Financial management for water, sewer, and stormwater systems

Financial environment for water, sewer, and stormwater systems

Most financial management of water, sewer, and stormwater systems takes place in a government environment in which rules of governmental accounting apply. The remainder is through regulated private utilities, in which private-sector rules and rules of regulatory commissions apply.

An adequate funding base for operations, maintenance, and renewal of water, sewer, and stormwater systems is probably the single most important management issue faced by utilities. Achieving this requires effective financial management by all managers, not just by the financial staff.

As managers advance in responsibility, the more they must know about finance. This chapter summarizes the financial knowledge they need to manage water, sewer, and stormwater systems.

The chapter explains the main points of financial management as gleaned from references from public finance and water, wastewater, and stormwater utility finance. The reader may consult references such as these for more details. For public finance, the Government Finance Officers Association (GFOA) and the International City and County Management Association (ICMA) have published a number of guides, such as Management Policies in Local Government Finance. The field of public finance also has its own journals, such as Government Finance Review.

For water supply finance, the AWWA has published manuals and guides such as Water Utility Accounting, Water Utility Capital Financing, and manuals on rate setting. In the wastewater field, less has been published, but the WEF has a guide for wastewater utility finance. Also, George Raftelis presented the Arthur Young Guide to Water and Wastewater Finance and Pricing. The field of stormwater finance is newer and not as well organized, but a
Financial tools
In Chapter 1, we saw that a number of “best practices” were in the finance area. These best practices included four main thrusts — funding commitments, revenues, use of information, and budgeting:

- The organization seeks sufficient funding, and operating and maintenance costs are fully funded annually.
- Alternative methods for financing are considered. Targeted and approved funding is available for the Capital Improvement Plan. Revenue bonds are used for capital financing. A pricing system and developer contributions are used to finance capital investments. Local funds are leveraged with state and federal dollars.
- Agency requests are supported by solid information. Estimates of costs and debt are accurate; long-term maintenance costs and life-cycle costing are used.
- Operating and capital budgets are linked.

Implementing best practices such as these is a valid starting point for organizing financial management in a water, sewer, and stormwater organization. Thus the manager will need information from accounting, engineering, economics, and financial planning and forecasting. Main points include:

- Public finance requirements
- Links between management work and organizational finance
- Budget process
- Sources of revenue
- Cost control
- Financial planning and projections
- Financial control and reporting

Links between management and finance work
The days when the financial section mainly “kept the books” but otherwise kept out of the way are over. Today, competitive pressures require line managers and financial managers to work together to use information to improve management in all areas. As outlined in other chapters, with the tremendous stakes involved in infrastructure capital, this will soon end up to be one of the most important driving factors in rates.

In infrastructure work, operations and maintenance mainly involve recurring expenses, and capital investment requires long-term funding. Managers budget for and manage finances separately in each area. The link between management and finance is in these two areas. For O&M the issue...
Financial management for water, sewer, and stormwater systems

is keeping costs under control, and in capital management the issue is raising and managing funds for new or renewed systems.

The water, sewer, and stormwater manager works with financial staff and other managers to obtain funding through the budget process and manage funding through systems of control and reporting. The activities within finance offices vary, but generally include budgeting, accounting, auditing, assessments, purchasing, and treasury work, and are handled by specialists in accounting and finance. Line managers also prepare budgets, plan operating and capital finances, plan rate changes, plan bond issues, report, and manage revenues and costs.

Bridging the dividing line between management and finance is one of the ways to improve infrastructure management systems. It is inefficient for each group to gather and maintain its own data. Chapters 10 and 12 discuss this issue further.

Public finance, government agencies, and regulated utilities

The field of public finance has its own rules, generally overseen and assisted by groups such as the Government Accounting Standards Board (GASB), the Government Finance Officers Association (GFOA), and oversight groups at the federal, state, and local levels. For example, for federal financial management, the General Accounting Office (GAO) has a key role.

Regulated utilities follow rules of commercial accounting but must comply with regulatory commission rules. While there are quite a few regulated water supply utilities, there are fewer private sewer systems and stormwater systems. In spite of this, a number of private or quasi-private entities do operate utility-like operations. For example, a large industrial site or recreation complex will operate its own water, sewer, and stormwater facilities.

Budget process

Chapter 4 introduced the PPBS process of capital improvement planning and how it links to budgeting to create an integrated planning and budget process. The PPBS process focuses mainly on capital needs, but it can also be applied to the operating budget.

Planning should be linked to budgeting, management should be concerned about long-term effects, and up-to-date information on physical capital should be used in the decision-making process.

A budget is an adopted plan for expenditures and revenues structured to follow the programs and divisions of an organization. After the budget is authorized, it becomes the official plan for the fiscal year. Before the budget is adopted, it is the “proposed budget.”

The budget is much more than just a tool for allocating money. It is a key to management control of the organization. The budget process is a powerful tool for managers, going beyond fiscal accountability.
Budgets are useful in planning, organizing, and controlling. The budget document fills the needs for a policy document, an operations guide, a financial plan, and a communications medium.

Budgeting involves several decisions about policies and directions of the organization:

- Revenues, levels of taxation, and charges
- How emphasis will be placed in different programs
- How money will be allocated to personnel, equipment, contracts, and other categories
- How revenue will be made available, whether from debt, user charges, or other sources

On an annual basis, the operating budget is a plan to manage funds to operate and maintain the agency and its systems. The capital budget displays the annual piece of the organization’s long-term plans to fund expansion and renewal.

As discussed in Chapter 4, many plans do not link to budgets. But if a plan is linked to the budget, it is more likely that something will happen. Until items appear in an appropriated budget, they do not represent commitments.

A best practice is to link operating and capital budgets. One way for this to occur is in the maintenance budget. If maintenance needs are minor, they are handled in the operating budget; if they are major, they become capital items.

Budget documents are communications vehicles and are helpful in interactions among staff, city council, and the public. The budget process consists of planning for, negotiating, presenting, adopting, following, and auditing the budget for the organization or program. The process is important because budgeting determines management’s operating resources.

Operating and capital budgets should be programmed on multi-year cycles. The capital budget should be linked with a comprehensive infrastructure planning and needs assessment process (see Chapter 4). The operating budget should be linked with plans for services, organizational development, and the development of programs.

In any given year, a manager deals with different budget years: one in the advance planning stage, another in the approval process, another for the current year, and another from a past year possibly being audited. Funds in a current year were approved during the previous fiscal year. Planning took place even earlier.

Operating budget

The operating budget is a day-to-day management tool: details of expenses and revenues are projected, approved, and reported. The resolution to approve the operating budget empowers the organization to spend its operating funds.
The operating budget has a number of uses:

- To control costs
- To be an interdepartmental informational vehicle
- To require the organization to estimate expenditures to check adequacy of revenues
- To provide a means to evaluate internal competition for resources
- To provide information for work planning and evaluation
- To provide a communication tool for the oversight body
- To provide information for the annual appropriation ordinance
- To provide a basis to adjust annual plans to appropriations
- To provide a basis for financial audit

The operating budget will include funds for operations and maintenance to include labor, materials, energy, contracted services, maintenance and repairs, and other ongoing needs. Funds are managed in operating accounts so that managers, operators, administrators, and maintenance personnel can run and care for systems.

In a stormwater system, for example, a section manager may supervise engineering and maintenance branches. Employees might include an engineer, a floodplain specialist, a data manager, and maintenance workers. Salaries and benefits would be paid by the operating budget. The group may also have office and maintenance equipment, including vehicles, and all of their ongoing expenses would be paid by the operating budget.

Capital budget

Capital budgeting should be linked to operating budgets and to capital planning and programming. Capital budgeting is “the way organizations decide to buy, construct, renovate, maintain, control, and dispose of capital assets.”

This refers to all types of organizations, as capital budgeting is an important issue in how private companies work, as well as government infrastructure organizations. Issues to address in capital budgeting include the time value of money, the cost of capital, the capital budgeting decision, and risk in capital budgeting.

Capital expenses are to build new systems or renew old ones. New systems may be required for growth, improvement, or regulatory requirements. Old systems might require major repairs, rehabilitation, refurbishment, or replacement.

For example, a sewer collection system might be 50 years old and contain pipes that are too small or worn out. The decision might be to replace part of the system with newer, larger sewers and to rehabilitate other parts. Funds for this would come from the capital budget.

Another case might involve a water supply transmission main that is vulnerable to failure because of a flood. The utility might decide to install a parallel main over another route to increase reliability and reduce risk.
Politics of budgeting

The politics of budgeting affects managers at all levels and is a form of bureaucratic competition. Infrastructure budgets involve a great deal of money and are especially susceptible to budget politics. Aaron Wildavsky discussed agency roles and expectations, deciding how much to ask for, deciding how much to spend, department versus bureau politics, role of the budget office, deciding how much to recommend, appropriations committees, deciding how much to give, and client groups.

Enterprise principle

If possible, utility management should follow the enterprise principle. This means that the utility is essentially self-supporting and does not receive a regular subsidy from general revenues or intergovernmental transfers. It may, of course, receive funds from sources other than user fees from time to time. The enterprise principle is the basis for enterprise funds (to be explained later in the chapter).

Sources of revenue

The operating and capital budgets should be financed from logical sources. Services should be charged according to benefits users receive. User charges are the basis for allocation of services and for raising revenue. Equity is central to management, and charging schemes should be fair. To be fair, charges ought to reflect benefits received by users. Fees ought to be cost-related, reflecting the cost of service. Percentage of cost recovery through fees might vary with the nature of facilities, extent of benefit to fee payers, level of service, and ease of collection of fees.

Operating revenues

Operating funds should come from current revenues and should avoid subsidies if possible. Operating revenues normally come from fees and user charges, taxes, grants and intergovernmental transfers, and interest income. Operating revenues must be renewed every year, and should be financed from recurring revenues. In past years, property taxes were often used for operating budgets, especially in sewer and stormwater services, but with emphasis on enterprise budgets, the trend is toward greater reliance on user charges, making the “user pays” principle possible.

User charges

The theory of user charges is that people pay for what they use. There should be a close connection between services rendered and the charge imposed. Theoretically, fiscal discipline occurs if charges are enough to attract attention
and economic efficiency and equity in services are present. Efficiency means no waste: the user gets the service paid for and use of the public service is rationed accordingly. Electricity and phone service are examples of high charges, resulting in rationing of use in most cases. Until recently, water, sewer, and stormwater charges were not high enough to attract much attention, but as discussed in Chapter 1, this situation is changing.

Some “public utility” services can be metered, such as use of water, electricity, gas, transit service, and use of airports. Other services, such as public purposes, are hard to measure. The dominant ones are water quality management, air pollution control, and nontoll highway usage control.

Sometimes user fees are opposed because certain services bring social benefits that cannot be measured and charged for. A surprising example was opposition to water meters in Fort Collins, Colorado, as those who favored water rationing opposed meters, because they might allow discrimination against lower-income people. Of course, it would be the rate schedule that discriminated, not the meters, but the opposition occurred anyway.

When user charges do not cover services with public purposes, tax payments provide for redistribution of benefits to those who cannot afford the services.

Principles for user charges can be summarized as follows:\(^\text{10}\)

- They should be levied on beneficiaries of services.
- Prices or fees should be set at the incremental cost of providing the service, not the average cost.
- Peak load pricing should be used to manage demand.
- Special provisions should ensure access to services for low-income residents when burdens result from marginal-cost pricing.
- User fees should be responsive to inflation and to economic growth.

**Taxes and user charges**

In spite of the popularity of user charges, tax revenues remain a popular source of finance for infrastructure, particularly services in which it is difficult to identify beneficiaries. Major sources of tax revenues are property, income, and sales taxes. Property taxes are “ad valorem” taxes, calculated according to value of property. Income taxes are used at the state level, and sales taxes are often used at both the local and state levels.

User charges came into popularity after taxpayer revolts, such as Proposition 13 in California in the 1970s, and Colorado’s Tabor Amendment of the 1990s. The use of user charges can be viewed as a technique to get around tax limits or resistance to taxes.

In the 1980s, for example, Fort Collins created a stormwater utility that enables the city to collect both operating and capital fees on a monthly basis. The funds are used to improve systems on a basin-by-basin basis. In the beginning, these fees were about $2 per month per house, split about evenly between operating and capital charges. Now, they are higher and will
continue to rise. For example, in 2001, capital expenses were slated at about $4 million for 120,000 people, or about $8 per month per house. Operating expenses for the stormwater utility, including depreciation, were scheduled at another $3.5 million for 2001.\(^{11}\)

**Capital financing**

Capital funds should also come from appropriate sources. The AWWA capital financing manual discusses the capital financing strategies for water utilities, and its principles also apply to most wastewater utilities.\(^3\) Stormwater finance is somewhat different because of the nature of the service.

Revenues for capital funding might be generated internally or obtained from external sources. Internal sources are generated from user rates and other contributions, and external sources include debt and stock issues (for investor-owned utilities).

System development charges are usually based on developer contributions, and are a way to have growth pay for capital needs.

Which source to use depends on factors such as:

- Government or investor-owned utility
- Short- or long-term needs
- Current inflation rate and economic condition
- Credit rating
- Availability of alternative sources
- Public support for funding mechanisms

Using current revenues, or “pay-as-you-go” financing, is the most direct way to finance capital because of the administrative ease involved and lack of carrying charges. Pay-as-you-go financing can reduce interest, and is convenient for low-cost, short-term projects. It is easily understood by the public and politically acceptable. In a survey by the International City Management Association, current revenues were used for capital spending by 73% of the respondents.\(^{12}\)

Some ways to generate internal funds are using savings, enhancing revenue, and including depreciation as a cost. Savings would feature cost-cutting while maintaining constant income, and directing the additional funds into a capital reserve account. Revenue enhancements involve new or expanded sources, such as billing for water that was formerly lost or unbilled, and finding new sources of revenue such as system development charges and other developer contributions. Including depreciation is a valid way to raise rates by including a provision for depreciation of systems. This fund is then diverted internally to the capital reserve account.

One disadvantage of capital reserve accounts is that they make tempting targets when other priorities hit or a crisis occurs.

When using pay-as-you-go financing, an equity issue may arise. Current revenues come from today’s rate payers, and if the funds are used for
future facilities, today’s users pay for facilities that will be used by others. Debt financing, or pay-as-you-use financing, may be more appropriate in these cases.

System development charges isolate the cost to serve a particular segment of a system, and charge for it. They allow new users to buy into an existing system by paying a fair share. System development charges are also known as plant investment fees, impact fees, or developer contributions. They are used most frequently in medium- to large-size areas, areas with growth, and areas with scarce water supply. They assign cost of capacity growth to those causing the growth rather than existing customers.

Facilities most often financed with system development charges include backbone facilities such as source of supply, transmission, treatment, high-service pumping, and major transmission mains. Distribution mains might also be covered, depending on state statutes and local rules.

Though opposition from builders might arise, they might also like the program because expansion could possibly occur.

Consider a community water supply system with capacity for new developments. The fair cost of serving new development is charged through a system development fee for new development to purchase their share of the system, which was financed by existing users. The fee is normally paid by the developer and passed on to the homeowner.

For example, Fort Collins follows the principle of “growth paying its own way” to justify system development charges. Charges that have been in use are the following:

- Water plant investment fee
- Water rights acquisition charge
- Sewer plant investment charge
- Storm drainage fee
- Street oversizing fee
- Off-site street improvements
- Electric off-site and on-site fees
- Parkland fees

Debt financing is known as pay-as-you-use financing because funds are borrowed to construct facilities to be used in the future, while and after the debt is repaid. If the repayment period is the same as the life of the facility, then the facility is paid for by the time it needs replacing. We do not know the lifetimes of facilities in general, of course, and repair and rehabilitation may extend the originally planned life.

Several sources of debt financing are available to utilities. For short-term debt: bank loans, anticipation notes (for bonds, taxes, grants, and revenue), commercial paper, tax-exempt commercial paper, and floating-rate demand notes can be used. For long-term debt: general obligation bonds, revenue bonds, and government loans are good sources.
Revenue-secured debt is popular for capital financing. Roger Vaughan reported that revenue debt was nearly three times general obligation debt, a trend that is consistent with enterprise management.\textsuperscript{10} The ICMA survey showed that general obligation bonds were the second most popular form of capital financing, with 59\% of the respondents using them.\textsuperscript{12}

Other views, however, may prevail. Touche Ross & Company surveyed infrastructure financing, and their conclusion was that general obligation bonds and federal grants were best for financing facilities, with revenue bonds and special assessments next. Less than 30\% of those surveyed favored privatization, tax-increment financing, infrastructure banks, or other financing means.\textsuperscript{13}

The East seems to favor general obligation bonds and federal grants, and the West favors revenue bonds. While the guarantee of general obligation bonds is the faith and credit of the organization, the bonds are usually paid off with revenue. An organization requires taxing power to issue these bonds, and it makes sense to issue them when the project has community-wide benefits.

Revenue bonds are used when the revenues of a self-supporting project can be used to pay off the bonds. They can be issued by more entities than general obligation bonds, and are usually viewed as riskier, with higher interest rates. Infrastructure services such as water, power, buildings, solid waste, parking garages, airports, and other facilities that can be used for a fee are candidates for revenue bond financing.

Because revenue bonds are paid by dedicated revenues, user charges are required. Repayment schemes require that citizens have fair access to needed services. If charges are too high, or not well distributed, it may adversely affect the community’s ability to compete. The repayment of the debt will require funds to be allocated from revenues, usually from the operating budget, to retire the bonds.

The approach to debt financing is to determine how much money is needed and when, and to find the best deal with professional advice. Many firms vie to provide this advice.

Preparing for a bond issue is complex and expensive. This is one of the disadvantages of going into the bond market.

Several parties have roles in bonding arrangements. When bonds are sold, they are issued by the “issuer” who goes through the trustee to sell them to the bondholders. Revenues flow from users to the issuer and eventually to the bondholders.

In debt financing, statutory limits apply, with usual limits of about 10\% of the assessed value.

Development banks provide special loans for infrastructure. They occur in state and national governments or internationally. A development bank makes loans to assist in economic development, and infrastructure projects are one of the most common loans.

Development banks have regular loans and subsidized loans. A regular loan is repaid at market interest rates and a subsidized loan is repaid at less than market rates, perhaps even with no interest.
Because the development bank may not make money, depending on the subsidy, it is necessary to have make-up funds from supporting governments. The bank may also borrow from the bond market and repay according to practices of bond financing.

In the U.S., one response to financing infrastructure has been infrastructure banks. They are similar to development banks, except that they are focused on funds for infrastructure. A national infrastructure fund was also proposed, but not approved. Three state programs are New Jersey’s program, Massachusetts’ “Mass Bank,” and the Oklahoma program.

The state revolving funds used in water and wastewater are types of development banks. The EPA administers these funds and in 1999, for example, announced state subsidies of from $8 million to $80 million from an allocation of $823 million. This is based on a 20-year needs estimate of $139 billion to meet SDWA regulations and ensure delivery of safe water.14

Grants are another strategy to pay for infrastructure systems. The wastewater construction grants program, for example, financed some $40 billion in treatment facilities over 10 to 15 years. “Intergovernmental revenue,” as grants are sometimes called, is an important part of the financing of local infrastructure. In the ICMA survey, grants from both the federal and state governments were reported to be important parts of the financing picture. Another way to gain access to capital is to lease it.

Repaying debt relies heavily on rate income. Typically, bond holders like to have a coverage of 1.1 to 1.2 (meaning that operating revenue needs to be 110% to 120% of operating expenses, including debt service). The proportion of debt service to operating revenue depends on how far the utility (and the rate payers) are willing to raise rates to support more debt. Some communities want little debt and want to pay-as-they go, while other communities are willing to issue more debt, sometimes requiring 50% of revenue to service, which is very high.15

**Cost control**

Cost control is used for fiscal discipline and is a function of management at all levels. It requires careful attention to planning and approval of expenditures, as well as postaudits to determine how well investments in program and equipment paid off. It involves budgeting, accounting, purchasing controls, and auditing, and is aimed at making sure that full value is received for every dollar spent.

**Financial planning and projections**

All organizations must make projections of cash flows and balances to make sure their plans are viable. A method for financial planning was described by the Government Finance Research Center, with the following activities as shown in Figure 6.1.16
Revenue analysis to determine sources that are feasible
• Cost analysis to consider construction, operation, and maintenance, and costs such as regulatory programs, as well as to determine components of cost that can be allocated to different users (cost allocation)
• Institutional analysis to determine ability of existing or planned institutions to manage the program
• Ability-to-pay analysis to determine capability of the community and its citizens to bear the cost of the service; financial ratios of possible help here, as in limitation on debt as a percentage of assessed valuation
• Secondary impacts analysis to study economic, social, and environmental issues
• Sensitivity analysis to examine changes in outcomes that result from changes in the assumptions

Direct costs (wages, equipment, operation and maintenance expenses, depreciation, and capital expenses) are assignable to particular services. Indirect costs (central services such as computer and support services) cannot be assigned directly to services.

Financial planning and projections can be presented using projected financial statements that include the income statement, the cash budget, and the balance sheet. The income statement estimates differences between
revenues and expenditures over a period of time, usually one year. The cash budget can be used to show balances in shorter periods. The balance sheet shows changes in assets and liabilities over the accounting period.

In a public enterprise that recovers costs, the cash budget is the most important analysis instrument. The income statement and balance sheet require the use of accounting values such as depreciation and book value, and are used more by the accountant than the manager. This can change with greater attention to the linking of accounting and management, however. For the manager, the income statement can be a financial control and the balance sheet can display debt structure and capital information.

**Accounting for financial control and reporting**

Managers of programs and facilities interact with accountants, who are responsible for financial control through reports, checks, and balances. Accountants keep financial records and provide analysis to support decisions. Basic information on transactions is recorded through bookkeeping, which allows the preparation of financial statements and reports. These furnish information for managers, and furnish reports for boards of directors, customers, and regulatory agencies.

Information recorded by managers such as time sheets, vehicle logs, receipts, and other reports of daily operations are all part of the system of accounts. After the information is processed, it becomes the basis for financial reports, budgets, and needs assessments.

Accounting information for operations of infrastructure organizations is similar that of other organizations, requiring analysis of labor, materials, and other expenses. However, a heavy percentage of fixed assets and scant knowledge of them distinguishes infrastructure organizations from most other types of organizations.

**Basic principles of accounting**

Accounting is the process of using information to create financial records for businesses, government, and nonprofit organizations. While methods differ, most accounting principles apply to all types of organizations. Infrastructure involves mostly government accounting.

From the manager’s viewpoint, accounting methods track planning and control of financial operations. Journals, ledgers, and accounts are used to record transactions. When transactions occur, they are recorded in journals, from which they are posted to ledgers. The budget is the plan for expenditures; and cash flow analysis, the income statement, and the balance sheet track flows of funds.

In the course of a year, changes in the elements of the equation, mainly revenues and expenses, are recorded and appear on the income statement or operating statement. Under the accrual basis of accounting, transactions are posted when they occur, not necessarily when cash changes hands.
Information about assets and liabilities is presented on the balance sheet or statement of financial position. The difference between assets and liabilities is equity or capital, and this provides the basic accounting equation: assets = liabilities + equity. An asset can and should be amortized and depreciated over a period of time. How this is done is an important aspect of GASB 34, described later.

Double-entry accounting tracks debits and credits as they affect assets, liabilities, and equity. Bookkeeping, or the mechanics of accounting, shows how transactions become debits or credits to different accounts.

Rules of accounting

Accounting rules emanate from “Generally Accepted Accounting Practices” (GAAP), which are managed by the accounting profession through the Financial Accounting Standards Board (FASB). The Government Accounting Standards Board (GASB) was established in 1984 as a companion to FASB, and both are overseen by the Financial Accounting Foundation (FAF). Members of the FAF and the FASB are appointed by the American Institute of Certified Public Accountants and other financial organizations.

Prior to the existence of GASB, a National Council on Government Accounting (NCGA) set guidelines as a committee of the Government Finance Officers Association (GFOA), which was formerly known as the Municipal Finance Officers Association. Now, the GFOA acts in an advisory capacity to the GASB. Government accounting generally complies with GAAP, but also follows a group of special rules unique to government, established by the GASB.

For-profit utilities are regulated by state public utility commissions and are called “regulated utilities.” The U.S. has a number of regulated water supply companies, far fewer wastewater utilities, and essentially no regulated stormwater utilities, as government usually provides stormwater service. Financial reports of publicly held companies are also regulated by the Securities and Exchange Commission (SEC).

Principles of government accounting

Twelve principles of government accounting have been developed and published as Codification §1100 by the GASB. These are summarized here, with additional information about those related to infrastructure systems.

1. A government accounting system must fully disclose operations of the government unit and comply with GAAP and legal and contractual provisions.
2. Government accounting systems should be organized around “funds,” which are segregated to focus on special program operations.
3. Types of funds include the General Fund; Special Revenue Funds; Capital Projects Funds; Debt Service Funds; Enterprise Funds; and Internal Service Funds.
4. The number of funds should be minimized to eliminate undue complexity.
5. Accounts should distinguish between fixed assets and long-term liabilities in proprietary funds (enterprise funds) versus other funds.
6. Fixed assets should be accounted for at cost (historical cost).
7. Depreciation of fixed assets “should not be recorded in the accounts of governmental funds. Depreciation may be recorded in cost accounting systems or calculated for cost funding analyses, and accumulated depreciation may be recorded in the general fixed asset account group.” (See later discussion of GASB 34.)
8. The modified accrual or accrual basis of accounting should be used. This means that expenses and revenues are credited when they occur, rather than when the cash is received or disbursed, and that the financial reports will reflect a picture of the actual financial health at all times.
9. An annual budget should be used by every government unit.
10. Interfund transfers and proceeds of long-term debt should be recorded separately from fund revenues and expenses.
11. Common terminology should be used in budgets, accounts, and financial reports.
12. Financial reports should be prepared to facilitate management control, legislative oversight, and external reporting.

Management accounting

The field of management accounting refers to accounts produced for the internal use of managers. Whereas financial accounting emphasizes flows of money, management accounting should produce timely statements so that managers can make decisions about expenses and actions. But management accounting does not normally produce much information on fixed assets, because the information is not used much by managers. Rather, the situation is akin to what Peterson described: “…put it in, use, if it breaks repair it; if it breaks too many times, discard it and replace it.” Fortunately, although asset accounting has not stimulated the interest of accountants and managers, new attention to fixed assets has begun to replace this old attitude.

Accounting for fixed assets

Principles 5, 6, and 7 of Codification §1100 by the GASB relate to fixed assets, but have been modified with the introduction of GASB 34.

Accounting for assets requires that they be classified. They can be classified as tangible (fixed assets) or intangible. On balance sheets, assets are classified as current or noncurrent, which include property, plant, and equipment, sometimes called fixed or plant assets.

Thus the relevant assets are intangible and noncurrent, and often called fixed assets. The distinction among property, plant, and equipment is also...
used, with the word “plant” originating from manufacturing accounts. Fixed assets generally have three attributes: they are tangible; they have a life longer than one year; and they are of significant value.

In general, fixed assets have not received as much attention from accountants as current assets, which have more dynamic financial turnovers and greater effects on tax and profit reports. No comprehensive document has been published to bring all of the concepts of accounting for property, plant, and equipment together. Accounting boards offer courses on capitalization of assets, but they cover tax implications or valuation and do not discuss how to set asset policies and apply them within an organization.

Fixed assets are depreciated by accountants, but depreciation relates to tax obligations more than it does to condition of assets. In government accounting, including that of water, sewer, and stormwater units, depreciation of fixed assets used to be optional. Now, with GASB 34, accounting for them is required.

The GASB, which specifies the GAAP for government accounting, has created a separate category for infrastructure fixed assets, which are "immovable and of value only to the government unit." It authorized the nonreporting of these assets for entities other than enterprises. If accounted for, they will be in a general fixed asset account group (GFAAG), which is an auxiliary record to be maintained at historical cost. Depreciation accounting for such assets does not work well.

Currently, the Government Accounting Standards Board (GASB) requires government entities to report their capital assets in their annual balance sheet and income statement. GASB Statement No. 34 (GASB 34) was adopted in 1999 to identify costs of acquiring, owning, operating, and maintaining infrastructure. It gives governments the choice to adopt traditional methods of calculating depreciation based on historical costs or to adopt an asset management system. The chapter on asset management covers the procedures in more detail.

Accounting practices, then, are one of the main constraints on doing a better job in capital management. Raymond Peterson asked the key question: "Do you have in place a process that monitors the current condition, evaluates the future need for replacement, and brings to your attention needs to modify that plan?" He also wrote:

There is a need to emphasize that assets must be managed, not just purchased, used up, and replaced. The objective is to provide not only accounting for assets, but include that accounting in a process that will allow management to get the most out of the company’s investment. It has become obvious that there is a need to change the manner in which management approaches long-term tangible assets. The many production facilities built in the United States
are wearing out. Government infrastructures of roads, sewers, sidewalks, and utilities are all suffering from the concept of “put it in place and forget about it.”

In the past, managers found it necessary to provide separate records for property, plant, and equipment, and created records for insurance, security, utilization, and maintenance. Now it is easier to integrate accounting with other records by using computers. Thus, with the advent of computerized management systems, we are able to integrate information for financial and management uses. This may still, however, be difficult.

Accounting for fixed assets in the framework of management accounting is where the world of inventory begins. The accounting for public fixed assets (infrastructure) that are immovable and have value only to the government unit was optional until GASB 34. In the case of regulated utilities, the cost of assets is part of the rate base, and naturally attracts a lot of attention from regulatory commissions.

Financial statements

The GASB’s Principle 12 requires financial statements, and these are published in a comprehensive annual financial report (CAFR), which contains three parts: introductory, financial, and statistical.

The most common financial statements are the balance sheet, the statement of revenues, expenses and changes in retained earnings (income statement), and the statement of change in financial position.

The statement of revenues, expenses, and changes in retained earnings is similar to the annual water budget for which the report is of inflows, outflows, and change in storage.

The balance sheet is similar to the report of how much water is in the reservoir at the end of the year, along with how much is owed to users and how much is expected from others.

Accounts for regulated utilities

The National Association of Regulatory Utility Commissioners (NARUC) has a uniform system of accounts, and specifies categories for water and wastewater (see Chapter 9).

Audits

Auditing is an important control function because of its independence and objectivity. No matter how careful management is, it cannot be fully objective, and the outside auditor provides this objectivity. Auditing is an important tool for management, as it also provides management consulting services to make suggestions of how things can be done better.
To extend the traditional financial audit into the broader function of performance evaluation, the GAO has begun to use the term “performance audit,” understood to include three elements: financial, economic, and programmatic. The full definition of these three elements by the GAO is as follows:

1. Financial and compliance — determines (a) whether financial operations are properly conducted, (b) whether the financial reports of an audited entity are presented fairly, and (c) whether the entity has complied with applicable laws and regulations.

2. Economic and efficiency — determines whether the entity is managing or utilizing its resources (personnel, property, space, and so forth) in an economical and efficient manner and the causes of any inefficient or uneconomical practices, including inadequacies in management information systems, administrative procedures, or organizational structures.

3. Program results — determines whether the desired results or benefits are being achieved, whether the objectives established by the legislature or other authorizing body are being met, and whether the agency has considered alternatives which might yield desired results at a lower cost.6

**AWWA financial data**

Data maintained in the AWWA Waterstats database illustrates financial parameters of most interest to managers. Table 6.1 illustrates this data.23

<table>
<thead>
<tr>
<th>Table 6.1</th>
<th>Information in the AWWA Waterstats Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>Type of ownership</td>
</tr>
<tr>
<td></td>
<td>Services provided by utility</td>
</tr>
<tr>
<td></td>
<td>Retail and wholesale population served</td>
</tr>
<tr>
<td></td>
<td>Size of service area in square miles</td>
</tr>
<tr>
<td></td>
<td>Percentage estimate of water demand by the year 2000</td>
</tr>
<tr>
<td></td>
<td>Residential water bill by usage in gallons and total cost per year</td>
</tr>
<tr>
<td>Financial data</td>
<td>Total assets</td>
</tr>
<tr>
<td></td>
<td>Total liabilities</td>
</tr>
<tr>
<td></td>
<td>Total outstanding debt</td>
</tr>
<tr>
<td></td>
<td>Total capital reserve</td>
</tr>
<tr>
<td></td>
<td>Last year’s, this year’s, next year’s capital expenditure budgets</td>
</tr>
<tr>
<td></td>
<td>Total operation and maintenance expenses</td>
</tr>
<tr>
<td>Meter readers and billing</td>
<td>Total number of meter readers</td>
</tr>
<tr>
<td></td>
<td>Whether readers read water meters only or other utility meters</td>
</tr>
<tr>
<td></td>
<td>Average number of total meters read per day</td>
</tr>
<tr>
<td></td>
<td>Reading and billing cycles</td>
</tr>
</tbody>
</table>
### Financial management for water, sewer, and stormwater systems

#### Table 6.1 (continued) Information in the AWWA Waterstats Database

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metered and unmetered customers</td>
<td>Residential, commercial, and industrial water rate structures</td>
</tr>
<tr>
<td>Water billing</td>
<td>Number of meters using Automatic Meter Reading (AMR)</td>
</tr>
<tr>
<td></td>
<td>Whether billing is for water only or other utility services</td>
</tr>
<tr>
<td></td>
<td>Percentage of uncollected bills</td>
</tr>
<tr>
<td></td>
<td>Payment methods of water bills</td>
</tr>
<tr>
<td></td>
<td>Percentage of unbilled water from free service (municipal, fire fighting, street cleaning/hydrant flushing, main breaks, main leaks, or other services)</td>
</tr>
<tr>
<td></td>
<td>Customer inquiries per day</td>
</tr>
<tr>
<td></td>
<td>Number of employees who handle water-related service questions</td>
</tr>
<tr>
<td></td>
<td>Percentage of water inquiries related to billing, water quality, water service, or other</td>
</tr>
<tr>
<td>Water charges</td>
<td>Total connection charges of different meter sizes ($\frac{5}{8}$ to $\frac{3}{4}$ in., 1 in., 3 to 4 in., 6 in., and 8 in.)</td>
</tr>
<tr>
<td></td>
<td>Connection charge rate differential for outside city limits</td>
</tr>
<tr>
<td></td>
<td>Monthly customer costs for different volumes of water (3750 gallons, 7500 gallons, 75,000 gallons, 750,000 gallons, and 7,750,000 gallons)</td>
</tr>
<tr>
<td></td>
<td>Water usage rate differential outside city limits</td>
</tr>
<tr>
<td>Water production and sales</td>
<td>Annual water revenue and water delivered in millions of gallons</td>
</tr>
<tr>
<td></td>
<td>Other water-related annual revenue from connection fees, inspection fees, developer fees, and other revenue, including general fund transfers, interest earnings, penalties, etc.</td>
</tr>
<tr>
<td>Annual O&amp;M expenses</td>
<td>Annual operation and maintenance expenses for each utility</td>
</tr>
<tr>
<td></td>
<td>Number of full-time employees for five major accounts: source of supply, pumping, and transmission lines; water treatment and laboratory; distribution, pumping, and main maintenance; customer accounts, meter reading, billing, collections, and customer service; administration and general</td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>Capital expenditures over a 3-year period (last year, current year, and projected budget) for five major accounts</td>
</tr>
<tr>
<td>O&amp;M outsourcing</td>
<td>Operation and maintenance outsourcing or plans to add practice within 5 years for: water sources, water treatment, distribution and main maintenance, laboratory operations, meter reading, accounting and billing, collections, engineering, public information/involvement, customer service, fleet management</td>
</tr>
</tbody>
</table>
References

15. Smith, M., City of Fort Collins, personal communication, 6/29/01.