

Water Utility Capital Financing

Fourth Edition



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Manual of Water Supply Practices—M29, Fourth Edition

Water Utility Capital Financing

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Preface



The American Water Works Association (AWWA) recognizes that customers' and the general public's interests are best served through well-maintained and efficiently operated water systems that are sufficiently funded to meet a utility's annual operating and capital needs. In support of this position, AWWA has published and regularly updated the M29 manual, now titled *Water Utility Capital Financing*, to assist utility management and stakeholders address the capital financing needs of their water systems. The terminology used in this manual is applicable to the United States and Canada; the manual does not attempt to identify practices and terminologies used in the myriad other countries with public utilities. It is likely that many countries outside the United States and Canada have financial instruments and government-sponsored programs that resemble those that are referenced in this manual. The financial management strategies presented herein are seen by AWWA as universal and thus valuable to all who make use of this document to guide their programs and decisions.

The financial operations of many water utilities are continually challenged by a variety of factors, such as adverse weather conditions, inflation, changes in the economy and/or political environment, growth or decline in service demand due to new construction, conservation programs, changes in environmental regulations, backlog of infrastructure repairs and improvements, staff turnover, and above all, public pressure to keep water rates low. Regardless of such challenges, water utilities remain very capital-intensive businesses. Despite the growing maintenance needs of aging water systems, many water utilities elect to postpone repairs, replacements, and rehabilitation expenditures to keep current operating costs, and corresponding service charges, as low as possible. However, deferring capital expenditures invariably results in higher operating costs in the short run and higher construction costs in the future.

Strategic planning helps utility management develop the steps necessary to reach the utility's short- and long-term goals and objectives. A strategic financial plan helps management meet the utility's operating and capital financing needs during a specified period. Similarly, strategic capital planning, while consistent with and supported by the strategic financial plan, addresses the utility's smaller recurring capital needs as well as its long-term expansion, upgrade, replacement, and reliability needs.

Strategic financial and capital plans also provide a platform for communicating the utility's needs to the public, thereby gaining greater stakeholder confidence in utility management. The plans inform investors of a utility's potential and support rating agencies' debt ratings. Whatever a particular water utility's capital requirements may be, knowledge

of available alternatives for obtaining funding is a key element in developing successful financing plans. Some financing alternatives come into, or are phased out of, current practice with changes in federal tax law and market conditions. Thus, an effective capital financing program should contain a variety of fundamental approaches to financing infrastructure that create a systematic means of addressing the utility's needs over time. One resource that should not be overlooked is the utility's financial advisor, who is often able to propose current financing alternatives that may provide greater benefit to the utility than originally envisioned in a utility's financing plan.

PURPOSE

This manual provides a comprehensive overview of best management financing practices that water utility management should evaluate when determining short- and long-term strategies for meeting capital requirements. Only by thorough analysis of a particular water utility's long-term capital requirements and financial position will utility management be able to determine the feasibility of one or more specific financing concepts.

This manual is not intended to be, nor should it be considered, a complete text on water utility capital-financing concepts. A variety of other sources are available through various industry and professional organizations. Instead, this manual should primarily be considered a guide for determining capital requirements, strategic planning, and financing alternatives. It also provides general information for those utilities considering the issuance of long-term debt. Each of these areas is critical to the capital planning and financing process but must be tailored to and reflect factors applicable to a local situation. No recommendations or opinions about the relevance of alternative forms of available financing have been provided. Determining the relevance of alternative financing options is considered to be the prerogative of utility management.

ORGANIZATION

The material presented in this manual is intended for use by both government-owned and investor-owned water utilities. Because financing alternatives and markets may differ for these two primary types of ownership, financing alternatives for each are discussed in separate places throughout this manual.

This manual covers six general areas:

1. The capital and financial planning process
2. Identification of financing alternatives
3. Evaluation of financing alternatives
4. The process of taking a debt issue to market
5. Participants' roles in the debt issuance process
6. Special considerations for investor-owned utilities

Information presented in this manual has certain limitations. Water utility capital requirements continually change, as do financial sources available to the utility. At any given time, financing alternatives available to a utility depend on:

- Tax laws and Internal Revenue Service rules and regulations
- Interest rates charged for various financing alternatives

- A utility's credit rating
- Decisions by governing bodies, by regulatory agencies, and in some instances, by investors, ratepayers, and/or voters

Appendix A provides a summary of capital project prioritization using asset management principles. Appendix B provides example financial plans based on various capital financing scenarios. Appendix C provides information regarding the general requirements of bond-rating agencies, which is particularly useful as a utility considers the use of long-term debt and begins the process of going to the financial markets. The glossary provides terms commonly used by the financial community and is a continuing step toward establishing uniform definitions.

AWWA advocates that specific financing requirements for any particular water utility be based on sound economic, financial, accounting, and engineering principles. Often the services of consultants and counselors experienced in such matters are required. When such advisors are employed, this document should serve as a resource that the policymakers and utility managers may draw on to guide their evaluations of the validity of any proposed financing alternative.

Several other AWWA manuals and books address financial management topics that may interest the reader are identified throughout the text and in the reference and bibliography sections.

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Chapter **1**

The Capital Financial Planning Process

The demands and expectations of water utility stakeholders (i.e., customers, regulators, and policymakers) create a challenging capital financing environment for water utilities. In addition to demanding consistently safe and reliable drinking water, stakeholders expect water service to be provided efficiently at a reasonable cost, and with an appropriate burden to ratepayers.

This chapter provides an overview of the capital financial planning process. The discussion emphasizes the importance of assessing current and future capital requirements and evaluating the common assumptions used in capital program development. Water utility managers should perform this evaluation as they move from reviewing historical capital programs and assessing past financial performance to taking the specific strategic, financial planning, and budgeting action steps necessary to successfully finance the construction of current and future capital projects.

Developing a comprehensive capital financial plan requires more than life-cycle costing for individual capital projects. The financial impacts on utility operations and customer bills must also be considered. Accordingly, a capital financing plan, including the revenue requirement and rate impacts of alternative capital financing strategies, should be integrated into the utility's overall long-term financial planning process.

STRATEGIC PLANNING—THE FIRST STEP

Strategic planning is a dynamic and continual process providing direction for operations as well as utility infrastructure additions and replacements. The strategic plan should describe when and how resources will be obtained and used as well as define outcomes

and outputs that facilitate performance monitoring. It also serves to guide the development of detailed policies that impact resource allocation and operational decisions.

Long-term strategic planning requires a long-term look at the future operations of a utility and maps a path between a utility's present position and its vision for the future. It assesses current conditions, strengths and weaknesses, identifies underlying causes and effects, and establishes a direction for accomplishing the utility's vision and objectives.

An effective strategic plan communicates management's goals for the future to customers, employees, rating agencies, investors, and the community as a whole. When developed in concert with an asset master plan, it also provides a framework for developing multiyear financial and capital improvement plans that can be implemented via annual budgets and spending plans. Figure 1-1 shows the steps used in developing a strategic plan with each step guided by the previous one.

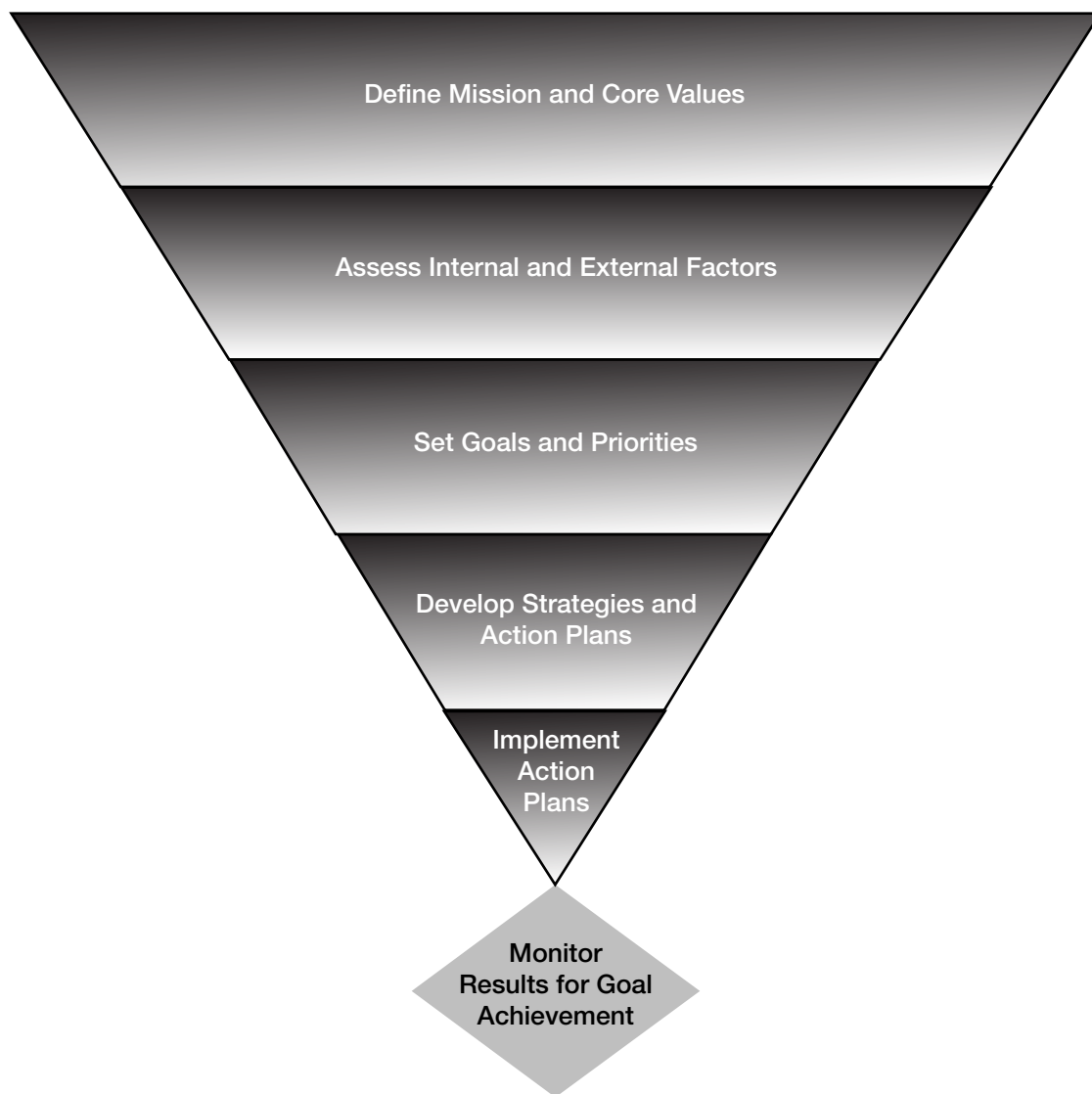


Figure 1-1 Strategic planning steps

Strategic Plan Components

As shown in Figure 1-1, the following components should be developed and/or incorporated into the strategic plan:

- Mission and core values
- Internal and external factors
- Goals and objectives
- Strategies and action plans

The *mission statement* describes a utility's basic reason for existence. This may be stated in legislation, corporate documents, or local ordinance.

Core values define how a utility will conduct its business and interactions with employees, ratepayers, and other stakeholders.

Internal and external factors should be listed and evaluated because of their potential to either help or hinder goal achievement. Internal factors are unique to the utility itself and include, but are not limited to, key staff and organizational structure, utility culture and image, utility plant condition, financial condition and strength, employee experience and turnover, operational efficiency, and technology.

External factors can be divided between those that affect many utilities and those that are unique to each water utility. External factors that affect many utilities include such things as changes in weather patterns and national and state/provincial economic conditions. External factors unique to the water utility include supply source and service area, changes in population and customer demographics, service-area economic conditions, customer water usage, federal and state regulatory mandates, and political climate. Each of these external factors affects long-term demand and the capital investments that will be needed.

Goals and objectives should be aligned with customer and stakeholder expectations, prioritized, and have clearly defined and measurable outcomes and outputs for evaluating success.

Finally, *strategies and action plans* for goal achievement should be developed. These are typically represented by separate multiyear capital improvement and multiyear financial plans based on the utility's asset management program and related infrastructure master plan. Figure 1-2 shows how each of these components are incorporated into developing a financial plan.

EVALUATE INTERNAL FACTORS

While many of the internal factors are important, those dealing with utility management and staff are beyond the scope of this manual. The two internal factors dealing with plant condition and financial condition and strength are factors most closely related to the capital financing process.

Risk Assessment and the Asset Management Program

The magnitude of expenditures that are or will be needed in the future to repair or replace aging water utility infrastructure has been well documented by the American Water Works Association (AWWA). Such expenditures are often a key component of a utility's capital requirements and can pose significant financial and rate affordability challenges. To meet these challenges in the most effective manner, utility managers need to ensure that capital expenditures for which they seek funding have been developed through a formal

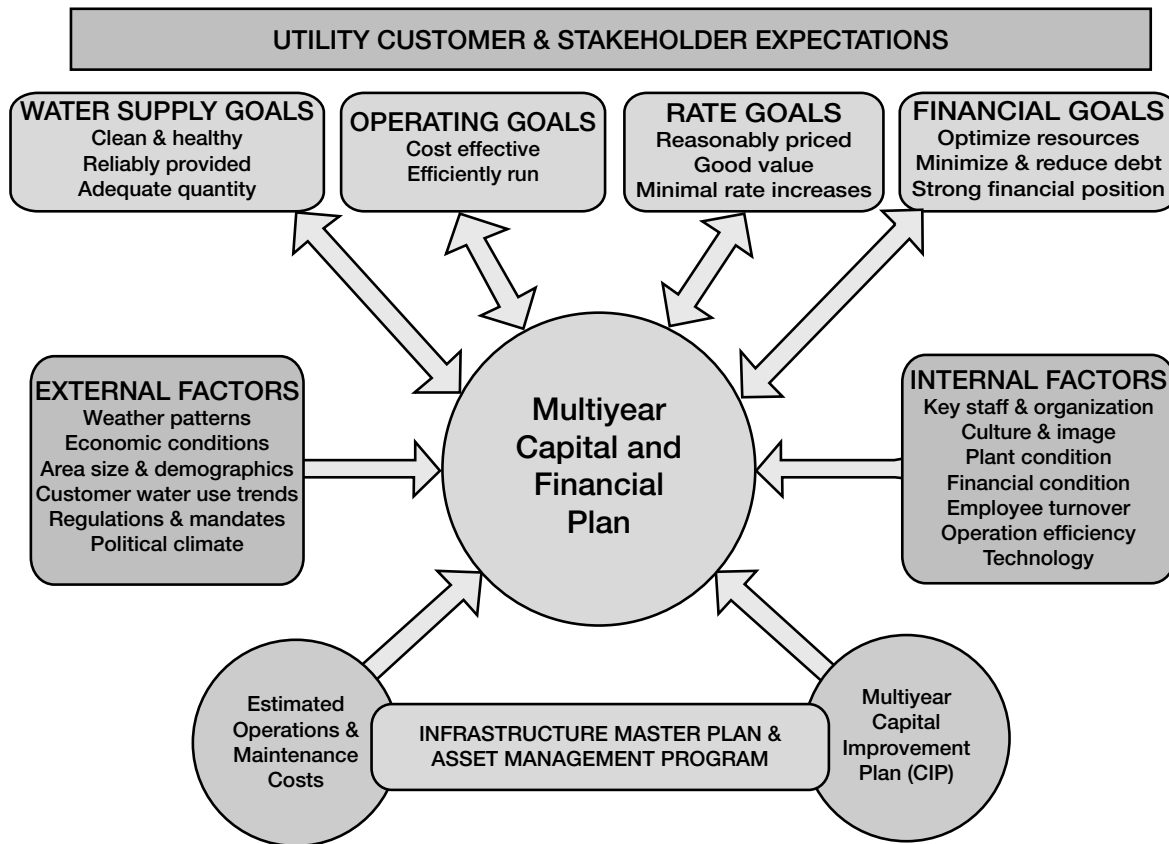


Figure 1-2 Capital and financial plan development

asset management program. A formal asset management program combines inputs from a variety of sources, including financial reports, asset operations and maintenance (O&M) records, geographic information, and risk assessment of utility plant assets.

Utility-plant asset risk assessment combines the likelihood of asset failure with the consequences of failure to the utility. When successfully implemented, asset risk assessment helps the utility develop a prioritized list of capital expenditures that are inputs to the infrastructure master plan and provide support for the multiyear capital improvement plan and the multiyear financial plan. A risk assessment also provides the utility with quantitative explanations to customers and stakeholders for planned expenditures that had previously been justified on a purely qualitative basis or after the occurrence of an actual asset failure.

A common practice in risk assessment is to assign a rating to each asset that combines the likelihood of failure with the consequence to the utility if the asset fails. For example, using a scale of 1 to 5, a 25-year-old pump in poor condition may have a probability of failure within the year of 5, but because it is used for decorative fountains, may only have a consequence of 1. So its combined rating is 5 (5×1). However, if a pump with the same probability of failure refills a major reservoir that serves a large portion of the utility's customers, the consequence of failure to the utility may be 5, producing a combined rating of 25 (5×5). By assigning each major asset a combined rating, a risk profile of water system's assets emerges, providing a way of prioritizing maintenance and/or replacement expenditures.

Table 1-1 is an example of a risk assessment matrix that could be used in asset maintenance/replacement planning. Capital projects that fall within the range of the highest likelihood of failure and the highest consequence of failure should receive the highest priority in terms of funding. Appendix A explains how risk assessment can be developed and used with an asset management program.

Infrastructure Master Plan

An infrastructure master plan may cover 20 or more years and has many benefits. It incorporates the utility's service goals and objectives (and stakeholder expectations). It also includes long- and short-term estimates of water service capacity needs, selection and design of system infrastructure, long-term capital needs for required infrastructure facilities, and when combined with asset risk assessments, the timely replacement and retirement of system assets. A master plan

- incorporates service goals and objectives,
- describes and characterizes the existing system,
- anticipates long-term capital needs, and
- guides prioritization of capital projects.

Utility managers should consider conducting a project-specific economic analysis when developing an infrastructure master plan, as well as a multiyear capital improvement plan. This analysis involves calculating the net present value and life-cycle cost of a capital project. It is often used to determine the most cost-effective project when more than one alternative is under consideration. This technique can be integrated with the asset management and master planning processes as part of a comprehensive approach to capital planning.

EVALUATE EXTERNAL FACTORS

External factors applicable to most utilities should be evaluated for their long-term impacts on the geographical region in which the utility operates. However, their impact on a utility's strategic plan may be much harder to quantify.

External factors unique to each utility will often have a more direct impact on the capital planning and financing process. Some, such as regulatory mandates or political climate, may be less predictable than those that impact future water demand. However, forecasting customer water demand, on both an annual and seasonal peak load basis, is important to determining a utility's future capital requirements.

Table 1-1 Risk assessment matrix

		Consequence of Failure				
		1	2	3	4	5
Likelihood of Failure	1	Very low	Very Low	Low	Low	Medium
	2	Very low	Low	Medium	Medium	High
	3	Low	Medium	Medium	High	Extreme
	4	Low	Medium	High	Extreme	Extreme
	5	Medium	High	Extreme	Extreme	Extreme

Long-Term Water Demand

Components that influence long-term water demand are changes in weather patterns, service territory, population, consumption (per capita, account, or unit), customer demographics, and land-use patterns.

Population forecasts can often be obtained from a variety of federal, state/provincial, or local government agencies. Compare forecasts made by external parties against actual utility experience during the previous 5- to 10-year period for the most accurate picture. Through the thoughtful use of both external and internal data, the utility can develop a long-term forecast of service area population and associated customer account growth suitable for demand forecasting and financial planning purposes.

Changing customer class demographics and changing land-use patterns also can have a large impact on water demand. For example, a shift in the profile of the commercial customer class to—or away from—large commercial and industrial customers to smaller service-oriented industries can greatly influence long-term demand. Changing land-use patterns, such as the movement from large-lot single family residential construction to higher density multi-family housing, can change both the amount and intensity of annual and peak-load water demands.

After completing a forecast of customer growth, water demand forecasts can be developed for each customer class served by the utility. To accomplish this, the utility may elect to undertake a comprehensive analysis of the historical trends in customer demand, on an average consumption-per-account-class basis. Such an analysis can be useful because many utilities throughout North America have experienced steady declines in the average residential consumption, and in some cases, declines in commercial customer consumption. Understanding the reason for these declines and using the most updated assumptions regarding customer consumption will facilitate more accurate long-term demand forecasts as part of the financial planning process.

Demand Forecasting Scenarios

For planning purposes, a utility may want to use regression analysis or Monte Carlo simulations to develop a range of long-term demand forecasting scenarios. Monte Carlo simulations rely on repeated random sampling to obtain a distribution of numerical results. The range is a characterization of probability based outcomes that provides intervals around expected values, allowing the user to select a scenario for planning purposes based on a utility's aversion to risk. A scenario that reflects the utility's most acceptable risk is then selected and used for conducting the remaining planning process.

Demand scenarios can be interchangeable according to the priority of the goals used to develop a utility's strategic plan. For example, if new supply is a high priority because the utility does not have the capacity to serve additional demand, one scenario is a rapid increase in forecasted demand. This scenario may require immediate and costly capital investments to increase supply, treatment, transmission, and distribution infrastructure.

A higher risk-based scenario would be to assume a forecast of lower demand and slower growth, with the lowest demand simulations creating the highest risk of not having sufficient capacity. However, if supply is not a high priority, and the utility has excess capacity, a worst-case scenario would be a declining customer base. An appropriate scenario to plan for is one where risks and predictions are balanced and correspond with the risk tolerance of the organization.

Depending on their intended use, alternative scenarios may be required. For example, demand projections suitable for facility planning may result in higher risk for financial planning purposes. The goal of facility planning is to ensure that service demands can

be met. Hence, demand projections that assume increased population growth (worst case) might be appropriate for facility-planning purposes. However, basing rates and revenue projections on the same growth estimates may understate required future rate revenues and increase financial risk for the utility. The timing of future rate revenues resulting from projected customer usage is a key financial planning element. Frequently, the use of two scenarios—one for facility planning and a second for financial planning—may be appropriate.

The acid test for any scenario is the utility's ability to demonstrate the probability that the chosen scenario will occur. In making the final presentation for budget approval, only the most probable scenario should be chosen for planning purposes. The chosen scenario should produce results that represent the least financial risk to the utility and ratepayers while ensuring that properly sized plant additions will be placed in service before capacity is required to meet increased demand.

Figure 1-3 illustrates the trade-offs between reliability and cost and indicates that utilities strive to strike a balance between the amount of system reliability and the cost of implementing and maintaining a reliable system. Figure 1-4 illustrates two possible cases for the same level of reliability and indicates that reliability could be measured by the frequency of shortages occurring as well as the magnitude and impact of the shortage when it occurs. In any case, the planning process should result in a common agreement by both the utility and its stakeholders and ratepayers as to what are acceptable levels of reliability and cost.

Integrated Resource Planning

One technique used by many utilities to identify the optimal portfolio of new supply side resources and demand management programs is integrated resource planning (IRP). IRP has its roots in a method of planning used by electric and gas utilities in the 1980s when supply was short and the cost of additional supply became a significant factor. IRP brings an important dimension into the strategic planning process for water utilities and opens the door to explicit evaluation of options that may not have been previously considered,

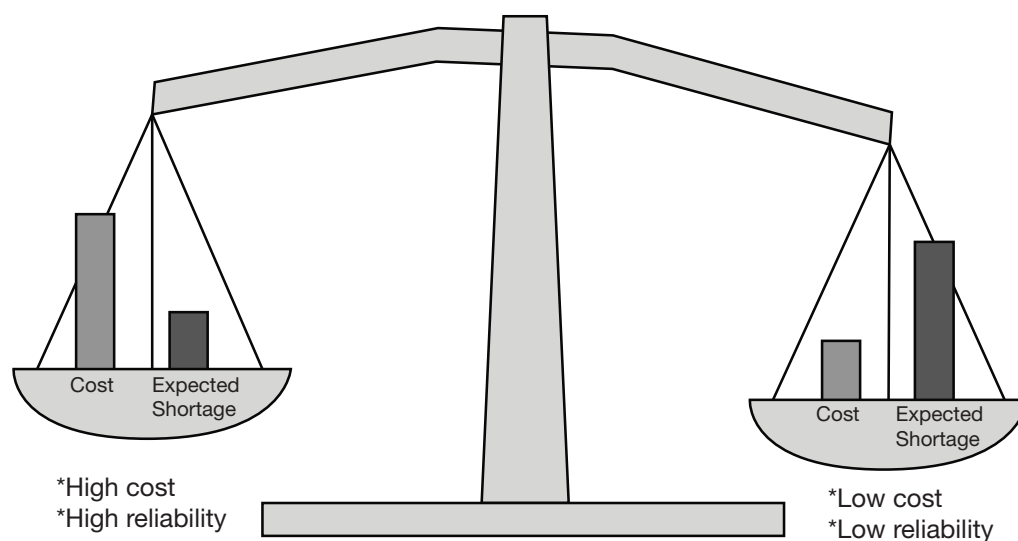


Figure 1-3 Trade-off between reliability and cost

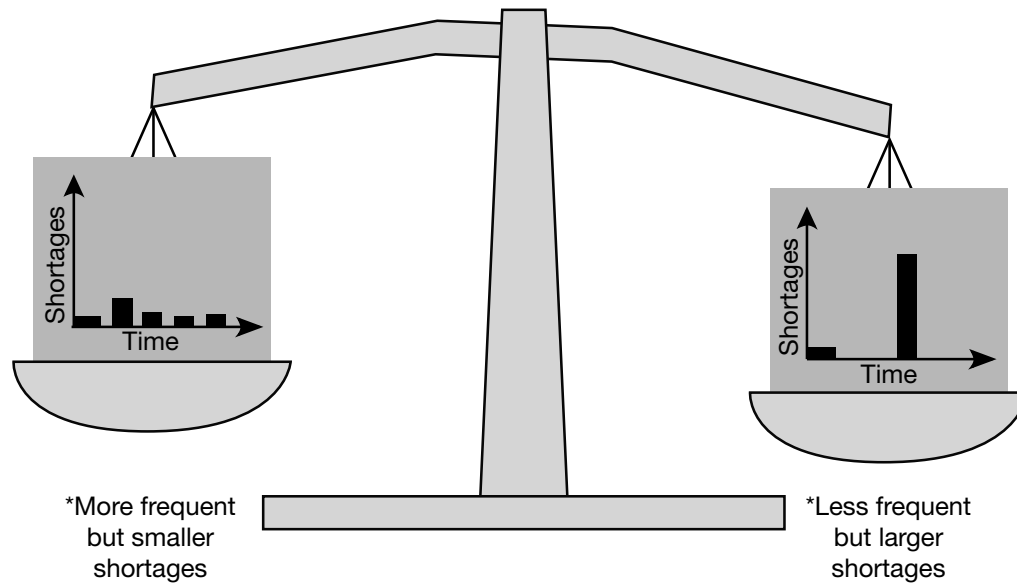


Figure 1-4 Different aspects of reliability

such as wastewater reuse, demand management, conservation, and planned shortages all with expanded stakeholder involvement.

Basically, strategic planning using IRP looks not only at cost and availability of supply but also at a utility's ability to manage demand through conservation and/or public outreach efforts. The process provides information on the consequences of various options and helps management judge the value of trade-offs among resource alternatives. When properly applied, the IRP process leads to sound long-term decisions and lower overall costs. A more detailed explanation of the IRP process can be found in AWWA's Manual of Water Supply Practices [M50](#), *Water Resources Planning*.

Utility Regulation

Another important factor to consider when forecasting utility capital requirements is the effect of current and proposed regulations and the dictates of all regulatory agencies at the federal, state/provincial, and local levels. For investor-owned water utilities, regulatory control is usually exercised by a state or provincial regulatory agency, such as a public utilities commission. The authority given these agencies is generally comprehensive. Government-owned utilities are often controlled and regulated by local governments such as city councils or municipal utility boards. In some states/provinces, government-owned utilities serving customers located outside their municipal boundaries are regulated by state or provincial agencies. Such utilities need to take steps to ensure they are in compliance with these regulatory agencies and verify that allowances in capital and operating budgets have been made to address deficiencies that may become evident as a result of specific regulations. For example, legislation such as the US Safe Drinking Water Act, as amended, and subsequent US Environmental Protection Agency regulations, which affect how all US utilities operate, can cause many utilities to make major modifications to their capital plans.

SET GOALS AND PRIORITIES

After considering all of the relevant issues, goals should be developed that address each of the relevant internal and external factors. In this process, some goals may conflict with others so the impact of each factor must be considered in order to prioritize goals for optimum resource allocation. Lower priority goals that conflict with higher priority goals should receive little or no resources.

Prioritized goals then become part of the utility's multiyear capital and financial plans. These plans should include comprehensive yet concise statements that consider and address each relevant factor.

Targets for specific action steps can be set during the planning phase; however, the results of those actions should be continually measured during the implementation phase by asking the following questions:

- Are we doing what we planned to do?
- Are we achieving the intended results?

The utility should conduct periodic assessments that measure both effectiveness and efficiency in reaching stated goals. A good assessment process answers both of these questions. The Governmental Accounting Standards Board (GASB) also encourages governmental entities to experiment with performance measures and standards reporting and to integrate performance measures into a utility's capital and operating programs.

Both the multiyear capital and financial plans must be fluid and will need to be updated as changes occur or when action steps are not yielding the desired results.

THE MULTIYEAR CAPITAL IMPROVEMENT PLAN

The multiyear capital improvement plan (CIP) is typically a 5- to 10-year forecast of infrastructure facility plans with estimated capital spending. Utilities may use longer planning periods; for example, from the subsequent fiscal year to service area build-out; however, the longer the planning window, the less reliable the estimates tend to be.

The multiyear CIP should reflect management's near-term goals and priorities and risk assessments that often include major as well as routine capital projects. Major capital projects include proposed additions and improvements that involve relatively large expenditures and are nonrecurring in nature. Routine capital projects include proposed additions, replacements, and improvements involving relatively small expenditures that may occur annually.

Developing the Multiyear CIP

The process of developing a multiyear CIP should integrate risk assessments and other aspects of planning. Include both the priorities for existing and new facilities and the impacts on operating and capital costs and associated rate revenues. The effect of the CIP on personnel and material resources serves as the basis for planning the operational and construction activities the utility will perform. Remaining activities may have to be outsourced. Through this comprehensive evaluation process, the plan provides an instrument for control over capital expenditures. The multiyear CIP should be reviewed and revised annually. As the current year drops off, plans for the next several years are reviewed and modified and the CIP extended for at least one additional year.

CIP Implementation

One of the most common indicators of strategic planning success is a utility's ability to implement its adopted CIP. A utility develops a schedule for completion of CIP projects based on goals, internal and external factors, and the infrastructure master plan. The schedule becomes a fundamental part of the utility's CIP. Table 1-2 shows a sample CIP schedule of project priorities resulting from a utility's capital planning process. An adopted CIP has a schedule and budgeted cost based on estimates, as described in later sections of this chapter. The CIP provides basic guidance for determining when each project will be implemented and how much of the utility's resources can be allocated toward completion of projects at any given time. Success in implementing the CIP is measured by comparing budgeted capital projects to actual work completed and actual costs incurred to complete work during the budget period.

Ideally, the CIP is completed as scheduled, demonstrating the utility's ability to achieve its stated goals. However, there are numerous reasons why a CIP schedule might not be met. The causes should be identified and evaluated. If schedule slippage is within management's control, action should be taken to correct identified problems during the planning process or as detailed action plans are completed. However, slippage may also occur because of changes in one or more factors or because the assumptions used to develop the strategic plan have changed. Regardless of the reason for falling behind, the utility needs to adjust its multiyear CIP and financial plan to reflect current implementation capabilities and changes in its allocation of resources.

Table 1-2 Sample CIP schedule

Project Name	Risk Score*	Estimated Cost (\$ millions)				
		FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Treatment facilities improvements	25	40.00	19.00	3.00		
Terminal reservoirs	25	78.05	65.50	18.25	12.00	20.50
Wellfield reliability enhancements	20	0.04	0.13	1.96		
Transmission mains	12	0.35		1.00	9.00	5.00
Distribution mains	12	6.60	6.60	6.60	6.60	6.60
Pump station improvements	12	5.00	3.15	0.20	1.00	2.00
ESA compliance—capital outlay	10	15.40	1.20	1.00	9.00	2.00
Interstate facilities rehabilitation	10	10.00	10.00	20.00	1.00	
Willamette River pipe crossing	10			2.60	5.00	20.00
Tank improvements	9	4.00	0.50	0.50	0.50	1.00
Conduit repair and rehabilitation	9			0.50	1.00	1.00
Services	8	3.50	3.50	3.20	3.50	3.50
Utility line relocates	8	2.00	0.10	0.10	0.10	0.10
Distribution mains	6				2.50	2.50
Hydrant replacement	6	0.50	0.80	0.80	0.80	0.80
Meter purchases	6	1.59	1.59	1.59	1.59	1.59
SCADA improvements	5	0.28	0.28	0.28	0.28	0.28
Wholesale connections	5		0.025	0.30	0.80	0.10
Conduits transmission	4				5.0	5.0
Equipment purchases	4	3.41	3.41	3.41	3.41	3.41
Fountain maintenance	3	0.15	0.15	0.15	0.15	0.15
Capital planning studies	3	1.10	1.10	1.10	1.10	1.10
Totals	172.27	117.035	66.84	66.54	64.33	76.63

* The risk score is the combination of score for the likelihood of failure with score for the consequence of failure. Projects with high probability of failure and high consequence of failure receive the highest risk score and should be highest in priority for funding.

THE MULTIYEAR FINANCIAL PLAN

The multiyear CIP guides the utility in carrying out the strategies included in its infrastructure master plan by providing a “road map” for capital improvements. Examples of multiyear capital financing scenarios are presented in appendix B. To implement this road map, the utility should follow these steps to develop a multiyear financial plan:

1. Assess current financial condition.
2. Estimate planning period’s capital and operating costs.
3. Identify capital financing alternatives.
4. Calculate the amount of revenue needed to cover costs.
5. Assess rate and service impacts on customers.
6. Revise capital program and operating costs to stay within financial capability.

This financial plan should also describe the sources of funds to initially construct facilities and then to operate and maintain them after construction is complete.

Assess Current Financial Position

The first step in developing a multiyear financial plan is to assess the utility’s current financial position. This step will identify available financial resources that may be used to finance the capital program, such as existing unrestricted cash reserves, debt authorizations, developer charges, and future revenues, and identify existing burdens on the utility, including annual debt service.

To assess current financial position, a utility must have accurate, detailed, and timely data. Well-managed utilities maintain good financial information systems. Such a system begins with a detailed accounting system that tracks assets, liabilities, revenues, and expenses over time and summarizes the results so that the current status of the utility can be evaluated and changes can be made in the future. Consult AWWA’s handbook *Financial Management for Water Utilities* for more in-depth discussions on financial accounting, reporting, and analysis, as well as a detailed explanation about what is considered a capital expenditure.

By using information contained in standard financial reports, a utility can determine financial position and calculate key financial indicators that assess its ability to support additional debt for capital improvements. Financial rating firms such as Fitch Ratings (www.fitchratings.com), Standard & Poor’s (www.standardandpoors.com), Moody’s (www.moody.com) and DBRS (www.dbrs.com) all provide indicators and industry statistics that can be used for such analysis (rating agencies are discussed in chapter 4).

In addition to financial information, a utility needs information on system use and customer accounting, billing, and collections. Comparing annual water bills per household to median household income may indicate whether or not customers can reasonably afford and support higher rates for a new or expanding capital program.

To determine a community’s ability to fund a capital program, financial analysts and rating agencies routinely measure financial performance. They rely on a compilation of financial, debt, socioeconomic, and management indicators, comparing them to regional and national averages to assess a community’s ability to repay debt. By accurately determining its current financial position, a utility is better able to assess the impacts of a proposed CIP on stakeholders and customers.

Forecast Revenues and Costs

Financial planning requires projections of utility revenues and costs over the financial planning period and possibly for a longer period in the case of an infrastructure master plan. Although projections for periods longer than five years become increasingly speculative, they provide insight into long-term impacts of current business decisions. Economic and regulatory conditions affecting future service requirements are uncertain, but long-term capital planning requires that the effects of these factors on revenues and costs be included for the specified planning period.

Cost projections show proposed changes in

- capital spending as a result of risk assessments and/or anticipated changes in service requirements;
- reserve policies and/or debt coverage requirements;
- employee benefits and pensions, inflation, or operating trends; and
- revenue based on the number of customers served or anticipated rate adjustments.

Generally, cost projections are based on historical trends adjusted for any known changes in future conditions. Several sources can be consulted for price increases and related cost trends, such as the US Congressional Budget Office, the US Department of Labor's Bureau of Labor Statistics Consumer Price Index, (which includes data on water, sewer, and trash collection services combined), and the Producer Price Index. Construction cost indices (e.g., the Handy-Whitman Index of Public Utility Construction Costs, the *Engineering News-Record* Construction Cost Index) and municipal bond interest rates may also be used to project current and anticipated new costs into the future.

Projections over the planning period generally start with the annual budget. Projections of revenues, O&M costs, and capital expenditure are extrapolated over the planning period and adjusted for inflation, changes in service levels, and other anticipated changes in conditions. Specific project-related O&M expenses should also be included (e.g., additional operating personnel to staff a planned new water treatment plant).

An asset management program will allow the utility to track original cost, age, and accumulated depreciation of capital assets by function. Maintenance frequencies and costs also assist in risk assessment and in deciding whether to repair or replace capital assets. Note: A thorough financial analysis should prevent the unfortunate situation of a utility being unable to fund its CIP or worse, implementing a CIP only to discover later that the resources to repay construction-related debt, or to properly operate and maintain the assets after they are built, are not available.

After determining its capital requirements, a utility should identify the financing alternative that best suits its needs and resources. This process is discussed more fully in chapter 2.

Who Should Pay for Plant Additions?

A utility has an obligation to serve all customers, both existing and new. However, the capital cost of providing service to new customers can be significantly higher than the cost of serving existing customers. The utility should develop a policy that addresses cost recovery for growth-related additions to capacity (i.e., a determination of who pays for the cost of growth) for use in developing multiyear CIP and financial plans.

The answer to the question of who pays is not as clear as would first appear. Not all additions to capacity benefit only new customers. Some plant additions may also improve the quality of service to existing customers. Service objectives for existing and new

customers are in many cases the same (water quality and safety, as well as service reliability, for example). However, current customers seek to minimize the impact of growth on general service charges, while new customers would like to minimize front-end costs to connect to the water system.

To the extent that capital additions satisfy similar objectives for both new and existing customers, the question of who pays becomes uncertain. However, capital costs that clearly benefit only new customers can be funded by those new customers directly through project-specific impact fees or system development charges. Capital costs can also be recovered from new customers connecting to the system through a reimbursement impact fee, which is a fee paid after the construction of the facilities. In some cases, utilities assess both types of charges depending on state/provincial law and the nature of the capital costs incurred. For a more in-depth discussion, refer to [AWWA Manual M1](#), *Principles of Water Rates, Fees, and Charges*.

Calculate Revenue Needed to Cover Costs

Once financing alternatives are selected, the resulting cash flows, as well as related operating expenses, must be integrated into the multiyear financial plan and finally, into annual operating and capital budgets. Revenues by source are typically identified in both the multiyear financial plan and annual budget. These sources may include user charges, tax revenues, impact fees or system development charges, connection fees, and bond proceeds.

[AWWA Manual M1](#) strongly supports the Association's policy statement regarding financing and rates, which stresses that the public is best served by enterprises that are adequately financed through rates based on sound engineering and economic principles and that do not require subsidies from other entities.

Assess Rate and Service Impacts on Customers

If additional revenues or spending reductions are needed to meet the utility's strategic service goals and objectives, they should be identified early in the process. The utility will need to determine whether the proposed level of spending will impose an undue financial burden on system users. If rate increases associated with a particular alternative are perceived to be too large, the planning process will need to be refined to either reduce project costs, adjust project schedules, identify alternative long-term financing, or find different sources of revenue.

Sensitivity to rate impacts often comes to the forefront in the development of optimal financial plans. Table 1-3 is a sample list of questions that should be considered during the financial planning process and the development of an optimum capital financing plan.

A key factor in obtaining the rate increases necessary to adequately fund a capital program is how much effort the utility puts into educating key stakeholders on the true value of water. Utilities must reset the common (mis)understanding of the value of water so that it gets the attention—and money—it deserves. This will take a two-pronged approach. Phase 1 is to win over decision makers using a rigorous asset management program. However, elected officials may be more motivated by votes than by what is “right” and raising water rates may not be as politically expedient. That's where the utility should also implement Phase 2—win over the public via community outreach. If the public truly understands and appreciates the value of water and, by extension, the role of the water utility, they are more likely to support the investment required to adequately fund the repair, expansion, and upkeep of vital water systems. Once the public is won over, governing bodies can grant approval on water rate increases with less fear of political fallout. Community outreach should be conducted in concert with asset management as a lead-up to funding proposals.

Table 1-3 Financial planning checklist

Yes	No	Assess Financial Condition
		Does the current financial condition meet or exceed industry standards?
		Do key financial ratios indicate the utility can support additional debt?
		Does the current credit rating allow access to the market at a reasonable cost?
		Can outstanding debt be defeased (refinanced) to save interest costs?
		Does the utility have excess bonding capacity?
		Are reserves adequate to smooth rate increases and meet debt coverage?
Yes	No	Estimate Capital and Operating Costs
		Is billed consumption trending upward or downward in all customer classes?
		Are there unintended negative impacts on the local economy?
		Are annual water bills growing faster than median household income?
		Has the public expressed concern over its ability to pay?
		Are operating costs growing faster than inflation?
		Does the utility have acceptable staff levels and expertise?
		Are employee benefits and pensions adequately funded?
Yes	No	Identify Capital Financing Alternatives
		Are other revenues available to fund capital and/or operating costs?
		Has the issue of “who pays for new capacity?” been resolved?
		Have alternative financing sources been identified and evaluated?
		Are capital cost estimates and implementation schedules reasonable?
		Have the utility’s needs been fully and continually explained to customers?
		Have customers accepted the capital program and related rate increases?
		Have capital improvement costs and/or schedules been adjusted?

For more information about raising the public’s and elected officials’ awareness of the cost of providing water services, see the AWWA handbook *Communicating Water’s Value: Talking Points, Tips & Strategies*, by Melanie Goetz.

Revise CIP to Stay Within Financial Capability

As previously discussed, evaluations of the financial impact of estimated future conditions should be based on multiyear analyses. The long-term impacts of bonding capacity, rate levels, and affordability for individual customers should also be considered when planning major projects. Infrastructure risk assessment needs to be considered because significant risk may exist even when planning for only one or two years. When extending capital planning over a longer period, it is imperative to minimize the possibility of making poor decisions that will have adverse consequences long-term.

Several measures may be used to evaluate financing alternatives, such as return on capital, internal rate of return, net present value, and life-cycle cost. Chapter 3 goes into this topic in more detail.

THE ANNUAL CAPITAL BUDGET

An annual capital budget is used to implement the CIP. An annual budget presents a picture of the course the utility is taking over the next fiscal year. It identifies what operating and capital expenditures will be incurred, including routine annual capital improvements and capital cost recovery components during the first year of the multiyear CIP.

For the CIP to be useful as a planning and control document, total anticipated capital expenditures should be supported by individual project budgets. Normally, project budgets specify a project number, brief project description, purpose and necessity for the project, the project's priority, the scheduled starting and estimated completion dates, a detailed cost estimate, an estimate of incremental operating revenues and expenses associated with the project, and, if applicable, the estimated return on investment. Although it may be difficult at times to trace the actual source of funds for individual projects, it is usually desirable to identify the intended financing source(s). This helps identify special financing opportunities, which may reduce the utility's total funding requirement.

Additional guidance on developing an annual capital budget can be found in AWWA's *Financial Management for Water Utilities*.

BUSINESS RISKS TO THE CAPITAL FINANCING PROCESS

Water utilities face significant requirements to comply with increasing regulations, replace aging infrastructure, fund employee health benefits and pension obligations, and meet growth-related increases in demand. Risks associated with meeting these requirements need to be managed to reduce the variance between anticipated outcomes and actual results.

A broad definition of risk is the possibility of something unexpected occurring and may result in a positive or negative outcome. However, the following discussion will deal primarily with the risk of negative outcomes that management should be aware of. Accordingly, risk may be further defined as:

- The possibility of suffering harm (a danger)
- A factor, thing, element, or course involving uncertain danger (a hazard)
- The possibility or an unacceptable probability of loss or harm

Risks associated with asset management were discussed previously; however, to achieve capital spending objectives, management will also need to consider other business risks to the utility. Business risks may be defined as “the threat that an event or action will adversely affect an organization's ability to achieve its business objectives and execute its strategies successfully.” Business risks are more general in nature and come primarily from external factors that utilities face such as financial, political, stakeholder, environmental, security, and regulatory risks. Failure to consider these more general risks could result in adverse impacts on customers and/or be detrimental to the utility's mission and goals. Business risks facing water utilities include the following:

- Regulatory mandates
- Construction
- System size and customer base
- Local economy and customer base
- Governance and management quality
- Strategic focus
- System source water and capacity
- Asset maintenance
- Regulatory compliance
- Rates, rate structure, and rate-making flexibility
- Liquidity

Dealing with business risk requires answers to three questions:

1. What major risks will the utility face?
2. To what extent will the utility be impacted positively or negatively with each identified risk?
3. What is the probability that gain or loss will occur with an identified risk?

Risk measurement plays a central part in answering questions 2 and 3 because only after uncertainty is quantified (i.e., when a probability is assigned to an uncertainty) can risk discussions become useful. Utilities may want to combine traditional risk analysis with other innovative methods such as Monte Carlo, Consequence or Probability modeling; Failure Mode Effect, What If, Fault Tree, or Event Tree analysis; and others to calculate the degree of risk.

Regulatory mandates. Can the water system meet current and future regulatory mandates? Regulation is frequently the driving factor for capital improvements. The primary tool for addressing this risk is a long-range infrastructure master plan that identifies necessary capital improvements to meet current national mandates and water quality requirements as well as future goals that are more stringent than current regulatory standards.

Construction risk. Can the project be constructed on time and on budget with full capabilities? For success, the key tools are using proven designs, realistic schedules, managed startup risks, and reasonable cost estimates. Risk can also be reduced when new construction and infrastructure replacement are coordinated with other public improvements, such as road and sewer construction.

System size and customer base risk. Can the system and customer base support planned capital improvements while also fully funding O&M? A water utility is limited in its opportunity to change the customer base. However, system size risk can be reduced by ensuring that improvements to support growth do not burden existing customers; seeking the benefits of a larger utility by partnering with other utilities; making process improvements that reduce O&M costs and free up revenues to fund necessary capital improvements; extending capital improvements over several years to minimize rate impacts; and ensuring that any additional systems acquired by purchase or merger do not burden existing customers, but pay for themselves.

Local economy and customer base risk. Can the water system meet the changing needs of the local economy and population? Limited options are available to a water utility regarding the composition of its customer base. This risk can be reduced by ensuring that business development initiatives are cost-based and provide, where possible, diversity in the customer base to reduce dependency on any one sector of the local economy or customer class.

Governance and management quality risk. Are management practices institutionalized, recognized by political leaders, and able to withstand key personnel changes? Of all of the risk factors identified, this has the most opportunity for management influence as well as greater risk from inattention. As the workforce ages and retires, utilities will experience more frequent turnover in key management and staff. As this occurs, can a utility continue to develop long-term strategic and operational plans, participate in the AWWA Utility Benchmarking Program, involve customer feedback in key decisions, ensure professional certifications for staff, and withstand routine audits of financial results? Well-documented transition plans and staffing overlap are two ways to reduce this risk.

Strategic focus. Does the water system adequately anticipate asset maintenance, upgrades, and expansion? This requires assessment of the condition of the water system,

clearly identifying system performance objectives, with strategies and funding to accomplish the objectives.

System source water and capacity. Are there possible threats to the water source from extreme weather patterns, fires, earthquakes, volcanic activity, aquifer contamination, or other jurisdictional encroachments? Will the water system be able to meet current and future maximum-day and maximum-hour demands? While natural disasters and threats to source water are difficult to plan for, mitigating alternatives will still need to be considered. Long-range facility plans that identify these mitigating alternatives and the related capital requirements are essential for system construction, as well as financial and rate planning. Consistent measurement and monitoring of demand patterns for hydraulic modeling and system planning can also support cost-of-service ratemaking.

Asset maintenance. Is the water system maintained to operate in perpetuity? This may be the single largest risk issue facing older water systems. Water systems were designed and built to a wide spectrum of useful lives using existing materials and design standards. The objective is to provide the continuous investment necessary to operate the system in perpetuity. This requires an inventory of aboveground and buried infrastructure, including condition and performance history. Preventive maintenance programs can keep assets operating successfully over their design life, but infrastructure rehabilitation and replacement will also be needed to ensure continued service into the future. Implicit in this is a determination that there should be no long-term deferred maintenance.

Regulatory compliance. What is the regulatory compliance record of the water utility? What is the impact of funding employee health care and pensions on utility operations? A time-consuming but valuable task is to compile an inventory of regulations affecting your utility and assign responsibility for compliance know-how to at least one specific individual for each. In addition, it is critical to rapidly and accurately respond to each occasion of a notice-of-violation.

Rates, rate structures, and rate-making flexibility. Do rates and charges reflect all financial commitments of the water system? The primary tools for managing this risk are regular cost-of-service rate studies based on best practices, long-term financial planning that includes all financial requirements, and full-cost pricing with no interclass rate subsidies.

Liquidity. Are revenues adequate to cover debt service and both recurring and one-time charges? This risk can be managed through financial modeling to forecast cash balances, complying with minimum debt-service coverage and investment requirements, timing of investment maturities to meet capital requirements, and insurance programs that provide a full range of liability coverage.

Managing and reducing risk. In addition to these practices, water utilities can incorporate a combination of preventive controls to keep risk events from occurring, detective controls that alert management to problems and irregularities that have already occurred, and corrective actions for those errors that are detected. Additional guidance can be found in chapter 20 of AWWA's *Financial Management for Utilities* and the 2013 *Internal Control—Integrated Framework*, by the Committee of Sponsoring Organizations of the Treadway Commission.

In a changing and unpredictable world, risk management provides a strategically based, comprehensive framework for identifying risks, avoiding pitfalls, and seizing opportunities to grow stakeholder value. How utilities perceive the probability of something occurring may determine how they deal with the event should it occur. When equipped with an awareness of potential events, management can foresee the likely effects of these events on future performance. By developing a better understanding of risks in relation to the strategies pursued, resources can also be used more effectively, and confidence in the utility's ability to perform as expected is increased.

Risk management also enables a utility to communicate more effectively with the investment community about the risks taken and the potential variations in the utility's performance, thereby reducing uncertainty and lowering the cost of capital. Utilities that understand risk and manage it strategically have the best chance of striking the optimum balance between risk and reward. Doing so is fundamental to creating value.

SUMMARY

This chapter describes the overall process of capital financial planning and sets the framework for more in-depth discussions of each of the steps presented in subsequent chapters of this manual.

Capital financial planning is a highly integrated and iterative process that begins with a strategic plan. Developing a strategic plan requires an evaluation of internal and external factors and the setting of prioritized and measurable goals. One important internal factor is the condition of utility plant assets and related risk to the utility of their failure. This leads to integration with a risk-based asset management program and an infrastructure master plan. Two very important external factors are future water supply and demand and new regulations. Goals should be prioritized and provide answers to the questions: "Are we doing what was planned?" and "Are we achieving the intended results?"

This leads to the development of multiyear capital improvement and related multiyear financial plans. The multiyear CIP shows how the utility will achieve its infrastructure master plan and asset management goals over the next three to five years. The multiyear financial plan shows how the utility will finance continued operations as well as planned capital expenditures over the next three to five years. Both of these plans work together to provide a road map of the utility's intended capital expenditures and related financing sources—including impacts on customers and stakeholders. After adjusting for the impacts of business risks, these plans are implemented through the utility's annual budget process.

Chapter 2 goes into more detail on identifying various financing alternatives and chapter 3 discusses factors to consider when evaluating each alternative.

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Chapter **2**

Identifying Financing Alternatives

Each time a utility's financial plan is updated, utility management should review its financing alternatives for capital projects. Management's goal should be to identify the alternative or combination of alternatives that provides the utility with funds needed to support the necessary capital program at the most acceptable cost recovery. The question to answer is: How can capital improvements be paid for without causing rate shock to the utility's customers?

This chapter examines various types of capital funding and financing alternatives available to water utilities in the United States. Capital improvement financing alternatives typically include internal sources, such as cash from operating revenues or accumulated reserves investment, as well as external sources, such as debt, grants, and leases, or a combination thereof. Privatizing and outsourcing of some operations may also be acceptable substitutes for some types of capital investment. After specific financing alternatives have been identified, the utility should explicitly evaluate the advantages and disadvantages of each source of funds. This evaluation process is discussed in more detail in chapter 3. Because financial markets continually change, this list of alternatives is not meant to be all-inclusive.

INTERNAL FUNDING

In the United States, many utilities pay for some system improvements with internal funding. Because of the implications to rate stability, this "pay-as-you-go" funding is often used to pay for smaller or short-term capital projects, or to reduce new debt interest expense related to large capital projects by partially funding construction costs from revenue. Internal sources of cash can include dedicated tax revenue, water rate revenue, impact

fees, system development charges (SDCs), and contributions from developers and customers. More extensive information on SDCs can be found in [AWWA Manual M1, *Principles of Water Rates, Fees, and Charges*](#).

To maximize the portion of operating revenues available for capital financing, utilities often look at one or more of the following:

- Cost reductions and cost avoidance
 - Process improvements
 - Energy cost savings
 - Outsourcing activities
 - Value engineering reviews of capital projects
- Revenue enhancements
- Depreciation
- Inter-enterprise or municipal agency loans

Cost Reductions and Cost Avoidance

Reviewing current business and operational practices can uncover ways to reduce the cost of those practices or ways of avoiding expenses altogether by increasing efficiencies.

Process improvements. An operational review to maximize the efficiency of an organization can often free up operating funds to be used for capital improvements. Process improvement involves identifying key business processes associated with operations and evaluating the effectiveness of each process. Once each process has been reviewed, operations can often be streamlined by eliminating wasteful practices, introducing standard practices, providing better training, or increasing use of automation. Such process improvements could reduce utility costs by decreasing nonrevenue water or enhancing and improving proactive maintenance programs. Opportunities for savings, such as through competitive bidding or the use of fixed-cost annual contracts, are often found as a result of this business process review. The adoption of a formal asset management system can also reduce capital expenditures over time by focusing on maintenance, repair, and replacement activities and their associated budgets to produce the lowest life-cycle costs for major assets.

A high number of approvals required in the course of a process often indicates inefficient business processes and that an operations review is needed. Additional approvals may have been incorporated into a process that did not consistently produce the desired results to catch costly errors. As processes evolve, inefficiencies such as duplicate tasks, incremental work steps, or outdated methods often become ingrained, adding time to the processes. This additional time usually results in increased labor or duplicated costs. By eliminating unnecessary steps and improving the remaining steps, a utility can improve the process itself, thereby spending less money on materials, equipment, and labor for associated activities. Such savings will release funds that can be used to pay for capital improvements. Process improvement effectively reduces costs by evaluating these tasks that may have become burdened by inefficiencies over time.

Energy cost savings. Energy to operate treatment and distribution-system pumping facilities represents a significant operating expense for water and wastewater utilities. Water utilities are typically among the largest customers of a local energy provider. Rate structures employed by electric utilities often include substantial demand charges for high

energy use during peak usage periods. A demand charge poses a problem for utilities because customer demands for water service and electric service often coincide. Such demands lead to the very result that the utility wants to avoid: high electric usage during peak periods.

Solutions for high electric demand charges include better management of system operations through the use of supervisory control and data acquisition (SCADA) systems, written policies, and operator training. Petroleum or propane gas-driven pumps can be installed and used during peak electric use periods to reduce demand charges or to prevent the utility from being placed in a higher rate bracket. Distribution system storage tanks can be filled during off-peak hours so that additional pumps do not have to be turned on during peak hours to address this need. As energy costs climb, the implicit ratios and trade-offs inherent in the design of capital facilities need to be examined and perhaps updated.

Electric and gas companies generally employ multiple rate structures. In most cases, a utility could potentially meet the criteria for several structures. By becoming familiar with the structures and negotiating for the most advantageous one, a water utility can realize significant savings.

In addition, some energy utilities have different rate incentives for different types of fuel. The water utility should account for these rate differentials when analyzing what types of pumps to use. Converting from one fuel source to another may be economical because the energy utility may be offering incentives that cover some or all of the conversion costs.

Recent developments and technological advancements in the field of Smart Energy may offer benefits to a water utility. Smart Energy refers to technologies that support the ability to send remote pricing signals and varying tiered-rate structures to customers. Automated metering infrastructure allows two-way communication between the user and the provider that can support moving energy usage from peak usage periods to non-peak periods.

With the deregulation of electric and gas rates, it may be advantageous for a water utility to examine the feasibility of joining a purchasing consortium or pool, to negotiate long-term power or gas rates as part of a larger group of energy consumers.

Outsourcing activities. Water utility operations include a wide variety of activities. While many of these activities may be performed more cost effectively by the utility, some activities may be more efficiently and effectively performed by others. Such activities should be considered for outsourcing. An example would be when significant capital outlays are required for equipment that is only seldom needed. Private businesses may be able to buy this equipment and contract with several entities to use it more fully. Because the cost of the equipment is spread over several entities, everyone can save money. Sharing of seldom-used equipment or facilities by two or more water utilities could also reduce costs.

Another example is contracting labor to handle peak activity that base staffing levels cannot support. An engineering division can be staffed at a level to handle normal design activity, and consultants can be employed when design and construction levels exceed the capabilities of the base staff.

A useful exercise when evaluating a utility's efficiency in performing an activity is to determine the cost of outsourcing that activity and then require the utility to meet or beat that cost. If the utility cannot operate at a cost that is competitive with outside entities, the utility should either reengineer the process to become competitive or contract the function. Some utilities have internal groups formally bid against outside contractors as a way to maintain cost-sensitive pressure on the utility.

Value engineering of capital projects. If a water utility has large dollar capital projects in its capital improvement plan (CIP), management may benefit by engaging an engineering firm, other than the design firm, and a general contractor to independently review the design of the capital project before putting it out to bid. This process is called *value engineering* and will result in suggestions to improve efficiencies and reduce associated costs of the project. The use of value engineering is a best management practice for large construction projects, and spending a relatively small amount for a second opinion can often produce significant savings in construction costs. Additionally, if value engineering determines that project implementation is not an immediate need and may be postponed, a significantly smaller impact on utility finances may be achieved.

Revenue Enhancements

Most utilities in the United States receive general revenue from several different stakeholders and investments. Stakeholders include

- developers (to support system expansion),
- builders (to offset the cost of installing new meters or distribution lines and facilities), and
- water customers (to pay for the cost of treating and delivering water).

Utilities should establish fees and charges that recover the cost of providing service to each group to prevent unintentional subsidizing of one group by another. Also, efforts should be made to ensure the utility's billing function captures all service provided. For example, the utility's engineering support provided to developers and builders for reviewing utility aspects of their site plans and for installing service connections and meters should be billed based on site needs. Programs should be established that minimize non-revenue water, beginning with a water audit that can provide a reliable assessment of water loss. The water audit process is described in [AWWA Manual M36, *Water Audits and Loss Control Programs*](#). Such water is costly because money is spent to obtain and treat water that is never sold. Revenue can be increased or costs reduced through testing and changing out faulty meters or through a leak-detection survey to identify needed repairs. More extensive information on water meters can be found in [AWWA Manual M6, *Water Meters—Selection, Installation, Testing, and Maintenance*](#).

Most utilities receive interest earnings on invested idle funds, either through daily investment of funds needed in the short-term or longer-term investment of funds needed in the future. Interest rates vary by length of investment. Careful management of idle funds investment, especially longer-term investment of funds intended for capital projects, should provide additional revenue for the utility that minimizes future revenue needs. A municipality can earn higher rates of interest on longer-term investments of its revenue sources. For example, customer contributions in the form of system development charges may be invested at a higher yield than daily pooled investments until they are used for capital projects.

Federal law regulates the rate of interest earned on borrowed funds. If a municipality must have funds on hand before authorizing project construction, a large project requiring more than one year's building time can generate significant interest earnings. Such interest earnings must be recognized in the sizing of the associated debt issue. A smaller debt issue may reduce future annual debt service requirements.

Depreciation

Annual depreciation expenses for existing capital is an accrual-based cost that may be appropriately recovered through water rates. This can be accomplished either by reflecting the actual accrual expense or as a systematic return of owner's invested capital through water rates. While depreciation is a noncash expense and is typically not included in the revenue requirement under the cash needs approach, the expense is often used to roughly approximate the minimum amount of needed repair and replacement investment to existing assets that may be necessary to maintain the condition of the system. If appropriate levels of annual depreciation are used to set rates and those internally generated funds are set aside for the replacement of worn-out capital infrastructure, a utility will be in a position to maintain its financial integrity and limit the use of debt financing.

If the equity or utility basis method of determining revenue requirements is used, then depreciation is included as part of the revenue requirement in lieu of debt service and pay-as-you-go capital expenditures, which costs cannot be included as cost-of-service to prevent the double recovery of renewal-related capital costs (see Glossary for cost-of-service). Chapter 7 describes the equity method of determining revenue requirements. If depreciation is used as a cost element, the return-on-rate base should also be included as a portion of the revenue requirement to provide compensation for borrowing costs and risk. Failure to include return as a cost-of-service component could cause serious cash flow problems for the utility because the combination of depreciation and return is intended to cover a utility's annual capital funding needs.

Investor-owned utilities and government-owned utilities whose rates are regulated by individual states are generally required to employ the utility basis cost-allocation methodology in their rate setting. However, state regulatory agencies limit the amount of depreciation and the investment on which a return may be earned to the level of original cost assets that the owners have built with the owners' resources. Although investor-owned utilities own the assets under their control regardless of funding source, regulatory agencies do not want investor-owned utilities to profit from the investment in fixed assets contributed by others. When investor-owned utilities replace contributed assets with facilities funded by the owners' resources, the utilities may recover depreciation and earn a return on such facilities.

Government-owned utilities in the United States are generally self-regulated and may define depreciation and return as applying to all of their assets, regardless of funding source. When such utilities accept contributed assets, they agree to operate, maintain, and replace such facilities. However, water rates are the major source of revenue for government-owned utilities. By including all annual depreciation and earning a return on a rate base that includes all undepreciated portions of assets in its rate calculations, government-owned utilities may generate sufficient funds to pay debt service on outstanding bonds and meet their recurring annual capital needs. The depreciation period is based on the useful life of the asset. If an asset is debt-financed, it may have a useful life (basis of depreciation) of 50 years, but a bond term of only 20 years. Under this circumstance, depreciation for a specific new asset may not produce sufficient cash to repay, in a timely manner, the principal portion of the debt on that asset. However, annual depreciation is generated from all assets, many of which may not have debt associated with them. Unless a utility is highly leveraged, total annual depreciation should be sufficient to cover the total annual principal costs of outstanding debt.

Municipal Enterprise Fund or Agency Loans

Frequently, municipalities operate multiple utilities, such as water, wastewater, and stormwater utilities. A more financially stable utility, which has temporarily available surplus

operating or capital funds, could make a short-term, 2- to 5-year loan to a utility attempting to become revenue self-sufficient and at interest rates similar to the investment earnings rates that the municipality receives on its investment of idle funds. The loan may help the receiving utility to phase-in new rates over time as it improves its financial position. If another municipal agency has available surplus funds, a similar internal loan could be made.

EXTERNAL FUNDING

As discussed in the previous section, internal funding mechanisms are frequently employed to finance some of a utility's capital needs and are an appropriate method for short-duration, low-cost routine capital projects. Utilities often pay for such projects on a pay-as-you-go basis (e.g., from existing customers through rates for service or from interest earnings on investment of utility funds). For more expensive major capital projects, however, utilities usually need to find an outside funding source. External sources can include the following:

- Debt financing
 - Common short-term debt
 - Common long-term debt
- Leasing
- Contributions
- Grants
- Tax benefit districts

To stay financially healthy, a utility should balance the manner in which it finances capital projects with a combination of internal and external funding. This section describes each of these external funding sources and their characteristics. Chapter 3 discusses some of the advantages and disadvantages of each and provides suggestions for evaluating each source of funding.

Debt Financing

Major capital projects are frequently funded with some form of debt. Debt financing allows a utility to raise more funds for capital projects than would be feasible on a pay-as-you-go basis, and it allows the utility to repay those funds over time. Debt can be repayable over various periods and spreads project costs to future, rather than current, users of the system. The length of time between borrowing and fully repaying determines whether the debt is considered long-term or short-term debt. Debt that must be repaid in one year or less is usually considered short-term debt. Debt that is repayable over longer periods may be called intermediate- or long-term debt.

The nature of the promise to repay debt may differ in various ways. Some debt may require that a portion be repaid each period; other debt may have periodic interest payments but require the full principal amount to be repaid at the end of the term. The utility may make a general promise to repay debt, or it may provide specific collateral as security for its repayment obligation.

Debt may be raised from various sources, both public and private. How easily a utility can access these sources, and how much it will be able to borrow, will depend on its

size, its current financial condition and ability to repay the debt, and the impact the debt will have on its rates.

Common Short-Term Debt

Short-term debt may take the form of bank loans, notes, commercial paper (CP), or floating-rate demand notes.

Bank loans. Loans from banks can be structured as term loans or as lines of credit. A *term loan* is repayable at a specific future date. A *line of credit* is an arrangement under which the borrower can borrow and repay money from time to time as needed. A line of credit may be *committed* or *uncommitted*. According to an uncommitted line, loans are made at the bank's discretion with terms set at the time of borrowing. In contrast, with a committed line of credit, the utility and the bank enter into an agreement that (1) sets the terms under which loans may be made and (2) obligates the bank to honor requests for loans during the duration of the agreement, as long as the borrower meets predetermined credit criteria. A committed line of credit generally requires that the borrower pay a fee to the bank in return for having a source of funds available.

Bond-, tax-, grant-, and revenue-anticipation notes. A note is an unsecured debt, usually with a maturity under 10 years. The various types of anticipation notes are promises by a municipal issuer to repay the borrowed amount from a source of money that the utility will receive in the future, such as a future bond issue (in which case the note is called a bond-anticipation note or BAN), anticipated revenues (revenue-anticipation note or RAN), taxes (tax-anticipation note or TAN), or grants (grant-anticipation note or GAN).

Commercial paper and tax-exempt commercial paper. CP is an unsecured short-term promissory note with an average maturity of 30 to 45 days. The notes, which according to security regulations have a maximum maturity of 270 days, are intended to be refinanced (rolled over) continuously for periods that may exceed one year. CP may be issued by investor-owned or government-owned utilities. When CP is issued by a state or local government, it is called *tax-exempt commercial paper* (TECP). CP and TECP differ from other interim financing in that they are generally rated by a national rating agency and supported by a backup source of funds, such as a bank line of credit, a letter of credit (LOC), or another credit facility, to protect the purchaser of the notes from default in the event the utility cannot sell a new issue when a maturing issue becomes due. The use of TECP by municipal issuers has increased because of financial market demands. TECP is a prime investment instrument for tax-exempt money market funds.

Floating-rate demand notes. Floating-rate demand notes are securities on which the interest rate changes at predetermined intervals (often monthly) and that give the purchaser of the security the right to demand that the seller (utility) redeem the notes at each interest adjustment date. Floating-rate notes are usually issued in \$100,000 denominations and are placed primarily with money market funds or other large institutional buyers.

Common Long-Term Debt

Long-term debt may take the form of a note, a debenture, or a bond. Both notes and debentures are unsecured borrowings. Notes generally have maturities under 10 years and debentures have maturities of 10 years or more. While the term *bond* in strict usage means a secured debt, in general usage, it can refer to various kinds of secured or unsecured debt. In this manual, bond refers to all types of long-term debt.

General obligation (GO) bonds. General obligation bonds, referred to as GO bonds, are debt obligations issued by a government entity, such as a state or local government, and backed by a pledge of the entity's full faith and credit. GO bonds can be issued only by units of government that have the authority to tax. Water utilities that are separate from local governments may not have this authority. GO bonds are secured by an unconditional pledge that the issuing government will, if necessary, levy unlimited taxes to repay the debt. This is the strongest pledge the government can provide, and it is usually regarded by investors and rating agencies as the strongest form of bond security. Therefore, a GO bond generally has the lowest cost of the various financing vehicles available to local governments.

Because GO bonds are issued by a state or local government, interest paid to the lender is usually exempt from federal income taxes. Depending on state tax laws, this debt may or may not be exempt from state income taxes. Municipalities should conduct further analysis if debt is used for any activity that may be associated with private use. Examples to scrutinize carefully are construction projects related to private–public partnerships and design–build–operate contracts. Utilities must ensure that constructed facilities are used for the public good to ensure tax-exempt status. Another important consideration between the use of GO and revenue bonds, which are described in the next paragraph, is that GO bond issuance often requires a public vote. Revenue bonds typically do not. At times, the public may vote down bond referendums. Utilities have the advantage in that they can usually issue revenue bonds without referendums.

Revenue bonds. Revenue bonds are debt obligations issued by local governments or other public agencies. Principal and interest on revenue bonds are secured by (and may be payable only from) the specific revenues named in the bond documents. Revenue bonds are commonly used to finance activities that generate revenue and that are expected to be self-supporting, such as a water utility. Periodic debt-service payments on revenue bonds issued by water utilities are usually paid from water rates and miscellaneous revenue, although all system revenues typically secure the bonds by covenant.

With a revenue bond, debt repayment may depend on timely completion of a project, on adequate rate or charge structure, and on sound fiscal management of the enterprise. For this reason, the bonds are assumed to be riskier and will have a higher interest rate than a GO bond issued by a comparable issuer. Investors' acceptance of revenue bonds is highly dependent on the service or project to be financed and on the creditworthiness of the borrower. The spread (difference) of interest rates between GO bonds and revenue bonds has historically varied. More recently, municipal bankruptcy has cast doubt on the strength of the "full faith and credit pledge" versus the security interest that is given in a revenue pledge, and in general, investors have favored water revenue bonds because of their essential nature and see them as less vulnerable to cyclical downturns associated with general governments.

Most revenue bond agreements or indentures contain provisions, or covenants, that are intended to enhance marketability by providing investors with additional assurances that their money will be repaid. The following are some provisions typically included in revenue bond documents:

- A rate covenant, by which the issuer agrees to set rates sufficient to meet all operating costs and some multiple of debt service. For example, a requirement may be that net revenues available after operating costs will be sufficient to cover 125 percent of debt service. The extra 25 percent may be available to contribute to reserves or for funding other capital costs needed to keep the system in good financial and working order.

- A flow-of-funds requirement that specifies the order in which revenues will be used. For example, there may be a requirement that revenues be used first to pay O&M expenses, then for debt service, then to replenish reserve funds, and then for costs associated with system repairs or replacement. The required reserve amount may decrease over time, freeing funds for other capital needs.
- The establishment of a fund to set aside money to ensure debt service payments are made on a timely basis or to cover debt service for some period of time in the event of a revenue shortage. This deposit of money is called a *debt service reserve fund*, and the indenture generally requires that the fund be administered by a third party, such as the trust department of a bank. For example, many agreements require the reserve amount to be equal to the maximum debt service in any year during which the bonds are outstanding.
- A parity test, which provides that additional bonds may not be issued unless historical and projected revenues indicate that there is sufficient revenue to avoid dilution of coverage on outstanding bonds. The test is typically testified as to its sufficiency by the chief financial officer or by an independent third party, such as an auditor, feasibility consultant, or consulting engineer.

Sometimes a government adds a GO pledge to a revenue bond backed by a specific source of revenues, such as the net revenues of a water system. These bonds are referred to as *double-barreled bonds* because they provide the dual security of a dedicated revenue source with the general taxing power of the government.

Bonds with credit enhancements. A municipality or utility may have difficulty issuing debt, especially if it has not issued debt before, does not have a credit rating, and is unknown to the investment community. One option available to this type of organization is to borrow from a local bank or other institution where the organization's creditworthiness is more easily demonstrated.

Another option is to obtain a credit enhancement, generally in the form of bond insurance or an LOC from a well-respected and financially sound entity. Under such an arrangement, the utility will pay a fee to have the financially sound party, such as an insurance company or bank, provide a guarantee to the investor in the bond's official statement that it will ensure the timely payment of principal, interest or both. The addition of a guarantee by a large, well-known entity with high credit ratings makes a bond more attractive to investors, resulting in a lower bond interest rate.

Strong municipal financial and economic positions and high bond interest rate levels are also situations where credit enhancements may warrant consideration. Credit enhancements may add a level of stability to the entire municipality's financial situation. Some municipalities may employ credit enhancements regularly as a matter of policy. When interest rates are high, credit enhancements, depending on the creditworthiness of the issuing company, may result in the highest credit rating for the municipality and a lower bond interest rate.

Unless the debt interest cost over the life of the bond, with a credit enhancement, plus the cost of the credit enhancement is significantly less than total debt interest costs without enhancement, third-party credit enhancements may not be appropriate. Utilities should evaluate the savings in debt interest cost over the life of the bond, with and without credit enhancements. If there are no savings, the utility may want to consider other factors in making its decision, such as the municipality's historical financing practice or policies. Employing credit enhancements is as much of a policy issue as it is a cost issue.

Interim (temporary) financing. It is common for a utility to begin construction of a capital project before the final construction cost for the project is known. In such cases, interim (temporary) financing is often used. Typically, a lender will issue a line of credit to be used to pay for the construction costs, and the utility will draw on the line of credit as needed. When construction is finished or when the utility has a reliable estimate of the final construction cost for the project, the interim financing is paid off by including the amount borrowed on an interim basis in the total amount of the long-term debt.

An alternative would be to issue consecutive bonds with each covering a portion of project construction. The first issue covers a significant portion of estimated costs that permits the initial phases of construction. The second issue, called a *completion bond*, covers all remaining costs of the project when they are better known. Purchasers of the first issue are notified, in the bond's first official statement, that a completion bond will be issued. The staging of bonds has an additional benefit of permitting the utility to phase-in rates over a period of two or more years to cover both issues.

Governmental loans. Federal and state agencies provide a valuable source of lower-cost financing through a number of programs that supply infrastructure financing. The federal Rural Utilities Service (RUS, formerly the Farmers Home Administration) is the most common provider of loans to rural and economically depressed areas for water and wastewater system improvements. Amendments in 1996 to the Safe Drinking Water Act establish a state revolving fund (SRF) program to provide loans to water utilities for capital improvements at interest rates at, or less than, market rates. A similar program under the Clean Water Act has supplied low-rate loans for wastewater treatment facilities for many years. On June 10, 2014, the Water Resources Reform and Development Act (WRRDA) was signed into law. This Act provides authorization for the Water Infrastructure Finance and Innovation Authority (WIFIA) five-year pilot program. This program will provide loans for large (\$20 million or more) water, wastewater, and stormwater infrastructure projects at US Treasury rates. The utility's financial advisor should be aware of current sources of governmental loans and should be consulted about the structure and terms of loans available to the entity.

These programs allow utilities to avoid many of the steps associated with an open market debt offering and are prevalent in many states, especially those with smaller or less tax-advantaged municipal debt markets. While these programs are popular, especially for smaller utilities, they often are accompanied with inflexible amortization schedules, significant fees from the sponsoring states, and may not offer the most cost-efficient funding available to the utility. In addition, each state fund will have legal requirements establishing the nature of the obligation.

Leasing

A *lease* is an arrangement between the owner of property (*lessor*) and the user of property (*lessee*) that gives the lessee the right to use the property for a defined period in return for meeting certain requirements, including the payment of rent. Leases may be attractive for municipal utilities as a means of acquiring the use of needed equipment and facilities when debt limitations restrict direct purchase and ownership. Leasing in some of its forms is treated as debt for financial reporting purposes, and leasing is generally viewed as a substitute for debt financing.

Because leasing often involves tax benefits to the lessor and tax implications to the lessee, and because it is subject to the interpretations of the US Internal Revenue Service, it is a complex form of debt financing. Tax acts passed in 1984 and 1986 substantially reduced the benefit of tax-oriented leasing. Utility managers should retain experienced legal assistance when considering a lease because tax laws are constantly changing.

Sources of lease financing include large banks, equipment manufacturers, real-estate development firms, and major leasing companies. Most firms provide preliminary lease-rate quotes, which may be used to compare lease costs against ownership costs. The major categories of leasing likely to be encountered by a finance staff that is considering how to finance a new facility or new equipment include direct leases, leveraged leases, and certificates of participation.

Direct leases. With a direct lease, the lessee negotiates the equipment or facility specifications, as well as the rental terms, with the lessor. After the lease is signed, the lessor purchases the equipment or constructs the facility exactly as specified in the lease agreement. When the equipment or completed facility is delivered, the lessee ensures all specifications have been met, then formally accepts the facility before making payments.

Leveraged leases. A leveraged lease is similar to a direct lease (which is sometimes called a nonleveraged lease), but it is more complex because another party is involved. The additional party is the entity that provides funds to the lessor for constructing the facility or acquiring the equipment.

Certificates of participation. A certificate of participation (COP) is a security backed by an interest in a stream of rental payments. The lessor is generally a governmental entity, often one specifically created to enter into lease transactions, and payments received by certificate holders are generally tax-exempt.

The financial advisor should be able to explain the current treatment of a COP transaction under any local debt statutes. The advisor should also be able to explain the current market requirements with respect to common restrictions concerning use of property, the flow of funds, security for the certificate holder, and the basis for tax exemption. Restrictions placed on the lessor concerning use of property and disposition of lease payments establish security for the certificate holder and the basis for tax-exempt interest payments from local government.

Contributions

Customer contributions of money or property are a common and important form of capital for water utilities. Historically, customer contributions have been related primarily to customer capacity in supply, treatment, storage, and distribution system facilities. Customers are frequently required to purchase their meters and pay for the installation of taps and services. Developers are often required to provide distribution mains, fire hydrants, and customer connections for new subdivisions as contributions in aid of construction. While these contributions relieve a water utility of some of its capital needs, they often do not provide financing for major supply, treatment, or distribution facilities.

Some utilities require developers to pay customer advances for construction of subdivision facilities. The utility may reimburse the developers during a specified period as new customers connect to the system. Any funds remaining at the end of the period are retained by the utility as contributions in aid of construction.

Government-owned utilities may also include funds provided through intergovernmental transfers as contributions if those funds are not intended to be repaid from utility revenues. This type of contribution is often used to cover a portion of capital requirements for specific facilities, and the funds may be provided by the local government from GO bond proceeds, property, or sales tax revenue.

Grants

Development of public water supplies in the United States has traditionally been a local responsibility. Unlike the wastewater industry, the drinking water industry has not had a large federally funded grant program. With limited federal spending and state revolving loan programs, a conservative financial plan does not count on federal grant money. This is true even as federally mandated drinking water quality standards require additional capital investment by local utilities.

However, a few grants from various federal and state agencies exist for physical plant security and rural or economically depressed areas. For example, RUS, operated under the auspices of the US Department of Agriculture, provides grants and loans for rural water and sewer systems and communities with populations of fewer than 10,000. The ratio of grant-to-loan funding from RUS is a function of the median household income of the population served.

Tax Benefit Districts

Many local governments have employed tax-benefit districts to cover the costs of local water distribution facilities serving specific portions of a utility's service area, and governments in several states employ them, including Alaska, Connecticut, Florida, New York, and Virginia. For example, by majority vote of the benefiting property owners, a local government could establish several tax benefit districts to initially fund, operate and maintain, and replace local facilities. The local government may also establish and own backbone facilities for supply, treatment, transmission, and storage to serve the benefit districts and charge customers within these districts on a wholesale water rate basis. In some situations, multiple tax-benefit districts could be provided with wholesale water service by a nearby incorporated community within a county. In other situations, large populated counties adjacent to large cities may fund all or a significant part of their water systems' capital and operating costs from a single tax benefit district.

When raising water rates to fund infrastructure replacements is met with customer and policymaker objections, employment of tax benefit districts to address critical local facility replacement needs in specific portions of a utility's service area may be a logical alternative.

Public-Private Partnerships

Public-private partnerships are contractual arrangements between public agencies and private companies. Public-private partnerships create benefits as they balance the resources, risks, and rewards of both the public agency and private company and provide greater efficiency, better access to capital, and improved compliance with a range of government regulations regarding the environment and workplace. An in-depth discussion of public-private partnerships may be found in chapter 3.

SUMMARY

In the United States, many sources of funds are available for capital improvement funding. Among these are internal sources, such as savings from improved operations and revenue enhancement, and external sources, such as grants, loans, and tax-benefit districts. Because of the size and long-term usefulness of capital assets associated with most CIPs, government-owned utilities generally rely on debt for a large proportion of their capital financing needs. Investor-owned utilities typically rely on reinvestment of utility net income, new investment from additional stockholders, and customer and developer contributions to meet their capital needs.

Chapter **3**

Evaluating Financing Alternatives

The legal environment, financial considerations that affect all issuers, issuer considerations specific to the issuer, and other external factors all play a part in whether a particular funding alternative is the best choice for a utility. Legal factors may restrict the size and type of debt that a utility may assume. Financial factors, including the condition of the capital markets, could result in limitations on the debt size and interest rate. Issuer considerations include factors specific to the issuing utility, and external factors include whether the alternative is likely to be accepted by governing authorities and the public. This chapter discusses these factors and some advantages and disadvantages of the various financing alternatives discussed in chapter 2.

LEGAL FACTORS

One of the first steps in evaluating any financing alternative is to determine whether a particular option is permitted under the various laws, regulations, and governing documents to which the utility is subject. The utility's financial advisor and bond counsel, in conjunction with in-house counsel, will be able to discuss the various legal factors that are relevant to the availability of financing alternatives. If an alternative being considered is not currently permitted, the utility may want to evaluate other alternatives or the feasibility of changing its legal operating environment to include the alternative. Certain factors such as cost, effort, probability of success, and risks can be evaluated against the benefit that the utility would gain if the alternative were available.

An investor-owned utility may be subject to rules promulgated by the local regulatory body, as well as to previous indenture requirements, corporate resolutions, and restrictions in the utility's by-laws. A government-owned water utility is often subject to

restrictions in its governing documents, as well as local and state/provincial laws. Both public and private utilities are subject to various federal laws if they wish to borrow on a tax-exempt basis.

Governing Documents

Legal factors affecting debt issuance are frequently found in a utility's own enabling documents, which typically include the original authorization and subsequent actions of the utility's board or other oversight agency. The governing documents for a government-owned utility often establish limits on borrowing, either as an absolute cap or as a ratio such as debt-service coverage. Governing documents may also identify what types of debt can be issued, including negotiated or competitive sales, restrictions on private placements, selection of the finance team, and other considerations. Most jurisdictions also have established rules about the investment of bond proceeds, with an emphasis on the preservation of capital assets.

Additional legal restrictions may be established by legislation or board action authorizing previous debt issuance. For example, a resolution may have already pledged certain assets as security for a previous debt issue. As a result, assets and revenues may not be available to support new debt unless the new debt is subordinated to the old. This may affect the feasibility and cost of the alternative.

State or Provincial Law

State and provincial laws in the United States and Canada frequently address the legal structure and borrowing capacity of local government entities, including municipal utilities and utility authorities. The requirements for voter approval of debt issuance, if any, are generally found in state and provincial statutes.

Some states require an additional level of review and approval before borrowing can be completed. One example of state involvement in municipal financing is the North Carolina Local Government Commission (LGC). A major function of the LGC is the approval, sale, and delivery of substantially all North Carolina local government bonds and notes. Before any unit of local government can incur bonded indebtedness, the proposed bond issue must be approved by the LGC. Some water utilities are regulated under their state's public service commission (PSC) or public utilities commission (PUC) and may require commission approval before borrowing. These regulations vary by states and whether the utility is private or public.

Federal Law*

The Securities and Exchange Commission (SEC) is the primary federal agency regulating utility financing in the United States. The SEC has extensive regulations that apply to public debt offerings made by investor-owned utilities. Through its regulation of underwriters, the SEC also mandates that public utility issuers make financial information available beginning at the time of borrowing and continuing until the debt is retired. The issuer's bond counsel often handles many of these activities; however, the issuer has the ultimate responsibility for ensuring compliance. In addition to financial reporting requirements, if a US based utility, whether investor-owned or government-owned, wishes to borrow on a tax-exempt basis, the utility will need to comply with arbitrage regulations of the US Internal Revenue Service, which address

* Please see chapter 8 for a discussion of Canadian utilities.

1. the maximum amount of interest that may be earned on borrowed funds after the transaction is completed and before the funds are expended on capital projects, and
2. how long the funds can be held before the issuer is subject to penalties and possible loss of the tax-exempt status of the issue.

Bond counsel and the financial advisor should be able to explain what is required from the utility so that it can assess the cost and administrative burden associated with federal requirements. It may be that the compliance requirements make the financing alternatives more attractive.

FINANCIAL FACTORS

Various financial factors can also affect a utility's financing decisions, including whether to pursue financing at all. While market conditions are beyond the control of the utility, these factors will play an important part in the decision-making process.

Financial factors that affect all borrowers include the current interest rate levels and terms, whether there is a general consensus about the level and direction of interest rates, the outlook for economic activity, and whether proposed legal or tax changes make borrowing more or less difficult than usual. Several of these factors are discussed in more detail in the following sections.

Market Conditions and Access

Utilities that plan to issue new bonds or refund existing bonds should be aware of the market factors that influence financial decisions. Bond markets have tremendous diversity. Corporate as well as municipal bond markets are influenced by the economic outlook, US Treasury activities, the shape of the yield curve* as presented in Figure 3-1, and general investor sentiment. In addition, municipal markets are influenced by proposed federal tax law changes, as well as by proposed changes in the requirements and specifications for issuance promulgated by the states or provinces.

If the markets are in an unsettled state, there could be advantages to using a negotiated sale or private placement (if available) rather than a public competitive sale because the issuer would have more flexibility in settling the time of sale. A *negotiated sale* is the sale of bonds directly to an underwriter and differs from a *competitive sale*, which requires

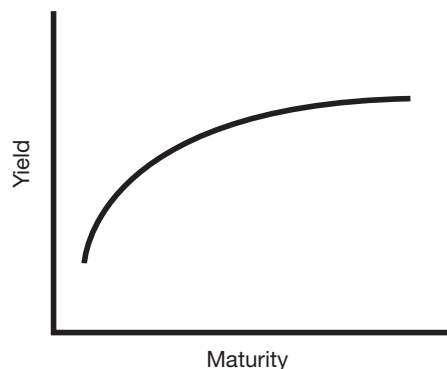


Figure 3-1 Treasury yield curve

* The yield curve shows the relationship between interest rate and time to maturity.

public bidding by one or more underwriters. Similarly, if the yield curve is flat, long-term interest rates may be comparable to short-term interest rates, which may influence the length of debt amortization. To properly assess the impacts of these and other market-related concerns and conditions, issuers typically rely on competent professionals in a variety of fields, including bond counsel, the financial advisor, and the underwriter. The assistance provided by these professionals is discussed in chapter 6.

ISSUER CONSIDERATIONS

Before making any decision regarding funding alternatives, a utility should carefully consider internal factors that influence which funding plan is most appropriate. If the plan includes new borrowing, financial considerations will be a factor in deciding which debt instrument is most appropriate. Among the financial factors specific to the issuer that need to be considered are

- whether the proposed alternative is compatible with the overall objective of the financing program, and
- whether selecting the proposed alternative will increase or reduce the utility's flexibility in the future.

As a part of its long-term financial plan the utility may have set targets for such things as the proportion of its debt that will be variable rate, the maximum amount of debt it will incur as a percentage of fixed assets, a maximum annual amount for debt service per connection, reserve funding requirements, or minimum debt-service coverage requirements in excess of indenture requirements.

Cash Versus Debt Funding

When considering funding options, one of the primary decisions that must be made is cash versus debt funding. The use of cash has benefits such as elimination of interest and issuance costs, reduced administrative effort, and decreased financial reporting requirements. However, to fully cash fund the capital needs of most utilities, rates would typically need to be set at levels that would be unacceptable to customers and governing officials. As such, the ability to assume debt is very important to a utility.

Other factors should also be considered when deciding between cash versus debt funding. Specifically, asset life should generally equal or exceed the term of the funding choice and recurring projects should be funded with recurring funds. Longer-life assets, such as treatment facilities and major transmission mains, are good candidates for longer-term financing. Shorter-life assets with recurring renewal and replacement needs, such as pumps, vehicles, and general equipment, are better candidates for cash funding. Many utilities establish rates such that levels of cash are generated each year to meet the utilities recurring renewal and replacement needs. Intergenerational equity is another consideration that should be given to the cash-versus-debt funding decisions. The use of debt financing can shift the burden of an asset's cost to future generations, thus requiring future customers to pay for projects completed in the past.

Meeting Covenants and Satisfying Revenue Requirements

The indenture requirements of existing debt are similar to the legal factors discussed previously. The indenture will contain provisions that affect a utility's ability to issue new debt. For example, existing bond covenants may specify that rates be established at a

sufficient level to meet defined requirements, most often a debt-service coverage requirement. The indenture will provide details about bond covenants and the specific items to be included in the debt-service calculation.

In general terms, debt-service coverage is defined as annual net revenues (gross revenues minus operating and maintenance expenses) divided by total annual debt service (principal and interest on outstanding debt) with the result expressed as a percentage or times factor. For example, general obligation bonds may require debt-service coverage of 100 percent or a times factor of 1.0; senior lien revenue bonds may require debt-service coverage of 110 percent or 1.10 times; and junior lien revenue bonds may require debt-service coverage of 125 percent or 1.25 times. In addition to specific coverage requirements, rating agencies may expect the total of all utility debt service, including that for general obligation and revenue bonds and any other debt, to be covered by a minimum of 100 percent or 1.00 times.

A utility must be able to satisfy the covenant or be able to amend existing provisions when new revenue bonds are issued. When the amount of the new revenue bond debt is greater than the amount of all outstanding revenue bonds, the new covenants may replace existing covenants. In this case the new issue purchasers are assumed to have voted-in the new covenants with their bond purchases. Otherwise, an amendment may not be possible unless the outstanding debt is repaid or financially defeased (i.e., where sufficient front-end funds, including future investment earnings associated with the funds, are turned over to the control of a third-party paying agent to pay the debt service when it becomes due for the remaining life of the defeased debt).

However, if the plan is to repay outstanding debt, new investors may not be willing to accept a lower coverage ratio without a significant increase in the interest rate. A lower coverage ratio may result in the bonds receiving a lower credit rating. When evaluating what coverage is appropriate, investors consider customer base, local economy, historical financial performance, cash position, etc., as well as the demonstrated political will to raise rates when needed. Investors also consider historical data in conjunction with projections and assess the reasonableness of the assumptions on which projections are based. This evaluation is completed to determine the quality of the revenue stream pledged to pay bondholders. Investors and credit rating agencies will examine intra-period fluctuations and their causes, as well as the sensitivity of the revenue stream to adverse external events. With increased volatile revenue (which is an indication of increased risk), coverage requirements will often be higher to attain comparable investment protection comparable to issues with more stable revenues. The utility may want to perform a similar analysis

- to assess the reasonableness of being able to obtain a lower coverage ratio, and
- to answer questions that arise during the marketing process.

When developing its long-term financial plan and its ability to issue new debt, the utility should ensure that both its revenue and its cash needs are met over the planning horizon. The analysis should disclose whether sufficient working cash is available after the debt service on the new debt is considered. As noted in chapter 1, this is often an iterative process that balances financial requirements with financing options. For example, if utility rates are to be left unchanged for two or more years, the financial plan should show that sufficient reserves, such as rate stabilization and operating reserves, will be built up during the first half of the forecast period to finance an expected deficit in the latter half of the forecast period. If sufficient revenues are not shown, the planner may want to evaluate whether the utility's governing board would be willing to consider annual, biennial, or triennial rate increases, or restructure the new obligation in a way that fits better with