

Principles of Water Rates, Fees, and Charges

AWWA MANUAL M1
Sixth Edition



**American Water Works
Association**



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Contents

List of Figures, ix

List of Tables, xi

Foreword, xv

Acknowledgments, xvii

Introduction, xix

Section I Introduction, 1

Chapter I.1 Overview of Cost-Based Water Utility Rate Making 3

Introduction, 3

Objectives of Cost-Based Rate Making, 4

Overview of the Generally Accepted Rate-Setting Methodology, 4

Overview of the Key Technical Analyses Associated With Cost-Based
Rate Making, 5

Other Water Rate Issues and Considerations, 6

Section II Revenue Requirements, 7

Chapter II.1 General Concepts for Establishing Revenue Requirements . . . 9

Adequacy of Revenues, 9

Approaches to Projecting Revenue Requirements, 10

Test Year, 11

Chapter II.2 Revenues 19

Sources of Revenue, 19

Cash Versus Accrual Revenues, 21

Unbilled Revenues, 22

Projecting Revenue, 22

Example, 24

Chapter II.3 Operation and Maintenance Expenses 27

Classifying O&M Expenses, 28

Identifying Nonrecurring O&M Expenses, 28

Identifying Capitalized O&M Expenses, 29

Identifying Special Considerations for Government-Owned Utilities, 29

Estimating O&M Expenses, 30

Example, 30

Chapter II.4 Taxes	33
Local Taxes, 33	
State Taxes, 34	
Federal Taxes, 34	
Tax Issues in Rate Cases, 35	
Chapter II.5 Capital-Related Costs.....	39
Cash-Needs Approach, 39	
Utility-Basis Approach, 43	
Rate of Return, 46	
Capital Structure, 47	
Chapter II.6 Examples of Revenue Requirements	51
Government-Owned Utilities, 51	
Investor-Owned Utilities, 54	
Section III Cost Allocation, 57	
Chapter III.1 Allocating Revenue Requirements to Cost Components ...	59
Assignment of Revenue Requirements to Functional Costs, 60	
Allocation of Functionalized Costs to Cost Components, 61	
Special Considerations, 71	
Chapter III.2 Distributing Costs to Customer Classes.....	75
Customer Classes, 75	
Units of Service, 77	
Distributing Cost Components to Customer Classes, 79	
Unit Costs, 80	
Distributing Costs to Customer Classes: Base-Extra Capacity Method, 83	
Distributing Costs to Customer Classes: Commodity-Demand Method, 85	
Section IV Rate Design, 89	
Chapter IV.1 Selecting Rate Structures	91
Planning the Rate Structure Study, 91	
Rate Structure Variables and Considerations, 94	
Summary, 96	
Chapter IV.2 Uniform Rates.....	97
General Considerations, 97	
Historical Perspectives, 98	
Advantages and Disadvantages, 99	
Example, 100	
Summary, 101	

Chapter IV.3 Decreasing Block Rates	103
General Considerations, 103	
Historical Perspectives, 104	
Advantages and Disadvantages, 105	
Determining Decreasing Block Rates, 107	
Example, 107	
Summary, 109	
Chapter IV.4 Increasing Block Rates	111
General Considerations, 111	
Historical Perspectives, 112	
Advantages and Disadvantages, 113	
Setting Block Size and Pricing, 114	
Examples, 115	
Summary, 116	
Chapter IV.5 Seasonal Rates	117
General Considerations, 117	
Historical Perspectives, 119	
Advantages and Disadvantages, 120	
Determining Seasonal Rates, 121	
Examples, 123	
Summary, 125	
Chapter IV.6 Water-Budget Rates	127
General Considerations, 128	
Historical Perspectives, 129	
Advantages and Disadvantages, 129	
Implementation of Water-Budget Rates, 131	
Example of Water-Budget Rate, 136	
Summary, 136	
Chapter IV.7 Fixed Charges	137
General Considerations, 137	
Fixed Charges, 138	
Summary, 140	
Chapter IV.8 Rates for Fire Protection Service	141
Historical Perspectives, 142	
Public Versus Private Fire Protection, 144	
Determining Fire Protection Costs, 145	
Rate Design, 148	
Emerging Issues, 152	

Section V Other Rate Issues, 155

Chapter V.1 Outside-City and Wholesale Rates.....157

- Introduction, 157
- Benefits From Providing Outside-City Service, 158
- Nature of the Relationship, 158
- Overview of Outside-City Rate Methodologies, 159
- Implementation and Administration Considerations, 169
- Stakeholder Involvement and Public Communications, 171
- Summary, 172

Chapter V.2 Standby Rates.....173

- General Considerations, 173
- Historical Perspectives, 174
- Advantages and Disadvantages, 174
- Example, 176
- Summary, 176

Chapter V.3 Drought and Surcharge Rates177

- General Considerations, 177
- Historical Perspectives, 179
- Advantages and Disadvantages, 179
- Determining Rate Surcharges, 180
- Determining Drought Surcharges, 181
- Drought Surcharge Considerations, 181
- Drought Surcharge Example, 185
- Summary, 187

Chapter V.4 Low-Income Affordability Rates189

- Introduction, 189
- Defining Affordability, 190
- General Considerations, 190
- Historical Perspectives, 194
- Policy Issues, 194
- Defining Affordability, 194
- Advantages and Disadvantages, 196
- Example, 196
- Summary, 198

Chapter V.5 Negotiated Contract and Economic Development Rates ...199

- General Considerations, 200
- Historical Perspectives, 204
- Advantages and Disadvantages, 204
- Negotiated Contract Rate Example, 206
- Economic Development Rate Example, 207
- Summary, 209

Chapter V.6 Indexed Rates.....	211
General Considerations, 211	
Advantages and Disadvantages, 212	
Example, 213	
Summary, 213	
Chapter V.7 Price Elasticity.....	215
General Considerations and Policy Issues, 216	
Historical Perspectives, 216	
Examples, 218	
Summary, 219	
Chapter V.8 Marginal Cost Pricing	221
General Considerations, 221	
Practical Considerations, 222	
Advantages, 224	
Disadvantages, 225	
Summary, 226	
Chapter V.9 Miscellaneous and Special Charges.....	229
Definition of Charges for Services, 230	
Example, 231	
Legal Authority for Service Charges, 231	
Selecting and Implementing Charges, 231	
Cost Basis and Rationale for Miscellaneous and Special Service Charges, 234	
Determining the Cost of Providing Service, 234	
Example Service Charges, 237	
Summary, 248	
Section VI Capacity and Development Charges, 251	
Chapter VI.1 Connection and Customer Facility Charges, 253	
Allocating Costs, 255	
Capital Cost Component, 256	
Calculating Connection and Customer Facility Charges, 257	
Examples, 258	
Chapter VI.2 System Development Charges, 261	
SDC Financial Goals and Objectives, 262	
Legal Issues Related to Methodology, 263	
Methods of Calculating SDCs, 265	
Examples of SDC Methodologies, 266	
Other SDC Technical and Administrative Issues, 275	
Administrative and Accounting Procedures, 278	
Updates of the SDC Analysis, 279	

Chapter VI.3 Availability Charges281

Section VII Implementation Issues, 283

Chapter VII.1 Public Involvement in Rate Making.....285

General Considerations and Policy Issues, 285

Historical Perspectives, 286

Public Involvement Planning, 287

Communications Tools, 291

Evaluating Communications, 293

Summary, 293

Chapter VII.2 Legal Considerations.....295

Jurisdiction of Economic Regulation of Water Utilities, 295

General Legal Standards, 296

Factors Used to Determine Unreasonably Discriminatory Rates, 297

Selected Court Decisions, 299

Summary, 301

Chapter VII.3 Data Requirements303

Customer Records, 303

Plant Investment, 307

Operation and Maintenance Expenses, 307

Reserves, Revenue Stability, and Sufficiency, 308

Customer Survey Information, 308

Summary, 308

Appendixes, 311

Appendix A Development of Peaking Factors by Customer Class313

Appendix B Equivalent Meter Ratios.....323

Appendix C Bill Tabulation Methods.....327

Appendix D Example of Citizens Advisory Committee Guidelines.....335

Glossary, 337

Index, 347

List of AWWA Manuals, 359

Section I

Introduction

I.1 Overview of Cost-Based Water Utility Rate Making



Chapter I.1

Overview of Cost-Based Water Utility Rate Making

INTRODUCTION

Establishing cost-based rates, fees, and charges is an important component in a well-managed and operated water utility. Cost-based rates provide sufficient funding to allow communities to build, operate, maintain, and reinvest in their water system that provides the community with safe and reliable drinking water and fire protection. Properly and adequately funded water systems also allow for the economic development and sustainability of the local community. The purpose of this manual is to discuss standard practices in financial planning and rate making that a utility can use to establish cost-based rates, fees, and charges to recover the full costs associated with their water system.

The methods and analyses used to establish cost-based rates, fees, and charges have a long history within the water utility industry. Operators of some of the earliest water systems recognized the need for sufficient funding and rates to properly operate, maintain, and expand their water systems. The American Water Works Association (AWWA) appointed the Committee on Water Rates in 1949. As time passed, the utility industry recognized the need for a manual of standard practice. Through the work of this committee, the first AWWA M1 manual, *Water Rates Manual*, was published in 1954. Many of the same concepts, methodologies, and analyses used in 1954 remain relevant today. As time has passed, the AWWA M1 manual has been updated and expanded to reflect the changing industry and its current financial and rate issues. The development of AWWA's Sixth Edition of the M1 manual continues the efforts of many dedicated rate professionals to provide a manual of standard practice for the development and establishment of cost-based water rates, fees, and charges.

As a manual of standard practice, AWWA advocates the use of the generally accepted cost-based principles and methodologies for establishing rates, charges, and fees contained and discussed within this manual. Establishing cost-based and

equitable rates is technically challenging and requires, at some level, knowledge and understanding of finance, accounting, budgeting, engineering, system design and operations, customer service, public outreach and communication, and the legal environment as it may relate to setting rates, fees, and charges.

OBJECTIVES OF COST-BASED RATE MAKING ---

Water rates developed using the methodologies discussed in this manual, when appropriately applied, are generally considered to be fair and equitable because these rate-setting methodologies result in cost-based rates that generate revenue from each class of customer in proportion to the cost to serve each class of customer. Water rates are considered fair and equitable when each customer class pays the costs allocated to the class and thus cross-class subsidies are avoided.

While recovery of the full revenue requirement in a fair and equitable manner is a key objective of a utility using a cost-of-service rate-making process, it is often not the only objective. The following list contains the typical objectives in establishing cost-based rates:*

- Effectiveness in yielding total revenue requirements (full cost recovery)
- Revenue stability and predictability
- Stability and predictability of the rates themselves from unexpected or adverse changes
- Promotion of efficient resource use (conservation and efficient use)
- Fairness in the apportionment of total costs of service among the different ratepayers
- Avoidance of undue discrimination (subsidies) within the rates
- Dynamic efficiency in responding to changing supply and demand patterns
- Freedom from controversies as to proper interpretation of the rates
- Simple and easy to understand
- Simple to administer
- Legal and defensible

OVERVIEW OF THE GENERALLY ACCEPTED RATE-SETTING METHODOLOGY ---

This manual outlines the methodologies and analyses that are used to establish cost-based rates. As displayed in Figure I.1-1, the generally accepted rate-setting methodology includes three categories of technical analysis. The first is the revenue requirement analysis. This analysis examines the utility's operating and capital costs to determine the total revenue requirement and the adequacy of the utility's existing rates. Next, a cost-of-service analysis is used to functionalize, allocate, and equitably distribute the revenue requirements to the various customer classes of service (e.g., residential, commercial) served by the utility. The final technical analysis is the rate-design analysis. The rate-design analysis uses the results from the revenue

* Paraphrased from *Principles of Public Utility Rates*, James C. Bonbright, Albert L. Daniels, and David R. Kamerschen, Public Utilities Reports, Arlington, Va., Second Edition, p. 383–384.

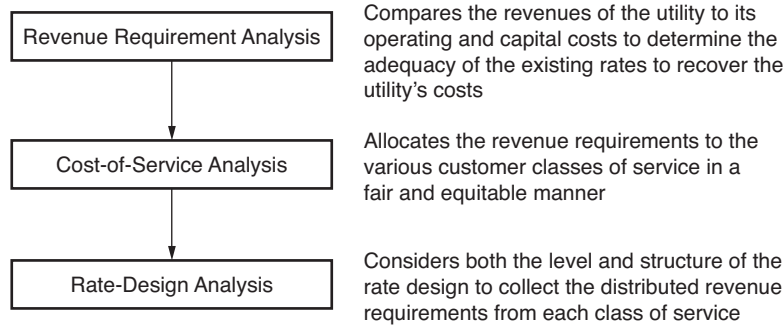


Figure I.1-1 Overview of the analytical steps of cost-based rate making

requirement and cost-of-service analysis to establish cost-based water rates that meet the overall rate-design goals and objectives of the utility.

A section of the manual has been dedicated to providing a detailed discussion of each type of analysis previously referenced. Section II of this manual discusses the various technical components of establishing a utility's revenue requirements. Section III discusses the various methodologies that may be used to conduct a cost-of-service analysis. Finally, Section IV reviews the various issues and technical considerations in designing water rates.

OVERVIEW OF THE KEY TECHNICAL ANALYSES ASSOCIATED WITH COST-BASED RATE MAKING

In establishing cost-based water rates, it is important to understand that a cost-of-service methodology does not prescribe a single approach. Rather, as the First Edition of the M1 manual noted, "the (M1 manual) is aimed at outlining the basic elements involved in water rates and suggesting alternative rules of procedure for formulating rates, thus permitting the exercise of judgment and preference to meet local conditions and requirements."^{*} This manual, like those before it, provides the reader with an understanding of the options that make up the generally accepted methodologies and principles used to establish cost-based rates. From the application of these options within the principles and methodologies, a utility may create cost-based rates that reflect the distinct and unique characteristics of that utility and the values of the community.

Revenue Requirement Analysis

The purpose of the revenue requirements analysis is to determine the adequate and appropriate funding of the utility. Revenue requirements are the summation of the operation, maintenance, and capital costs that a utility must recover during the time period for which the rates will be in place. There are two generally accepted approaches discussed in this manual for establishing a utility's revenue requirements: the cash-needs approach and the utility-basis approach. Section II of the manual provides a detailed discussion and numerical examples about how to establish a utility's revenue requirement using these two approaches, and this section provides a framework for determining how to select between the two approaches.

* AWWA M1 manual, *Water Rates Manual*, First Edition, 1954, p. 1.

Cost-of-Service Analysis

The purpose of the cost-of-service analysis is to equitably distribute the revenue requirements between the various customer classes of service served by the utility. The cost-of-service analysis determines what cost differences, if any, exist between serving the various customer classes of service. There are two generally accepted methodologies for conducting the cost-of-service analysis. They are called the base-extra capacity methodology and the commodity-demand methodology. The functionalization, allocation, and distribution process of the base-extra capacity and commodity-demand methodologies are generally considered fair and equitable because both approaches result in the revenue requirements being distributed to each class in proportion to each class's contribution to the system cost components. A discussion of both cost-of-service methodologies, along with numerical examples to illustrate their differences, are provided in Section III of this manual.

Rate-Design Analysis

The final technical analysis is the rate-design analysis. This analysis determines how to recover the appropriate level of costs from each customer class of service. There are different rate structures that may be used to collect the appropriate level of revenues from each customer class of service. Section IV of this manual covers the selection and development of rate designs in detail.

OTHER WATER RATE ISSUES AND CONSIDERATIONS _____

In addition to the topics previously discussed, this manual also contains guidance on a variety of other water rate and cost recovery issues, capacity and development charges, and water rate implementation issues. These topics are discussed in Sections V through VII.

Section V provides an overview of many distinct situations and pricing considerations that utilities may need to address. It is not unusual for a utility to face situations where a customer or group of customers has unique characteristics and circumstances. These situations include establishing inside- versus outside-city rates, standby rates, drought and surcharge rates, low-income and affordability rates, negotiated contract and economic development rates, indexed rates, price elasticity of rates, and marginal cost pricing. Regardless of the distinctive situation and pricing considerations, the cost-based principles and methodologies as discussed within this manual should be adapted for the cost analysis to provide proper support for the rates.

In recent years, the cost of system expansion and customer growth has had a significant financial impact on utilities. The development of cost-based connection fees, system development charges, or dedicated capacity charges are the topics reviewed in Section VI.

Finally, while cost-of-service principles for rate making and related fees and charges relies on significant amounts of financial analysis, engineering analysis, and policy decisions, it is necessary to engage the public and to understand the legal environment in which fair and equitable rates are set. These topics, along with the data needs for developing cost-based rates, are discussed in Section VII of the manual.