Ratemaking 101 – Revenue Requirement

Utility Basis

- Operation and Maintenance
- Depreciation
- Taxes
- Return

Cash Basis

- Operation and Maintenance
- Debt Service
- Replacements, extensions, improvements
- Taxes
- Provision for major capital improvements from revenues

Source: AWWA Manual M-1

Points to Consider

Utility Basis

- Funds for debt service come from depreciation and ROI
- Assets must be "used and useful" to earn a return
- ROI highly dependent on utility circumstances (e.g. age, etc.)
- Excellent method for investor-owned utilities

Cash Basis

- Most common method for municipally-owned utilities in the U.S.
- Requires more judgment regarding balance between borrowing for capital improvements and pay-as-you-go
- Independent of prior investment in plant
- CIAC not an issue

Assuming equal efficiency in management, the amounts are independent of the type of ownership or control of the utility.

Taxes collected through revenue by the privately owned utility must include all taxes that the utility is obligated to pay to federal, state, and local governments. For publicly owned water utilities, the tax item may vary from none to most of the taxes required of the privately owned system, although in the publicly owned utilities where allowances are made for this item the amount is often limited to local taxes.

Depreciation allowances are based on annual percentages of the items of plant investment. The annual percentages, or rates of depreciation, are established at levels considered necessary to yield a dollar amount equivalent to the initial plant investment by the end of the useful life of the physical property. Under regulatory commission control, rates for depreciation are fixed or approved by order and are adjusted from time to time to accomplish their objective. Privately owned utilities generally use depreciation funds as a source of capital for replacements, and the balance may be invested in plant extensions.

Frequently, with growing publicly owned properties, rates of depreciation provide more funds than currently necessary for normal replacements. Any annual balance accumulated from this source may be used for extensions, major improvements, and debt retirement. Ultimately, in an inflationary economy, replacements will exceed depreciation appropriations.

The rate base and rate of return are determined by regulatory commission or court decisions for all utilities subject to such control. For publicly owned and locally controlled water utilities, such machinery is usually not available, and the determination of rate base and rate of return is made by local authorities, with or without the aid of consultants, accountants, or other experts. It is not uncommon, in such instances, for local authorities to determine rate base from recorded plant investment, which may reflect only actual cash expenditures for plant facilities without other legitimate elements such as administration, engineering, and legal costs; interest during construction; allowance for necessary working capital; and materials and supplies inventory.

Courts and regulatory commissions in the various states determine rate base quite differently. The methods range from original cost less depreciation, which is recent practice with many regulatory commissions, to reproduction cost less depreciation, which is required by statute in at least one state. Obviously, a regulatory commission must fix a rate base and rate of return for a utility that will assure an income sufficient to attract the capital necessary to maintain and develop the corporation.

For the publicly owned and locally controlled water utilities, the rate base and rate of return are usually not significant items in the matter of debt financing. Money is borrowed through the sale of general-obligation, special-assessment, or revenue bonds. General-obligation or special-assessment bonds have a lien on all or a portion of the property in the city and are not affected by the value of the

property or the rate of earnings of the water utility. Revenue bonds are secured by a lien on the earnings of the water utility, but the buyer is not especially interested in the value of the property involved. Rather, he is concerned with the net operating revenue available for interest and debt retirement.

If the revenue requirements of a publicly owned water utility are computed on the utility basis, the rate base and rate of return may be comparable to those of a privately owned utility. The various commissions and regulatory bodies view requirements differently and there are many variables in practice among them. In preparing for any rate matter for a specific utility it is necessary to be familiar with the practices of the regulatory agencies having jurisdiction.

Cash Basis

The revenue requirements of publicly owned water utilities generally are not premised on rate base and rate of return, but on the cash or budget requirements of the system as determined by local conditions and policies. A cash basis affords an alternative, and more realistic approach to the revenue problem for most publicly owned water utilities because these utilities are financed largely by serial bonds whose retirement must be provided for on an annual basis while they are outstanding. Publicly owned utility bonds generally are not refunded at maturity by additional borrowing, as with investor owned utilities, but are an obligation that must be met from annual revenues.

Another factor leading to the use of the cash basis is that publicly owned water utilities are not operated for a profit in the ordinary sense, but attempt only to cover total operation costs and to provide for investment in plant facilities.

The cash basis is similar to the budget basis of other city departments and, as such, is more easily explained and justified to city administrations. The total revenue should be based on detailed estimates of cash requirements supported by operating experience and knowledge of future needs.

The items to be included may be separated into basic and optional classifications. The basic items are operation and maintenance expenses; debt service requirements (interest, principal, and stipulated reserves); plant replacements; and normal plant extensions and improvements. The optional items are payments in lieu of taxes; appropriations for major improvements, or reserves therefor; and contributions to other city departments—the last sometimes taking the form of free water service. Coverage requirements on revenue-bond debt service also should be considered. The basic items cover the essential requirements with which no water-utility manager, council, or commission will disagree in their entirety. The optional or additional items involve matters about which there may be wide differences of opinion and which, in the last analysis, are policy matters to be decided by local authorities.

The extent to which construction of major capital improvements should be financed from revenue or from bonds is quite often an area of controversy. If the

decision is made to cash-finance all or part of these expenditures from rate revenues, that amount must be included with the other basic items in establishing the total annual revenue requirement.

Debt requirements generally should include the current interest and principal payments on all outstanding general-obligation and revenue bonds used in financing construction of water utility property. Additionally, many bond indentures, particularly for revenue bonds, specify that a separate bond reserve fund be established, and until its requirements are fulfilled, the annual cash needs of the reserve fund are a part of the overall debt requirement of the utility.

Estimates of revenue required for replacements should be sufficient to provide for the current renewal and replacement of such units of equipment and property that are no longer serviceable. The allowance for normal or routine extensions and improvements should cover year-to-year costs for small main extensions, services, meters, hydrants, valves, and similar minor items, but should not include the cost of major improvements. Normal extensions and improvements, together with replacements, often may be substantially equivalent to depreciation allowances. It should be emphasized that although depreciation accounting and accrued depreciation are properly recognized for publicly owned systems, the annual depreciation expense is not a part of the annual revenue requirement under the cash basis.

The provision for payment by the water utility of local taxes and for payments in lieu of taxes depends on local policy and will vary widely among the utilities. If a utility makes payments in lieu of all taxes, the governmental units should make appropriate payments to the utility to cover the costs of water use and fire-protection service.

If it is local policy to avoid debt either partially or entirely in meeting the cost of major improvements, a reserve or sinking fund may be created. This fund should be kept separate, carefully invested, and earmarked exclusively for major improvements to prevent diversion of money from the fund to other purposes. However, such a reserve may not be legal in some states, so the status of its propriety should be checked.

Diversion of water-utility funds to other city departments is the item among the optional additions to revenue requirements most subject to differences of opinion. Although the practice is common, its equity can be questioned when the diversion exceeds a payment in lieu of taxes, and recognition of costs for fire protection and other services rendered by the water utility. The inherent danger in such a practice is that it may afford an opening for further claims on water-utility revenue.

Illustrative Applications

The following examples illustrate methods of determining revenue requirements using both the utility and the cash bases. The first set of figures shows

revenue requirements for a publicly owned system assuming annual operation and maintenance expense of $259,000; an investment in plant of $8,400,000; a rate base recognizing depreciated plant investment and working capital of $6,300,000; an annual debt service requirement amounting to $214,000 based on equal annual principal and interest payments on an assumed $4,200,000 indebtedness and 30-yr. serial bonds bearing an average annual interest rate of 3 per cent; and a requirement for normal annual replacements, extensions, and improvements of $140,000. It is assumed that the water utility makes a payment in lieu of taxes equal to 3 per cent to the depreciated plant value, or $189,000, and is undertaking a major capital improvement program to be financed partially from current revenues and partially from bond funds. Provision for the partial financing of major improvements from revenues will add $150,000 per year to the revenue required.

On the cash basis, annual revenue requirements would be

Operation and maintenance	$259,000
Debt service	214,000
Annual requirement for replacements, extensions, and improvements	140,000
Taxes	189,000
Provision for major capital improvements from revenues	150,000
	$952,000

It should be pointed out that a properly expressed cash basis for determining revenue requirements results in a minimum level of revenue on which the water utility may continue to operate and provide adequate service.

On the utility basis, for the same publicly owned water system, annual revenue requirements would include depreciation and return in addition to the cash-basis elements of operation and maintenance and taxes. Annual revenue requirements would be as follows:

Operation and maintenance	$259,000
Depreciation ($8,400,000 × 1 1/2 per cent)	126,000
Taxes ($6,300,000 × 3 per cent)	189,000
Return ($6,300,000 × 6 per cent)	378,000
	$952,000

Annual depreciation allowances vary among utilities depending upon the amount of investment in each of the various types of system facilities, and the rate of depreciation established for each type of facility. The provision for depreciation is based on an assumed average rate of 1 1/2 per cent of total plant investment, which amounts to $126,000 for the assumed example conditions.

In order to meet the total cash requirements of the utility, the required level of