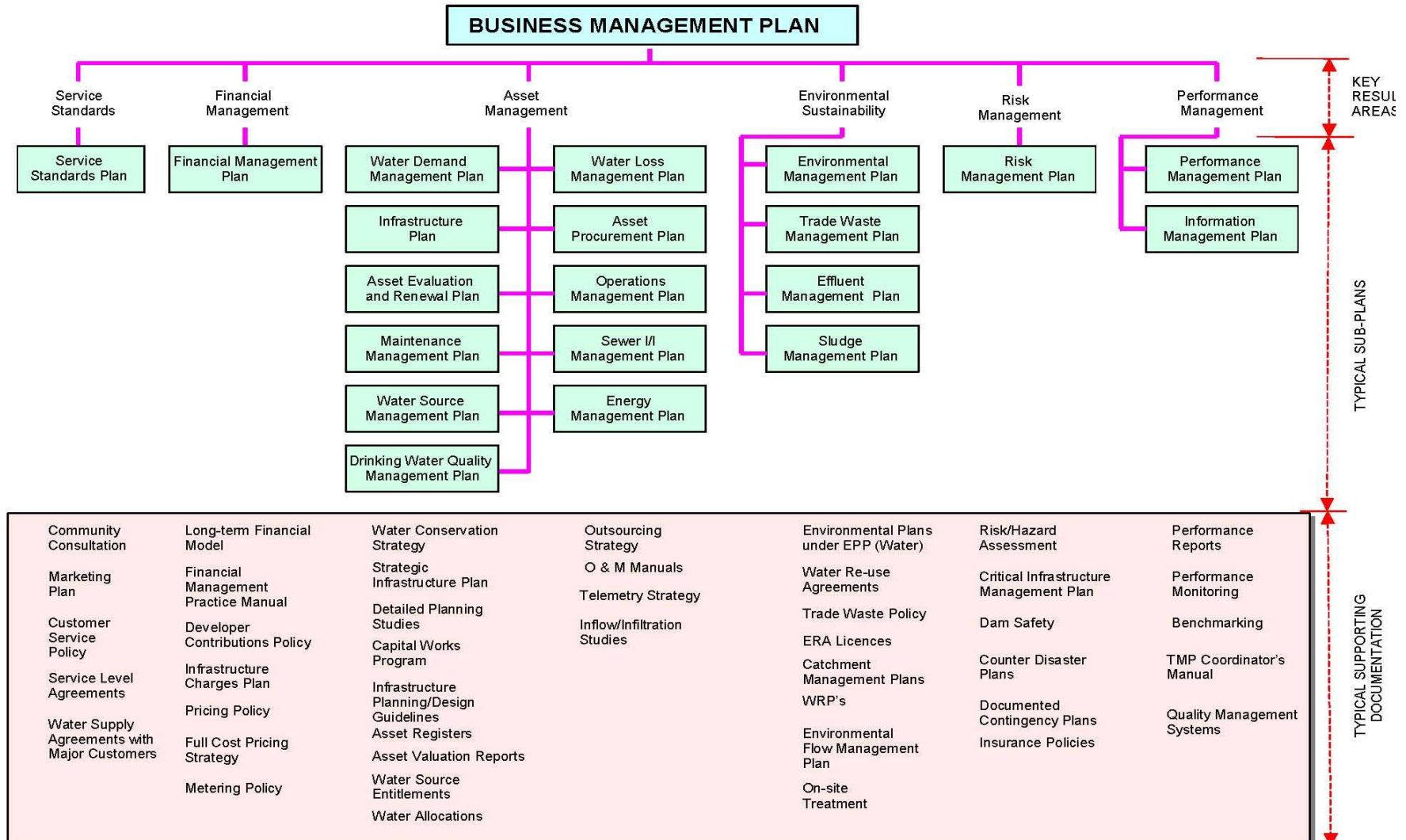
- Define management policies.
- Establish action plans for management to achieve defined targets.
- Demonstrate the WSP's commitment to service delivery and improvement, and how it proposes to meet targets.
- Provide a basis for justifying Public investment in infrastructure
- Meet the basic requirements of a Strategic Asset Management Plans (SAMP) and the Customer Service Standard (CSS)

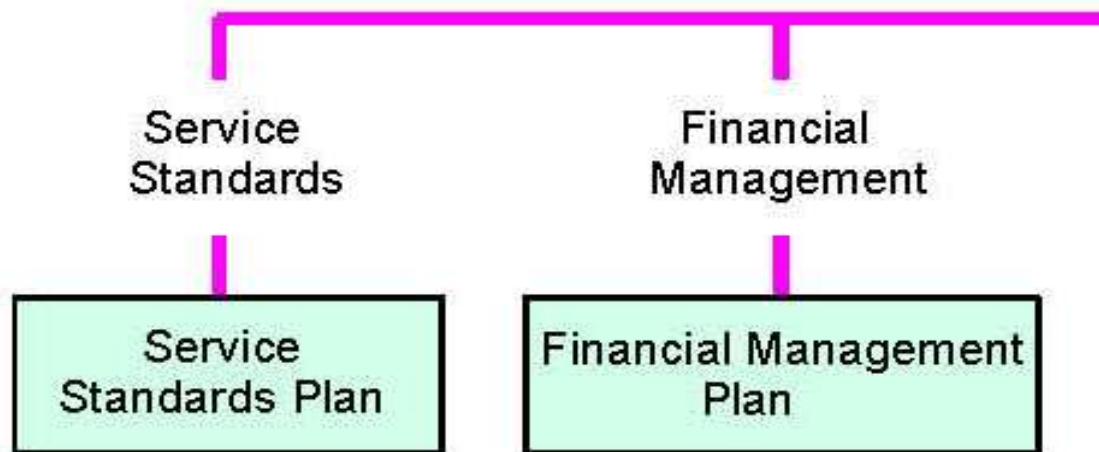
A TMP is essentially a hierarchy of planning documents in which each successively lower tier is progressively more detailed and focused, and generally targets a different readership.

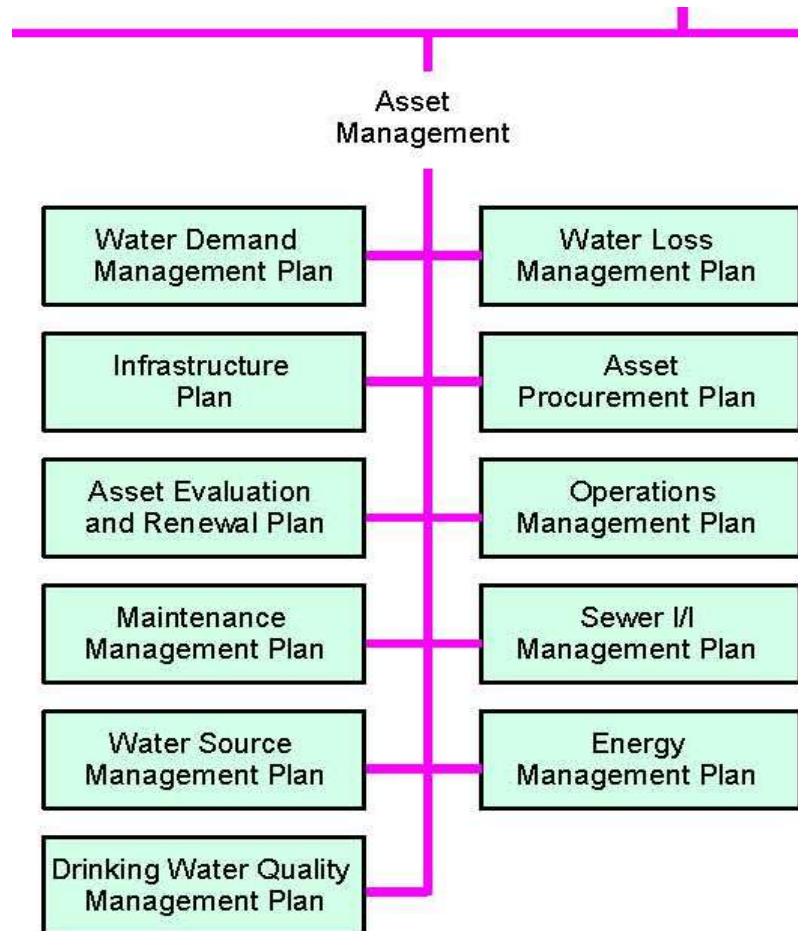
| Level | Element | Main target readership |
|-------|---|--|
| 1 | Business management plan (overview) | Elected representatives; Executive management; Regulators |
| 2 | Operational sub-plans (including action plans) | Operational management; Regulators |
| 3 | Supporting documentation (including procedure manuals, reports etc.) | Operational supervisors; Technical staff |

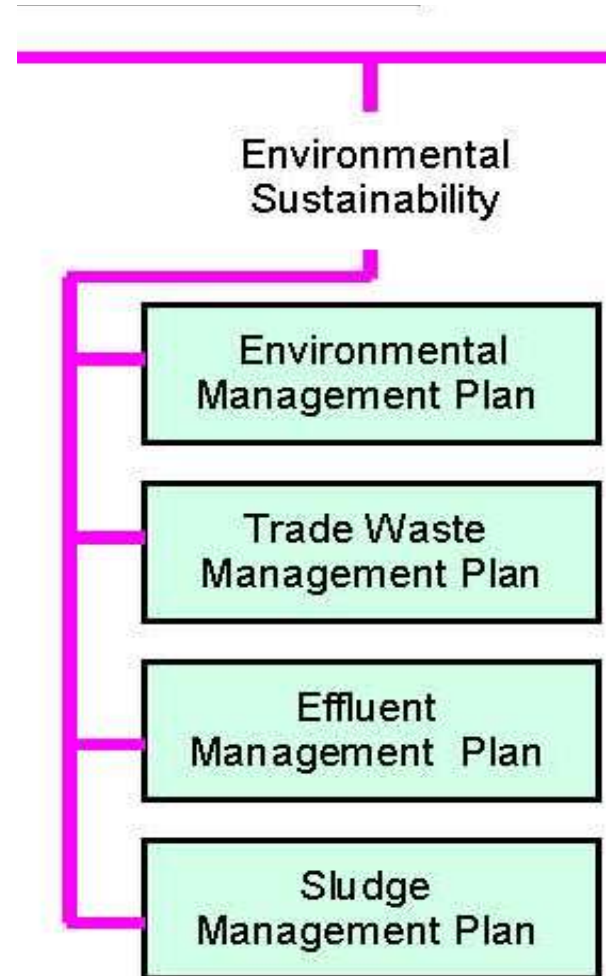


Model TMP framework

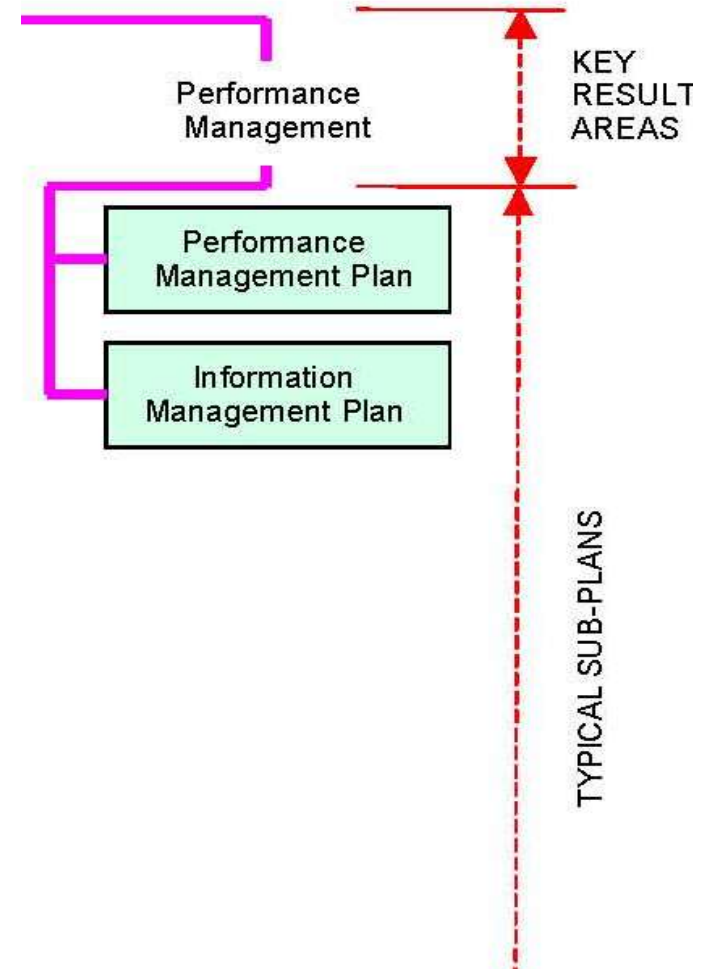




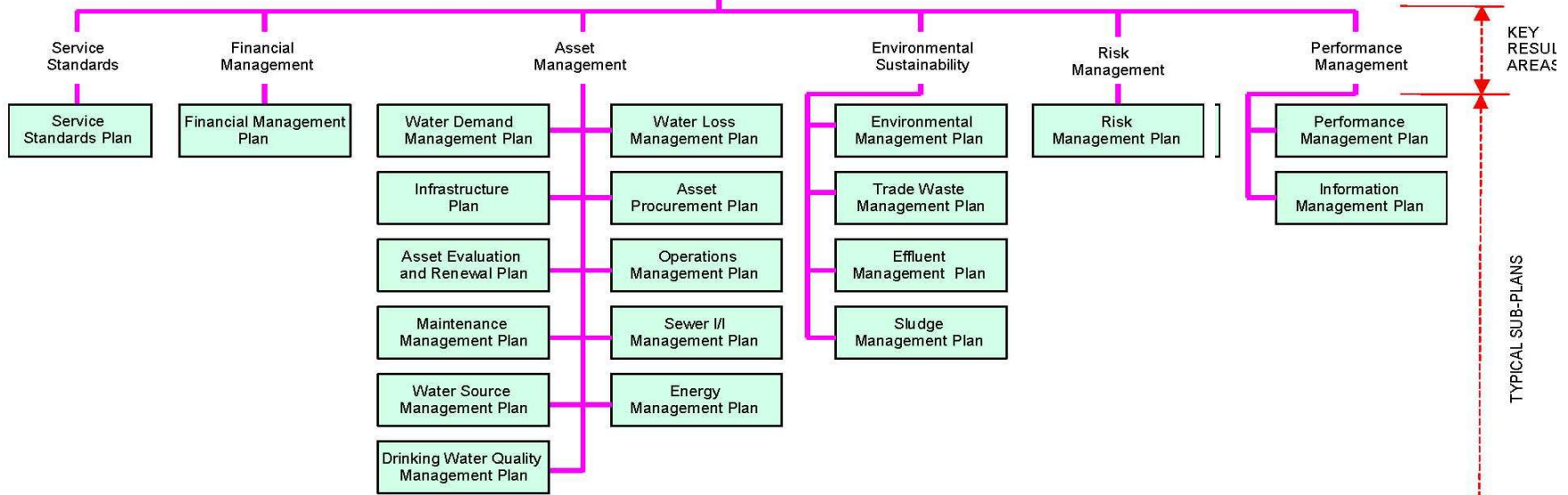




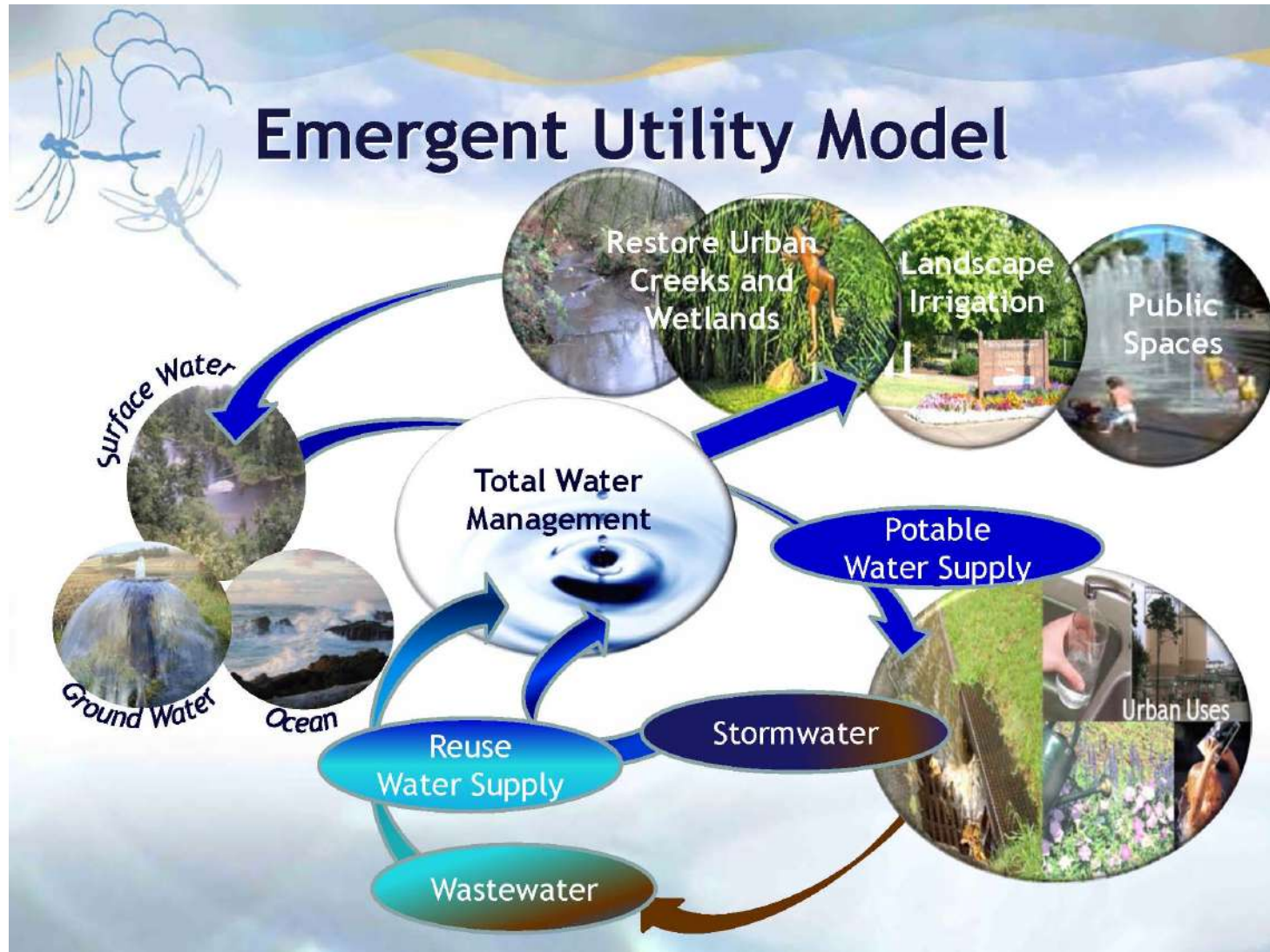


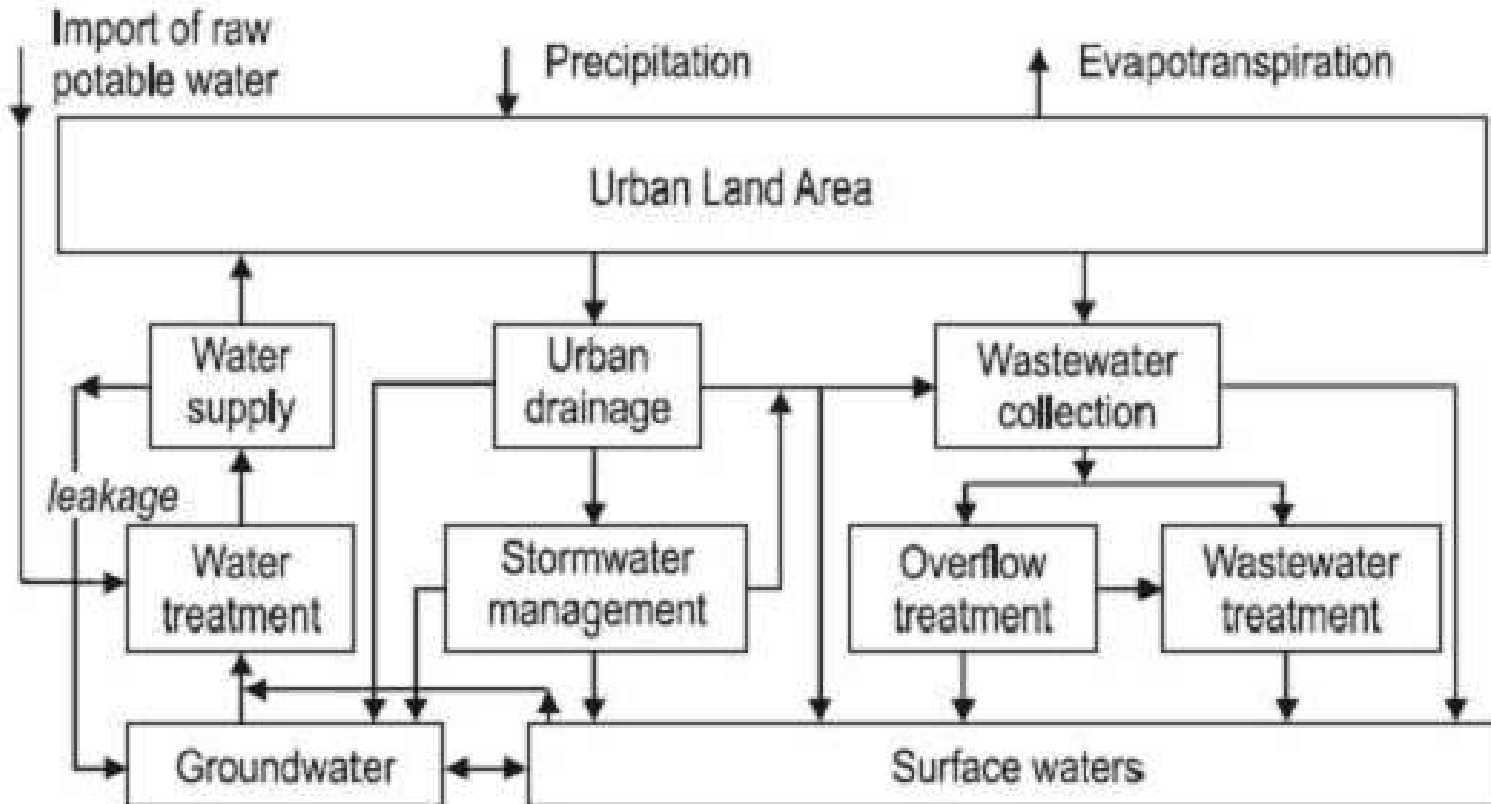


BUSINESS MANAGEMENT PLAN

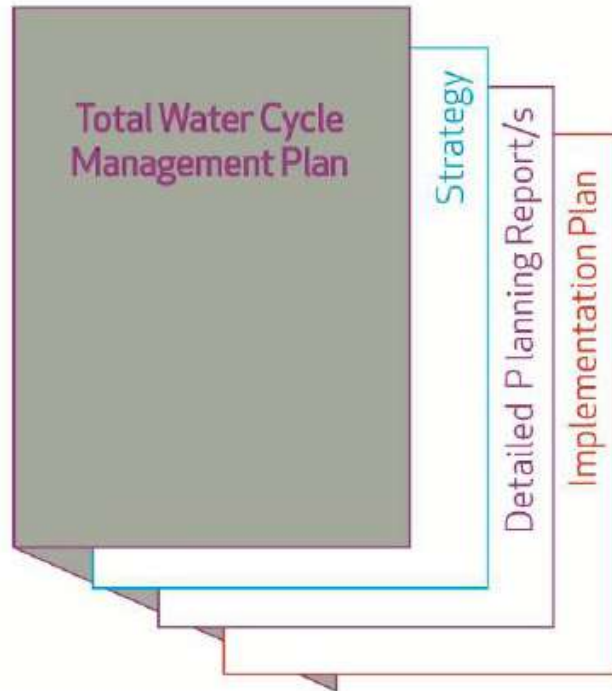


| | | | | | | |
|--|--------------------------------------|---|-----------------------------|---------------------------------------|---|----------------------------|
| Community Consultation | Long-term Financial Model | Water Conservation Strategy | Outsourcing Strategy | Environmental Plans under EPP (Water) | Risk/Hazard Assessment | Performance Reports |
| Marketing Plan | Financial Management Practice Manual | Strategic Infrastructure Plan | O & M Manuals | Water Re-use Agreements | Critical Infrastructure Management Plan | Performance Monitoring |
| Customer Service Policy | Developer Contributions Policy | Detailed Planning Studies | Telemetry Strategy | Trade Waste Policy | Dam Safety | Benchmarking |
| Service Level Agreements | Infrastructure Charges Plan | Capital Works Program | Inflow/Infiltration Studies | ERA Licences | Counter Disaster Plans | TMP Coordinator's Manual |
| Water Supply Agreements with Major Customers | Pricing Policy | Infrastructure Planning/Design Guidelines | | Catchment Management Plans | Documented Contingency Plans | Quality Management Systems |
| | Full Cost Pricing Strategy | Asset Registers | | WRP's | Insurance Policies | |
| | Metering Policy | Asset Valuation Reports | | Environmental Flow Management Plan | | |
| | | Water Source Entitlements | | On-site Treatment | | |
| | | Water Allocations | | | | |

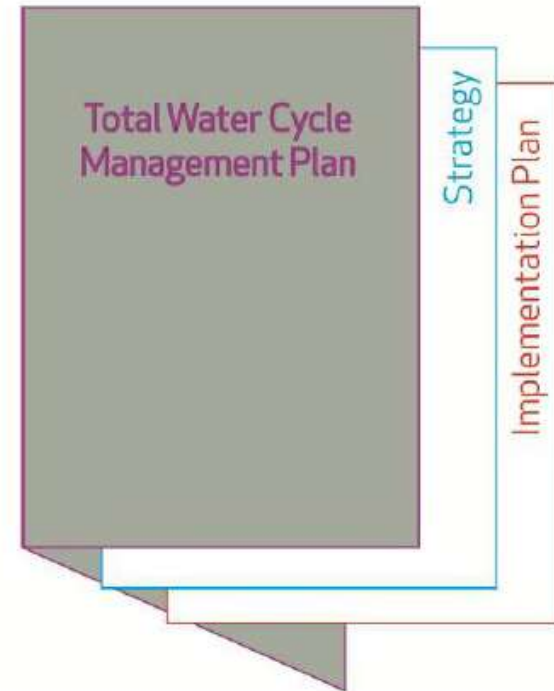




Urban water cycle: main components and pathways (Source: Marsalek et al., 2006).



Total Water Cycle Management Plan contents (typical)



Total Water Cycle Management Plan contents (if no detailed planning is needed)



- Based on the published work of Humphries et al, principles-based Governance of a large water utility, Springer, 2009
- The work was done in response to declining water resources in Western Australia which has been assumed to be related to climate change
- A sustainability strategy was prepared considering the balance among four types of capital



The four types of capital are:

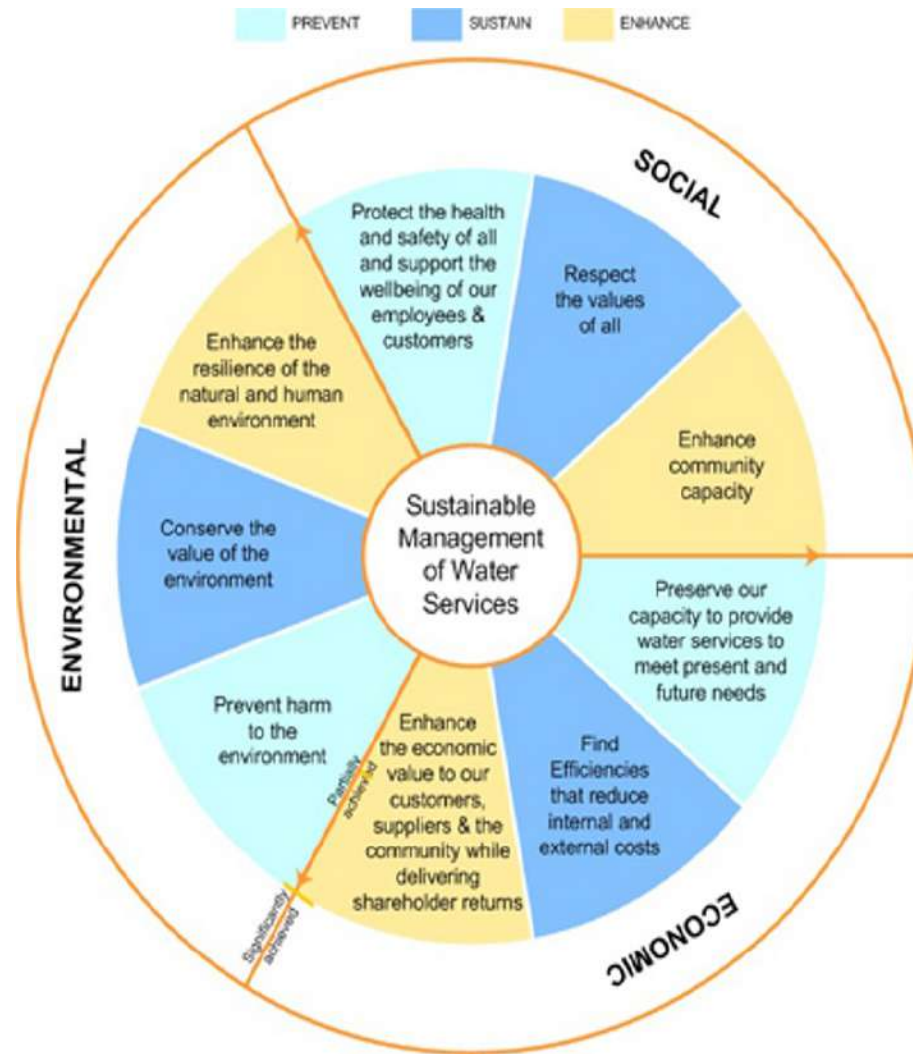
- Human capital: labour and intelligence, culture and organization
- Financial capital: cash, investment
- Manufactured capital: infrastructure, equipment,
- Natural capital: natural resources, ecosystem

The sustainability strategy was based on 18 guiding business principals to be adopted by the Executive of the water corporation as the thinking and governance framework for the buisness.



Business principles wheel

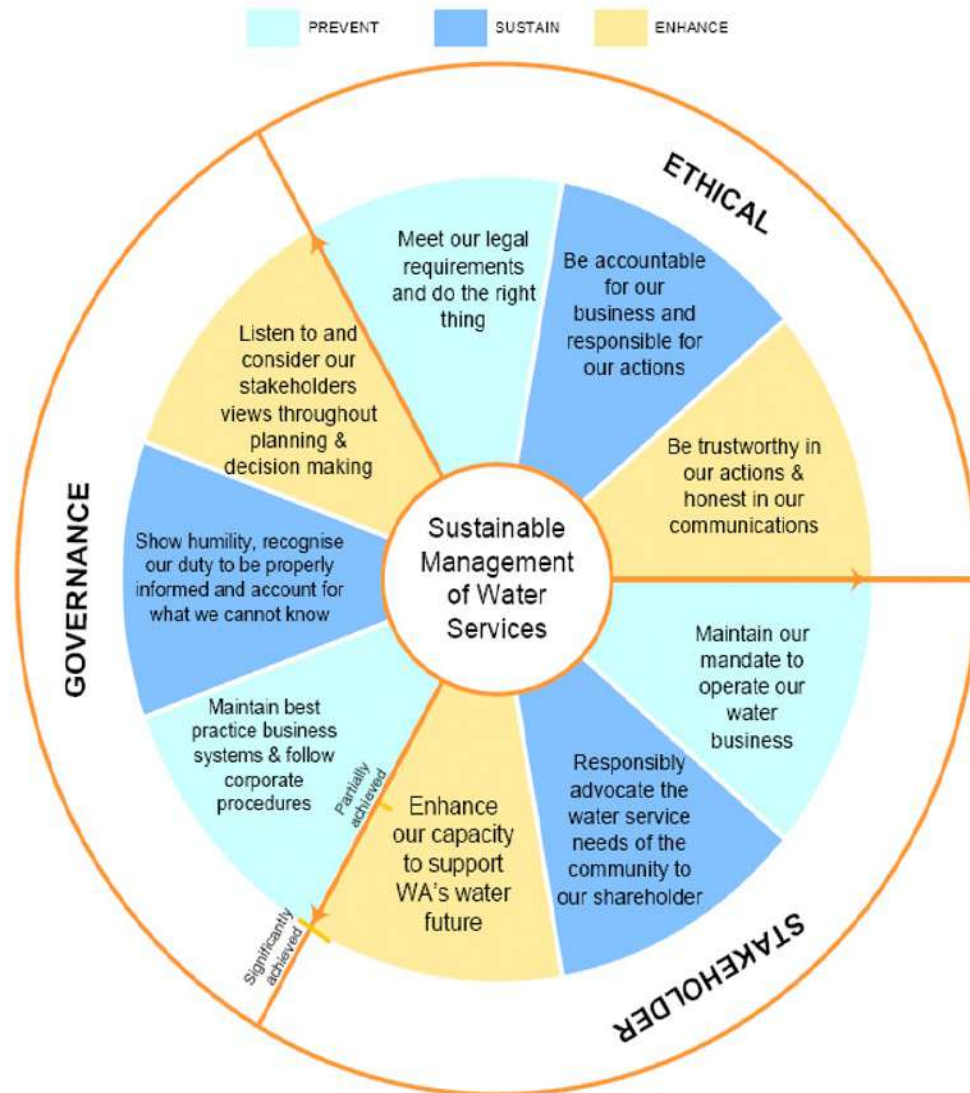
Three Outcome groups:
 Social
 Environmental
 Economic
 Each principal reflects the aspiration to prevent loss, sustain gains and enhance value across the three outcome dimensions





Business Principles

Three process principal groups:
Ethical
Stakeholder
Governance
It describes the features of an inclusive and conscious decision-making framework which support sustainable outcomes





1. Water utilities are facing various types of pressures and challenges (global and local-specific)
2. Industry response varied tremendously among water utilities in different countries and regions
3. Wealth of information necessitates the establishment of knowledge management infrastructures

