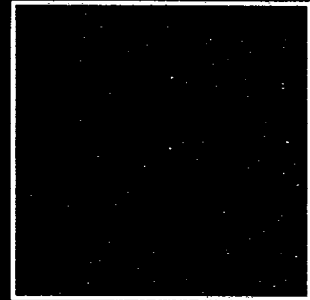
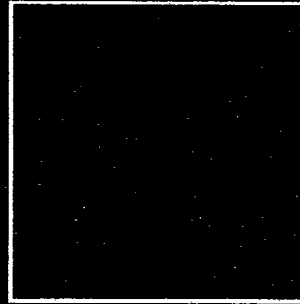




AMERICAN WATER WORKS ASSOCIATION

MANUAL OF WATER SUPPLY PRACTICES

Revenue Requirements

AWWA M35

Revenue Requirements

AWWA MANUAL M35

First Edition



American Water Works Association

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Introduction

The American Water Works Association Statement of Policy regarding "Financing and Rates," adopted by the AWWA Board of Directors on Jan. 25, 1965, and revised on Jan. 31, 1982, states in part: "The AWWA believes the public can be served best by self-sustained enterprises adequately financed with rates based on sound engineering and economic principles." This manual discusses the principles and practices involved in determining the revenue requirements for a self-sustaining water utility enterprise. In the United States, water service is provided through government-owned and investor-owned systems. Although the financing principles are similar under both types of ownership, there are numerous and distinct differences. This manual on revenue requirements addresses these differences.

This manual's principal purpose is to assist water utilities in developing adequate, fair, and equitable water rates by expanding on the revenue requirements section of AWWA Manual M1, *Water Rates*.^{*} Allocating total revenue requirements or costs of service among various classes of customers is a subject of AWWA Manual M1.

This manual addresses adequacy of revenues derived from rates. However, the concepts regarding adequacy of revenue measurement, which are discussed and shown here, apply to analysis of past utility performance (if such analysis is required).

The subject matter for Manual M35, *Revenue Requirements*, is presented in six chapters. A brief synopsis of each chapter follows.

Chapter 1 is an overview of the issues involved in the study of revenue requirements. The two generally accepted methods of determining revenue requirements, the "cash-needs" approach and the "utility" approach, are defined. The concept of a test year is discussed with an explanation of test years typically used by government-owned utilities as well as by investor-owned utilities.

Chapter 2 discusses the need for utilities to examine sources of revenues. Billing data and possible adjustments to historical usage patterns are often used to accurately estimate future revenue levels, and this is discussed in this chapter.

Chapter 3 defines and discusses operation and maintenance (O&M) expenses, including classifying O&M expenses, nonrecurring O&M expenses, and special considerations for government-owned utilities. In addition, projections for future years are included.

Chapter 4 presents local, state, and federal tax considerations. In addition, some of the factors involved in tax computation are discussed.

Chapter 5 presents the elements of capital-related costs for both government-owned and investor-owned utilities. Depreciation expense as a capital cost is discussed. Utility concepts of capital funding and rate base are also considered, including their function in determining revenue requirements. In addition, a discussion of components of rate base is presented, including adjustments that are

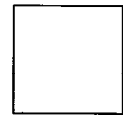
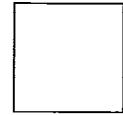
^{*}*Water Rates*, AWWA Manual M1, Denver, Colo. (1983).

typically used in determining rate base. The section on rate of return recognizes landmark court decisions as well as capital structure and the cost of debt and common equity.

Chapter 6 presents numerical examples of revenue requirements for both government-owned and investor-owned utilities to provide readers with simplified illustrations of revenue-requirement considerations.

Finally, a glossary of terms and definitions is provided. This is important in establishing the uniformity of terms used. This glossary may be used to supplement other rate and financing manuals published by AWWA.

The development of revenue requirements for a water utility, whether government-owned or investor-owned, may become a complicated matter requiring the input of qualified individuals with expertise in a number of disciplines, including accounting, economics, engineering, finance, law, and utility operation. This manual, while discussing the major components of revenue requirements, cannot be considered a complete text on the subject. It is a guide, but does not cover all applicable local policies, regulatory policies, state laws, and tax laws that must be considered when developing revenue requirements for a specific utility.



Chapter 1

General Concepts

In providing adequate water service to its customers, every water utility must receive sufficient total revenue to ensure proper operation and maintenance (O&M), development and perpetuation of the system, and preservation of the utility's financial integrity. The majority of total revenue requirements for most utilities are met from revenues derived from rates applicable to their customers. Other revenue not derived from rates may come from a variety of sources such as rentals, merchandising, and jobbing.

ADEQUACY OF REVENUES

Adequacy of water revenues can be measured by comparing revenue requirements to be met from rates with revenues under existing or authorized rates.

Length of Projections

Projections can be made for any length of time depending on the purpose of the projection. For budgetary purposes, utilities sometimes project only one year ahead, generally because one-year budgets are commonly adopted. From a revenue-adequacy standpoint, projections beyond 10 years tend to be quite speculative and are of questionable value. Usually a projection period of about five years is considered adequate. This period presents a reasonable forecast of anticipated future revenue needs, thereby assisting management, policymakers, and the public to foresee potential problems and to avoid surprise when future changes in rate levels are requested or announced. When a utility adequately plans ahead, five-year projections are typically sufficient to satisfy investors, bond-rating agencies, and others. These projections also give indications of the security of potential investment in the utility system.

Regardless of the projection period used, the utility should review its projections at least annually to incorporate recognition of changed conditions. A projection should be considered a living document subject to change as conditions change.

2 REVENUE REQUIREMENTS

Throughout this manual, the projection period is assumed to be the utility's next five fiscal years. However, the principles discussed and shown apply to any projection period appropriate for the particular circumstances at hand.

In making projections for more than one year, measures of adequacy (in terms of indicated annual deficiencies) do not necessarily imply that an immediate rate change sufficient to cover deficiencies for the entire projection period is required or recommended. Rate changes for only a portion of the projection period may be appropriate. Reference is made to the section in this chapter related to test-year determination for further elaboration of this point.

Other Adequacy Studies

The adequacy of water revenues is measured and studied to assist in the process of rate making for future service. Studies can be made for other purposes, including

- input for overall financial planning and budgeting;
- support for (often part of) documentation for issuance of debt securities to be financed from utility revenues; and
- measurement or evaluation of the adequacy of revenues in the past or future as a part of contractual, litigation, rate-proceeding, or other requirements.

Rate making and planning require projections of future revenue needs. The issuance of debt securities and contractual, litigation, or rate-proceeding requirements may necessitate both evaluation of past performance and projections of future adequacy.

APPROACHES TO REVENUE-REQUIREMENT PROJECTION _____

The two generally accepted and practiced approaches to projecting total revenue requirements of a water utility are the "cash-needs" approach and the "utility" approach. Each has a proper place in utility practice and each, when properly used, can provide for sound utility financing. A broad overview of the elements of revenue requirements to be considered under each of these two accepted approaches is presented in the following paragraphs. Subsequent chapters discuss each of the elements.

General Techniques

It is emphasized that, as discussed in AWWA Manual M1, it is acceptable to measure total revenue requirements using one approach, and subsequently, allocate those costs among customer classes using another approach. Historical data must be normalized and/or adjusted to reflect conditions that may not continue into the future. Such factors include but are not limited to those listed in Table 1-1. Each of these factors as well as other appropriate factors must be considered when making projections of revenues and revenue requirements.

It is expected that actual performance will vary from that projected. The intent of projections is to forecast, as nearly as practicable, the future revenue and revenue-requirement situation so that adequate, but not excessive, adjustments in revenue levels may be provided for the utility in a timely manner.

Cash-Needs Approach

The objective of the cash-needs approach for projecting revenue requirements is to ensure that utility revenues are sufficient to recover total cash needs for a given

Table 1-1 Normalization Factors

Factors Affecting Revenues	Factors Affecting Revenue Requirements
Number of customers served	Number of customers served
Customer water use	Customer water use
Rate changes	Nonrecurring sales
Nonrecurring sales	Weather
Weather	Conservation
Conservation	Use restrictions
Use restrictions	Inflation
Price elasticity	Interest rates
	Capital financing needs
	Changes to tax laws
	Other changes in operating and economic conditions

projection period. Generally, the cash-needs approach is used by government-owned utilities (except in a few states where regulation requires the use of the utility approach).

As used in this manual, the term "cash needs," as it applies to measuring revenue requirements of a utility, should not be confused with the accounting term "cash" as compared to "accrual" as an accounting method. Cash needs refer to the total revenues required by the utility to meet its cash expenditures, whereas the accounting term "cash" refers to revenues being recognized as earned when cash is received and expenses charged when cash is disbursed. The cash-needs approach to measuring revenue requirements of a utility may be evaluated on either the cash or accrual basis of accounting.

Generally, revenue-requirement studies using the cash-needs approach are simpler than studies using the utility approach. An important factor of the cash-needs approach, particularly when used by government-owned utilities, is the reliance on debt financing. Here debt indentures specify that sufficient cash is derived to meet cash expenditures, make deposits to specific reserve accounts, and meet stipulated debt-service coverage requirements.

Revenue-requirement components. Basic revenue-requirement components of the cash-needs approach include O&M expenses, debt-service payments, contributions to specified reserves, and the cost of capital expenditures that are not debt-financed or contributed. Depreciation expense is not included.

O&M expenses. The O&M expense component is usually projected based on actual expenditures and adjusted to reflect anticipated changes in expenditures during the projection period. Pro forma adjustments to historical O&M expenses are determined by incorporating known and measurable changes to recorded expenses, and by using well-considered estimates of future expenses.

Generally, O&M expenses include salaries and wages, fringe benefits, purchased power, other purchased services, rent, chemicals, other materials and supplies, small equipment that does not extend the useful life of major facilities, and general overhead. For a government-owned utility, other elements of O&M expense might also include the costs of support services rendered by the municipality, such as the use of computer facilities, assistance in collecting water bills, or office rental.

Debt-service payments and specified reserves. The debt-service component of the cash-needs approach usually consists of principal and interest payments on bonds or other debt instruments. It may also include debt-service reserve requirements as established by the indenture. Other reserves are often required to provide for emergency repairs and replacements, as well as for routine replacements and extensions. In addition to debt service and payments to reserve fund accounts, many utilities are required to provide net revenues sufficient to meet coverage on the bonded debt, particularly if revenue bonds are involved. Typically, coverage requirements specify that revenues be sufficient to meet O&M expenses and, as a minimum, to equal or exceed (by a stated percentage) the annual debt-service payments. Coverage requirements are a test of the adequacy of utility revenues and do not necessarily represent a specific cash requirement or funding obligation. The coverage requirements are intended to provide a measure of security for bondholders. As such, coverage requirements must also be considered in determining the total annual revenue needed to comply with the utility's debt covenant agreements.

Capital expenditures. Capital expenditures are generally classified into three broad categories: (1) normal annual (routine) replacement of existing facilities; (2) normal annual extensions and improvements; and (3) major capital replacements and improvements. A utility should periodically review and update its needs in each of these areas to recognize changing conditions. Projections for such needs are essential in developing overall revenue-requirement projections. Such projections of total capital needs should be accompanied by estimates of receipts of contributions from developers or customers, government grants, and other nonutility sources.

It is common practice in government-owned utilities to finance from current revenues: normal annual replacements, extensions, and improvements (such as meters, services, vehicles, smaller mains, and similar items that occur regularly each year).

Major capital projects are typically debt-financed. The repayment of the debt over a number of years distributes the capital costs over the term of the bonds. To some degree, this debt-financing approach results in a matching of customers' charges with the use of the facilities so that existing customers will not be paying 100 percent of the initial cost of facilities to be used in the future.

Other components. Other cash revenue requirements of a government-owned utility that may be financed from water system revenues include payments made to a municipality's general fund in addition to interdepartmental expenses for services rendered. Such additional requirements are unique to each local situation and should be considered where applicable.

Utility Approach

The utility approach to measuring revenue requirements is mandated for all investor-owned water utilities and mandated or permitted for government-owned utilities in states where the utility is under the jurisdiction of state commissions or other regulatory bodies.

The term "utility approach" or "utility basis" tends to have two uses in water utility rate making. One use involves the measuring of the revenue requirements of a utility—without concern for the allocation of those revenue requirements among classes of customers served. Utility-based revenue requirements may consist of O&M expenses, depreciation expense, return on rate base, and taxes and/or other payments to the municipality's general fund. The second use of the term "utility basis" in rate making is in allocating revenue requirements, or total costs of service to be derived from water rates, among the classes of customers served.

As described in AWWA Manual M1, the utility basis of cost allocation is an appropriate method for calculating the costs of service applicable to all classes of customers. It is particularly applicable to those customers located outside the geographical limits of a government-owned utility. When a government-owned utility provides service to customers outside its geographical limits, the situation is similar to the relationship of an investor-owned utility to its customers because the owner (political subdivision) provides services to nonowner customers (customers outside its geographical limits). In this situation, the government-owned utility, like an investor-owned utility, is entitled to a reasonable return from nonowner customers based on the value of its plant required to serve those customers. Some states have laws or guidelines intended to regulate the rates that government-owned utilities charge customers located outside their limits.

Projections for Government-Owned Utilities

For a government-owned utility, the total level of annual revenue required may be the same under either the cash-needs approach or the utility approach. The O&M expense component of total revenue requirements is usually the same under both approaches. Under the utility approach, the annual requirement for capital-related costs consists of two components—depreciation expense and return on rate base.

Depreciation. Depreciation is a real part of the cost of operating a utility, whether government owned or investor owned. Depreciation is the loss in value of facilities, not restored by current maintenance, that occurs in the property because of wear and tear, decay, inadequacy, and obsolescence. The annual depreciation-expense component of revenue requirements provides for the recovery of the utility's capital investment over the anticipated useful life of the depreciable assets. Therefore, it is proper that this expense be borne by the customers benefiting from the use of these assets during their useful lives.

Depreciation expense should be based on the depreciable plant investment that is in service during the period for which rates are being established. Because depreciation expense is a noncash requirement, the inclusion of depreciation expense in calculating revenue requirements provides the utility with funds that are available for use as a source of capital for system replacements, improvements, and expansions or for repayment of debt.

Return on rate base. The return component is intended to pay the annual interest cost of debt capital and provide a fair rate of return for the total equity capital employed to finance facilities used to provide water service. While the annual interest costs can be readily determined, the cost of equity capital is more difficult to determine. The return to the equity owner should be commensurate with the return in other enterprises having corresponding risks. Moreover, the return should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract and hold capital.

The utility basis of determining revenue requirements necessitates the establishment of a rate base, defined to be the value of the assets on which the utility is entitled to earn a return, and the setting of a fair return rate on the rate base. The rate base is primarily composed of the value of the utility's property devoted to serving the public. In addition, it is often proper to include an allowance in the rate base for working capital and construction work in progress (CWIP). On the other hand, contributions in aid of construction (CIAC), such as developer-donated facilities and other customer-supplied funds, are generally deducted from the utility plant in service for rate-base determination.

As previously mentioned, another element of utility basis revenue requirements for a government-owned utility may be payments to the general fund of the municipality.

Projections for Investor-Owned Utilities

The total annual revenue requirements of an investor-owned utility include O&M expenses, depreciation expense, income taxes, other taxes, and return on rate base. The O&M expenses, depreciation expense, and return on rate base for an investor-owned utility involve the same considerations discussed above for a government-owned utility using the utility approach.

Federal and state income taxes must be paid by an investor-owned utility and, therefore, are properly included in the determination of total revenue requirements. Other taxes, such as general property taxes and gross receipts taxes, must also be recognized.

Each state commission and regulatory body has its own rules, regulations, and policies for determining total revenue requirements. In preparing for any rate matter within a specific jurisdiction, it is essential that the procedures and policies of the regulatory body be determined and the utility be guided by them in the determination of its revenue requirements.

TEST YEAR

Revenue requirements are frequently expressed in terms of a test year for purposes of allocating costs and designing rates. Although rates are not required to be designed for a specific 12-month period, it is helpful to express financial information on an annualized basis. The test year may represent a specific 12-month period of time or it may be an annualization of a rate-design period of more than one year.

Test-year periods are usually of three general types—historical, current, and future. A “historical test-year period” is defined as a prior 12-month period or annual period for which actual operating data is available. A “current test-year period” may be defined as any 12-month period that includes both historical and projected data. A current test year usually includes not more than six months of projected data, but in some cases up to nine months of projected data is used. A “future test-year period” is defined as any 12-month period beginning after the date the rate changes are to be made.

Generally, government-owned utilities are free to set their own policies regarding test-year periods. However, investor-owned and some government-owned utilities, which are included under the jurisdiction of state public utility commissions, are subject to particular state legislative and regulatory practices that must be followed. These practices vary from state to state.

Government-Owned Utilities

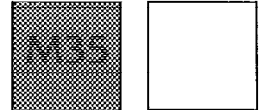
Government-owned utilities typically select a future test year in recognition of budgetary requirements and rates being designed for a future period. The test year may simply correspond to an upcoming fiscal year or represent the annualization of the period for which rates are intended to be effective. For example, if a projection of revenue requirements and revenues indicates that a 16 percent increase in revenues would meet the revenue requirements for a period of 24 months, then the utility may wish to use a test year that averages the revenue requirements and revenues for the 24-month period.

The selection of a test year for a government-owned utility may involve consideration of legislative or debt-indenture requirements. Certain government-owned utilities are required by their ordinance or governing instruments to establish rates and charges that are adequate to provide for specific revenue requirements and coverages for certain projected test periods. These generally require projections based on historical data to develop a future test year in evaluating the adequacy of revenues under proposed rates and charges.

Debt-related agreements may include provisions that could influence the selection of the test year. The specified debt-service coverage tests and conditions for the issuance of additional parity bonds must often be considered when selecting a test year. Some debt indentures specify that rates be enacted for each upcoming fiscal year for a specific period in the future.

Investor-Owned Utilities

An investor-owned utility must follow the established practices and policies of the applicable state public utility commission when selecting a test year. Many state regulations require the use of a historical test year, which may be adjusted for known or reasonably anticipated changes. Some state commissions allow a current test year that includes a combination of historical and projected data. Other state commissions may accept a future test year.



Chapter 2

Revenues

Revenues are the lifeblood of a water utility. Without adequate revenues, the quality of service will quickly deteriorate because of the lack of proper maintenance and system improvements.

SOURCES OF REVENUES

There are two basic sources of revenues available to a water utility—operating revenues and nonoperating revenues. Operating revenues include sales of water to general customers and other services that are usually provided under standard rate schedules or by contractual arrangements. Nonoperating revenues include merchandising and jobbing, gains or losses from sale of property, rental of nonoperating property, interest income, and other items not usually directly related to the provision of water service.

Additionally, in some government-owned utilities, transfers from the government-entity general fund are used as a revenue source to fund such items as debt service, various capital outlays, and, in some cases, O&M expenses. Utilities using such transfers are not considered to be adequately financed self-sustaining enterprises.

Revenue Classifications

Table 2-1 shows a list of typical revenue classifications. As noted in the table, sales to general retail customers may be subdivided into unmetered and metered sales (if applicable), and each category is usually further subdivided into customer classes such as residential, commercial, and industrial. Additional subdivisions or alternative classifications may include such categories as governmental, apartments, single-family, and multifamily dwellings—small, medium, and large.

Where applicable to government-owned utilities, each of these general water-service classes is considered separately as to whether it is inside or outside of the jurisdictional limits of the owning agency.

In looking at Table 2-1, sales for resale generally consist of deliveries to customer groups, such as suburban cities or water districts, on a wholesale basis

Table 2-1 Typical Revenue Classifications

Operating Revenues	Nonoperating Revenues	Contributions to Capital
<i>General Water Service</i>	Merchandising and jobbing	Developer and customer contributions
Unmetered sales to general retail customers	Rents from non-operating property	Grants in aid of construction
Metered sales to general retail customers	Interest and dividend income	
Sales for resale (wholesale service)	Gains or losses from disposition of property	
Other special sales	Tax revenues	
Private fire protection service	Transfers from other governmental funds	
Public fire protection service		
	<i>Other Nonoperating Revenues</i>	
<i>Other Operating Revenues</i>		
Miscellaneous service revenues		
Forfeited discounts		
Rents from water property		
Other water revenues		

through master meters. Other special sales may include irrigation, air conditioning, standby, off-peak, interruptible, and individual contract service where special rates may apply.

Private fire protection service revenues include charges for sprinkler-service connections, standpipes, fire hydrants, and other fire protection facilities located on the customers' premises. Public fire protection service revenues generally include the charges for service provided through public fire hydrants.

Miscellaneous service revenues include any revenues resulting from other services regularly provided by the utility. This includes revenues from charges for service turn ons or turn offs, special meter readings, temporary hydrant-use permits, new account charges, and collection-related charges.

Forfeited discounts include revenues from discounts foregone due to lack of timely payment of water bills. They can also include penalties assessed for late payment of water bills.

Rents from water property include rental income from the lease or rental of operating property and equipment. Other water revenues may include billings for outside agencies, gain on sale of materials, wheeling charges, or any other sources not covered by published rates. Utilities required or wishing to include service-connection fees or system-development charges (impact fees) as operating revenues could include them in other water revenues. However, if these items of revenues are significant, they should be accounted for separately. Service-connection fees and system-development charges are more properly included under nonoperating revenue (if considered as revenue). In the case of investor-owned utilities, these items have, in the past, normally been treated as contributions in aid of construction on the utility's books and not as a revenue item. However, under recent tax law changes, these items are treated as revenues for income tax purposes.

Merchandising and jobbing revenues are net revenues from sales of equipment and services rendered to customers. Water utilities rarely sell equipment and this account normally includes only net jobbing revenues. Jobbing includes such items as installation of customers' services on their premises, repairs to customers' services or plumbing, and any other type of construction or repair for which the utility charges the customer on a one-time basis. The utility credits this account with the amounts billed to customers for work and concurrently charges the account with the cost, including labor, materials, equipment use, labor overheads, taxes, and any other costs attributable to the work performed. In this manner, the net revenue from such operation is reflected in the account. The result can be either a gain or a loss to the utility depending on the utility's diligence in properly establishing charges related to jobbing work.

Rents from nonoperating property include rental income from utility property not used for operating purposes (such as the rental of buildings on land purchased to acquire water rights). If the utility has investments that earn interest or dividends, such income should be reported in the interest and dividend income account.

If a utility sells or otherwise disposes of an item of utility property, the net proceeds are reported as gains or losses from sale or disposition of utility property. The net gain or loss is measured by the net selling price less the net book cost (book cost less accumulated depreciation) of the property sold.

Developer and customer contributions consist of cash or property donated for plant construction, which may include one-time connection fees and system-development charges (impact fees) assessed to new customers. These fees and charges provide funds that are intended for purchase or construction of the utility plant. Connection fees normally are intended to cover the cost of the customer's service and tapping into the water main. Sometimes the cost of the customer's meter and meter installation is included. System-development charges are generally designed to help offset the capital cost of existing or future water supplies and other backbone plant required to provide service to a new customer. In both government-owned and investor-owned utilities, these items are generally accounted for as customer contributions in aid of construction. System-development charges paid to an investor-owned utility must be treated as revenues for income tax purposes under the provisions of the Tax Reform Act of 1986 (TRA-86).

Grants in aid of construction are usually considered to be contributions by the granting agency, such as the federal government or the state. Tax revenues usually consist of ad valorem or other taxes assessed for the benefit of the water utility. Transfers from other government funds are often considered to be similar to grants and are usually treated the same.

Other nonoperating revenues is an all-encompassing term for items of nonoperating revenues that do not warrant a separate individual accounting. Nonoperating revenues are considered to be "below-the-line" items, that is, they are not necessarily treated as available to meet the revenue requirements of the utility.

Historically, for investor-owned utilities, these revenues were not considered to be a part of the water system operations. Generally, water customers were not entitled to benefit from the gains, nor made to suffer the losses that resulted from nonoperating endeavors or investments of the utility. Recent rulings in some jurisdictions have provided for gains from land sales to be shared between customers and stockholders. However, many government-owned water utilities use nonoperating revenues to reduce the net operating revenue requirement. In a government-owned water utility, the customers within the owner jurisdiction are, in effect, the stockholders and may be entitled to have their rates reflect gains from such

nonoperating endeavors. However, these revenues are normally quite unstable and, therefore, cannot be relied on. Caution and diligence is necessary in forecasting nonoperating revenues if they are to be used to reduce the operating revenue requirement.

UNBILLED REVENUES

All water meters are not read and billed at the same time, since most water utilities cycle their billing. Under any cycle-billing system, there are unbilled revenues at the end of each accounting period representing the water sales from the last billing of each customer to the end of the accounting period. Thus, earned revenues do not equal the billed revenues for any accounting period. The difference between the unbilled revenues at the end and at the beginning of an accounting period is the accrued amount to be applied to the billed revenues to determine the earned revenues for the accounting period.

If there is no growth in number of customers, no rate change during the accounting period, and customer usage is stable, there will be little difference between earned revenues and billed revenues. However, if customer growth is significant or if a rate change is placed into effect during the period, the unbilled revenues at the end of the accounting period will likely be different from those at the beginning of the period. Therefore, this accrued amount may be large, and earned revenues may be significantly different from the billed revenues.

For rate-making purposes, the accrued amount must be excluded from base revenues because rate changes and customer growth are annualized and added to the billed revenues. Thus, if the accrual adjustment is not excluded, base revenues would be adjusted twice for rate changes and growth.

Some utilities bill service charges or minimum charges in advance. In such cases, there could exist some billed but unearned revenues at the end of each accounting period. Therefore, if the unearned revenues at the end of the accounting period exceed the unearned revenues at the beginning of the accounting period, a negative revenue accrual would result.

CASH VERSUS ACCRUAL REVENUES

Cash receipts are sometimes used as a basis for setting and adjusting water rates. However, most investor-owned water utilities and many government-owned utilities maintain their accounting records on an accrual basis. This provides a better matching of revenues and expenses and a more accurate assessment of the profitability of the utility than does cash-basis accounting.

Many government-owned water utilities operate on a cash basis of accounting due to bond indenture or other requirements. In recognition of the fact that cash revenues often lag accrued revenues, government-owned utilities must account for this lag in cash receipts and provide for it, particularly if they operate strictly on a cash basis of accounting.

PROJECTING REVENUE

In projecting revenue that may be available to the utility from the sources listed in Table 2-1, it is essential to first develop adequate historical data to serve as a basis for projecting future revenues.