colorado waterwise

Guidebook of Best Practices

for Municipal Water Conservation in Colorado

SUMMARY

Colorado Water Conservation Board 1876 1937

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WATER ENGINEERING & MANAGEMENT

Acknowledgements

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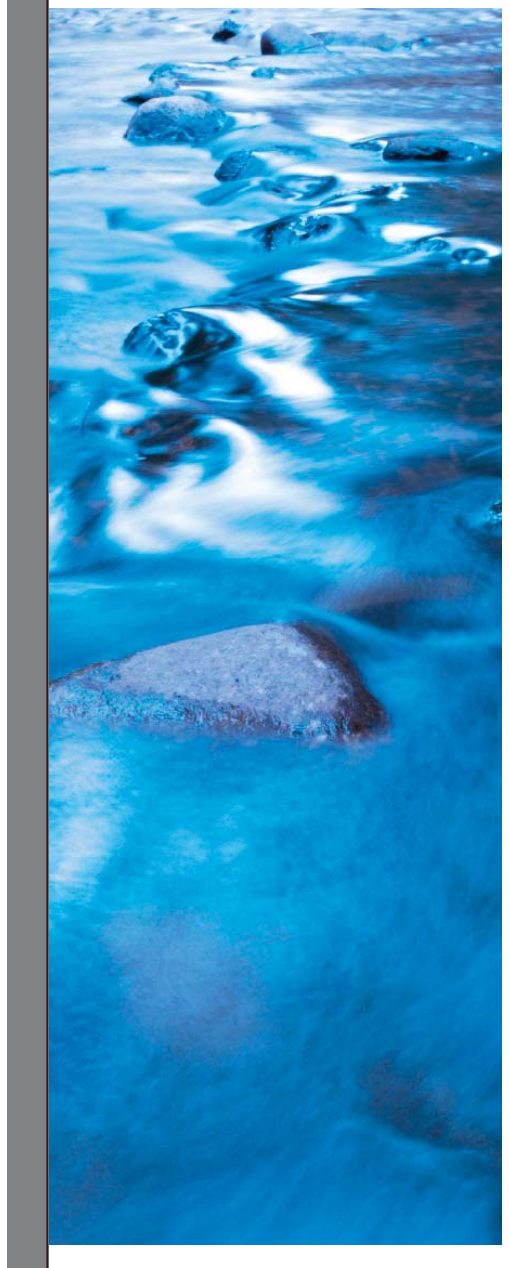
TABLE OF CONTENTS

Water System and Utility Best Practices

Outdoor Landscape and Irrigation Best Practices

Indoor Residential and Non-Residential Best Practices

Introduction



Experience in developing and implementing water conservation programs over the past decades has resulted in a body of knowledge in Colorado and across the United States. This knowledge, combined with experience, research, and analysis, has resulted in the development of "best practices" (aka best management practices), which are water planning, management and efficiency measures and policies designed to deliver proven water savings and improved water management.

The Colorado WaterWise *Guidebook of Best Practices for Municipal Water Conservation in Colorado* (*Best Practices Guidebook* for short) is a planning tool prepared for the purpose of improving and enhancing water efficiency in Colorado. The *Best Practices Guidebook* offers a detailed description of specific water conservation measures, program elements, regulations, policies, and procedures that can be implemented by Colorado water providers to help ensure reliable and sustainable water supplies for future generations.

This summary to the *Best Practices Guidebook* offers an introduction to the best practices and is intended as a companion piece to the full *Best Practices Guidebook* which is available for free download from Colorado WaterWise at http://colorado waterwise.org/.

Colorado WaterWise envisions that the *Best Practices Guidebook* will be used by water professionals including water providers, local governments, consultants, building managers, design engineers, green industry professionals, and others throughout the state to help select the most sensible and cost effective water conservation measures and programs to implement. Utilities can use the *Best Practices Guidebook* to help select water conservation program options to include in their conservation plans to be submitted to the Colorado Water Conservation Board (CWCB). Building trade professionals may use the *Best Practices Guidebook* to determine the most sensible water efficiency practices to implement in new construction projects and existing buildings. Others may find the *Best Practices Guidebook* a useful tool to increase water efficiency in their local community.

Preparation of the *Best Practices Guidebook* was made possible through grant funding from the Colorado Water Conservation Board. The *Guidebook of Best Practices for Municipal Water Conservation in Colorado* is an essential companion to the water conservation planning resources developed by the CWCB and can be used by water providers big and small to help select appropriate, cost effective water conservation program measures.

What are Best Practices?

Best practices are water planning, management, and efficiency measures and policies designed to deliver proven water savings and improved water management. In this guidebook, prepared specifically for Colorado, the best practices are designed to assist water

providers of all sizes to develop effective water conservation programs that deliver real demand reductions among existing customers and ensure new customers join the system with efficiency already "built in."

A best practice is intended to encompass a broader range of actions and activiies than a best management practice, although at the end of the day it is only a relatively minor semantic distinction. The authors have chosen the term "best practice" rather than "best management practice" because not all of the best practices described in the guide are directly related to management of water. Some of the best practices included describe methods to improve the efficiency of water use while others describe a regulatory framework that can be used to manage the demand of new and existing customers.

These Colorado-focused water conservation best practices were developed to fit into the Colorado Water Conservation Board's guidelines for preparing a water conservation plan. Each best practice is structured similarly with a clear definition that describes the practice itself as well as implementation techniques, scope, potential water savings, water savings estimating procedures, cost effectiveness considerations, and references to assist in implementation.

What is Included in the Guidebook?

The *Guidebook of Best Practices for Municipal Water Conservation in Colorado* includes the following elements:

- Detailed information on 14 selected best practice options including: implementation approach and methods, likely costs, anticipated water savings, and barriers and challenges.
- Guidance on prioritizing and selecting appropriate water conservation program tools and measures for different communities and situations.
- Descriptions of appropriate utility best practices for water management including conservation-oriented rate structures and utility water loss programs.
- Descriptions of appropriate end user (customer) indoor and outdoor best practice options for urban water conservation in Colorado.
- A resource guide for anyone seeking water conservation information, assistance, and financing in Colorado.
- A literature review of urban water conservation best management practices and best practice guidance documents developed in Colorado and elsewhere.

The best practices included in the guidebook were selected and carefully reviewed by a project advisory committee and a stakeholder committee each comprised of Colorado water conservation, water management, and green industry experts from all areas and sectors in the State. The authors and the review committees worked to ensure that the descriptions, information, and data provided in this guidebook are as accurate and complete as possible.

The Colorado WaterWise *Guidebook of Best Practices for Municipal Water Conservation in Colorado* is a planning tool prepared for the purpose of improving and enhancing water efficiency in Colorado.

BEST PRACTICE #1

BEST PRACTICE #1:
Metering, conservation-oriented rates and tap fees, and customer categorization within billing system

This best practice impacts the way utilities charge new customers when they join the system, bill their existing customers for the water they use, and understand who customers are and which customers might benefit from improved water efficiency. This best practice can also include advanced metering systems that provide leak detection and real time use data for customers.

Metering

Measuring use and billing customers for what they use is fundamental to all water conservation efforts. Colorado already has a mandatory metering requirement for systems with more than 600 taps (CRS 37-97-103). Customers who pay for how much water they use, consume less water. Adoption of smart meters, that can be used to notify customers of leaks and provide real time consumption information, is also encouraged.

Rate structure

A number of conservation-oriented pricing systems have been successfully implemented across the U.S., including water budget-based rates, increasing block rates, and seasonal rates. Utilities in Colorado that have implemented conservation-oriented rate structures include: Denver Water, Durango, Boulder, Fort Collins, Colorado Springs, Glenwood Springs, Aurora, and many others.

Tap or connection fees

Tap fees can be developed based on anticipated future demand. By tying tap fess to more efficient fixtures, developers are encouraged to implement water conserving fixtures and landscapes from the very beginning. Linking tap fees to water budgets will insure that the low demands projected when tap fees are paid will actually be observed over time.

Customer categorization and information

To effectively plan, implement and evaluate conservation more precisely, categorization of customers is highly encouraged. Residential customers can be categorized as single family or multi-family. Multi-family should include the number of units served by each tap. Non-residential customers can be categorized based on North American Industry Classification System (NAICS) codes. Having this information in the utility billing and customer information system is tremendously useful. This is not a water saver by itself, but is a foundational improvement that benefits a program over the long haul, and makes planning and evaluation more effective. This is very important if water budgets are going to be used.

This best practice impacts the way utilities charge new customers when they join the system, bill their existing customers for the water they use, and understand who customers are and which customers might benefit from improved water efficiency.

Estimated savings potential

Metering: 10 – 40% reduction vs. un-metered.
Rate structure: Varies by structure and rates. Reduction range = 0 – 30%.
Tap fees: Varies by method. Efficient buildings have been shown to use 30 - 70% less water. Linking tap fees to demands will encourage conservation.
Customer categorization: None.

BEST PRACTICE #2

BEST PRACTICE #2:
Integrated resources planning, goal-setting, and demand monitoring

Integrated resources planning (IRP) is a comprehensive planning effort that incorporates water conservation programs as another option for meeting future needs. IRP encompasses least-cost analyses of demand and supply options that compares supply-side and demand-side measures on a level playing field and results in a water supply plan that keeps costs as low as possible while still meeting all essential planning objectives.

Key components of integrated resource planning are:

- equal treatment of supply-side and demand-side options,
- clear objectives,
- consideration of supply-side and demand-side reliability,
- an open process,
- integrating engineering analysis with a range of policy objectives,
- a planning horizon or future design year,
- explicit consideration of uncertainty,
- demand monitoring.

Goal setting is part of the IRP process, but is important in its own right. Establishing demand management goals or targets provides a clear vision for the community and provides incentive for developing programs to meet the goals.

Demand monitoring provides regular feedback on consumption patterns in a utility. Tracking demands over time is essential for determining if a conservation program is achieving the desired results. Without demand monitoring there is no way to determine if a conservation goal has been achieved.

Estimated savings potential

A plan by itself doesn't save water. A utility without a conservation plan doesn't save water either.

BEST PRACTICE #3:
System water loss control

BEST PRACTICE #3

Water loss control is the practice of system auditing, loss tracking, infrastructure maintenance, leak detection and leak repair for water utilities. Leak detection and repair are familiar water agency practices, but true water loss control is more pragmatic than simply finding and fixing leaks. Auditing a water distribution system for real and apparent losses and evaluating the costs of those losses is the foundation of water loss control. Cost and benefit considerations drive implementation actions in the recommended methodology, described in detail in the American Water Works Association M36 Manual (2009).

Auditing a water distribution system for real and apparent losses and evaluating the costs of those losses is the foundation of water loss control. Real losses are actual physical losses of water due to leaks or other problems with the system. Apparent losses are due to meter inaccuracy, unauthorized consumption, and data handling errors. Cost and benefit considerations drive implementation actions in the recommended methodology, described in detail in the AWWA M36 Manual.

Water loss control represents the efforts of water utilities to provide stewardship and accountability in their operations and sets a positive example for customers. Water auditing and loss control give water utilities the potential to conserve significant volumes of treated water by reducing real losses and to increase revenue by reducing apparent losses. Water loss control is a foundational, cost-effective water conservation practice that should be implemented by all providers in Colorado.

Estimated savings potential

Water savings from water loss management programs depend entirely on the ongoing level of loss. It should be the goal of all water providers to limit real and apparent losses to economically efficient levels.

BEST PRACTICE #4:
Conservation coordinator

BEST PRACTICE #4

A conservation coordinator is critical for every utility aiming to reduce water demand. A "go to" person for water conservation is essential to the successful implementation and management of water conservation programs. For large water utilities, the job of water conservation coordinator is a full time job. Small utilities may not have sufficient resources to have a dedicated conservation coordinator. Small agencies should select a staff member who has other primary assignments to be the designated conservation coordinator – the person responsible for planning and implementing water conservation efforts.

Ideally, a conservation coordinator needs to have equal footing with other resource planning divisions. A conservation coordinator who cannot sit at the table with other managers will only coordinate what is given and not be part of the supply discussion.

Successful conservation programs need leadership. The fundamental responsibilities of a water conservation coordinator or program manager are to:

- Develop (or supervise development of) the utility's water conservation plan.
- Organize and direct implementation of the conservation plan.
- Track, monitor, and evaluate water conservation programs.

Estimated savings potential

A conservation coordinator alone doesn't save water, but a coordinator (or someone filling that role) is essential to successful plan and program implementation.

BEST PRACTICE #5:
Water waste ordinance

BEST PRACTICE #5

A water waste ordinance is a local regulation that explicitly prohibits the waste of water. Waste includes things such as irrigation runoff, irrigation that occurs on a prohibited day and/or time, leaks, use of inefficient fixtures and appliances, or use of wasteful commercial or industrial processes (i.e. poorly controlled cooling towers).

Conservation through ordinance can have limitations. Enforcement is a key piece of making an ordinance effective and enforcement requires staff resources. Additionally, some entities such as special districts may lack proper jurisdiction to enact a water waste prohibition ordinance.

A water waste ordinance is an important regulatory tool for water utilities that serves several useful purposes:

- Establishes the importance of wise water stewardship in a community and establishes a utility's intent to put its water resources to maximum beneficial use.
- Establishes penalties for the blatant waste of water. Such an ordinance empowers local officials to target hands-on assistance and education as well as issue warnings and fines.
- Provides an important regulatory "stick" during a drought when agency-wide restrictions are put in place and enforcement is required to ensure water supplies are adequate.
- Without a water waste ordinance, a utility may be powerless to act against egregious and profligate waste of water.

Estimated savings potential

Savings depend upon publicity and enforcement – much like traffic laws. Having an ordinance provides a legal basis for enforcement and drought management. It also aids in peak demand management.

BEST PRACTICE #6:
Public information and education

BEST PRACTICE #6

Public information and education encompass social marketing, school education, public outreach and education, and other information efforts aimed at raising awareness and fostering a culture of conservation and behavior change. An element of public information and education is required in nearly all other best practices in this guidebook. Central components of this best practice include effectively communicating the value of water, and delivering consistent and persistent messages. This best practice also includes measures to provide customers with timely information on their water consumption and alerts if unusual usage or leakage is detected. Water conservation programs cannot hope to succeed without a public information and education component. Sometimes public information by itself comprises a utility's entire water conservation program, but for most agencies it is the mortar that holds together all other program elements. Raising awareness about conservation and water use is fundamental to getting people to take the next step and doing something practical that saves water directly.

Conservation outreach programs help establish a culture of wise water stewardship which over time results in behavior change and effective action.

Estimated savings potential

Utilities should not rely on any water savings from a public outreach campaign alone. Conservation outreach programs help establish a culture of wise water stewardship which over time results in behavior change and effective action such as replacing inefficient fixtures and appliances. Successful conservation marketing efforts increase participation levels in other utility sponsored programs, such as landscape audits or rebates.

BEST PRACTICE #7

BEST PRACTICE #7:
Landscape water budgets, information, and customer feedback

Landscape water budgets address landscape water use and encourage efficiency. Water budgets compare actual metered consumption against the legitimate outdoor water needs of the customer based on landscape area, plant materials, and weather conditions. The customer is provided information about their irrigation practices and efficiency.

Information is power. Landscape water budgets provide essential information to help customers manage their water use:

- How much water was required?
- How much water was used?
- What is the efficiency of use at this site?

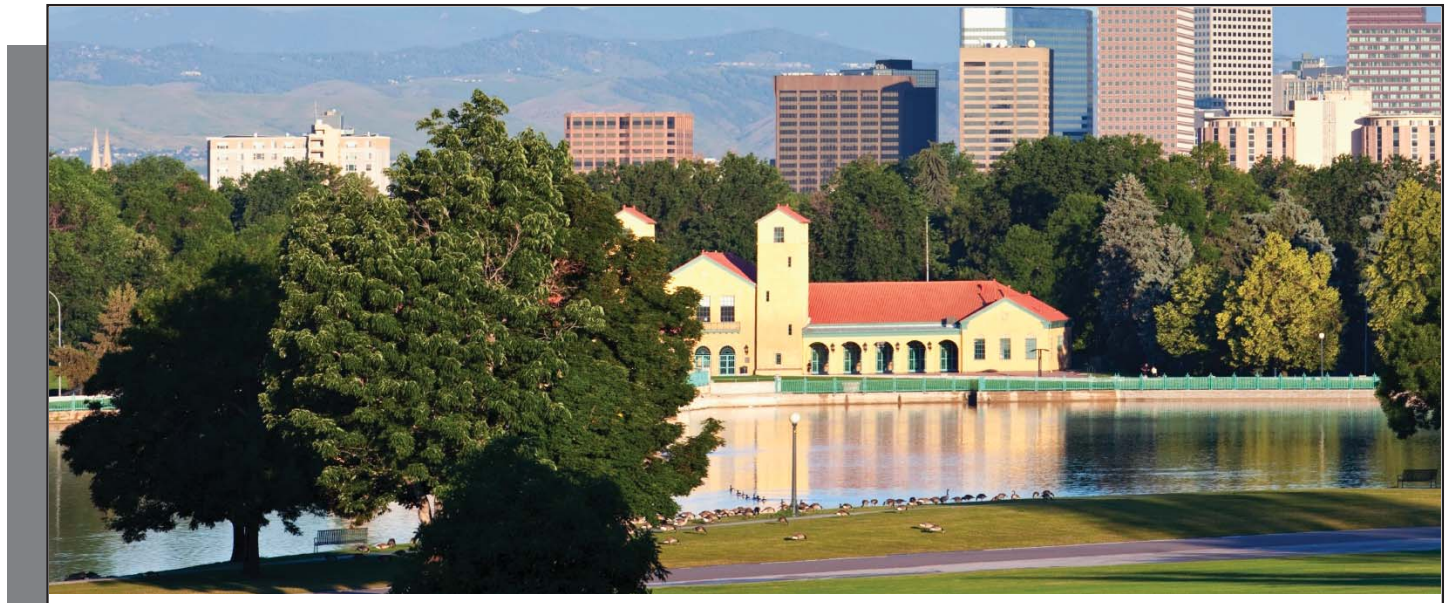
Because many landscapes, particularly turf, can accept excess irrigation without damage many irrigators are not aware of whether they are using water efficiently or grossly over-irrigating. A landscape water budget provides a reasonable target level of water use that is customized for each customer and landscape. Water budgets help water users better understand their consumption patterns and make sound decisions about how to best manage irrigation properly.

Water budgets provide utilities with a powerful tool for identifying which customers are over-irrigating and could most benefit from efficiency improvements. Water budgets can be incorporated into a utility rate structure as has been done in Castle Rock, Centennial Water and Sanitation District, and Boulder, but they are also useful in their own right outside of a rate structure as a tool for assessing water use.

Water budgets help water users better understand their consumption patterns and make sound decisions about how to best manage their property.

Estimated savings potential

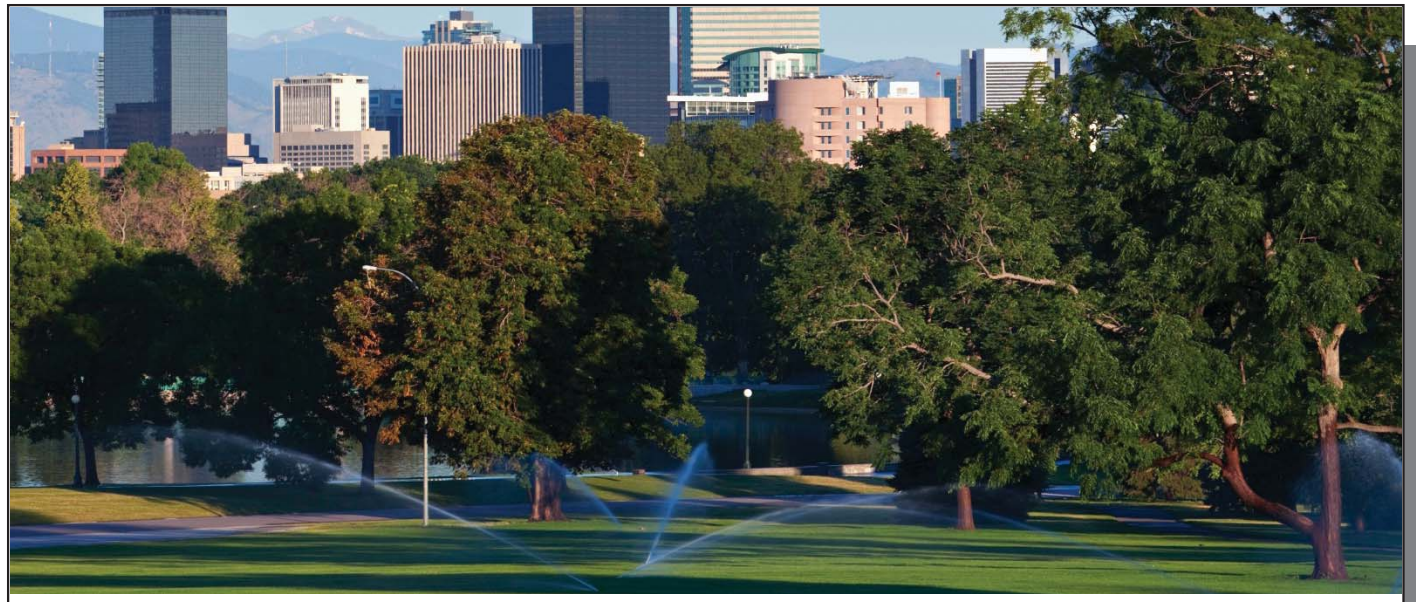
Varies. Many landscapes are already irrigated at an efficient level and for customers who use less than efficiency levels, budgets have the potential to increase consumption. Efficient irrigation practices have the capability of reducing landscape water by up to 35%. Water budgets, particularly when linked with an increasing block rate structure, can lead to significant reductions in water use. After implementing budget-based rates, Centennial Water and Sanitation District reported a 25% reduction in demand.



BEST PRACTICE #8

BEST PRACTICE #8:
Rules and regulations for landscape design and installation and certification of landscape professionals

The key concept of this best practice is creating landscapes that are "water smart from the start." Creating rules for new landscape and irrigation system design and installation is a relatively inexpensive way to affect landscape water use. Proper installation and maintenance are needed to create and maintain water-efficient irrigation. A second powerful tool is minimum training requirements and certification for landscape irrigation professionals. These requirements can function in concert as trained and certified professionals are in the best position



In Colorado, urban landscape irrigation accounts for 40 percent or more of the total annual water demand for a utility.

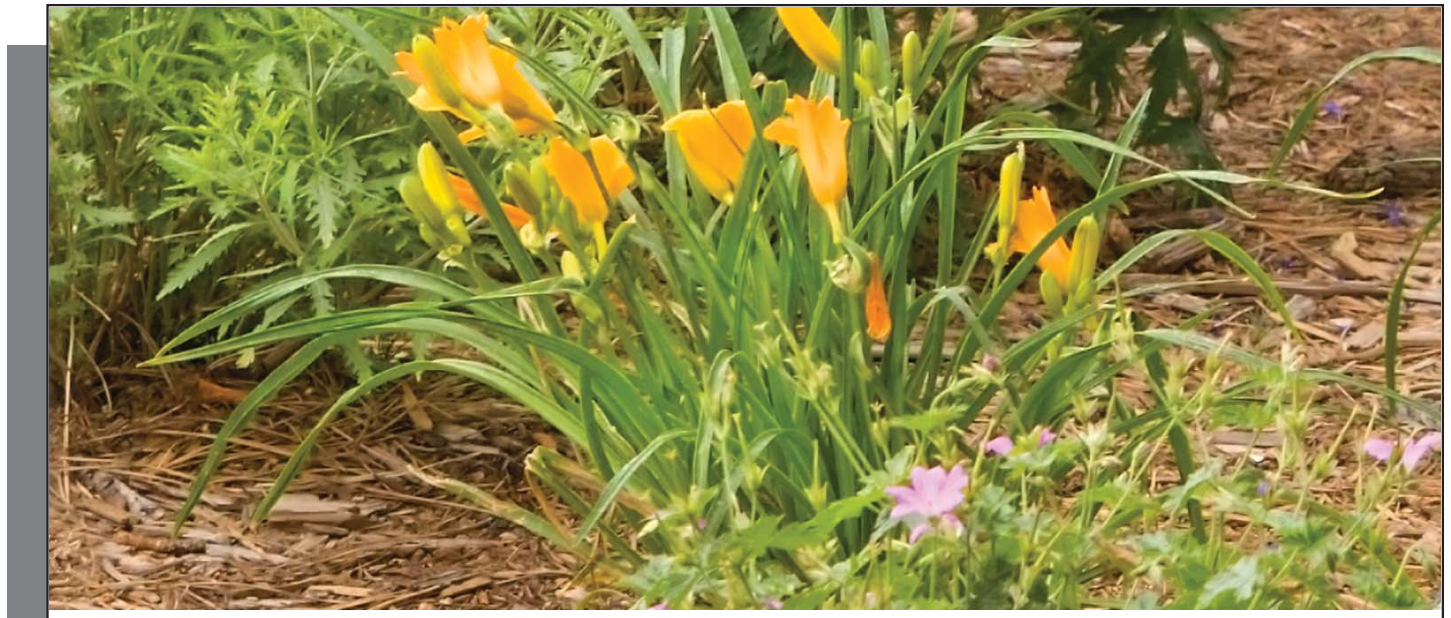
to design and install water efficient landscapes and irrigation systems that meet mandated standards.

In Colorado, urban landscape irrigation accounts for 40 percent or more of the total annual water demand for a utility. Improving the efficiency of water use on urban landscapes is perhaps the single most important urban water conservation effort than can be made in Colorado.

Colorado's population is expected to double over the next 40 years. If all new landscapes in Colorado are designed, installed and maintained with water efficiency as a priority there is tremendous potential to reduce future demands below what they might be otherwise.

Estimated savings potential

A 2002 study in Colorado Springs compared water use between a traditional landscape and two landscapes developed using the principles of Xeriscape. The study found water savings ranging from 22% - 63% after implementing the rules and regulations set forth in the 1998 Colorado Springs Landscape Code and Design Manual. Typical savings from landscape regulations range from 15 - 35%. Contractor certification has unmeasured water saving benefits.



BEST PRACTICE #9

BEST PRACTICE #9:
Water efficient design, installation, and maintenance practices for new and existing landscapes

How we design, install, and maintain our landscapes and irrigation systems can greatly impact the amount of water needed to keep the plants alive and healthy. This best practice describes key considerations for maximizing water efficiency through the proper design, installation, and maintenance of new and existing landscapes and irrigation systems. The information presented here is largely based on the work of the Green Industries of Colorado (GreenCO) published in their 2008 BMP guide.

Irrigation must be addressed with a systems approach that includes design, installation, and maintenance as well as the selection of plant materials and individual irrigation technologies. Education of those operating and maintaining systems should not be overlooked.

Landscape design, installation, and maintenance practices offer a non-regulatory approach to improving outdoor water use efficiency. Proper design and installation can ensure landscapes are capable of thriving on less water. Maintenance practices can help preserve and ensure conservation savings. This best practice is wide ranging and includes many commonly used everyday practices.

The seven basic principles of Xeriscape, developed years ago by Denver Water (and others), remain the fundamental underpinning for conservation-oriented landscapes. These principles are: planning and design, soil improvement, grouping plants with similar water demands, practical turf areas, efficient irrigation, mulching, and appropriate maintenance. In the *Handbook of Water Use and Conservation*, Amy Vickers adds one additional principal to this foundational list: selection of native and low-water-use plants.

Proper design, installation, and maintenance can ensure landscapes are capable of thriving on less water.

Estimated savings potential

Applies to new and existing landscapes. Savings potential of a landscape designed, installed, and maintained for water efficiency can be a 35% reduction in annual irrigation use or more according to GreenCO. Designing the landscape to meet a water budget target can establish a savings level. Many landscapes are already irrigated at an efficient level. Proper on-going maintenance helps preserve the water efficiency of the original design.

BEST PRACTICE #10

BEST PRACTICE #10: Irrigation efficiency evaluations

The efficiency of an irrigation system can greatly impact the amount of water that is used in the landscape. Over time, even a well designed and properly installed irrigation system becomes less efficient unless it is well maintained and operated for maximum efficiency. This best practice describes key considerations for maximizing water efficiency through the use of regular irrigation efficiency evaluations.

Landscape irrigation accounts for more than half of all potable water used in Colorado. Improving the efficiency of water use on urban landscapes is perhaps the single most important urban water conservation effort that can be made in Colorado.

Irrigation efficiency evaluations offer a non-regulatory approach to improving outdoor water use efficiency. Proper operation of the irrigation system reduces water use by ensuring that the landscape receives the appropriate amount of water when it is needed. Regular maintenance practices help to ensure the health and appearance of the landscape and to preserve and ensure conservation savings.

The Irrigation Association Certified Landscape Irrigation Auditor Training Manual (IA 2002, 2007) is the fundamental companion document to this best practice. Practices recommended by the Irrigation Association have been adapted for GreenCO BMPs and provide recommendations on the methods and practices for performing water efficiency evaluations in Colorado. These BMPs were developed with broad stakeholder support and form the foundation for the best practices described in this section.

Estimated savings potential

If recommendations are implemented, savings can range from 5 - 40%. Savings depend upon the severity of problems at each site, the level of over-irrigation prior to the evaluation, and implementation of recommendations.

BEST PRACTICE #11

BEST PRACTICE #11:
Rules for new construction

Many Colorado communities with high growth rates anticipate increasing water demand that will exceed current supplies. Water conservation measures that are "built in" to new buildings can help slow the growth of new water demands. This best practice describes water efficiency specifications that water utilities can make voluntary or mandatory for new residential and non-residential development within their service areas.

This best practice presents a framework for incorporating "built-in" indoor water efficiency in all new construction. Increased interest in "green" building and green building programs like LEED (Leadership in Energy and Environmental Design) presents opportunities for water utilities to promote water efficiency in new construction. However, green building programs including LEED are voluntary and have largely focused on energy conservation and in some cases water efficiency was only added as an afterthought. Fortunately this situation is improving as new specifications are rolled out.

The concept of "smart from the start", when applied to water conservation, means that new properties that join a water system are efficient at the outset. This is a best practice because it costs very little to implement and it means new customers will use significantly less water and will not require water conservation interventions for the foreseeable future. New customers benefit from reduced water bills, the water system benefits from reduced growth in demand, and scarce conservation program funds can be directed toward existing customers.

Estimated savings potential

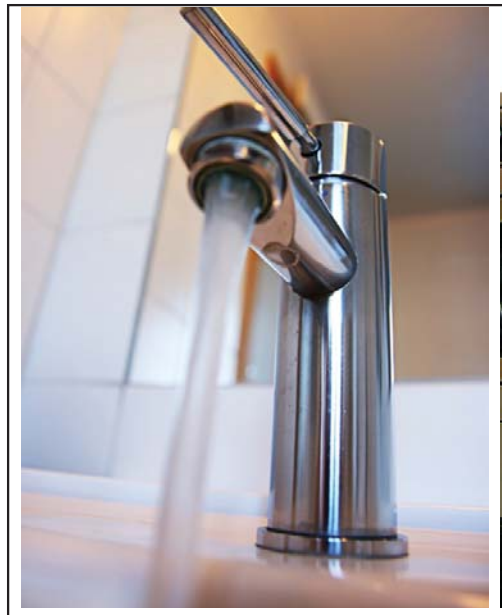
High efficiency homes are expected to use approximately 15 - 30% less indoors than standard new homes. Similar reductions are expected for multi-family properties. High efficiency non-residential (commercial, industrial and institutional) buildings are expected to use approximately 15 - 25% less indoors than standard buildings.

BEST PRACTICE #12

BEST PRACTICE #12:
High-efficiency fixture and appliance replacement for residential and non-residential sectors

The goal of this best practice is to increase the installation rate of water efficient fixtures and appliances and to remove inefficient and wasteful devices from the service area in favor of efficient products. Various means are used to spur customers into replacing products. In some programs, customers are simply given hardware that is more water efficient. Faucet and showerhead replacement programs often take this tact. Rebates and vouchers are also important tools for coaxing customers to replace devices with more water efficient models.

A "retrofit on reconnect" ordinance may be the most effective and least-cost implementation method for accelerating installation of efficient fixtures and appliances. There are a variety of ways this type of ordinance can be written and implemented, but the general concept is that when a property is sold or changes hands, the new owners or occupants must sign up for water service – i.e. reconnect to the system. As a condition of providing water service to the property, the water provider can require that designated fixtures and appliances be upgraded to meet current plumbing code and efficiency standards.



Programs relying on rebates or vouchers must carefully assess the economic trade offs in order to maximize benefits. Incentives are best targeted to customers with high demand who would be unlikely to take action in absence of an incentive. Incentive programs must also guard against customers who would purchase new fixtures or appliances regardless of the financial incentives (i.e. free riders). Water utilities should maintain lists of equipment eligible for incentive programs. These lists might include hundreds of makes and models. One way to streamline this process is to rely on the EPA's WaterSense labeled products. These products are intended to use at least 20% less water than conventional devices.

Estimated savings potential

- High-efficiency toilets (HET) using 1.28 gallons per flush (gpf) or less vs. 3.5 gpf toilet = saves approx. 8,000 - 20,000 gallons per household per year.
- HET vs. Ultra-low flush toilets (ULF) using 1.6 gpf = approx. 1,500 gallons per year.
- High-efficiency clothes washer vs. standard top loader = saves approx. 5,000 - 20,000 gallons per household per year.
- 1 gallon per minute (gpm) faucets vs. 2.2 gpm faucets saves 2,000 - 10,000 gallons per household per year.
- 2.0 gpm showerhead vs. 2.5 gpm showerhead saves approximately 0 - 5,000 gallons per household per year.

*The savings that can be achieved in the non-residential sector through the replacement of domestic fixtures and through specialized equipment (described in more detail in Best Practice 14) are substantial, but less definitively quantified because of the variability inherent in non-residential demand.

BEST PRACTICE #13

BEST PRACTICE #13:
Residential water surveys and evaluations targeted at high demand customers

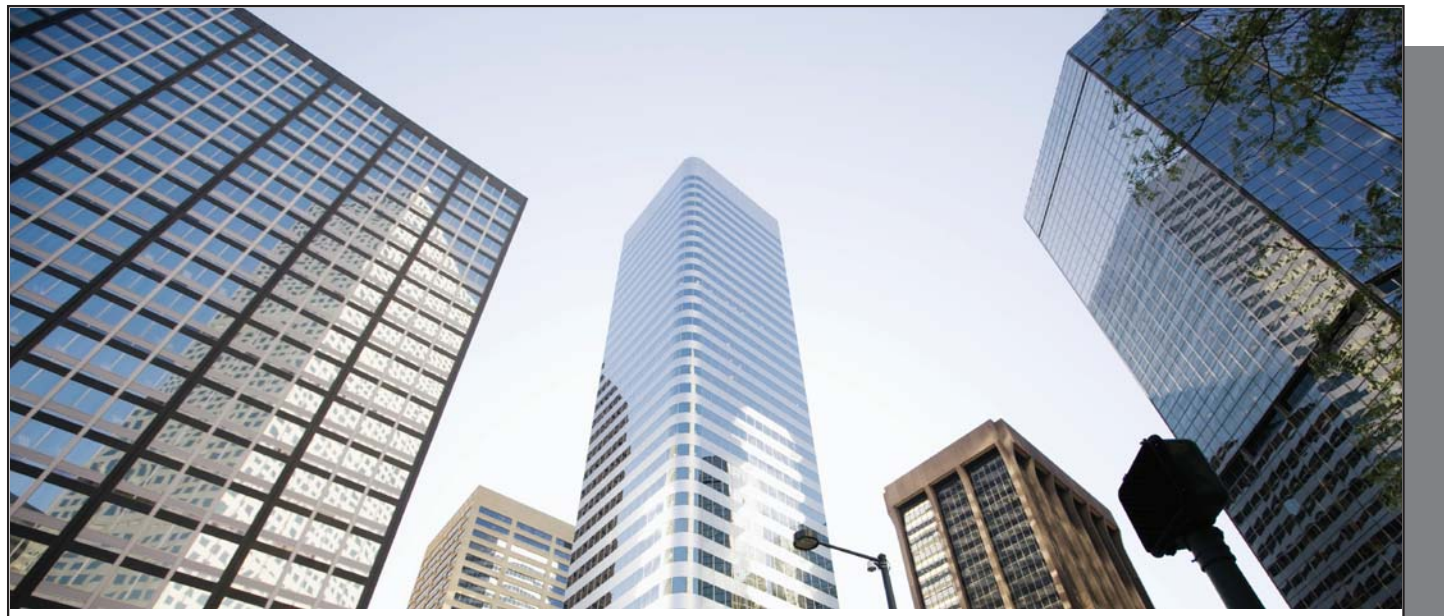
Water surveys and evaluations (frequently referred to as "audits") that identify water savings opportunities and educate customers are a fundamental component of residential water conservation programs. Although often offered to all customers, high volume customers should be targeted first to maximize water savings and minimize program expenses.

Residential water use evaluations cover both indoor and outdoor use and identify concrete methods for reducing water use in a home. Water surveys often reveal leaks and unintended water usage that some customers are simply not aware of. Water surveys are also an excellent way for water utilities to extend customer service beyond metering and billing and to help customers save water and money.

Targeting is essential because program budgets are limited and not all households can achieve measurable water savings. Once targeted, water surveys present utilities with the opportunity to work with their highest use customers to achieve meaningful demand reductions.

Estimated savings potential

Surveys by themselves don't save water, but they often spur savings. Consider impacts to wastewater flow too. Eliminating inefficient water uses should be able to reduce annual consumption by 10 – 20% after implementing the recommendations of a carefully conducted site audit.



BEST PRACTICE #14:
Specialized non-residential surveys, audits, and equipment efficiency improvements

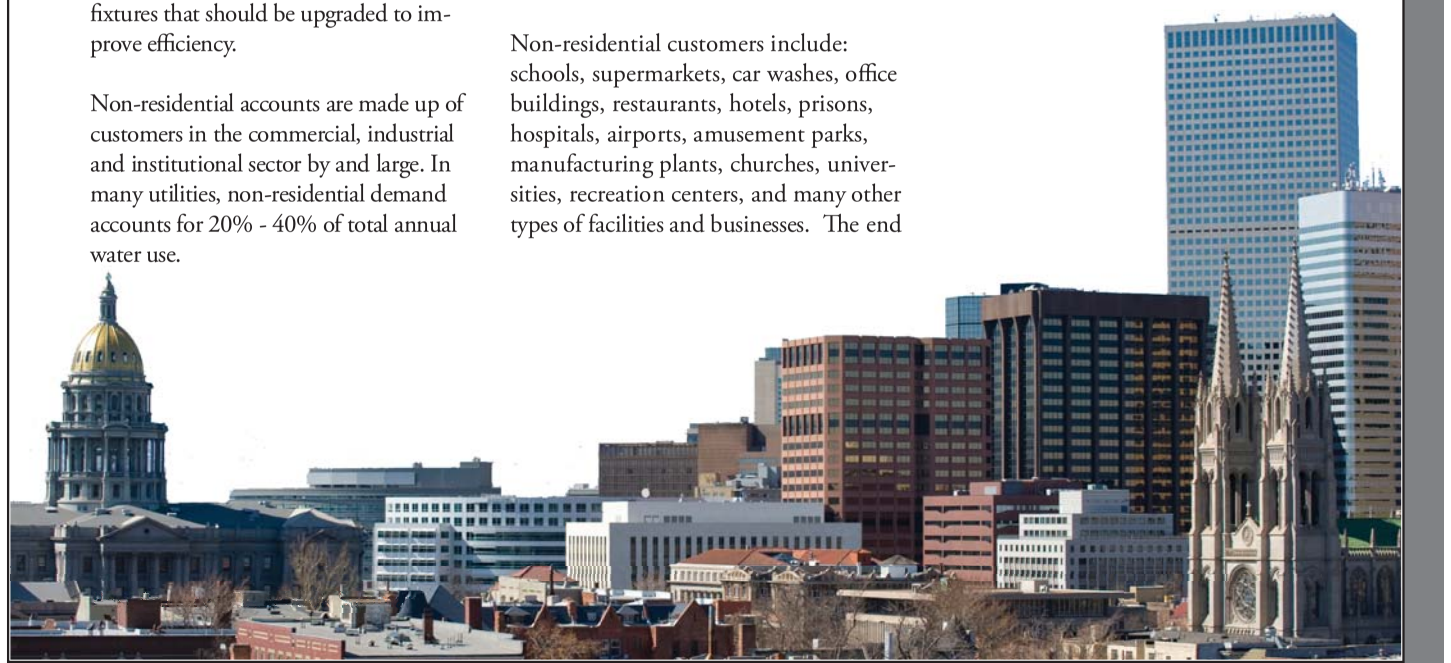
BEST PRACTICE #14

Specialized non-residential surveys and equipment efficiency improvements reduce water demands in the commercial, institutional and industrial (CII) sector. This best practice specifically excludes toilets, showers, and faucets (i.e. fixtures found in residential and non-residential accounts); however, part of the survey process involves identifying all domestic fixtures that should be upgraded to improve efficiency.

Non-residential accounts are made up of customers in the commercial, industrial and institutional sector by and large. In many utilities, non-residential demand accounts for 20% - 40% of total annual water use.

The end uses of water in non-residential accounts are more diverse and complex than for residential customers. Non-residential water users are heterogeneous, and each business or institution may have unique and differing water use patterns. Seasonal and time of day variations in water use may be more pronounced for non-residential customers.

Non-residential customers include: schools, supermarkets, car washes, office buildings, restaurants, hotels, prisons, hospitals, airports, amusement parks, manufacturing plants, churches, universities, recreation centers, and many other types of facilities and businesses. The end



In many utilities, non-residential demand accounts for 20% to 40% of total annual water use.

uses of water within the non-residential sector are as diverse as the sector itself and includes irrigation, toilets, faucets, showers, evaporative cooling, dishwashing, ice machines, swimming pool refilling and backwash, decorative fountains, water cooled equipment, autoclaves, dialysis machines, car washes, pavement washing, and the list goes on and on.

Targeting specific sectors and end uses, such as replacing water-cooled ice machines in restaurants, may result in significant water savings but utilities with limited conservation resources may find it difficult to implement a broad array of non-residential programs. Establishing useful customer categories within the utility billing database (as described in Best Practice 1) allows an agency to determine which type of non-residential customers use the most water in summer or winter and provides a sound basis for establishing a manageable and cost-effective non-residential demand management program. Sometimes implementing conservation measures at a small number of high-demand, non-residential sites can impact overall water use measurably.

Estimated savings potential

The range of savings will vary greatly and depend entirely on the measures implemented at the site. As part of the 2000 AWWA Commercial and Institutional End Uses of Water study it was estimated that many non-residential sites have the potential to conserve between 15 - 50% of their current demand (Dziegielewski et. al. 2000).

Funding for Best Practices Implementation

The Colorado Water Conservation Board administers the Water Efficiency Grant Program for water conservation planning and measure implementation.

The Guidebook of Best Practices for Municipal Water Conservation in Colorado can be used as a reference to develop more effective water conservation plans as well as prioritizing implementation of water conservation programs and measures.

Utilities that wish to implement measures from this guidebook may be eligible to receive grant funding from the CWCB to assist with implementation. Details for the Water Efficiency Grant Program can be found at:
http://cwcb.state.co.us/Conservation/WaterEfficiencyGrantProgram

colorado waterwise

The mission of Colorado WaterWise is to promote and facilitate the efficient use of Colorado's water.

Colorado WaterWise is the voice for water conservation in Colorado. Since 2001, Colorado WaterWise has provided support to water professionals, water providers, and communities across Colorado empowering them to offer more responsive, and effective programs to their own customers, clients, and citizens.

Additional information about Colorado WaterWise can be found at www.coloradowaterwise.org.