

Manual of Water Supply Practices

**M1**

# Principles of Water Rates, Fees, and Charges

Seventh Edition



American Water Works  
Association

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## Principles of Water Rates, Fees, and Charges

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# Preface



In 1954, AWWA published the report *Determination of Water Rate Schedules*, which later was issued as the first AWWA manual on water rates. Since then, AWWA Manual M1, *Water Rates*, has been updated several times, most recently in 2012. The fifth edition, titled *Principles of Water Rates, Fees, and Charges*, consolidated several previous publications into what has been referred to as the M1 Super Manual. For a more complete history of AWWA's rate manual publications, see "A Brief History of Water Rates Manuals and Publications—The New England Water Works' Involvement" in the December 2013 edition of the *NEWWA Journal*.

The issues associated with water rates and charges have continued to evolve, and this update of M1, the seventh edition, is a reflection of that evolution. For example, this edition makes current the numeric examples used throughout the manual, consolidates chapters where appropriate, and includes new material reflective of changes in the industry (e.g., chapter III.3, "Emerging Trends"). In the future, the AWWA Rates and Charges Committee will continue to update this manual as new issues and questions arise.

As with the other manuals prepared by the Rates and Charges Committee and AWWA in general, this manual will not prescribe a solution. Rather, it is intended to provide guidance and advice. The examples presented are used only to demonstrate the generally accepted methodologies discussed in this manual. The underlying data and assumptions are not endorsed or recommended either by AWWA or the Rates and Charges Committee for use elsewhere. The purpose of this manual is to describe and present issues associated with developing water rates, fees, and charges; to enumerate the advantages and disadvantages of various alternatives; and to provide information to help users determine water rates, fees, and charges that are most relevant to a particular situation.

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## **Editorial Committee**

*Chris Woodcock*, Chair of the M1 Seventh Edition Editorial Committee and Working Group, Woodcock & Associates, Northborough, Mass.

*Rick Giardina*, Chairman, Rates and Charges Committee, Raftelis Financial Consultants, Denver, Colo.

*Todd Cristiano*, Vice-Chairman, Hawksley Consulting, a Stantec Company, Denver, Colo.

*Paul Matthews*, Tualatin Valley Water District, Beaverton, Ore.

*Jeffrey Ripp*, Wisconsin Public Service Commission, Madison, Wis.

## **Contributors to the Seventh Edition**

*Roland Asp*, National Fire Sprinkler Association, Linthicum Heights, Md.

*Stacey Isaac Berahzer*, Environmental Finance Center University of North Carolina at Chapel Hill, Marietta, Ga.

*Ann T. Bui*, Black & Veatch Corporation, Los Angeles, Calif.

*Andrew J. Burnham*, Hawksley Consulting, a Stantec Company, Tampa, Fla.

*Tom Catlin*, Exeter Associates, Columbia, Md.

*Kees Corssmit* (retired), Geitner Environmental Management, Denver, Colo.

*Joe Crea*, Raftelis Financial Consultants, Cincinnati, Ohio

*Sanjay Gaur*, Raftelis Financial Consultants, Pasadena, Calif.

*Tom Gould*, HDR Engineering, Bellevue, Wash.

*Robert Grantham*, FCS Group, San Francisco, Calif.

*Kerry Heid*, Heid Rate & Regulatory Services, Newburgh, Ind.

*Cecelia Huynh*, Portland Bureau of Water, Portland, Ore.

*David Hyder*, Hawksley Consulting, a Stantec Company, Bowie, Md.

*Jennifer Ivey*, Carollo Engineers, Dallas, Texas

*Brian Jewett*, Black & Veatch, San Marcos, Calif.

*Theresa Jurotich*, CDM Smith, Seattle, Wash.

*Daniel Lanning*, Willdan Financial Services/Economists.com, Plano, Texas

*Bryan A. Mantz*, Public Resources Management Group, Maitland, Fla.

*James B. Marshall III*, Jackson Thornton Utilities Consultants, Montgomery, Ala.

*John Mastracchio*, ARCADIS U.S., Clifton Park, N.Y.

*Mike Matichich*, CH2M, Washington, D.C.

*Jason Mumm*, Hawksley Consulting, a Stantec Company, Broomfield, Colo.

*Robert Ori*, Public Resources Management Group, Maitland, Fla.  
*Kristin Rehg*, City of Evanston Utilities Department, Evanston, Ill.  
*Eric Rothstein*, Galardi Rothstein Group, Chicago, Ill.  
*David F. Russell*, Russell Consulting, Newburyport, Mass.  
*Robert P. Ryall*, Willdan Financial Services, Orlando, Fla.  
*Sean Senescall*, Tacoma Public Utilities, Tacoma, Wash.  
*David G. Shank*, San Diego County Water Authority, San Diego, Calif.  
*June Skillman*, Metropolitan Water District of Southern California, Los Angeles, Calif.  
*Kathryn Sorensen*, City of Phoenix, Phoenix, Ariz.  
*Angie Sanchez Virnoche*, FCS GROUP, Redmond, Wash.  
*John Wright*, Raftelis Financial Consultants, Greenwood Village, Colo.  
*Bill Zieburz*, Hawksley Consulting, a Stantec Company, Atlanta, Ga.

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# Introduction



During the last 20 years of the 20th century and now into the second decade of the 21st century, the cost of supplying potable water increased significantly. This rapid increase can be attributed to many factors, including the passage and implementation of the US Safe Drinking Water Act and corollary legislation in other countries, population growth, the need to develop more remote and expensive water supplies, the need to replace aging infrastructure, and rapid economic development in some areas. The amplified costs of meeting water quality requirements and utility plant needs have resulted in increased water rates and charges.

Historically, customers generally paid little attention to their water bills or the rate structure. However, as the rates and charges increased and water bills became a more significant percentage of customers' overall expenses, consumers have become increasingly interested in the rate-setting process. And with the heightened focus on conservation and water-use efficiency, water utilities are also recognizing the effect that rates and charges can have on customer use patterns.

With this recognition, new challenges in customer engagement, revenue stability, and the use of accepted cost-of-service and rate-design approaches become apparent. As the challenges of the industry change, so do the "tools" available, including how customers are charged for service. To this end, the types of rate structures used by utilities and discussed in this manual now include emerging trends in cost-based rate design.

In the past, rates were developed for broad classes of customers with similar usage patterns. With enhanced meter reading capabilities and more powerful billing software, water utilities are more able to tailor rates to individual customer use. The new data and faster computing abilities are enabling the development and implementation of new forms of rates that can better reflect the cost to serve customers and send proper economic signals for the use of our most precious resource.

This seventh edition of AWWA Manual M1 includes an update to the rates charged to retail and wholesale customers outside an "owning city's" boundaries (new section VI), an update to the rates for fire protection service (chapter IV.8), additional treatment of fixed charges and declining revenue (chapter IV.7), an update regarding system development charges (chapter VII.2), new guidance on the growing issue of affordability (chapter V.4), and new chapters on water reuse (chapter V.1) and emerging trends (chapter III.3). The chapter on legal considerations has been removed; readers are referred to AWWA's publication titled *Water Rates, Fees, and the Legal Environment* for more on that matter.

The AWWA Rates and Charges Committee believes that a utility's full revenue requirements should be equitably recovered from customers or classes of customers in proportion to the cost of serving those customers. However, the committee also recognizes that other considerations may, at times, be equally important in determining rates and charges and may better reflect emerging objectives of the utility or the community it serves, including water-use efficiency, revenue stability, and affordability.

The emergence of new rate and pricing policies has brought a continuing evolution in rate structures. In some cases, water rates and charges may have been adopted to achieve certain goals without a full understanding of the impacts or resulting implications. Some rate alternatives, if not properly designed, may even have effects that counteract what was intended.

This manual is intended to help policymakers, managers, and rate analysts consider all relevant factors when evaluating and selecting rates, charges, and pricing policies. It is a comprehensive collection of discussions and guidance on a variety of issues associated with designing and developing water rates and charges.

This manual contains eight sections:

- Section I provides an overview of the rate-setting process and the key steps in completing a cost-of-service analysis.
- Section II discusses the determination of revenue requirements.
- Section III presents the process in which costs are functionalized, allocated, and distributed to classes of customers as well as a discussion of emerging trends.
- Section IV presents various rate structures and how they are developed.
- Section V presents pricing alternatives related to specific customers or groups of customers and a number of rate-design considerations.
- Section VI is a new section devoted to matters associated with rates charged to customers outside a city's or owner's territorial limits, including both retail and wholesale rate considerations.
- Section VII discusses the derivation and implementation of capacity and development charges.
- Section VIII presents various implementation considerations and data requirements.

*Section I*

# Introduction

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

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Chapter **I.1**

# Overview of Cost-Based Water Utility Rate-Making

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 the 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 its 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. 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. (For a more complete history, see Woodcock 2013.) Many of the same concepts, methodologies, and analyses used in 1954 remain relevant today. As time has passed, AWWA Manual M1 has been updated and expanded to reflect the changing industry and its current financial and rate issues. The development of this seventh edition 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,