

CRESCENTA VALLEY WATER DISTRICT

**2700 Foothill Boulevard
La Crescenta, California**

**Agenda for the
Special Meeting of the Board of Directors
of the Crescenta Valley Water District**

To be held on Friday December 2, 2016 at 9:00 a.m.

At Los Angeles County Sheriff Station Community Room

4554 Briggs Avenue, La Crescenta, California

Posted: November 30, 2016 at 3:00 pm

Call to Order and Determination of Quorum

Pledge of Allegiance

Adoption of Agenda

Action Calendar

The public shall have an opportunity to comment on any action item as each item is considered by the Board prior to action being taken. This opportunity is non-transferable and speakers are limited to one two (2) minute comment.

1. **Strategic Planning Workshop** – Discussion regarding the Strategic Plan of the District.

Board Members Request for Future Agenda Items

Adjournment

CRESCENTA VALLEY WATER DISTRICT

BOARD OF DIRECTORS - STAFF REPORT

Item No. 1
December 2, 2016

To: Honorable President and Members of the Board of Directors
From: Thomas A. Love, General Manager
Subject: Strategic Planning Board Workshop

ACTION ITEM:

1. **Strategic Planning Board Workshop** – Discussion of District mission, status, goals and objectives.

BACKGROUND:

On October 20th, 2015 the Board and General Manager identified development of an updated strategic plan as an objective to be completed in 2016. The Board discussed the strategic planning process on June 7, 2016 and provided direction to initiate the strategic planning process through a series of management staff workshops and focused Board workshops to be facilitated by Legal Counsel.

Leadership staff participated in three workshops on August 30th, October 7th and October 12th. The Leadership Team has reviewed the District's Mission Statement and conducted an analysis of strengths, weaknesses, opportunities and threats (SWOT Analysis) including ranking by importance. The Leadership team also discussed a value statement (how we conduct business) and vision statement.

A notebook containing reference information previously provided to the Board is attached.

DISCUSSION:

The Board strategic planning workshop discussion items are as follows:

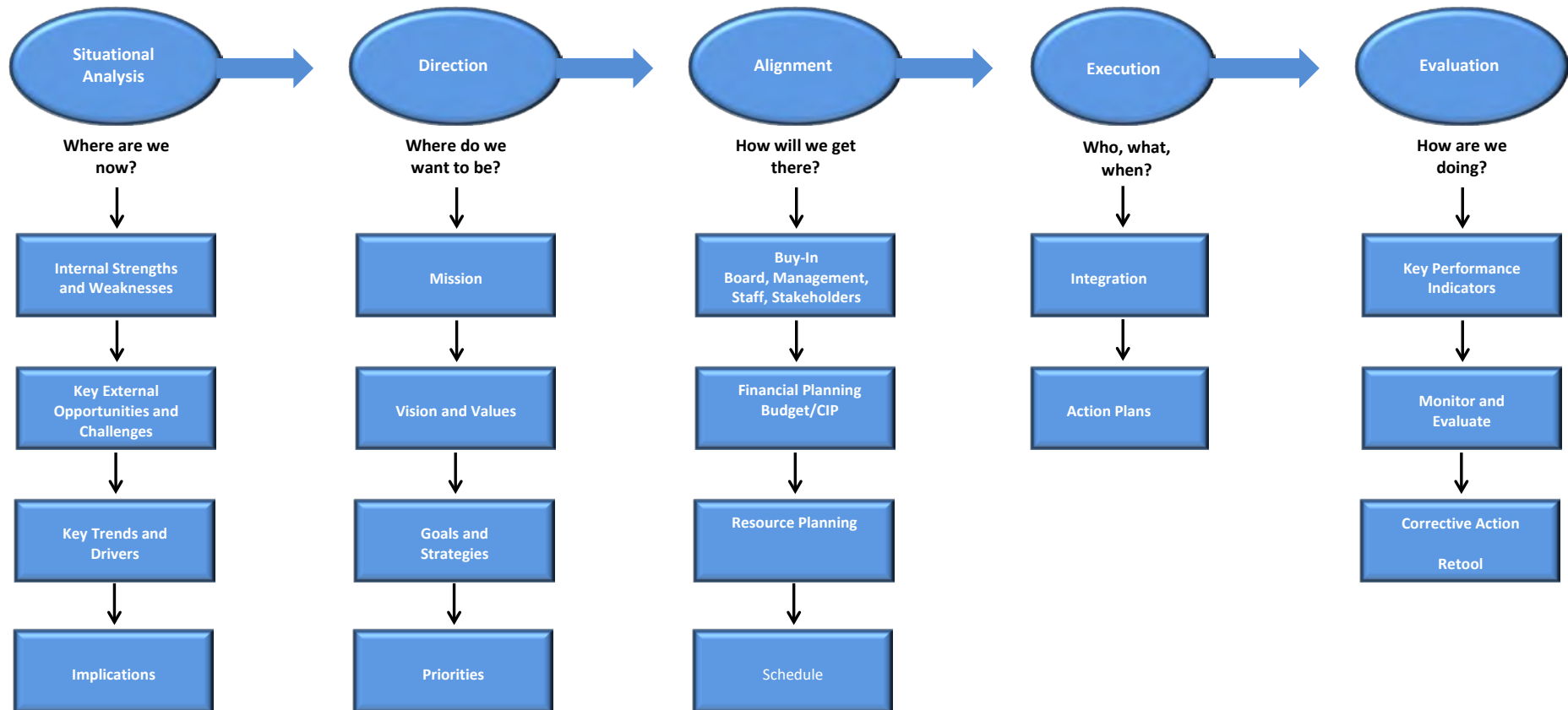
1. Introduction/Objectives
2. Review Mission Statement
3. Leadership Team SWOT Analysis Summary
4. SWOT Analysis
 - a. Internal Strengths/Weaknesses
 - b. External Opportunities/Threats
 - c. Focus Areas Ranking
5. Value Statement - How we conduct business
6. Vision Statement
7. Next Steps

Prepared & Submitted by:



Thomas A. Love, P.E.
General Manager

CVWD Strategic Planning Process



Possible Focus Areas:

Water Quality	Organizational Effectiveness
Water Supply	Finance
Infrastructure	Regulatory
System Reliability	Customer Service/Satisfaction
Workforce Planning	Environmental Stewardship
Technology	Stakeholder Support

Crescenta Valley Water District

Strategic Planning Schedule

Task	Status	Person Responsible	Start Date	End Date	Participants	Comments
Strategic Planning Process Outline	Complete	TL	7/29/2016	8/5/2016		
Board review - Strategic Planning Process	Complete	TL/TB		8/9/2016	Board/Management	
Kick-off Workshop	Complete	TL	8/10/16	8/30/16	Leadership Staff	Strategic Plan overview, schedule. Discuss mission/vision/values. Develop Work Plan.
Management Workshop - Situational Analysis	Complete	TL		10/7/16	Leadership Staff	SWOT Analysis, Key Trends/Drivers, Implications
Management Workshop - Follow-up	Complete	TL	10/7/16	10/19/16	Leadership Staff	Review of Focus Areas, Identify Objectives
Summary Memorandum	Complete	TL	10/7/16	11/1/16		Summary of situational analysis. Primer for Board workshop on Direction.
Board Workshop - Direction		TB/TL		12/2/16	Board/Management	2-4 Hrs. Review SWOT workshop. Review mission, vision, values.
Management Workshop - Planning		TL	10/21/16	12/6/16	Leadership Staff	Priorities, Goals and Strategies
Board Workshop - Planning		TB/TL		1/10/16	Board/Management	2 Hrs. Priorities, Goals and Strategies
Alignment		TL	8/30/16	1/17/17	Leadership Staff	Identify and Engage Stakeholders
Implementation Plan		TL	10/19/16	12/16/16	Leadership Staff	What/Who/When
Board Workshop - Final Draft Strategic Plan		TL		1/25/17	Board/Management	

Revised 11/29/16

CVWD Strategic Planning 2016

Leadership Team Workshop October 7, 2016 8:00am – 3:00 PM Meeting Notes

Participants: Tom Love, David Gould, Christy Scott, Ron Mitchel, Mark Hass, Dennis Maxwell, Dave Spain, Raymond Dodge, Bryan Jones, Wendy Holloway, Lynne Sovich,

Mission Statement Review: The Districts Mission Statement was reviewed and no changes are recommended.

“The mission of the Crescenta Valley Water District is to provide dependable water service and wastewater collection to its customers in La Crescenta, Montrose, and portions of Glendale and La Canada Flintridge.”

Situational Analysis

Strengths: The group developed a list of internal strengths which were ranked based on the group’s level of concurrence.

Staff Concurrence Ranking

Strengths:

1. Experienced, dedicated, reliable, safe workforce	38
2. Reliable infrastructure systems (redundancy)	31
3. Reliable, responsive customer service	24
4. Compliance with regulatory requirements	19
5. Good water quality	16
6. Mandatory appropriate safety measures and practices	9
7. Diverse water supply portfolio	7
8. Effective use of asset management principals	5
9. Adequate Financial Reserves	3
10. Sustainable long term financial plan	0
11. Appropriate rate adjustments implemented (with Cost of Service)	1
12. Effective internal communications	3
13. String reliable leadership	3
14. Proactive environmental stewardship	2
15. Prepared for emergency response	1

Weaknesses: The group developed a list of internal weaknesses which were ranked by the group based on importance.

Weaknesses:

Importance ranking

1. Aging infrastructure	6
2. Limited cross training	5
a. For succession and backup	
3. Outdated/Lack of Emergency response plan	5
a. Equipment SOP’s, training	
4. Lack of long term water supply strategy	4
5. Lack of internal communication, management-staff, dept-dept	4

6. Aging workforce	3
7. Reactive vs. proactive maintenance, limited preventive maint. and planning	1
8. Sensitivity to rate increases results in lack of funding for	1
a. Maintenance and system reliability	
9. Limited, ineffective external communication	0
10. Little or no accountability for actions or inaction	0
11. Limited employee development	1
12. Low employee morale	1
13. Resistance to change, comfort with status quo	0
14. Missed opportunities for efficiency - \$\$ and labor	1
15. Need improvements in governance effectiveness	2

Weaknesses Summary: The weaknesses were grouped into five categories or focus areas and ranked based on importance and number of weaknesses in each category.

Focus Areas:	Ranking
1. Workforce Planning	15
2. Emergency Planning	5
3. Infrastructure	7
4. Water Supply Planning	4
5. Finance	2

Threats/Opportunities

Threats: The group identified the following list of external threats (events or actions which the District cannot control).

Contamination	Natural Disaster	Terrorism – cyber, water supply
Malicious attacks – vandalism, theft	Regulations	Legislation
Litigation	Economic changes	Climate change
Negative industry media stories (Flint Michigan)		Labor shortages
Demographic changes	Supply interruptions (power, chlorine, consumables)	
Community activism		

Opportunities: The group identified the following list of external opportunities.

Grant funding	Legislation	Economy
Technology	Partnerships	Community involvement
Education system (leveraging for workforce replacement)		Workforce skill set (technology savvy)

Trends/Drivers: The group discussed recent trends and drivers that could influence change.

Declining groundwater
Increasing customer awareness (conservation/drought)
Political climate related to water supply and conservation
Calls for transparency
Inflation
Technological advancements

“Internet of Things” connectivity, social media, instant information
Incoming workforce (millennials, gen x, gen y) attributes, work environment (flexibility, telecommuting)

Implications of failure to act: The consequences of failing to address the weaknesses were discussed.

Workforce planning-

- Loss of institutional knowledge
- Loss of incident responsiveness
- Loss of morale
- Increase in accidents
- Loss of efficiency
- Additional cost
- Loss of customer confidence

Emergency planning-

- No coordination
- Lengthy service interruptions
- Regulatory violations
- Jeopardize employee/public safety
- Loss of customer confidence
- Loss of partner support

Infrastructure-

- Lengthy service interruptions
- Regulatory violations
- Jeopardize employee/public safety
- Loss of customer confidence
- High repair/replacement costs
- Consequential damages

Water supply planning-

- Higher water supply cost
- Increased infrastructure cost
- Water quality impairment
- Severe mandatory water use restrictions
- Loss of customer confidence

Financial health-

- Reductions in services
- Loss of customer confidence
- Increased debt cost
- Loss of reserves and interest earnings
- Layoffs
- Consolidation/takeover
- Significant rate increases

Values: The group discussed descriptors about how we conduct business and treat customers, members of the community, and employees:

Integrity, respect, competence, professionalism, innovation, effectiveness, teamwork.

Vision: The General Manager presented a draft vision statement to describe his vision for the District in the future. The following vision statement was drafted with input from the leadership team:

CVWD provides water and wastewater services efficiently and effectively and the value of these services are recognized by the customers and community.

Next Steps:

Action	Responsible	Due Date
Meeting notes	GM	10/11/16
Schedule follow-up workshop	GM	10/11/16
Update strategic planning schedule	GM	10/14/16

Strategic Planning 101

Posted on [August 15, 2013](#)

Getting Started

As I noted in the previous blog post, companies have three main tools or methods available to achieve greater alignment between the goals of the organization, the capabilities of the management team, and the aspirations and needs of the employees—while taking care of the all-important customer.

The first of these tools is strategic planning. In plain English, strategic planning 101 is a process whereby the organization:

- Figures out where it is today (current reality).
- Figures out where it is going in the future (desired future).
- Creates the “map” (the strategy to achieve the desired future).
- Develops an operating plan (detailed action items to execute the strategy).
- Creates a scorecard (measures and monitors progress towards the vision).

Sounds simple enough, doesn't it? If only it were that easy.

Pitfalls of Strategic Planning – Don't make this mistake!

- Most leaders — thus, organizations — fail at strategic planning because they mistakenly treat it as a one-time or occasional event rather than an ongoing process.

Comprehensive Strategic Planning

Organizations that take the time to engage in a comprehensive strategic planning process on a regular basis achieve better results. They also often find that there are several paths they could take. It's important to consider the alternatives, but it's even more important to ultimately pick one (with a reasonable chance of success, of course) and execute on that path rather than endlessly debate the alternatives and do nothing.

What, why and how

In addition to the components of strategic planning discussed above, you also must determine the following:

- **Vision:** The vision of an organization is the exciting and meaningful picture of the future that its leaders paint for the employees. These should be shared aspirations for everyone in your company, who can all work together to help achieve the vision.

- **Mission and values:** If the vision is what the organization is ultimately trying to accomplish, the mission is why it wants to achieve that vision. The values of the organization form a framework for how it will conduct itself and outline guiding principles for how it approaches employees, customers, and community.

- **Strategy, initiatives and roles:** The strategy defines in broad strokes how the organization is going to accomplish its vision. It should consist of a set of stepping-stones or initiatives, which move the company from its current state to its desired future. In addition, each member of the team needs to have a clear understanding of their own role and the roles of the other members. Confusion and frustration are the inevitable results when your team and leadership are unclear about roles, and that inevitably reduces your organization's capacity to execute the strategy.

- **Operating plan:** The operating plan is the tool that is used on a day-to-day basis to define and manage the company's initiatives by breaking them down into bite-sized chunks or action items. It is critical that all action items in the operating plan have an objective, owner, due date and current status, which is updated regularly. It is equally important that someone has clearly assumed responsibility for this plan. If no one is actively managing the operating plan and ensuring that your organization is progressing toward its goals, it will not execute its strategy or achieve its vision.

- **Balanced scorecard:** The balanced scorecard (as pioneered by Robert Kaplan and David Norton) is the dashboard or vital signs monitor that records whether your organization is actually achieving its goals. In addition to financial metrics, a balanced scorecard should include customer-, operational-, and employee-centric metrics, giving the organization a 360-degree view of the performance. It acts as a compass and GPS at the same time, showing you where you are as it points the way forward.

INTEGRATED RESOURCE PLANNING AND STRATEGIC PLANNING FOR WATER UTILITIES

Gerald Wexelbaum

President, Strategy Support Associates

INTRODUCTION

The principles of integrated resource planning will influence utility behavior only if they become part of the utility's core mission and objectives. Strategic planning by water utility managers can complement and enhance IRP. The likelihood of a successful IRP process is greatly enhanced if (1) the utility also engages in a process of long-term strategic planning, and (2) IRP goals are incorporated into the utility's mission and strategic planning goals.

THE NEED FOR STRATEGIC PLANNING

Water and wastewater utilities are facing numerous interlocking challenges involving the environmental quality of life in their communities, increasing capital construction needs in a time of economic scarcity, the need to control rates and charges, the demands of their customers for improved service, the requirements of local, state and federal regulators and many others. To meet these challenges, management of utilities must prioritize the allocation of limited resources and focus the utility organization on the key factors necessary for success. To accomplish this, each utility must:

- Define the organization's ultimate goals, including goals related to integrated resource planning and total water management.

- Allocate the organization's financial, organizational and political resources towards achieving those goals.

- Energize management and staff as a team dedicated to achieving short and long term success.

To assist in this effort, management of several progressive utilities have implemented a strategic planning process designed to help drive their organizations towards improved performance and strategic success. The purpose of this article is to define the elements of a strategic plan, to discuss how strategic plans are developed and to present the potential results of successful strategic planning.

ELEMENTS OF A STRATEGIC PLAN

Mission

The central focus of a utility's operations and decisions should be its mission, which is the fundamental, unique purpose that sets it apart from other organizations, and identifies its scope of operations. The mission is a general, enduring statement of the organization's intent and describes the areas of emphasis for the organization in a manner that reflects the values and philosophies of management and other key decision makers.

The three basic components of the mission statement are:

- The shared values or beliefs of the members of the organization.

- The central vision or purpose of the organization.

- The needs of the key parties who have a stake in the operations of the organization.

In the context of IRP, the utility mission might address values and beliefs related about water resource management. Water utilities today often are expected not only to provide water service but to provide "total water management" and act as conscientious stewards of nature's water resources. The most important purposes of a mission statement are to help the organization determine and prioritize strategic alternatives, and to guide long-term execution of the selected strategies. These critical functions require that care be taken in developing and communicating a meaningful mission statement. A mission statement reflecting a belief in environmental stewardship may help pave the way to IRP strategies, including conservation and demand management.

Goals and Objectives

To drive strategies and evaluate achievement of an organization's mission, greater specificity concerning what is to be achieved needs to be expressed in terms of goals and objectives.

Goals are qualitative statements that, in their totality, represent achievement of the mission. Goals should direct the operations of the organization's operations in key external and internal areas. External areas in which goals may be required include all the elements of integrated resource planning, such as environmental issues, supply and demand management, water quality, community involvement, and so on. Internal factors include those necessary to operate the business of the utility such as human resources, financial management and customer service.

Objectives are quantitative performance indicators that measure the achievement of each goal. Objectives are critical because they provide the important element of accountability to the strategic planning process. Senior management is responsible to their board, city council, city manager or other governing authority for achievement of measurable objectives. Other members of management should be held accountable for performance relative to specific objectives that they are responsible to achieve. In some organizations, compensation and other rewards are tied to the achievement of specific measurable objectives stated in the organization's strategic plan, or the strategic plan of their particular organizational unit.

Strategies

Strategies are specific allocations of time, money and effort, and are designed to achieve the various goals and objectives. The strategies selected must reflect the priorities of the utility as expressed by the mission, goals and objectives. In the context of IRP, strategies might include specific demand-management programs. Unfortunately, virtually every utility organization is faced with the reality of limited resources, and therefore, the strategies must reflect carefully considered choices, and should be evaluated in terms of resources required, results expected, probability of successful implementation and potential impact on overall performance.

Implementation Plans

The final element of a strategic plan, the implementation plan, is necessary to facilitate implementation of the selected strategies and to provide accountability for the actions decided upon. The implementation plan should consist of a series of action plans that, for each strategy, indicate:

- Tasks necessary for effective implementation.
- Due dates for the various tasks.
- Individual responsibility assignments.

These action plans should serve as a guide in ongoing strategy implementation and as a means for evaluating progress.

Strategic Framework

Figure 1 presents a simplified strategic framework showing the linkages between the various elements of the strategic plan. The discipline of portraying mission, goals, objectives and strategies in this framework helps to assure that the strategies are directed towards specific goals and that collectively, they are sufficient to achieve the respective goals. Each strategy presented on the strategic framework should be supplemented by an action plan. The strategic framework also serves as an excellent vehicle for communicating the strategic plan, both internally and externally.

THE PROCESS

Experience with many organizations in virtually all industries indicates that to achieve the kind of strategic success described above, a utility must develop:

A shared vision of utility's ultimate goals. Organizations driven by shared vision and shared values have a greater capacity to succeed than other organizations.

A common understanding of the principles under which the utility will operate.

Across the board acceptance of the urgency of implementing the strategic plan.

As a result of these requirements, strategic plans that have been successfully implemented have been developed by teams of employees and other involved individuals (often assisted by professional strategic planning facilitators). Since employees operate the utility and will be responsible for strategy implementation, it is essential that they be actively involved in strategy development.

The most effective way to develop a strategic plan that will be successfully implemented, is through a series of workshops. The design of the structure, and determination of the participants, at these workshops are difficult and must be customized for each organization and the unique issues each faces. Some of the process

designs that have been successful, and the particular issues they were designed to address, are presented in the following paragraphs.

Senior Management Strategy Group

The most common approach is to convene a senior management strategy group to develop the strategic plan. This group, which meets in a series of facilitated workshops, generally includes the Director of the utility (whatever the title may be), and that individual's direct reports. Also included would be the leaders of the various functional units within the utility. Sometimes, members of the Board, and/or oversight agencies, are included as part of the strategy group. Mid-management input is obtained through questionnaires, interviews, interim meetings and involvement in implementation planning. This approach is generally used when there is effective inter-departmental cooperation and a good working relationship between mid-management and the senior group, and the greatest need is for the development and documentation of a meaningful strategic plan.

Active Board Involvement

In some situations, it is critical that the Board (or similar body) become actively involved in the strategic planning process. Some organizations have worked at the board level to develop the vision, values and overall mission of the organization, and have used management groups to develop the remainder of the plan. In this alternative, the board states what is to be accomplished on an overall basis, and management determines how the organization will achieve the ultimate goals. The participation of the board can be important when the utility has an active and interested board that desires to provide the kind of overall direction contemplated by this approach.

Cross Functional/Multi-Level Strategy Groups

When it is important to improve teamwork among the various functional areas and the various levels of management, some organizations have created cross functional/multi-level teams to develop objectives and strategies. In this alternative, senior management (possibly in conjunction with the board) develops the mission and goals. Separate "goal teams" of individuals from all functional areas and various levels of management are convened to develop the objectives, strategies and action plans for their respective goal areas. Upon completion of this process, a final strategic plan

is reviewed, revised as necessary, and adopted by senior management at a strategy review workshop.

Functional Unit Strategy Groups

Under this alternative, senior management and/or the board develop the mission and goals (as in the previous alternative) and then, strategy workshops are conducted for each functional area to determine how each unit will contribute to the achievement of the overall utility mission and goals. Each unit would, in effect, develop its own strategic plan, which, when combined with the plans of the other units, would represent the overall utility's strategic plan. This approach is utilized when teamwork and cooperation within an functional unit is a key issue

Clearly, there are numerous variations of the alternative described above, and the specific approach utilized should reflect the unique characteristics of the particular utility.

Ongoing Implementation

Implementation planning is only the first step in strategy implementation. Ongoing and consistent attention is required to assure that the strategies developed are actually implemented. Some of the techniques to monitor and facilitate implementation include:

- Assignment of goal and strategy champions to monitor the implementation of strategies on an ongoing basis.

- Inclusion of an update on implementation progress at each management meeting.

- Periodic formal reviews of the strategic plan to identify and changes to the plan so that it becomes a dynamic document which is an integral part of the manner in which the utility is operated.

In addition to the above direct means of strategy implementation, it is important that management also contribute to the implementation strategies through indirect methods such as:

- Consistently talking about the utility's mission and overall strategic plan.

- Recognizing special contributions to the strategy implementation process by individuals or teams.

- Redefining the utility's culture in accordance with the strategic plan.

RESULTS OF SUCCESSFUL STRATEGIC PLANNING

The most important result of effective strategic planning is improved short-term and long-term utility performance. This is achieved through the implementation of a strategic planning process that is designed to:

- Develop meaningful strategies that, when implemented, will have a positive impact on performance.

- Create a commitment and dedication to the strategic plan by a cohesive and dedicated management and utility team.

- Focus the allocation of resources on those factors that are critical to the utility's success.

- Create a mechanism to facilitate the measurement of performance as compared to plan to enhance management's accountability for long-term success.

Strategic planning and integrated resource planning are not easy. Planning is an ongoing process that requires

continued management commitment attention. Organizations that have developed and implemented comprehensive strategic plans have experienced consistently improved performance. Strategic management not only is worth the effort, but in today's and tomorrow's dynamic and complex environment, it is essential for long-term success.

THE AUTHOR

Gerald Wexelbaum is President of Strategy Support Associates, a management consulting firm dedicated to assisting clients in the development and implementation of strategic plans. He has considerable consulting experience in the private and public sectors and has worked with several water and wastewater utility organizations.

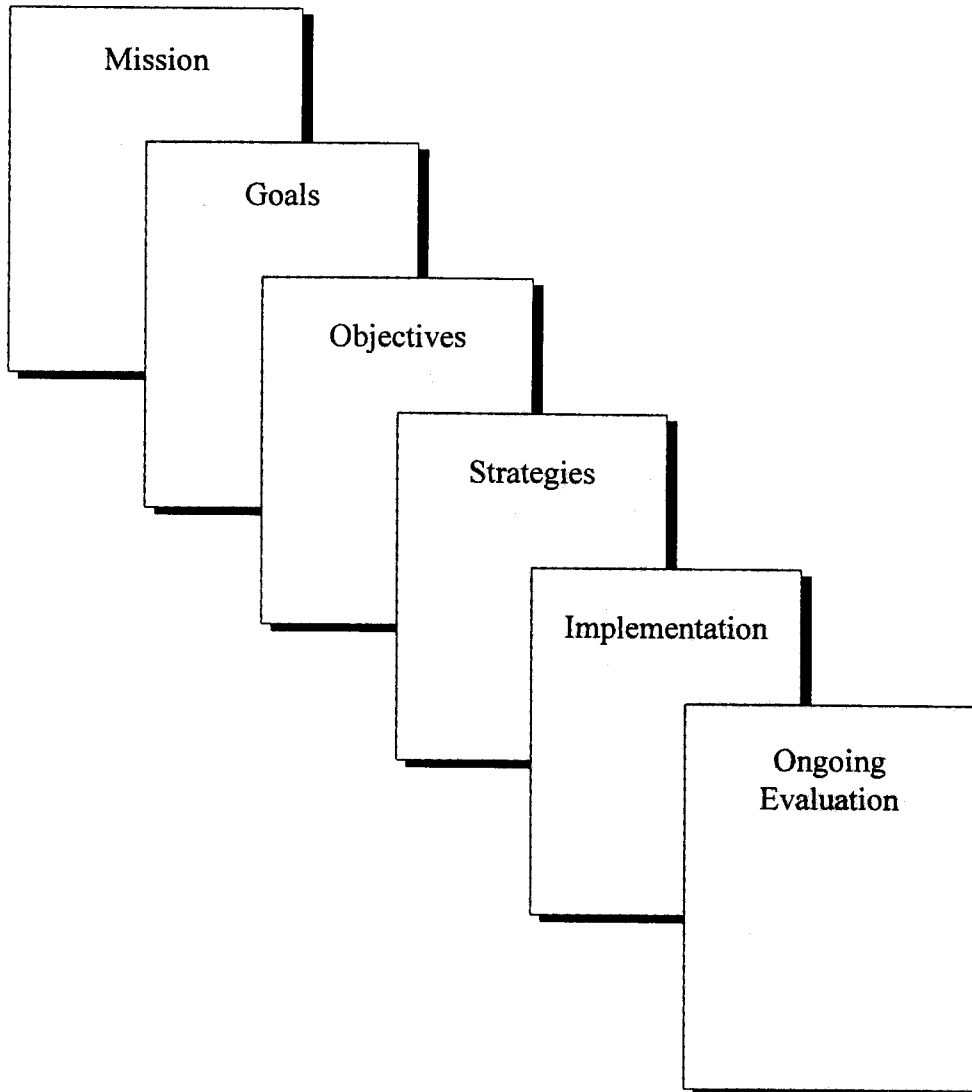


Figure 1. Elements of Strategic Planning



Effective Utility Management

A Primer for Water and Wastewater Utilities

June 2008



Foreword

Water and wastewater utilities across the country are facing many common challenges, including rising costs, aging infrastructure, increasingly stringent regulatory requirements, population changes, and a rapidly changing workforce. Effective utility management can help utilities respond to both current and future challenges and support utilities in their common mission of being successful 21st century service providers.

Based on these challenges, EPA and six national water and wastewater associations signed an historic agreement in 2007 to jointly promote effective utility management based on the *Ten Attributes of Effectively Managed Water Sector Utilities* and five *Keys to Management Success*.

This Primer is an outgrowth of that agreement and distills the experience of a group of leaders in water and wastewater utility management into a framework intended to help utility managers identify and address their most pressing needs through a customized, incremental approach that is relevant to the day-to-day challenges utilities face. In the future, the Collaborating Organizations will continue to work collectively and individually to implement a range of short-term and long-term actions designed to promote and recognize excellence in utility management based on the principles and practices described in the Primer throughout the water sector.

We, the Utility Advisors and Collaborating Organization representatives who participated in this ground-breaking effort, believe that this Primer will be helpful to both individual utilities and the water utility sector on the whole. Based on our own experience, as well as the experience of others across the country, it is clear that effective utility management is critical to helping utilities address challenges, improve performance, and be successful in the long run. We strongly encourage all utility managers, regardless of their utility's size, budget, and unique circumstances, to read, consider, and implement the strategies and approaches outlined in this Primer.

Sincerely,

Utility Advisory Group

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I. Effective Utility Management

Water and wastewater utilities across the country face common challenges. These include rising costs, aging infrastructure, increasingly stringent regulatory requirements, population changes, and a rapidly changing workforce. While many utility managers find themselves turning from one urgent priority to the next, others have systematically applied effective utility management approaches that have helped them improve their products and services, increase community support, and ensure a strong and viable utility long into the future.

Effective utility management can help water and wastewater utilities enhance the stewardship of their infrastructure, improve performance in many critical areas, and respond to current and future challenges. Addressing these challenges also requires ongoing collaboration between government, industry, elected officials, and other stakeholders.



In May, 2007, six major water and wastewater associations and the U.S. Environmental Protection Agency (EPA) signed an historic agreement pledging to support effective utility management collectively and individually throughout the water sector and to develop a joint strategy to identify, encourage, and recognize excellence in water and wastewater utility management. This Effective Utility Management Primer (Primer) is the result of the agreement among the following organizations:

- Association of Metropolitan Water Agencies (AMWA)
- American Public Works Association (APWA)
- American Water Works Association (AWWA)
- National Association of Clean Water Agencies (NACWA)
- National Association of Water Companies (NAWC)
- United States Environmental Protection Agency (EPA)
- Water Environment Federation (WEF)

This Primer is designed to help water and wastewater utility managers make practical, systematic changes to achieve excellence in utility performance. It was produced by water and wastewater utility leaders who are committed to helping utility managers improve water and wastewater management. The Primer distills the expertise and experience of these utility leaders into a framework intended to help a utility manager identify and address their most pressing needs through a customized, incremental approach that is relevant to the day-to-day challenges utilities face.

Effective utility management is essential to sustaining our nation's water and wastewater infrastructure.

Rather than focusing on just financial or operational goals, this Primer considers all significant aspects of water and wastewater utility management. The Primer has three primary components:

- *The Ten Attributes of Effectively Managed Water Sector Utilities (Attributes).* These Attributes provide a clear set of reference points and are intended to help utilities maintain a balanced focus on all important operational areas rather than quickly moving from one problem to the next (Section II).
- *Keys to Management Success.* These proven approaches help utilities maximize their resources and improve performance (Section III).
- *Where to Begin—A Self-Assessment Tool.* A utility-tailored self assessment tool helps utility managers identify where to begin improvement efforts. By assessing how a utility performs relative to the Attributes, utility managers can gain a more balanced and comprehensive picture of their organization (Section IV).



Photo by Ryan Hofmeister/Heaven's View



Effective utility management is applicable to all utilities, regardless of size or circumstance

In addition, the Primer provides a set of sample measures to help utility managers gauge performance and assess improvement progress (Section V). It also provides links to a web-based “resource toolbox” which offers additional information and guidance on effective utility management (Section VI).

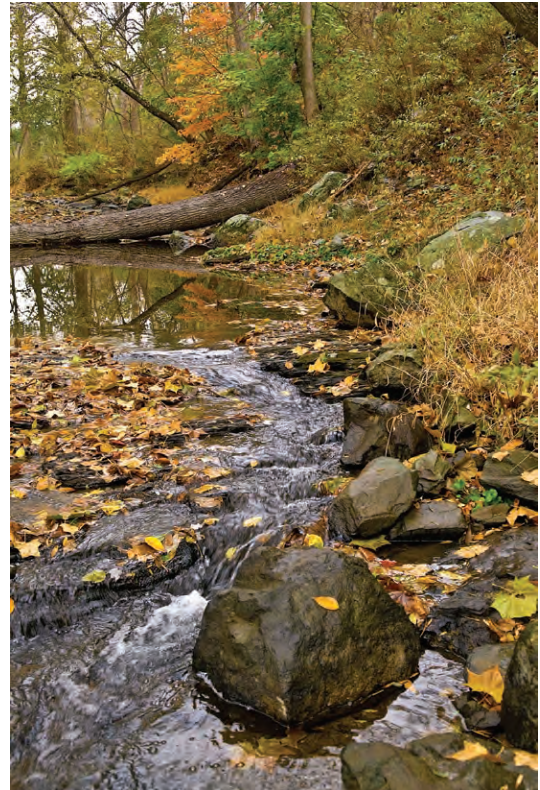
Utility managers and stakeholders can use this Primer in a variety of ways. At one end of the spectrum, the Primer can educate utility staff and stakeholders regarding the range of responsibilities faced by water and wastewater managers. At the other end of the spectrum, it can provide a framework for a utility’s long-term strategic planning efforts. Regardless of where a utility is in the spectrum, this Primer can help integrate the Attributes of effective utility management with existing strategic, business, and/or asset management plans.

All water and wastewater utilities can benefit from applying this Primer. Each utility has unique management opportunities and challenges, and this Primer provides guidelines and tools that are relevant to any utility, regardless of size, budget, or circumstance. This Primer’s aim is to support all water and wastewater utilities in their common mission of being successful 21st century service providers.

II. Ten Attributes of Effectively Managed Water Sector Utilities

The Ten Attributes of Effectively Managed Water Sector Utilities provide useful and concise reference points for utility managers seeking to improve organization-wide performance. The Attributes describe desired outcomes that are applicable to all water and wastewater utilities. They comprise a comprehensive framework related to operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship, and financial performance.

Water and wastewater utilities can use the Attributes to select priorities for improvement, based on each organization's strategic objectives and the needs of the community it serves. The Attributes are not presented in a particular order, but rather can be viewed as a set of opportunities for improving utility management and operations. Section IV (Where to Begin), provides a basic self-assessment tool to help utilities easily identify needs and opportunities. However, utilities will be able to deliver increasingly efficient, high-quality service by addressing more, and eventually all, of the Attributes. Section V provides several sample performance measures for each of the Attributes.





Ten Attributes of Effectively Managed Water Sector Utilities

Ten Attributes of Effectively Managed Water Sector Utilities

Product Quality

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.

Customer Satisfaction

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.

Employee and Leadership Development

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. **Provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team.**

Operational Optimization

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.

Financial Viability

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, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs.

Infrastructure Stability

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 consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

Operational Resiliency

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.

Community Sustainability

Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and watershed health and welfare. Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources; promotes economic vitality; and engenders overall community improvement. 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.

Water Resource Adequacy

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 and replenishment.

Stakeholder Understanding and Support

Engenders understanding 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.

III. Keys to Management Success

The Keys to Management Success are comprised of frequently used management approaches and systems that experience indicates help water and wastewater utilities manage more effectively. They create a supportive climate for a utility as it works towards the outcomes outlined in the Attributes, and they can help integrate the utility's improvement efforts across the Attributes. The Keys to Management Success are listed below.



Effective leadership produces organizational alignment and clear direction

I. Leadership

Leadership is critical to effective utility management, particularly in the context of driving and inspiring change within an organization. “Leadership” refers both to individuals who can be effective champions for improvement, and to teams that provide resilient, day-to-day management continuity and direction. Effective leadership ensures that the utility’s direction is understood, embraced, and followed on an ongoing basis throughout the management cycle. Leadership has an important responsibility to communicate with the utility’s stakeholders and customers. It further reflects a commitment to organizational excellence, leading by example to establish and reinforce an organizational culture that embraces positive change and strives for continual improvement. Organizational improvement efforts require commitment from the utility’s leadership.

2. Strategic Business Planning

Strategic business planning is an important tool for achieving balance and cohesion across the Attributes. A strategic plan provides a framework for decision making by:

- Assessing current conditions, strengths and weaknesses;
- Assessing underlying causes and effects; and
- Establishing vision, objectives, and strategies.



Photo by Tsjaal, <http://flickr.com/photos/10451396@N00/>

It establishes specific implementation steps that will move a utility from its current level of performance to achieving its vision.

Preparation of a strategic business plan involves taking a long-term view of utility goals and operations and establishing a clear vision and mission. When developed, the strategic business plan will drive and guide utility objectives, measurement efforts, investments, and operations.

A strategic plan can help explain the utility's conditions, goals, and plans to staff and stakeholders, stimulate change, and increase engagement in improvement efforts.

After developing a strategic business plan, it is important that the utility integrates tracking of progress into its management framework.

3. Organizational Approaches

There are a variety of organizational approaches that contribute to overall effective utility management and that are critical to the success of management improvement efforts. These include:

- Actively engaging employees in improvement efforts (helping to identify improvement opportunities, participating in cross-functional improvement teams, etc.);
- Deploying an explicit change management process that anticipates and plans for change and encourages staff at all levels to embrace change; and
- Utilizing implementation strategies that seek, identify, and celebrate early, step-by-step victories.

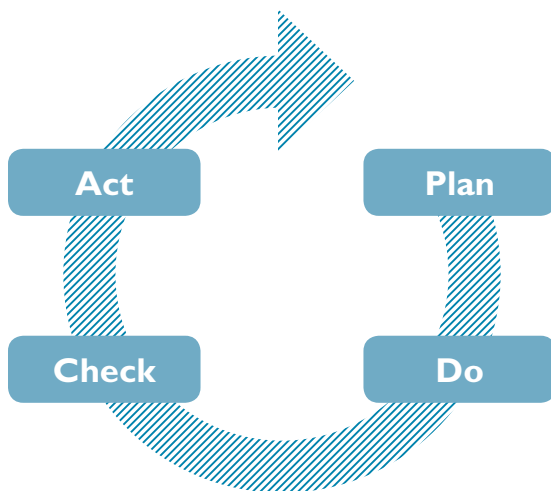
4. Measurement

Measurement is critical to management improvement efforts associated with the Attributes and is the backbone of successful continual improvement management and strategic business planning. A measurement system serves many vital purposes, including focusing attention on key issues, clarifying expectations, facilitating decision making, and, most importantly, learning and improving. As one utility manager put it, "You can't improve what you don't measure." Successful measurement efforts often are:

"You can't improve what you don't measure."

- Viewed as a continuum starting with basic internal tracking, and, as needed and appropriate, moving to more sophisticated baselining and trend analysis, development of key performance indicators, and inclusion of externally oriented measures which address community sustainability interests;
- Driven by and focused on answering questions critical to effective internal management and external stakeholder needs (e.g., information needed to allow governing bodies to comfortably support large capital investments); and
- Supported by a well-defined decision framework assuring results are evaluated, communicated, and responded to in a timely manner.

Deciding where to start and what to measure can be challenging. Measures can also be taken out of context. Therefore, while an essential tool in the self-improvement process, measurement is not the only tool and should be approached, structured, and used thoughtfully. Section V includes **sample performance measures that can be used in conjunction with utility-specific baselines and targets.**



5. Continual Improvement Management Framework

A continual improvement management framework is usually implemented through a complete, start-to-finish management system, frequently referred to as a “Plan-Do-Check-Act” framework. This framework plays a central role in effective utility management and is critical to making progress on the Attributes. Continual improvement management includes:

- Conducting an **honest and comprehensive self-assessment** to identify management strengths, areas for improvement, priority needs, etc.;
- Conducting frequent sessions among interested parties to identify improvement opportunities;
- Following up on improvement projects underway;
- **Establishing and implementing performance measures** and specific internal targets associated with those measures;
- Defining and implementing related operational requirements, practices, and procedures;
- Establishing supporting roles and responsibilities;
- Implementing measurement activities such as regular evaluation through operational and procedural audits; and
- Responding to evaluations through the use of an explicit change management process.



This “Plan-Do-Check-Act” continual improvement framework is quite effective when applied internally. It can also be enhanced by using gap analysis, establishment of standard operating procedures, internal trend analysis and external benchmarking, best practice review, and other continual improvement tools. The framework can help utilities understand improvement opportunities and establish explicit service levels, guide investment and operational decisions, form the basis for ongoing measurement, and provide the ability to communicate clearly with customers and key stakeholders.

The Resource Toolbox described in Section VI, Utility Management Resources, provides links to resources that support utilization of the Keys to Management Success.

IV. Where to Begin

Step 1

Candidly Assess
Current
Conditions

Step 2

Rank Importance of
Each Attribute to
Your Utility

Step 3

Graph Attributes
to Determine
Importance and
Level of
Achievement

Step 4

Choose Attributes

Step 5

Develop and
Implement an
Improvement Plan

There are many ways to improve utility performance and each utility is unique. Many utilities may choose to start small and make improvements step by step, perhaps by working on projects that will yield early successes. Other utilities may choose to take on several ambitious change efforts simultaneously. Some may prefer to enhance their strengths, while others will prefer to focus on addressing weaknesses. Each utility should determine for itself the most important issue to address, based on its own strategic objectives, priorities, and the needs of the community it serves.

A candid assessment of current performance is often a useful first step in identifying options for improvement. It also establishes a quantifiable baseline from which to measure progress. As conditions change, future reassessments will reveal new opportunities and new priorities.

The following self assessment tool can help water and wastewater managers evaluate their utility's current performance against internal goals or specific needs and determine where to focus improvement efforts. It can be completed by an individual manager, but would also be useful as a vehicle for conversation and consensus building among the utility's management team and other appropriate stakeholders, such as oversight bodies, community and watershed interests, and regulatory authorities.

The assessment tool has five steps: 1) Assess current conditions; 2) Rank the importance of each Attribute for your utility; 3) Chart the results; 4) Choose one or more Attributes to focus on; and 5) Develop and implement an improvement plan.

The Self Assessment can also be found in Appendix B.

Step 1: Assess Current Conditions

On a 1-to-5 scale, assess current conditions by rating your utility's systems and approaches and current level of achievement for each Attribute. Consider the degree to which your current management systems effectively support each of the Attributes and their component parts. Consider all components of each Attribute and gauge your rating accordingly. Use these descriptions to guide your rating.

Rating	Description
1.	Effective, systematic approach and implementation; consistently achieve goals.
2.	Workable systems in place; mostly achieve goals.
3.	Partial systems in place with moderate achievement, but could improve.
4.	Occasionally address this when specific need arises.
5.	No system for addressing this.

Step 2: Rank Importance of Attributes

Rank the importance of each Attribute to your utility, based on your utility's vision, goals, and specific needs. The ranking should reflect the interests and considerations of all stakeholders (managers, staff, customers, regulators, elected officials, community and watershed interests, shareholders, and others).

There are ten Attributes; considering long-term importance to your utility, rank the most important Attribute 1, the second most important 2, and so on. The least important Attribute would be ranked 10. Your ranking of each Attribute's importance might be influenced by current or expected challenges in that particular area, recent accomplishments in addressing these issues, or other factors. Importance ranking is likely to change over time as internal and external conditions change.

As you fill in numbers on the table below, please note that your analysis for Step 1 (rating achievement) should be separate and independent from your analysis for Step 2 (ranking importance).

Attribute	Attribute Components	Step 1: Rate Achievement (1-5)	Step 2: Rank Importance (1-10)
Product Quality (PQ)	- Complies with regulatory and reliability requirements. - Consistent with customer, public health, and ecological needs.		
Customer Satisfaction (CS)	- Provides reliable, responsive, and affordable services. - Receives timely customer feedback. - Responsive to customer needs and emergencies.		

Rating and Ranking Table, *continued*

Attribute	Attribute Components	Step 1: Rate Achievement (1-5)	Step 2: Rank Importance (1-10)
Employee and Leadership Development (ED)	- Recruits and retains competent workforce. - Collaborative organization dedicated to continual learning and improvement. - Employee institutional knowledge retained and improved. - Opportunities for professional and leadership development. - Integrated and well-coordinated senior leadership team.		
Operational Optimization (OO)	- Ongoing performance improvements. - Minimizes resource use and loss from day-to-day operations. - Awareness and timely adoption of operational and technology improvements.		
Financial Viability (FV)	- Understands full life-cycle cost of utility. - Effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. - Predictable and adequate rates.		
Infrastructure Stability (IS)	- Understands the condition of and costs associated with critical infrastructure assets. - Maintains and enhances assets over the long-term at the lowest possible life-cycle cost and acceptable risk. - Repair efforts are coordinated within the community to minimize disruptions.		
Operational Resiliency (OR)	- Staff work together to anticipate and avoid problems. - Proactively establishes tolerance levels and effectively manages risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related).		

Rating and Ranking Table, *continued*

Attribute	Attribute Components	Step 1: Rate Achievement (1-5)	Step 2: Rank Importance (1-10)
Community Sustainability (SU)	- Attentive to impacts on community and watershed health and welfare. - Operations enhance natural environment. - Efficiently use water and energy resources; promote economic vitality; and engender overall community improvement. - Maintain and enhance ecological and community sustainability including pollution prevention, watershed, and source water protection.		
Water Resource Adequacy (WA)	- Ensures water availability through long-term resource supply and demand analysis, conservation, and public education. - Manages operations to provide for long-term aquifer and surface water sustainability and replenishment.		
Stakeholder Understanding and Support (SS)	- Engenders understanding 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.		

Step 3: Graph Results

Graph each Attribute based on your rating and ranking. For example, if you rated Product Quality (PQ) 4 for achievement and ranked it 3 for importance, you would place it on the graph as illustrated below. Similarly, if you rated Customer Satisfaction (CS) 3 for achievement and ranked it 5 for importance, you would place it on the graph as illustrated below. A blank graph is provided in Appendix B.

Rating	Lower Achievement	5										
		4			PQ							
		3					CS					
	Higher Achievement	2										
		1										
		1	2	3	4	5	6	7	8	9	10	
			More Important					Less Important				
Ranking												

Step 4: Choose Attributes

The goal of effective utility management is to establish high-achieving systems and approaches for each Attribute. Ultimately, utilities should strive to improve performance for all Attributes until each can be charted in the lower half of the table (high achieving). Utility managers may wish to focus on one or a few Attributes at a time, aiming to eventually ensure that all Attributes have been addressed and improved upon over time.



Examining the results of the charting exercise in Step 3 can help identify Attributes to focus on. Attributes that graph into the *blue quadrant* are both very important (ranked 1-5), and under-developed (rated 3-5). These Attributes are strong candidates for improvement efforts. Attributes that fall in the lower left-hand quadrant are both important and well-developed. Some utilities may choose to focus on these areas to continue further improving upon important and well-developed areas, due to their long-term importance (for example, water resource adequacy). Specifically examining these areas may also help a utility identify success factors which would be helpful in addressing areas need-

ing improvement. Others may choose to focus on Attributes that would lead to early successes to build confidence in effecting change, Attributes that maximize benefit relative to the utility's key goals, or Attributes that minimize risks (e.g., fines, penalties, lawsuits, poor public perception).

The choice to embark on improvements in one or more areas is up to the judgment of utility managers, and may also involve consideration of resources (staff and financial), leadership support, and other competing activities. Applying strategic business planning, measurement, and other Keys to Management Success is very important for moving each Attribute over time to the “well-developed” quadrants.

Step 5: Develop and Implement an Improvement Plan

Once you choose to improve one or more Attributes, the next step is to develop and implement a plan for making the desired improvements. Effective improvement plans commonly include the following features:

- A “gap” analysis to identify root causes of under-performance. This analysis would describe the utility's performance goals, its current position relative to its goals, and the reasons for not achieving its goals;
- Development of a utility-specific plan and/or strategy to achieve performance goals and address the root causes. The plan should consider how to incorporate customer and, as appropriate, broader stakeholder interests;
- Specific tasks, tactics, or management adjustments necessary to implement the utility's strategy;
- Utility-specific measures to track progress toward achievement of performance goals; and
- A timeframe for follow-up measurement to assess the degree of accomplishment and potential need for additional effort.

Utilities may also find it useful to appoint an overall improvement program manager to oversee individual improvement projects.

The improvement plan should be developed and implemented within the context of strategic business planning, the “Plan-Do-Check-Act” continual improvement framework, and other components of the Keys to Management Success discussed in Section III.

V. Utility Measures

Measuring performance is one of the keys to utility management success. This section of the Primer provides ideas about how to approach measurement and then offers measures for each Attribute to help understand a utility's status and progress.

Approaching Measurement

There are two general approaches to performance measurement. Internal performance measurement, which is the focus of this Primer, involves evaluating current internal utility performance status and trends. It can also include comparison of outcomes or outputs relative to goals, objectives, baseline status, targets, and standards. Benchmarking—which is not this Primer's focus—is the overt comparison of similar measures or processes across organizations to identify best practices, set improvement targets, and measure progress within or sometimes across sectors. A utility may decide to engage in benchmarking for its own internal purposes or in a coordinated fashion with others.



While performance measures should be tailored to the specific needs of your utility, the following guidelines can help you identify useful measures and apply them effectively.

1. Select measures that support the organization's strategic objectives, mission, and vision, as well as the ten Attributes.
2. Select the right number, level, and type of measures for your organization. Consider how measures can be integrated as a cohesive group (e.g., start with a small set of measures across broad categories and increase number and specificity over time as needed), and consider measures that can be used by different audiences within the organization.
3. Measuring performance will not necessarily require additional staff, but will require resources. Allocate adequate resources to get the effort off to a good start, and fine tune over time to balance the level of measurement effort with the benefit to the organization.
4. Develop clear, consistent definitions for each measure. Identify who is responsible for collecting the data, and how the data will be tracked and reported.
5. Engage the organization at all levels in developing, tracking, and reporting measures, but also assign someone in the organization the role of championing and coordinating the effort.

6. Set targets rationally, based on criteria such as customer expectations, improvement over previous years, industry performance, or other appropriate comparisons. Tie targets to improving performance in the Attributes.
7. Select and use measures in a positive way to improve decision making, clarify expectations, and focus attention, not just to monitor, report, and control.
8. When selecting measures, consider how they relate to one another. Look for cause-and-effect relationships; for example, how improvements in product quality could result in increased customer satisfaction.
9. Develop an effective process to evaluate and respond to results. Identify how, when, and to whom you will communicate results.
10. Incorporate the “Plan-Do-Check-Act” cycle approach into evaluating both the specific measures and the system as a whole. Regularly review the performance measurement system for opportunities to improve.

... and remember to celebrate your measured and documented successes!

Attribute-Related Measures

The list below provides a limited list of targeted, Attribute-related measures. Taken as a whole, the measures provide a utility with a cohesive, approachable, and generally applicable starting place for gauging progress relative to the Ten Attributes. The list, for brevity, contains measure “headlines” for each Attribute; Appendix C provides further explanation and, where applicable, example calculations.

You can choose and tailor the measures to your own needs and unique, local circumstances. They are intended for your own internal use, even as certain measures (e.g., those noted as QualServe Indicators) can support benchmarking purposes. In these cases, the measures have been selected because they are relevant to the Attributes, have been tested and are in use by utilities, are supported by reference information useful for implementation, and generally can act as a good starting point for Attribute-related progress assessment.

As described in Appendix C, the measures are both quantitative and qualitative. Most are quantitative and include generally applicable example calculations. The qualitative “measures” encourage active assessment of the management area and most have a “yes/no” format.

Like the Attributes themselves, certain measures focus on core utility operations. Several measures reflect emerging utility issues, challenges, or opportunities that have

received increasing attention from a growing number of utility managers. Other measures may reflect broader interests that are worthy of consideration from a broader community perspective.

List of Attribute-Related Utility Measures

See Appendix C for measure descriptions and details.

Product Quality

1. Product quality regulatory compliance
2. Product quality service delivery

Customer Satisfaction

1. Customer complaints
2. Customer service delivery
3. Customer satisfaction

Employee and Leadership Development

1. Employee retention and satisfaction
2. Management of core competencies
3. Workforce succession preparedness

Operational Optimization

1. Resource optimization
2. Water management efficiency

Financial Viability

1. Budget management effectiveness
2. Financial procedure integrity
3. Bond ratings
4. Rate adequacy

Infrastructure Stability

1. Asset inventory
2. Asset (system) renewal/replacement
3. Water distribution/collection system integrity
4. Planned maintenance

Operational Resiliency

1. Recordable incidents of injury or illnesses
2. Insurance claims
3. Risk assessment and response preparedness
4. Ongoing operational resiliency
5. Operational resiliency under emergency conditions

Community Sustainability

1. Watershed-based infrastructure planning
2. Green infrastructure
3. Greenhouse gas emissions
4. Service affordability

Water Resource Adequacy

1. Water supply adequacy
2. Supply and demand management

Stakeholder Understanding and Support

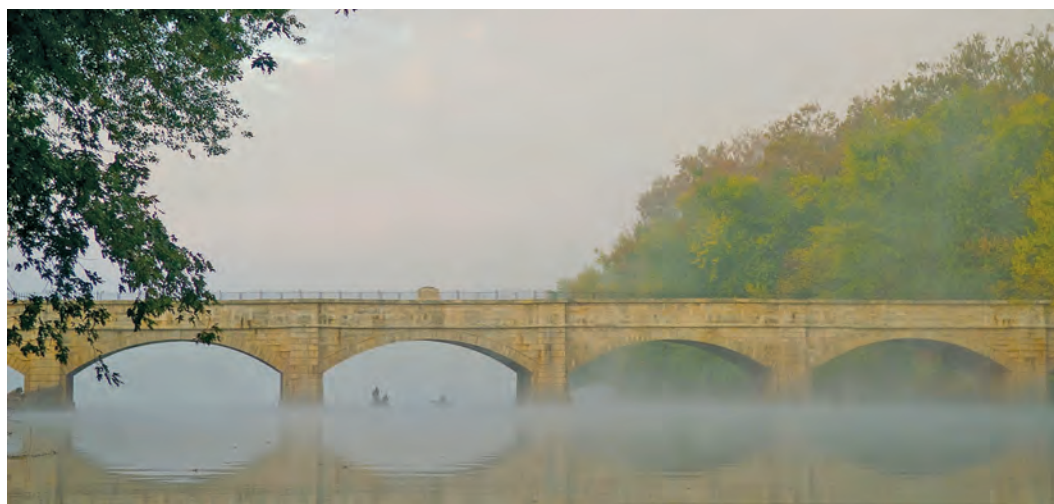
1. Stakeholder consultation
2. Stakeholder satisfaction
3. Internal benefits from stakeholder input
4. Comparative rate rank
5. Media/press coverage

VI. Utility Management Resources

As a companion resource to this Primer, the Collaborating Organizations developed an online Resource Toolbox which offers additional information and guidance on effective utility management. The Toolbox provides a compilation of resources from the seven Collaborating Organizations designed to help the water and wastewater utility community further improve the management of its infrastructure.

The Resource Toolbox is organized according to the Ten Attributes of Effectively Managed Water Sector Utilities and five Keys to Management Success, providing a set of resources relevant to each Attribute and Key. The Toolbox also includes information on where to find these resources.

The Resource Toolbox is located at the website for the Effective Utility Management initiative, at www.watereum.org.



VII. For More Information

This Primer was developed through a collaborative partnership with the following groups. More information about this partnership can be found on their websites or by contacting specific individuals directly.

American Public Works Association

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Association of Metropolitan Water Agencies

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UtilityManagement

VIII. Appendix A: Definitions

The following terms are presented in this Primer. These definitions provide a brief overview of their meaning.

- **Attribute:** A characteristic or outcome of a utility that indicates effective performance.
- **Benchmarking:** The comparison of similar processes or measures across organizations and/or sectors to identify best practices, set improvement targets, and measure progress.
- **Effective Utility Management:** Management that improves products and services, increases community support, and ensures a strong and viable utility into the future.
- **Gap analysis:** Defining the present state of an enterprise's operations, the desired or "target" state, and the gap between them.
- **Internal trend analysis:** Comparison of outcomes or outputs relative to goals, objectives, baselines, targets, and standards.
- **Life-cycle cost:** The total of all internal and external costs associated with a product, process, or activity throughout its entire life cycle – from raw materials acquisition to manufacture/construction/installation, operation and maintenance, recycling, and final disposal.
- **Performance measurement:** Evaluation of current status and trends; can also include comparison of outcomes or outputs relative to goals, objectives, baselines, targets, standards, other organizations' performance or processes (typically called benchmarking), etc.
- **Operations and maintenance expenditure:** Expenses used for day-to-day operation and maintenance of a facility.
- **Operating revenue:** Revenue realized from the day-to-day operations of a utility.
- **Performance measure:** A particular value or characteristic designated to measure input, output, outcome, efficiency, or effectiveness.
- **Source water protection:** Efforts to prevent water quality degradation in streams, rivers, lakes, or underground aquifers used as public drinking water supplies.
- **Standard operating procedure:** A prescribed procedure to be followed routinely; a set of instructions having the force of a directive, covering those features of operations that lend themselves to a definite or standardized procedure without loss of effectiveness.

- **Strategic plan:** An organization's process of defining its goals and strategy for achieving those goals. Often entails identifying an organization's vision, goals, objectives, and targets over a multi-year period of time, as well as setting priorities and making decisions on allocating resources, including capital and people, to pursue the identified strategy.
- **Stewardship:** The careful and responsible management of something entrusted to a designated person or entity's care; the responsibility to properly utilize its resources, including its people, property, and financial and natural assets.
- **Sustainability:** The use of natural, community, and utility resources in a manner that satisfies current needs without compromising future needs or options.
- **Watershed health:** The ability of ecosystems to provide the functions needed by plants, wildlife, and humans, including the quality and quantity of land and aquatic resources.

IX. Appendix B: Self Assessment

Step 1: Assess Current Conditions

On a 1-to-5 scale, assess current conditions by rating your utility's systems and approaches and current level of achievement for each Attribute. Consider the degree to which your current management systems effectively support each of the Attributes and their component parts. Consider all components of each Attribute and gauge your rating accordingly. Use these descriptions to guide your rating.

Rating	Description
1.	Effective, systematic approach and implementation; consistently achieve goals.
2.	Workable systems in place; mostly achieve goals.
3.	Partial systems in place with moderate achievement, but could improve.
4.	Occasionally address this when specific need arises.
5.	No system for addressing this.

Mark your answers in the Step 1 column of the table on the next page.

Step 2: Rank Importance of Attributes

Rank the importance of each Attribute to your utility, based on your utility's vision, goals, and specific needs. The ranking should reflect the interests and considerations of all stakeholders (managers, staff, customers, regulators, elected officials, community and watershed interests, shareholders, and others).

There are ten Attributes; considering long-term importance to your utility, rank the most important Attribute 1, the second most important 2, and so on. The least important Attribute would be ranked 10. Your ranking of each Attribute's importance might be influenced by current or foreseeable challenges in that particular area, recent accomplishments in addressing these issues, or other factors. Importance ranking is likely to change over time as internal and external conditions change.

Mark your answers in the Step 2 column of the table on the next page. As you fill in numbers, please note that your analysis for Step 1 (rating achievement) should be separate and independent from your analysis for Step 2 (ranking importance).

Attribute	Step 1: Rate Achievement (1-5)	Step 2: Rank Importance (1-10)
Product Quality (PQ)		
Customer Satisfaction (CS)		
Employee and Leadership Development (ED)		
Operational Optimization (OO)		
Financial Viability (FV)		
Infrastructure Stability (IS)		
Operational Resiliency (OR)		
Community Sustainability (SU)		
Water Resource Adequacy (WA)		
Stakeholder Understanding and Support (SS)		

Step 3: Graph Results

Graph each Attribute based on your rating and ranking.

Rating	
Higher Achievement	Lower Achievement
5	
4	PQ
3	CS
2	
1	
	12345678910
	More ImportantLess Important
	Ranking

X. Appendix C: Attribute-Related Water Utility Measures

This Appendix provides more detailed information on the measures offered in Section V of the Primer, including descriptions and example calculations and questions.

Product Quality

1. Product quality regulatory compliance

Description: Water product quality compliance, particularly with regards to 40 CFR Part 141 (the National Primary Drinking Water Regulations), the National Pollutant Discharge Elimination System, and any other relevant federal (Clean Water Act, Safe Drinking Water Act, etc.) or state statute/regulations and permit requirements. The scope can include the quality of all related products, including drinking water, fire suppression water, treated effluent, reused water, and biosolids, as well as quality-related operating requirements such as pressure and number of sewer overflows.

Example calculations:

- *Drinking water compliance rate* (percent): $100 \times (\text{number of days in full compliance for the year} \div 365 \text{ days})$. This is a QualServe Indicator.¹
- *Wastewater treatment effectiveness rate* (percent): $100 \times (365 - \text{total number of standard noncompliance days} \div 365 \text{ days})$. This is a QualServe Indicator.²
- *Number, type, and frequency of “near (compliance) misses”*: For example, reaching 80-95% of allowable levels of “X” during reporting period, typically per month. Tracking this type of measure could be used to improve performance in these “near miss” areas before violations occur.

2. Product quality service delivery

Description: This measure assesses delivery of product quality service based on utility-established objectives and service level targets. It focuses on non-regulatory performance targets.

¹ This is one of the 22 Performance Indicators from the Qualserve program, a voluntary quality improvement program designed for water and wastewater utilities by the American Water Works Association and the Water Environment Federation. Reference from the American Water Works Association and the Awwa Research Foundation, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 57. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

² Ibid., p. 71. 2004.

Example calculations:

- *Drinking water flow and pressure* (percent): $100 \times [\text{number of customers with less than (flow of "X" gallons per minute (gpm) and pressure of "Y" pounds per square inch (psi)—levels set by utility)} \div \text{total number of customers}]$ (during reporting period, typically per month).
- *Fire suppression water flow and pressure* (percent): $100 \times [\text{hours of time when (flow of "X" gpm and pressure of "Y" psi—levels set by utility) is available for fire suppression at maximum day demand} \div \text{total number of hours when fire suppression water should be available at maximum day demand}]$ (during reporting period, typically per month).
- *Service interruptions* (percent): $100 \times (\text{number of active account customers experiencing a service interruption of greater than 1 hour} \div \text{total number of customers during reporting period})$ (typically per month). Note: the utility may elect to measure planned and unplanned interruptions separately.
- *Water quality goals met/not met*: Number of days in reporting period (typically one month) where utility-defined beyond-compliance targets are met/not met.
- *Sewer backups* (if not included in permit requirements) (amount and percent): Number of customers experiencing backups each year; $100 \times (\text{number of customers experiencing backups each year} \div \text{total number of customers})$.
- *Sewer overflows* (if not included in permit requirements): Number of sewer overflows per 100 miles of collection system piping.
- *Water reuse* (amount and percent):
 - Amount: Amount of water supplied that is from reused/recycled sources.
 - Percent: $100 \times (\text{amount of water supplied that is from reused/recycled water} \div \text{total amount of water supplied})$.

Then, as desired, these amounts can be broken into recipients/applications (e.g., irrigation, agriculture, industrial processes, etc.).

- *Biosolids put to beneficial use* (percent): $100 \times (\text{amount of biosolids produced that are put to a beneficial use} \div \text{total amount of biosolids produced})$ (in wet tons per year).

Customer Satisfaction

1. Customer complaints

Description: This measure assesses the complaint rates experienced by the utility, with individual quantification of customer service and core utility service complaints.³ As a “passive measure,” it will not likely be numerically representative (i.e., a statistically valid customer sample group) and is a “starting point” measure for understanding customer service problems.

Example calculations:

- Number of complaints per 1,000 customers per reporting period, recorded as either customer service or technical quality complaints. These calculations are based on the QualServe Customer Service Complaints/Technical Quality Complaints Indicator.
 - *Customer service complaint rate:* $1,000 \times (\text{customer service associated complaints} \div \text{number of active customer accounts})$. This is a QualServe Indicator.⁴
 - *Technical quality complaint rate:* $1,000 \times (\text{technical quality associated complaints} \div \text{number of active customer accounts})$. This is a QualServe Indicator.⁵

For both calculations, utilities may wish to subcategorize complaints by type and aspect (e.g., customer service into billing, problem responsiveness, interruptions, etc., and technical quality into service deficiencies such as taste, odor, appearance, flow/pressure, etc.) and by type of customer (e.g., residential, industrial, commercial, etc.)

2. Customer service delivery

Description: This measure requires the utility, based on internal objectives and customer input, to set desirable customer service levels, then determine an appropriate (target) percentage of time to meet the performance levels. Once established, the utility can track how often it meets the service levels, helping the utility to determine how well customer needs are being satisfied (e.g., have 95 percent of service calls received a response within 60 minutes). A utility can average across individual measures to determine the overall percentage of service level commitments met.

³ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 41. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association

⁴ Ibid., p. 41.

⁵ Ibid., p. 42.

Example calculations:

- *Call responsiveness* (percent): $100 \times (\text{number of calls responded to within "X" minutes} \div \text{total number of calls during reporting period})$ (typically per month).
- *Error-driven billing adjustment rate* (percent): $100 \times (\text{number of error-driven billing adjustments during reporting period} \div \text{number of bills generated during reporting period})$. This is a QualServe Indicator.⁶
- *Service start/stop responsiveness* (percent): $100 \times (\text{number of stop/start service orders processed within "X" days} \div \text{total number of stop/start service orders during reporting period})$.
- *First call resolution* (percent): $100 \times (\text{number of calls for which problem was resolved/fixed/scheduled to be fixed at the time of the first call} \div \text{total number of calls during reporting period})$.

3. Customer satisfaction

Description: This is an overarching customer satisfaction measure based on requested customer feedback (surveys), not calls received or internal customer satisfaction service level commitments. A utility can measure customer satisfaction immediately after service provision or use a periodically performed, more comprehensive customer satisfaction survey. After-service surveys are simpler and easier for the utility to develop and implement without professional advice, but they tend to over represent the most satisfied (e.g., those who just received service) and the most dissatisfied (e.g., those who just called with complaints) customers. Comprehensive surveys can provide statistical validity enabling extrapolation to the population served. A utility can verify survey information through customer conversations, either as follow up to a survey, during public meetings or focus groups, or by some other method (e.g., individual telephone calls).

Example calculation:

- *Overall customer satisfaction:* Percent of positive or negative customer satisfaction survey responses based on a statistically valid survey or on an immediately after-service survey. Satisfaction responses can be divided into categories such as: highly satisfied/satisfied/moderately satisfied/unsatisfactory; exceeding expectations/meeting expectations/not meeting expectations; numerical scales (e.g., 1-5); or other divisions. Customer satisfaction information is often also gathered and assessed by topic areas such as product quality, service reliability, billing accuracy, customer service, costs/rates/value, crew courtesy, notification around street construction/service interruptions, etc.

⁶ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 49. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

Employee and Leadership Development

1. Employee retention and satisfaction

Description: This measure gauges a utility's progress toward developing and maintaining a competent and stable workforce, including utility leadership.

Example calculations:

- *Employee turnover rate* (percent): $100 \times (\text{number of employee departures} \div \text{total number of authorized positions per year})$. Can be divided into categories such as:
 - *Voluntary turnover* (percent): $100 \times (\text{number of voluntary departures} \div \text{total number of authorized positions per year})$. (Perhaps the best indicator of retention problems.)
 - *Retirement turnover* (percent): $100 \times (\text{number of retirement departures} \div \text{authorized positions per year})$. (Measures loss/retention of institutional knowledge.)
 - *Experience turnover* (percent): $100 \times (\text{number of years of experience represented by all departures} \div \text{total years of experience with the organization})$ (at the beginning of the year). (These are harder data to collect but provide a good assessment of institutional knowledge loss potential and therefore the need to retain/capture institutional knowledge.)
- *Employee job satisfaction* (percent): $100 \times (\text{number of employees with "X" job satisfaction level} \div \text{total number of employees})$ (based on implementation and monitoring over time of a comprehensive employee survey). Can be divided into work type or job classification categories, etc., and cover overall satisfaction and topics deemed relevant to longer-term employee satisfaction and retention, such as:
 - Compensation and benefits
 - Management
 - Professional development and long-term advancement opportunities
 - Work and teamwork
 - Procedures
 - Fairness and respect
 - Communication

2. Management of core competencies

Description: This measure assesses the utility's investment in and progress toward strengthening and maintaining employee core competencies.

Example calculations and assessment areas:

- *Presence of job descriptions and performance expectations:* Does your organization have and maintain current job descriptions and related performance expectations (yes/no)?
- *Training hours per employee:* Total of qualified formal training hours for all employees ÷ total FTEs worked by employees during the reporting period. This is a QualServe Indicator.⁷
- *Certification coverage (percent):* $100 \times (\text{number of certifications achieved or maintained} \div \text{number of needed certifications per year})$ (across the utility).
- *Employee evaluation results* (assumes utility evaluates employee performance in a routine way and documents results): Results of employee evaluations (e.g., employee growth not clearly demonstrated, employee growth only demonstrated in certain areas or for certain labor categories, etc.).
- *Presence of employee-focused objectives and targets:* Do you have employee-focused organizational objectives and targets and a related professional management system in place? Are you meeting your targets (yes/no)? (Targets could be, for instance, related to quantity, quality, timeliness, or cost. A timeliness target could, for example, relate to the number of hours it takes on average to complete a routine task.)

3. Workforce succession preparedness

Description: This measure assesses utility long-term workforce succession planning efforts to ensure critical skills and knowledge are retained and enhanced over time, particularly in light of anticipated retirement volume in coming years. Focus is on preparing entire groups or cohorts for needed workforce succession, including continued training and leadership development.

Example calculations:

- *Key position vacancies:* Average time that critical-skill positions are vacant due to staff departures per vacancy per year.
- *Key position internal/external recruitment (percent):* $100 \times (\text{number of critical-skill positions that are filled internally (through promotion, transfer, etc. rather than outside recruitment)} \div \text{total number of positions filled per year})$. (This will help the utility to understand if internal workforce development is covering long-term succession needs.)

⁷ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 38. 2004.
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- *Long-term succession plan coverage (percent):* $100 \times (\text{number of employees (or cohorts, work units, etc.) covered by a long-term workforce succession plan that accounts for projected retirements and other vacancies in each skill and management area} \div \text{total number of employees (or cohorts, work units, etc.)})$.

Operational Optimization

1. Resource optimization

Description: This measure examines resource use efficiency, including labor and material per unit of output or mile of collection/distribution system.

Example calculations:

- *Customer accounts per employee:* Number of accounts $\div$ number of FTEs. (FTE = 2,080 hours per year of employee time equivalent.) This is a QualServe Indicator.⁸
- *MGD water delivered/processed per employee:* Average MGD delivered/processed $\div$ FTEs per year. This is a QualServe Indicator.⁹
- *Chemical use per volume delivered/processed:* Amount of chemicals used $\div$ MG delivered/processed during reporting period. (Alternatively can use dollar amount spent on chemicals $\div$ MG delivered/processed; in this case a rolling average for amount spent would account for periodic bulk purchases.)
- *Energy use per volume delivered/processed:* KWH $\div$ MG delivered/processed during reporting period. (Alternatively can use dollar amount spent on energy $\div$ MG delivered/processed.)
- *O&M cost per volume delivered/processed:* Total O&M cost $\div$ MG delivered/processed during reporting period.

A utility can also apply the above resource use per volume delivered/processed calculations to resource use per mile (or 100 miles) of collection/distribution system, (i.e., chemical use per mile, energy use per mile, or O&M cost per mile).

2. Water management efficiency

Description: This measure assesses drinking water production and delivery efficiency by considering resources as they enter and exit the utility system.

⁸ Part of the same Indicator (set) as MGD water delivered/MGD waste water processed per FTE. From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 40. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

⁹ Ibid., p. 40.

Example calculations:

- *Production efficiency*: Ratio of raw water volume taken into the treatment system to treated water produced.
- *Distribution system water loss* (a.k.a. non-revenue water) (percent): $100 \times [\text{volume of water distributed} - (\text{volume of water billed} + \text{volume of unbilled authorized water}) \div \text{total volume of water distributed}]$. (Quantifies the percentage of produced water that fails to reach customers and cannot otherwise be accounted for through authorized usage.) This is a QualServe Indicator.¹⁰
- *Meter function* (percent): $100 \times (\text{total number of active billable meters minus stopped or malfunctioning meters} \div \text{total number of active billable meters})$.

Financial Viability

1. Budget management effectiveness

Description: This measure has short-term and long-term aspects. The short-term calculations are commonly used financial performance indicators, and the long-term consideration is a more comprehensive analytical approach to assessing budget health over the course of several decades.

Example calculations:

Short-term (typically per year):

- *Revenue to expenditure ratio*: $\text{Total revenue} \div \text{total expenditures}$.
- *O&M expenditures* (percent): $100 \times (\text{O\&M expenditures} \div \text{total operating budget})$.
- *Capital expenditures* (percent): $100 \times (\text{capital expenditures} \div \text{total capital budget})$.
- *Debt ratio*: $\text{Total liabilities} \div \text{total assets}$. Total liabilities are the entire obligations of the utility under law or equity. Total assets are the entire resource of the utility, both tangible and intangible. Utilities often have different debt-risk acceptability levels, thus the ratio itself should be considered within each utility's unique circumstances. This is a QualServe Indicator.¹¹

¹⁰ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 59. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

¹¹ Ibid., p. 51. 2004.



Long-term:

- *Life-cycle cost accounting:* Has the utility conducted a life-cycle cost accounting analysis¹² that explicitly incorporates accepted service level risks, asset condition, budget needs based on the values (net present values) of utility current and future assets, etc., and made financial and budget management decisions accordingly (yes/no)?

2. Financial procedure integrity

Description: Questions that gauge presence of internal utility processes to ensure a high level of financial management integrity.

Example calculations:

- Does the utility have financial accounting policies and procedures (yes/no)?
- Are financial results and internal controls audited annually (yes/no)?
- Have the number of control deficiencies and material weaknesses been reduced from previous audits (yes/no)?

3. Bond ratings

Description: Bond ratings are a general indicator of financial viability; however, they are not always within a utility's control and are less important if a utility is not participating in capital markets. Smaller utilities often struggle to obtain high ratings. Even though a higher bond rating is desirable and this provides a general indicator of financial health, the bond rating should not be considered alone. It should be considered in light of other factors such as the other measures suggested for this Attribute.

Example question:

- Has your bond rating changed recently? If so, why? Does the change reflect the utility's financial management in a way that can and should be acknowledged and, if need be, addressed?

¹² Section 707 of Executive Order 13123 defines life-cycle costs as, "...the sum of present values of investment costs, capital costs, installation costs, energy costs, operating costs, maintenance costs, and disposal costs over the life-time of the project, product, or measure." Life-cycle cost analysis (LCCA) is an economic method of project evaluation in which all costs arising from owning, operating, maintaining, and disposing of a [facility/asset] are considered important to the decision. LCCA is particularly suited to the evaluation of design alternatives that satisfy a required performance level, but that may have differing investment, operating, maintenance, or repair costs; and possibly different life spans. LCCA can be applied to any capital investment decision, and is particularly relevant when high initial costs are traded for reduced future cost obligations. See also: <http://www.epa.gov/EMS/position/eo13148.htm>, <http://www.wbdg.org/resources/lcca.php>.

4. Rate adequacy

Description: This measure helps the utility to consider its rates relative to factors such as external economic trends, short-term financial management, and long-term financial health. It recognizes that a “one size fits all” calculation would not be realistic due to each utility’s unique situation and the number of variables that could reasonably be considered. The following three questions prompt assessment of key components of rate adequacy.

Example questions:

- How do your rate changes compare currently and over time with the inflation rate and the Consumer Price Index (CPI) or Consumer Price Index for All Urban Consumers (CPI-U)? (Rate increases below CPI for very long may suggest rates are not keeping up with utility costs.) (Using a rolling rate average over time will adjust for short-term rate hikes due to capital or O&M spending needs.)
- Have you established rates that fully consider the full life-cycle cost of service and capital funding options? (See the life-cycle cost accounting discussion, above.)
- Does your utility maintain a rate stabilization reserve to sustain operations during cycles of revenue fluctuation, in addition to 60- (or 90-) day operating reserves?

Infrastructure Stability

1. Asset inventory

Description: This measure gauges a utility’s efforts to assess assets and asset conditions, as the first steps towards building a comprehensive asset management program.

Example calculations:

- *Inventory coverage* (percent): $100 \times (\text{total number of critical assets inventoried within a reasonable period of time (e.g., 5-10 years)} \div \text{total number of critical assets})$. A utility will need to first define what it considers to be a critical asset and a complete inventory will involve understanding the following for each:
 - Age and location;
 - Asset size and/or capacity;
 - Valuation data (e.g., original and replacement cost);
 - Installation date and expected service life;

- Maintenance and performance history; and
 - Construction materials and recommended maintenance practices.¹³
- *Condition assessment coverage* (percent): $100 \times (\text{total number of critical assets with condition assessed and categorized into condition categories within a reasonable period of time (e.g., 5-10 years)} \div \text{total number of critical assets})$. Condition categories could include: unacceptable, improvement needed, adequate, good, and excellent to reflect expected service levels and accepted risks.

2. Asset (system) renewal/replacement

Description: This measure assesses asset renewal/replacement rates over time. The measure should reflect utility targets, which will vary depending on each utility's determinations of acceptable risks for different asset classes. Decisions on asset replacement typically factor in internally agreed-upon risks and objectives, which may differ by asset class and other considerations. For instance, a utility may decide to run certain assets to failure based on benefit-cost analysis.

Example calculations:

- *Asset renewal/replacement rate* (percent): $100 \times (\text{total number of assets replaced per year for each asset class} \div \text{total number of assets in each asset class})$. For example, a two percent per year replacement target (50-year renewal) for a particular asset class could be identified as the basis for performance monitoring.
- or —
- *Asset (system) renewal/replacement rate*: $100 \times (\text{total actual expenditures or total amount of funds reserved for renewal and replacement for each asset group} \div \text{total present worth for renewal and replacement needs for each asset group})$. This is a QualServe Indicator.¹⁴

3. Water distribution/collection system integrity

Description: For drinking water utilities, this measure quantifies the number of pipeline leaks and breaks. Distribution system integrity has importance for health, customer service, operational, and asset management reasons. For wastewater utilities, this measure examines the frequency of collection system failures. When tracked over time, a utility can evaluate whether its failure rate is decreasing, stable, or increasing. When data are maintained to characterize failures by pipe type and age, type

¹³ From the U.S. General Accounting Office, *Water Infrastructure: Comprehensive Asset Management Has Potential to Help Utilities Better Identify Needs and Plan Future Investments*. GAO-04-461. March 2004. Available: <http://www.gao.gov/new.items/d04461.pdf>.

¹⁴ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 53. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

of failure, and cost of repairs, decisions regarding routine maintenance and replacement/renewals can be better made.¹⁵

Example calculation (drinking water utilities):

- *Leakage and breakage frequency rate* (percent): $100 \times ((\text{total number of leaks} + \text{total number of breaks}) \div \text{total miles of distribution piping per year})$. (Note: leaks and breaks are distinctly different events.) This is a QualServe Indicator.¹⁶

Example calculation (wastewater utilities):

- *Collection system failure rate* (percent): $100 \times (\text{total number of collection system failures} \div \text{total miles of collection system piping per year})$. This is a QualServe Indicator.¹⁷

4. Planned maintenance

Description: Planned maintenance includes both preventive and predictive maintenance. Preventive maintenance is performed according to a predetermined schedule rather than in response to failure. Predictive maintenance is initiated when signals indicate that maintenance is due. All other maintenance is categorized as corrective or reactive.¹⁸

Example calculations:

This measure can be measured in different ways. Calculating costs may be preferable to encourage business decisions based on total cost; however, the reliability of costs is uncertain. Hours are likely to be less variable than costs, but not all utilities track hours. Thus, cost and hours ratios are desirable, where possible.

- *Planned maintenance ratio by hours* (percent): $100 \times (\text{hours of planned maintenance} \div (\text{hours of planned} + \text{corrective maintenance}))$. This is a QualServe Indicator.¹⁹
- *Planned maintenance ratio by cost* (percent): $100 \times (\text{cost of planned maintenance} \div (\text{cost of planned} + \text{corrective maintenance}))$. This is a QualServe Indicator.²⁰

¹⁵ From AWWA and AwwaRF, *Selection and Definition of Performance Indicators for Water and Wastewater Utilities*, p. 70. 2004. Note: This material is copyrighted and any reprinting must be by permission of the American Water Works Association.

¹⁶ Ibid., p. 61.

¹⁷ Ibid., p. 70.

¹⁸ Ibid., p. 65.

¹⁹ Ibid., p. 66.

²⁰ Ibid., p. 66.

Operational Resiliency

1. Recordable incidents of injury or illnesses

Description: Incidence rates can be used to show the relative level of injuries and illnesses and help determine problem areas and progress in preventing work-related injuries and illnesses.

Example calculations:

The U.S. Bureau of Labor Statistics has developed instructions for employers to evaluate their firm's injury and illness record. The calculation below is based on these instructions, which can be accessed at: <http://www.bls.gov/iif/osheval.htm>.

- *Total recordable incident rate:* (Number of work-related injuries and illnesses X 200,000²¹) ÷ employee hours worked.

2. Insurance claims

Description: This measure examines the number, type, and severity of insurance claims to understand insurance coverage strength/vulnerability.

Example calculations:

- *Number of insurance claims:* Number of general liability and auto insurance claims per 200,000²² employee hours worked.
- *Severity of insurance claims:* Total dollar amount of general liability and auto insurance claims per 200,000²³ employee hours worked.

3. Risk assessment and response preparedness

Description: This measure asks whether utilities have assessed their all-hazards (natural and human-caused) vulnerabilities and risks and made corresponding plans for critical needs. Risk assessment in this context includes a vulnerability assessment regarding, for example, power outages, lack of access to chemicals, curtailed staff availability, etc.

²¹ 200,000 hours is a standard number used by OSHA to normalize data. It represents the equivalent of 100 employees working 40 hours per week, 50 weeks per year, and provides the standard base for the incidence rates.

²² See the explanation in the footnote above regarding the 200,000 hours standard.

²³ See the explanation in the footnote above regarding the 200,000 hours standard.

Example calculations:

- Emergency Response Plan (ERP) coverage and preparedness:
 - Does the utility have an ERP in place (yes/no)?
 - Number and frequency of ERP trainings per year: $100 \times (\text{number of employees who participate in ERP trainings} \div \text{total number of employees})$.
 - Number and frequency of ERP exercises per year: $100 \times (\text{number of employees who participate in ERP exercises} \div \text{total number of employees})$.
 - Frequency with which the ERP is reviewed and updated.
- *Vulnerability management*: Is there a process in place for identifying and addressing system deficiencies (e.g., deficiency reporting with an immediate remedy process) (yes/no)?

4. Ongoing operational resiliency

Description: This measure assesses a utility's operational reliability during ongoing/routine operations.

Example calculations:

- *Uptime for critical utility components on an ongoing basis* (percent): $100 \times (\text{hours of critical component uptime} \div \text{hours critical components have the physical potential to be operational})$. Note: a utility can apply this measure on an individual component basis or summed across all identified critical components. Also, a utility can make this measure more precise by adjusting for planned maintenance periods.

5. Operational resiliency under emergency conditions

Description: This measure assesses the operational preparedness and expected responsiveness in critical areas under emergency conditions.

Example calculations (all apply to emergency conditions and, where relevant, factor in anticipated downtimes relative to required/high demand times):

- *Power resiliency*: Period of time (e.g., hours or days) for which backup power is available for critical operations (i.e., those required to meet 100 percent of minimum daily demand). (Note: "minimum daily demand" is the average daily demand for the lowest production month of the year.)
- *Treatment chemical resiliency*: Period of time (e.g., hours or days) minimum daily demand can be met with water treated to meet SDWA standards for acute contaminants (i.e., *E.coli*, fecal coliform, nitrate, nitrite, total nitrate and nitrite, chlorine dioxide, turbidity as referenced in the list of situations requiring a Tier 1 Public Notification under 40 CFR 141.202), without additional treatment

chemical deliveries. (Note: “minimum daily demand” is the average daily demand for the lowest production month of the year.)

- *Critical parts and equipment resiliency*: Current longest lead time (e.g., hours or days) for repair or replacement of operationally critical parts or equipment (calculated by examining repair and replacement lead times for all identified critical parts and equipment and taking the longest single identified time).
- *Critical staff resiliency*: Average number of response-capable backup staff for critical operation and maintenance positions (calculated as the sum of all response-capable backup staff ÷ total number of critical operation and maintenance positions).
- *Treatment operations resiliency* (percent): Percent of minimum daily demand met with the primary production or treatment plant offline for 24, 48, and 72 hours. (Note: “minimum daily demand” is the average daily demand for the lowest production month of the year.)
- *Sourcewater resiliency*: Period of time (e.g., hours or days) minimum daily demand can be met with the primary raw water source unavailable. (Note: “minimum daily demand” is the average daily demand for the lowest production month of the year.)

Community Sustainability

1. Watershed-based infrastructure planning

Description: This measure addresses utility efforts to consider watershed-based approaches when making management decisions affecting infrastructure planning and investment options. Watershed protection strategies can sometimes, for example, protect sourcewater quality limiting the need for additional or enhanced water treatment capacity.

Example question:

- Does the utility employ alternative, watershed-based approaches to align infrastructure decisions with overall watershed goals and potentially reduce future infrastructure costs? Watershed-based approaches include, for example: centralized management of decentralized systems; stormwater management; sourcewater protection programs; and conjunctive use of groundwater, sourcewater, and recycled water to optimize resource use at a basin scale. (See also “green infrastructure” below.)

2. Green infrastructure

Description: “Green infrastructure” includes both the built and natural/unbuilt environment. Utilities may promote source water protection and conservation “green infrastructure” approaches in support of water conservation (e.g., per capita demand reduction) and water quality protection objectives. Green infrastructure approaches can include: low-impact development techniques (e.g., minimization of impervious surfaces, green roofs); protection of green spaces and wildlife habitat; incentives for water-efficient domestic appliance use and landscaping; green building standards such as those promoted through the Leadership in Energy and Environmental Design (LEED) program; management of energy, chemical, and material use; etc.²⁴ Utilities often coordinate these efforts with community planning offices.

Example question:

- Has the utility explored green infrastructure approaches and opportunities that are aligned with the utility’s mandate, goals, and objectives and community interests (yes/no)?
- Does the utility have procedures that incorporate green infrastructure approaches and performance into new infrastructure investments (yes/no)?

3. Greenhouse gas emissions

Description: This measure will help drinking and wastewater utilities to understand and reduce their individual contributions to area greenhouse gas emissions. Trends indicate that water utility emissions of these gases will likely be of interest to stakeholders. Monitoring of these emissions is becoming more common among water sector utilities, and some utilities are beginning voluntary efforts to reduce their emissions (e.g., through production of reusable methane energy by wastewater utilities).

Example calculation:

- Net (gross minus offsets) greenhouse gas emissions in tons of carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and, as applicable, hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). Start by establishing an emissions baseline and then track emission trends in conjunction with minimizing/reducing emissions over time, where possible.²⁵ Emissions inventories often incorporate indirect emissions such as those generated during the production and transport of materials and chemicals.

²⁴ For more information about green infrastructure, visit www.epa.gov/npdes/greeninfrastructure.

²⁵ EPA’s industry-government “Climate Leaders” partnership involves completing a corporate-wide inventory of their greenhouse gas emissions. Information and related guidance is available at <http://www.epa.gov/stateply/index.html>.

4. Service affordability

Description: Drinking water and wastewater service affordability centers on community members' ability to pay for water services. The true cost of water/wastewater services may be higher than some low-income households can afford, particularly when rates reflect the full life-cycle cost of water services. Each utility will want to consider and balance keeping water services affordable while ensuring the rates needed for long-term infrastructure and financial integrity.

Example calculations and considerations:

- *Bill affordability* (households for which rates may represent an unaffordable level) (percent): $100 \times (\text{number of households served for which average water bill is} > \text{"X" percent (often 2-2.5\% of median household income}^{26} \div \text{total number of households served})$.

Coupled with:

- *Low-income billing assistance program coverage* (percent): $100 \times (\text{number of customers enrolled in low-income billing assistance program} \div \text{number of customers who are eligible for enrollment in low-income billing assistance program})$. (The utility can try to increase participation in the program for eligible households that are not participating.)

Water Resource Adequacy

1. Water supply adequacy

Description: This measure assesses short-term and long-term water supply adequacy and explores related long-term supply considerations.

Example calculations and questions:

- *Short-term water supply adequacy:* Period of time for which existing supply sources are adequate. This can be measured as a ratio of projected short-term (e.g., 12-month rolling average) monthly supply to projected short-term monthly demand. Often an index or scale is used, for example, short-term supply relative to severe drought (assigned a "1") to abundant supply conditions (assigned a "5").

²⁶ This calculation focuses on identifying low-income households based median household incomes (MHI); however, MHI is not strongly correlated with the incidence of poverty or other measures of economic need. Further, populations served by small utilities in rural settings tend to have lower MHI and higher poverty rates, but fewer options for diversifying water/wastewater service rates based on need compared to larger municipal systems.

- *Long-term water supply adequacy:* Projected future annual supply relative to projected future annual demand for at least the next 50 years (some utilities project out as far as 70-80 years). Statistical forecasting and simulation modeling and forecasting techniques are typically used for such long-term projections. Analysis variables in addition to historical record (e.g., historical and year-to-date reservoir elevation data), forecasted precipitation, and flows can include:
 - Future normal, wet, dry, and very dry scenarios (including anticipated climate change-related scenarios);
 - Anticipated population changes;
 - Future service areas;
 - Availability of new water supplies, including recycled water (plus availability of water rights for new supplies, where applicable); and
 - Levels of uncertainty around the above.

2. Supply and demand management

Description: This metric explores whether the utility has a strategy for proactive supply and demand management in the short and long terms. Strategy needs will depend on community circumstances and priorities, anticipated population growth, future water supply in relation to anticipated demand, demand management and other conservation options, and other local considerations.

Example questions:

- Has the utility developed a sourcewater protection plan (yes/no) and is the plan current (yes/no)?
- Does the utility have a demand management/demand reduction plan (yes/no)? Does this plan track per capita water consumption and, where analytical tools are available to do so, accurately attribute per capita consumption reductions to demand reduction strategies (such as public education and rebates for water-efficient appliances) (yes/no)?
- Do demand scenarios account for changes in rates (which can change for many reasons) and conservation-oriented, demand management pricing structures (yes/no)?
- Does the utility have policies in place that address, prior to committing to new service areas, availability of adequate dry year supply (yes/no)? Alternatively, does the utility have a commitment to denying service commitments unless a reliable drought-year supply, with reasonable drought use restrictions, is available to meet the commitment (yes/no)?

Stakeholder Understanding and Support

1. Stakeholder consultation

Description: This measure addresses utility actions to reach out to and consult with stakeholders about utility matters, including utility goals, objectives, and management decisions.

Example questions:

- Does the utility identify stakeholders, conduct outreach, and actively consult with stakeholders about utility matters (yes/no)? Elements of this plan can include:
 - Number of active contacts with stakeholders in key areas (e.g., from local government, business, education, non-governmental groups)?
 - Does the utility actively seek input from stakeholders (yes/no)?
 - Frequency with which the utility actively consults with stakeholders. This measure should go beyond counting the number of calls or times information is sent out or posted on websites to items such as number of stakeholder outreach and education activities, number of opportunities for stakeholders to provide input, participation of stakeholders on utility committees, etc.
- Does the utility actively consider and act upon stakeholder input (yes/no)?

2. Stakeholder satisfaction

Description: This measure addresses stakeholder perceptions of the utility. Stakeholder satisfaction can be measured through surveys sent to stakeholders, formal feedback surveys distributed to stakeholders at events, etc.

Example calculations:

- *Overall satisfaction* (percent): $100 \times (\text{number of stakeholders who annually rate the overall job of the utility as positive} \div \text{total number of stakeholders surveyed})$.
- *Responsiveness* (percent): $100 \times (\text{number of stakeholders who annually rate utility responsiveness to stakeholder needs as positive} \div \text{total number of stakeholders surveyed})$.
- *Message recollection for outreach programs targeted to specific stakeholder groups* (percent): (a) $100 \times (\text{number of stakeholders who recall key messages} \div \text{total number of stakeholders surveyed})$; and (b) $100 \times (\text{number of stakeholders who recall the message source (TV, utility mailers, newsletters, etc.)} \div \text{total number of stakeholders surveyed})$.

3. Internal benefits from stakeholder input

Description: This measure addresses the value utility employees believe stakeholder engagement has provided to utility projects and activities. Measurement by the utility can focus on surveying utility employees running projects that have stakeholder involvement.

Example calculations:

- $100 \times (\text{number of utility projects or activities where stakeholders participated and/or provided input for which utility employees believe there was value added as a result of stakeholder participation and input} \div \text{total number of projects where stakeholders participated and/or provided input})$.
- *Overall value added (percent):* $100 \times (\text{number of utility employees who rated their overall sense of value added from stakeholder participation and input as (high value added, some value added, little value added, no value added)} \div \text{total number of utility employees surveyed})$.

4. Comparative rate rank

Description: This measure depicts how utility rates compare to similar utilities (e.g., utilities of the same type (drinking water, wastewater) that are similar in terms of geographic region, size of population served, etc.). A utility can use the measure internally or to educate stakeholders. It should be noted that the lowest rate is not necessarily best (see Financial Viability).

Example calculations:

- Typical monthly bill for the average household as a percentage of typical monthly bills for similar area utilities.

5. Media/press coverage

Description: This measure captures media portrayal of the utility (newspaper, TV, radio, etc.) in terms of awareness, accuracy, and tone.

Example calculations:

- *Amount of coverage:* Total number of media stories (newspaper, TV, radio, etc.) concerning the utility per year.
- *Media coverage tone (percent):* $100 \times (\text{number of media stories concerning the utility that portray the utility in a positive way} \div \text{total number of media stories concerning the utility})$ per year.
- *Media coverage accuracy (percent):* $100 \times (\text{number of media stories that accurately describe the utility} \div \text{total number of media stories concerning the utility})$ per year.





Effective Utility Management: A Primer for Water and Wastewater Utilities



DAVID K. CLARK

Comprehensive Succession Planning: Preparing the Next Generation for Success

FACED WITH PROJECTED HIGH TURNOVER RESULTING FROM AN APPROACHING RETIREMENT WAVE, THE ENGINEERING SERVICES GROUP OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA HAS DESIGNED A TWO-PART APPROACH TO SUCCESSION PLANNING.

The Metropolitan Water District of Southern California (MWDSC) meets about one-half of the treated and untreated water demands of more than 18 million people living within a 5,200-mi² service area along the California coastal plain. MWDSC was created by the legislature of the State of California in 1928 to construct and operate the Colorado River Aqueduct (CRA) that serves Southern California. MWDSC's system includes five regional water treatment plants, nine reservoirs, 16 hydroelectric plants, 830 mi of large-diameter pipelines and tunnels, and the 242-mi CRA. MWDSC delivers, on average, about 1.7 bgd of water to 26 member agencies within Los Angeles, Orange, San Bernardino, Riverside, Ventura, and San Diego Counties.

MWDSC has approximately 1,750 employees, with about 370 of them working in the Engineering Services Group. This group, which provides a full array of engineering and general technical services and is responsible for executing MWDSC's capital improvement program (CIP), includes registered engineers, designers, environmental specialists, surveyors, construction managers, inspectors, and other technical specialists. A significant number of these individuals were hired during the late 1980s and early 1990s when MWDSC was launching a number of large-scale capital programs to expand the system's treatment and conveyance capacity, provide additional seasonal and emergency water storage, and convert to ozone treatment at each of its water treatment plants.

The significant hiring wave that occurred 20–25 years ago is now leading to an equally significant wave of retirements. In 2012, Engineering Services projected that it would experience 50% turnover of its workforce by 2022 primarily because of these retirements. Working from this projection, Engineering Services refined its workforce development strategies to ensure that the organization would continue to

thrive during this challenging decade of high turnover. Engineering Services' new strategy for succession planning includes two programs: Workforce Development, which focuses on developing existing staff, and Career Launch, which focuses on hiring and training new employees.

WORKFORCE DEVELOPMENT

The first part of Engineering Service's succession planning effort,

the Workforce Development program, focuses on the continued growth of employees who already work for Engineering Services. This effort ensures that existing staff clearly understand organizational goals and will have the necessary skills to perform at high levels. Workforce Development efforts include helping staff members achieve more success in their current roles, preparing them to be of greater service as mentors to the class of new recruits, and developing greater pools of candidates for future management and upper-level technical positions. Engineering Services' workforce development efforts focus on six key areas.

Clarification of expectations.

Employees generally perform better when they fully understand what is expected of them (Fournies 1999). In 2012, Engineering Services revisited its current mission statement and guiding principles and produced an updated, comprehensive version that more clearly communicated organizational goals and provided specific expectations for all staff, including managers. The goal was to take an already thriving organization to the next level by raising the bar of performance with revised goals and expectations. Staff members at all levels are encouraged to demonstrate more leadership, exhibit the utmost professionalism under all circumstances, value and respect the contributions of all others, and accept complete accountability for their work. Managers are asked to convey and reinforce the organizational goals and expectations to staff on a regular basis, including regular staff meetings. Large, colorful posters such as the one shown on this page are displayed throughout Engineering Services offices to summarize the group's mission and guiding principles and to reinforce expectations.

Skill-gap assessments. In this area, managers assess proficiencies for fulfilling essential team functions, evaluate the depth of coverage for each proficiency, and then determine

At the Metropolitan Water District of Southern California, as part of the Engineering Services Group's Workforce Development program, posters such as this are displayed to clarify core values for employees.

potential risks such as retirements, transfers, unexpected departures, shifting workloads, and technological innovations; a sample analysis is shown in Table 1. This exercise helps individual managers create more effective plans to address current and future needs for staff development. This approach also allows Engineering Services to react more quickly to the evolving nature of MWDSC's CIP and to accommodate attrition of highly experienced staff members who possess essential knowledge. The result of the assessment is a team-specific action plan that includes strategies for mentoring and knowledge transfer, objectives for individual staff training plans, and strategies for backfilling upcoming vacancies.

Cross-training. Engineering Services expanded its cross-training opportunities to better prepare a deeper and more diverse pool of candidates to fill future openings in leadership roles. The cross-training opportunities include both short-term rotation assignments, which are typically two to six months, and long-term assignments, which may require up to a three-year commitment.

The short-term rotation program, previously initiated only for entry-level engineers, is no longer restricted to this narrow segment of the workforce and has become more flexible so that it also helps to balance

development and reinforce ties between the two units.

The long-term rotation program offers employees a chance to interact directly with MWDSC's Water System Operations Group (Operations) at one

In 2012, Engineering Services revisited its mission statement and guiding principles and produced an updated, comprehensive version that more clearly communicated organizational goals and provided specific expectations for both staff and managers.



shifting workloads. The short-term rotations involve moving individuals from their "home team" to a team in a different functional unit; this way, staff members gain exposure to a different aspect of the overall engineering process and strengthen relationships between functional units. For example, a design engineer may rotate from a team in the design unit to a team in the project management unit to further his or her professional

of its facilities. These employees typically serve as liaisons between Engineering Services and Operations on large capital projects, provide technical support to help resolve operational issues, plan for future capital work, and execute operations-and-maintenance projects at their assigned facility. Each assignment, which originally had been limited to licensed engineers who would serve a three-year assignment

TABLE 1 Sample skill-gap analysis measuring depth of coverage in key proficiencies

	Team Members						
	A	B	C	D	E	F	
Projected Years Until Retirement	10+	15+	10+	<10	10+	<10	
Duties/Work Description	Skill Level						Team Average
Water distribution modeling	4	4	4	4	3	3	3.7
Water treatment hydraulics	4	4	4	3	3	2	3.3
Open channel flow	4	4	4	4	4	2	3.7
Hydrology studies	4	3	4	2	4	2	3.2
Computational fluid dynamics	2	2	2	1	1	4	2.0
Surge/transient analysis	3	4	2	1	1	1	2.0
Preparing hydraulic plan and profiles	4	4	4	4	4	2	3.7
Dam break inundation mapping (one-dimensional)	3	4	4	2	1	3	2.8
Knowledge of hydraulic software	4	4	4	3	3	3	3.5

Skill level is ranked 1 (low) to 4 (high).

Shaded cells indicate areas to develop or in which consultants should be relied on when workload is high.



In 2013, the Engineering Services Group at Metropolitan Water District of Southern California started a formal mentoring program for staff. In this photograph, program participants attend a mentoring kickoff meeting.

at one of MWDSC's water treatment plants, now allows for nonlicensed engineers or specialists to participate. The long-term assignments also incorporate more flexibility in the length of the assignment and include additional rotations with Operations' conveyance and distribution system.

All of these cross-training opportunities provide an indispensable experience for the participants as they develop a broader view and understanding of the overall organization; acquire new skills; and develop advantageous, lasting relationships. For a number of past participants, the rotations have also served as a launching point for a permanent transfer, a promotion, or even a new career as a manager within Operations. Although the occasional "loss" of individuals from Engineering Services to Operations may present near-term challenges, those challenges are already anticipated through the skills-gap assessment. These transfers also serve the greater good of MWDSC and the individuals, and they help maintain strong relationships across the entire organization.

Mentoring program. Engineering Services launched a formal mentoring program in 2013 that helps existing staff receive targeted feedback. Under this program, participants are matched with a manager or technical specialist outside of their reporting structure to receive one-on-one mentoring. In addition, group activities are organized for all mentors and protégés to supplement the individual sessions. The group activities include an overview presentation in which protégés are provided with advice on how to get the most out of the program (see the photograph above), field trips to two MWDSC facilities, and training activities focused on leadership and career development. This program is building momentum as more managers and staff realize that the benefits of mentoring work both ways (Copeland 2012). As Robert Ingersoll said, "We rise by lifting others." This win-win aspect of mentoring can be communicated within organizations to achieve greater support for and involvement in such programs so that more employees will benefit from them.

Leadership training. To further encourage growth of existing managers and a broader pool of potential future managers, a training program is being provided to all managers and staff members in senior and principal technical classifications. This program, Leading Technical People, focuses on helping individuals recognize and build upon their strengths, as well as encourages participants to recognize the needs of technical people, the importance of building trust, and the rewards of leadership. This contemporary approach better resonates with participants and yields more positive feedback than past approaches have.

Technical brown-bag lunch series.

About once a month, Engineering Services sponsors a technical presentation during the lunch period (see the sample announcement on page 37). These sessions are open to all MWDSC staff; typically cover an MWDSC project, initiative, or issue; and serve to inform staff about other people, functions, or topics of which they may only be tangentially aware otherwise. The program also provides staff members with an opportunity to enhance their communication skills by speaking in a formal setting before a group of 40–100 people.

CAREER LAUNCH

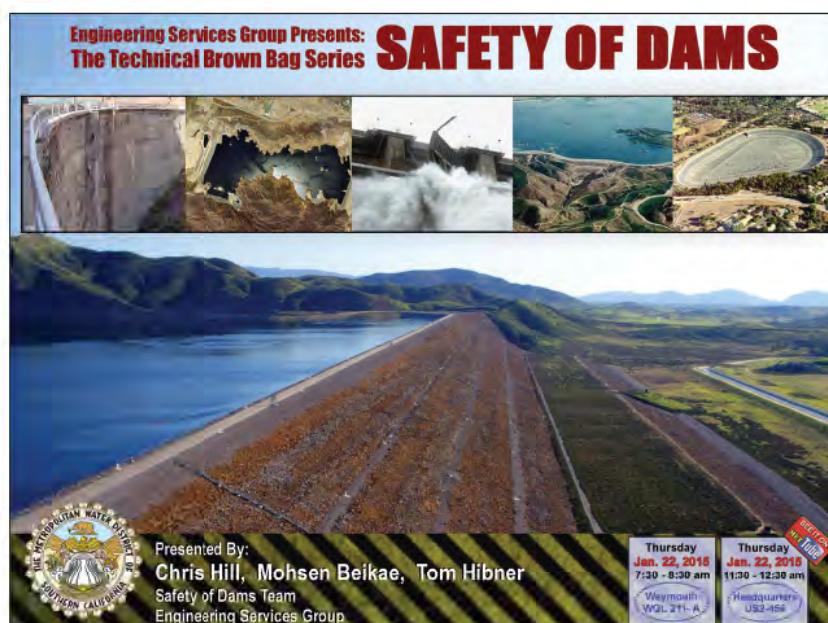
The Career Launch program—the second part of Engineering Services' succession planning efforts—was initiated in late 2012 to enhance the onboarding process in Engineering Services as a wave of new employees came on board. The program was designed to improve all aspects of hiring, orienting, and bringing new employees up to speed. The primary goals were to hire the best candidates possible and then to invest in these individuals to ensure their near- and long-term success. The initial program focused primarily on entry-level engineers, and 12 employees participated in it.

A major component of the program was group training sessions that

provided valuable information and abundant opportunities for new employees to establish connections with their peers and managers. These sessions were aimed at making the participants feel welcome and valued by the organization, letting them know that they had promising careers ahead of them, and reinforcing the message that management cared enough about their success to personally get involved in helping the new employees get off to a good start. All participants were brought together at least twice each month during their first six months (their probationary period) for this purpose.

The training material for this program was structured to help participants understand the big picture of MWDSC and how each employee's role fit into the whole. This material complemented the specific training the participants would receive within their home teams, which normally focused on information necessary to complete their immediate work assignments. The peer interactions were useful for increasing participants' comfort while they adjusted to a new setting and for establishing relationships across the organization that would help them appreciate other team functions and consider working with members of other teams on future assignments. The interaction with managers, within and outside of Engineering Services, helped make managers more approachable, encouraged increased informal communications and mentoring, and empowered staff. In addition to the scheduled meetings with managers, several voluntary lunch sessions were organized that allowed established managers to share career advice with interested participants. These sessions proved to be quite popular, insightful, and inspirational for the participants.

Following the completion of the initial program in 2013, feedback was solicited from the 12 participants to help Engineering Services make the program more effective for future sessions. Participant input was



Metropolitan Water District of Southern California's Engineering Services Group hosts regular technical brown-bag lunches that are open to all staff members. Pictured here is a sample brown-bag-lunch meeting announcement.

constructive and included a number of valuable suggestions, such as to optimize the order of the presentations, avoid presenting too much information in each session, provide more time for questions, and adjust the logistics to enable greater participation by field personnel (most of the initial sessions had been held at the MWDSC headquarters facility).

In late 2014, Career Launch was refined and expanded to include all recently hired Engineering Services

Recruitment process. In the past, Engineering Services hired entry-level engineers intermittently. While convenient, the random timing made it more difficult to have a consistent, structured approach that included optimal outreach to local universities. This process was refined in a number of ways. For example, Engineering Services has moved toward filling approximately five entry-level positions each year, during the winter/spring,

To further encourage growth of existing managers and an enlarged pool of potential future managers, a training program is being provided to all managers and staff members in senior and principal technical classifications.



employees rather than only entry-level engineers. The 2014–2015 session included about 35 participants who were recruited over the previous 20 months. The process improvements associated with Career Launch and the program's major components are discussed next.

to better match universities' schedules for on-campus job fairs. More outreach efforts are being geared toward a wider variety of schools, and Engineering Services' well-established intern program is being used more effectively as a pre-recruitment tool. In addition, a



As part of a "Conveyance and Treatment" training module, new employees at Metropolitan Water District of Southern California visit the F. E. Weymouth Water Treatment Plant. Pictured here, a group of trainees tours the Materials Testing Laboratory.

manager is now assigned to oversee and lead each "group" recruitment process. This promotes consistency and allows hiring managers to be coached in what to look for in candidates who will best serve the organization over the long term. Engineering Services is also placing more emphasis on attitude (Murphy 2012) and communication skills than it has in the past, when selections tended to be heavily weighted toward technical skills.

Team-specific orientation. Engineering Services developed templates to promote a more comprehensive and consistent approach toward orienting new employees within the group's 28 teams. The first template helps managers plan activities during the first several days after a new employee reports to work. These basic activities ensure that employees are made to feel comfortable in their surroundings, that they understand Engineering Services' mission and their role in it, and that they learn key policies and procedures. New employees are also assigned a more experienced "buddy" who can answer questions as they arise.

The second template helps managers plan activities and assignments

during the first six months of employment. Advanced planning of this phase of orientation serves both the manager and employee well. Managers are better prepared to engage and challenge their staff from the beginning, which leads to more satisfied and productive employees who are better equipped to demonstrate their capabilities (Murphy 2010). These plans ensure that managers will communicate overall objectives, values, expectations, and the performance evaluation process; explain team processes and standards; and set specific goals to be accomplished by new employees during the probationary period, including materials to review, training activities to be completed, facilities to be visited, people to whom they will be introduced, and group activities in which they will take part. Managers and employees are encouraged to review and refine this plan together and personalize it in order to maximize its effectiveness.

General orientation and training. The defining component of Career Launch is the general orientation and training. Engineering Services invests a significant amount of time

in supplementing the team-specific orientation with group activities and foundational material to make sure that new employees feel welcome, cared for, and prepared for successful careers. This training is about connecting the dots for new employees, linking their specific function to that of other individuals and to MWDSC's overall mission. On the basis of participant feedback, the 12 original orientation sessions were rearranged and packaged into eight modules for headquarters personnel and five modules for field personnel (for field personnel, modules 1 through 4 were combined into a single session).

Module 1: Program overview. Participants are welcomed to Engineering Services by the chief engineer, provided a synopsis of the program and an overview of Engineering Services functions, and then enrolled in an interactive training session called "Success Signals" (Hilyer 2001). This exercise is used to help participants get to know one another and to increase their understanding of different communication styles so they will have more effective interactions in their work assignments.

Module 2: MWDSC's history. This session provides the background on why and how MWDSC was formed, the challenges faced in constructing the CRA, technological advancements achieved during this project, and the importance of imported water to Southern California. All employees benefit from being connected to the history and purpose of the organization. In the case of water agencies, which provide an essential service to their community, this overriding purpose should be clearly communicated to staff.

Module 3: Conveyance and treatment. This extended module is conducted at MWDSC's F. E. Weymouth Water Treatment Plant located in La Verne, Calif., a facility first placed into operation in 1941 and currently being retrofitted to use ozone as its primary disinfectant. Participants take a tour of the plant,

MWDSC's Water Quality Laboratory, and Engineering Services' Materials Testing Laboratory (see the photograph on page 38). Presentations cover imported water (CRA, the City of Los Angeles Aqueduct, and California's State Water Project), water storage, the water treatment process, and an overview of water quality regulations. The facility tours help employees to become more aware of and appreciate coworkers in other parts of the organization, to quickly multiply the number of contacts new employees establish within the organization, and to grasp the scale of MWDSC's facilities.

Module 4: Water system operations and planning. This module gives employees an understanding of the various components of MWDSC's distribution system and their functions, and helps the participants appreciate all of the efforts necessary to effectively operate and maintain MWDSC's entire water system from the primary sources to the delivery service connections. This includes consideration of agency demands, hydrologic conditions and projections, current and projected water storage levels, water quality issues and water blending goals, energy costs, conveyance costs, and the scheduling of facility outages. This exposure to the challenges faced by Operations helps motivate staff members to do their best to provide high-quality services to Operations, as well as other organizations within MWDSC.

Module 5: Engineering Services overview, part 1. The initial portion of this module focuses on the Engineering Services mission, core values, and roles and responsibilities. The middle portion provides managers in the Program Management Section an opportunity to discuss their personal careers and the responsibilities of their teams. The third and final portion focuses on potential career paths at MWDSC. As part of the third session, participants learn how various managers advanced to their current positions. The stories these



Participants in the Metropolitan Water District of Southern California's (MWDSC's) Career Launch program stand on the east dam of Diamond Valley Lake, MWDSC's largest water reserve. The final training module of the program covers water storage and environmental mitigation.

managers share clearly illustrate the benefits of high performance; the advantages of individuals remaining open to challenging assignments, rotations, and special projects; and the lesson that not all advancements follow traditional paths.

Module 6: Engineering Services overview, part 2. In this module, participants are introduced to each of the managers of the Infrastructure Reliability and Facility Development Sections. These managers discuss their education, careers, and team

Diemer Water Treatment Plant, which was constructed during the 1960s. Participants learn about the ozone disinfection process and tour the recently completed ozone facilities. Presentations also cover Engineering Services' project delivery processes, expectations of public employees, and a training module aimed at helping participants learn how to become more effective at influencing others.

Module 8: Water storage. The final module includes a visit to MWDSC's

The interaction with managers, both within and outside of Engineering Services, helped make managers more approachable, encouraged increased informal communications and mentoring, and empowered staff.



functions, consistent with the Module 5 presentations. The contact with managers in these two sessions is appreciated by the participants, fosters more open communications, and increases collaboration between teams.

Module 7: Ozonation. This module is held at MWDSC's Robert B.

Diamond Valley Lake (DVL) near Hemet, Calif. This 810,000-acre-ft reservoir is MWDSC's largest and was placed into service in 2000 to increase seasonal and emergency water storage. It is located west of the San Andreas Fault to ensure continued water deliveries should a large earthquake on this fault temporarily

interrupt one or more of MWDSC's imported water conveyance systems. Participants benefit from better understanding the importance of surface water storage as a component of water reliability in Southern California. Employees also tour the

MWDSC's workforce and the water industry in general. This shift in demographics has been beneficial, welcomed, and supported, but it has not occurred seamlessly. Achieving and maintaining diversity within technical fields is often challenging

good long-term fit for the organization. As part of the program, for example, managers are provided guidance for handling a situation in which an employee may be underperforming during the probationary period. While decisions regarding these situations are difficult and occur infrequently, they are better handled and less stressful with proper guidance and support.



As part of Career Launch, Engineering Services managers are more careful to use the probationary period to fully evaluate a new employee's performance and attitude to ensure that he or she is a good long-term fit.

DVL reserve lands that were created as mitigation for construction of this reservoir. Touring the reserves helps employees better identify with MWDSC's commitment to fulfill its mission in an environmentally responsible manner (see the photograph on page 39).

Rotation assignments. As discussed earlier under the Workforce Development program for existing employees, most new entry-level engineers are provided with one or two short-term rotation assignments during their first three years of employment (typically between two and six months each). These assignments allow new staff members to better understand the overall organization and to build strong relationships outside their home team. These opportunities are appreciated by staff and occasionally lead to permanent transfers to better align staff with workloads and/or staff interests. The success of the initial implementation of the program led to its expansion to allow existing employees and those in classifications up to journey level to participate.

RELATED EFFORTS

Networking for women professionals. Career Launch also focuses on the fact that an increasing number of women have entered technical fields over the past several decades, leading to greater diversity within

as a result of inadequate training, limited opportunities, and, in some cases, the need to change longstanding corporate culture (Rubin 2014). To achieve greater successes in this area, organizations can take proactive steps to increase training and mentoring opportunities for women, including having established managers support or even lead women's networking groups (Lipman 2014). Engineering Services is addressing these and other issues raised by newly hired professionals, including providing more flexible work schedules and networking opportunities to create a more effective support structure. This informal networking initiated through Career Launch has led to the formation of a core group of professionals that is now developing a permanent structure to provide support to existing and future women professionals within Engineering Services.

Probationary period. Recruiting an employee is an expensive process and, at public agencies such as MWDSC, typically leads to a long-term commitment (the average length of service in Engineering Services is almost 20 years). This makes the probationary period a critical time. As part of Career Launch, Engineering Services managers are more careful to use the probationary period to fully evaluate a new employee's performance and attitude to ensure that he or she is a

CONCLUSION

The two-part approach to succession planning used by MWDSC's Engineering Services Group is a rewarding way for existing managers to give back to the water industry that they have been proud to be a part of. This approach is also proving to be an effective, robust method for preparing the next generation of young professionals for successful and rewarding careers and, ultimately, for ensuring MWDSC's continued long-term success in providing an essential service to a large, vibrant, and densely populated region.

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