

A young child in a green and blue patterned shirt and dark shorts is running through a splash pad. The child is barefoot and has a joyful expression. The splash pad consists of numerous vertical water jets. The background shows a sunset with a bright orange and yellow glow, and some trees and a metal structure are visible. The sky is a mix of blue and orange.

Water Use

Actions

- N13** Implement educational campaign on reducing water use.
- A9** Develop event-based, water-use criteria.
- A10** Update building code to require more efficient water use.
- A11** Improve irrigation through changes in infrastructure and practices that more efficiently use water.
- A12** Improve efficiency of water use in city fountains, pools, splash pads, and ponds.

Background

Increasing temperatures will bring a greater demand for water and energy for industrial cooling, agriculture, and irrigation due to heat waves and an extended growing season.

Climate projections indicate that summer precipitation will decline even as precipitation increases during other seasons.¹ This raises the potential for summer droughts and seasonal water shortages, particularly for industrial and agricultural uses. Because of these risks, the City should take measures to encourage efficient water use.

By increasing efficiency, local water demand and costs can be reduced. There are a variety of ways that efficiency can be improved, including utilizing compact development, which requires shorter pipes and reduces water loss through leaks; implementing conservation pricing, which allows utilities to charge increasing water rates based on higher levels of water use; and encouraging water recycling for non-potable uses, which reduces the amount of treated water used for toilets flushing and landscape irrigating.

Efficient water use is both a local and regional concern. In 2015, a team composed of the City of Columbus, DELCO Water Co., Mid-Ohio Regional Planning Commission (MORPC), United States Geological Survey (USGS), and several others collaborated to produce the **Sustaining Scioto** adaptive management plan.² The goal of this plan is to ensure that future Central-Ohio residents will be able to enjoy the same high-quality water sources that we have today by developing water utility strategies that account

for population growth and climate change. Using local water usage per capita rates, as well as population projections, Sustaining Scioto projected that the water usage rates will increase by 4.3% by 2035 and by 105.2% by 2090.

Although models largely agree is that supply will likely meet demand, some Sustaining Scioto models show that there are climate change scenarios where the region's water supply could become scarce.

Currently, Columbus residents use on average 115 gallons of water per day (gpd), which is comparable to other Ohio cities such as Cleveland (158 gpd) and Cincinnati (120 gpd).^{3, 4, 5, 6, 7, 8} To ensure that the increasing water demand will be met, the City should continue to evaluate the local water balance, improve its understanding of how future changes may affect the water supply, and promote water use efficiency throughout the city. The City's Water Use Efficiency Plan calls for citizen engagement through **GreenSpot** programming, which educates residents and businesses on the environmental and economic benefits of efficient water use and encourages the implementation of efficiency by providing residents with spray nozzles and low flow showerheads.^{9, 10} By building awareness of daily water use, encouraging increased efficiency, and improving estimates of future availability, Columbus will be able to meet the water demands of the future. This chapter proposes one necessary (N) and four aspirational (A) actions to ensure efficient water use.

Implement educational campaign on reducing water use.

In 2013, for the Water Use Efficiency Plan, the City evaluated a wide range of efficiency measures and recommended additional items for implementation via GreenSpot.⁹ GreenSpot is the City's signature environmental education program, with more than 17,000 members. Along with GreenSpot, the *Community Backyards* program educates residents on the proper use of rain barrels, which can conserve water; the program also covers compost bins and native trees and plants.¹¹ This program has reached 1,364 residents. GreenSpot has also incorporated water-use reduction commitments and tips in its messaging.

The Water Use Efficiency Plan suggests several additions to the Greenspot program, including the creation of a new sustainability class for businesses, engagement with the City's Top 100 users, and providing residents with efficient devices. The GreenSpot program is uniquely situated to connect consumers with information about the long-term costs and benefits associated with improvements. GreenSpot should continue to emphasize the economic and environmental co-benefits of water efficiency, including reduced energy consumption related to treating, transporting, and heating water.

To complement GreenSpot, the City should consider adding additional, more detailed consumption information in quarterly bills to ratepayers to increase awareness of personal consumption. The City is in the midst of implementing new meters and automatic metering systems that will provide increased water-usage information to customers. Once automatic metering is online, the City should consider communicating information to customers that puts their consumption in context by providing information on a property's water use relative to average comparable properties

and ones that have utilized water-efficiency programs. Additionally, the City should consider increasing its promotion of efficient fixtures, such as those certified as *WaterSense*.¹⁵ Columbus could better publicize the availability of home water-use audits with recommendations on specific actions that property owners could take to reduce their water consumption.

Discounts or rebates for purchase of efficient fixtures, could be offered. Likewise, consumers need to understand long-term costs associated with particular efficiency improvements, including their payback periods, to increase their likelihood of taking action. There are additional economic and environmental co-benefits of water efficiency including reduced natural gas and electricity consumption for generating hot water. In fact, energy audits conducted by electric and natural gas providers often include free distribution of sink aerators and low flow showerheads due to their rapid payback periods in energy efficiency.

In Franklin County, the *Columbus-Franklin County Finance Authority Energy Program* offers ways for businesses, nonprofits, and government agencies to finance improvement with payback periods of up to 30 years.¹⁶ Similarly, the Office of the Ohio Treasurer (OOT) has an energy efficiency program called *ECO-Link* that allows homeowners to reduce their interest rate by as much as 3% on bank loans to pay for energy-efficiency improvements over an extended period of time.¹⁷ Both of these programs apply to water use because of the savings on electricity and natural gas associated with a reduced need to generate hot water on site. The City already collaborates with the utilities and MORPC to offer *energy efficiency programs* to low-income populations.¹⁸ Specifically, they provide low flow showerheads to customers at no cost. Water efficiency and information regarding WaterSense technology should be considered an integral component of every energy audit.

The Connection Between Water Use and Energy

The interrelationship between water use and energy is well established. Reducing water use in the built environment in response to climate change has the co-benefit of reduced energy use in three primary areas: the energy needed to treat water, the energy needed to transport water from the treatment facility to the home or business and back, and the energy needed to heat water at the point of use. According to the 2009 *Residential Energy Consumption Survey* conducted by the United States Energy Information Administration, roughly 17% of home energy use in Ohio is for heating water. Recognizing this, most *utilities* across the United States have at one time offered low flow faucet attachments and showerheads.^{12, 13, 14}

Finally, this campaign should include information for vulnerable populations and low-income households regarding available programs that can reduce water-utility costs. For example, current low-income and senior citizen *discount programs* provide a 20% discount on water- and sewer-usage charges for the households that qualify.¹⁹ However, this also includes communicating the ways that reducing water use can lead to lower water bills. This may include information on efficient fixtures like low flow showerheads, or how to identify and fix leaking toilets and faucets. This educational campaign may be most effective by stressing the economic co-benefits that result from reduced water use rather than just the environmental benefits.

A9

Develop event-based, water-use criteria.

A number of factors, including extended dry periods and droughts, rising temperatures, and longer growing seasons, may lead to uncertainty in the water supply and demand. As a result, river, lake, and reservoir levels could drop,

groundwater recharge may be reduced, and our water supply may be strained during certain times of the year due to changing seasonal precipitation patterns. Therefore, guidelines need to be developed for all users regarding different scenarios that might threaten the water supply. In the event of a water emergency, the Ohio Environmental Protection Agency requires each community water system to have a contingency plan to ensure that necessary water needs are met.²⁰ These plans provide the response and recovery actions to be taken during emergency situations, while the guidelines suggested here would be used for less critical events.

These guidelines detail the measures that will be taken in the event of heat waves, droughts, or even intense precipitation events that could affect both water availability and water quality (N10 and N12). For large users, such as agriculture and industry, water restrictions for certain activities already take effect under specific drought conditions. Currently, several utilities in the region already have limits on the amount of water they can extract from surface

water supplies, based on set minimum stream flows that need to be maintained.²¹ While voluntary water conservation should be promoted and practiced at all times, certain events (e.g., droughts and extended heat waves) necessitate stricter water-use criteria.

The Department of Public Utilities (DPU), Division of Water has a drought management plan that provides a conservative timetable for initiating drought restrictions.²² The goal is to extend the available water supply during drought conditions. The plan includes demand management in conjunction with source management. It establishes operations, actions, and procedures for responding to drought-related water shortages in advance of an actual emergency. The plan has four phases, ranging from voluntary to mandatory actions. Phase 1 calls for voluntary water conservation, including limiting outdoor water use to early morning hours. Phases 2 and 3 are both mandatory restrictions and further limit outdoor water and hydrant use. Phase 4 is employed during extreme droughts and limits water use to critical consumers (e.g., hospitals and nursing homes).

A10 Update building code to require more efficient water use.

The current Ohio Building Code reflects the 2015 edition of the International Building Code standards and is set by the state not local government. Therefore, the City should advocate that the state follow the latest international building code standards. Doing so may increase construction costs in some cases, but these revisions will improve energy and water efficiency of new buildings. Additional construction costs are often more than recovered over the life of the building, and in terms of water efficiency, the reduction in per-person water use can result in savings to the entire community through lower demand for water-treatment

infrastructure. Without updated building codes, Columbus will need to continue to use incentives, such as the [Green Columbus Fund](#), to promote efficient construction and renovation.²⁴

A11 Improve irrigation through changes in infrastructure and practices that more efficiently use water.

Action Statements N14 and A16 in the Ecosystems chapter of this plan describe how sustainable landscaping practices and alternate use of spaces can reduce landscaping water demands. Selecting native and low-water variety plants can provide benefits such as aesthetic beauty, additional spaces for outdoor leisure, increased food and habitats for wildlife, and reduced energy consumption through shading and wind barriers. Likewise, edible species can be planted that provide food for people. Thus, when well-designed, building landscapes may provide greater value than monoculture lawns.

Lawns should be appropriately sized and planted with varieties of grass that require the least amount of water, fertilizer, and herbicide. When it is still necessary to provide irrigation for landscapes, systems such as drip irrigation that target water to specific plants should be considered. Also, many modern irrigation systems may be integrated with weather stations and/or soil moisture sensors. Such systems allow users to deliver an appropriate volume of water at preferred intervals while taking into account natural rainfall and soil conditions. Columbus Recreation and Parks (CRPD) is leading by example in this area by installing rain sensors on all irrigation systems and well-irrigation systems on all new sports complexes when possible. As a rule, CRPD does not irrigate its parks, aside from speciality parks such as the Scioto Mile, Topiary Garden, and Park of Roses.

Drought Conditions in Central Ohio

As specified in the [State of Ohio Emergency Operations Plan](#), the Ohio Emergency Management Agency will activate the Drought Assessment Committee and Impact Task Force to appropriately match the state response to the severity of a drought.²³ Under this plan “local jurisdictions may enact ordinances to assure equitable water distribution and may establish local drought emergency public information and education programs.” Emergency management activities during a regional drought emergency would be coordinated between Franklin County Emergency Management and Homeland Security and leadership of the City of Columbus, including the Department of Public Utilities, Division of Water.

A12

Improve efficiency of water use in city fountains, pools, splash pads, and ponds.

Columbus has renovated and constructed a number of buildings to Leadership in Energy and Environmental Design (LEED) standards over the past decade. Similar standards for efficient use of water should be applied to fountains, pools, splash pads, and ponds. To ensure a holistic analysis for new facilities or retrofits of existing facilities, any plans should consider the costs and energy consumption associated with pumps and filtration equipment.

To achieve water efficiency, some improvements have already been made to many of these public water bodies, while new construction includes water-efficient designs. To avoid using treated water, CRPD ponds are fed by streams, rivers, or wells, and they are lined using industry standard practices pursuant to the [Ohio Pond](#)

[Management Handbook](#).²⁵ The [Scioto Mile Fountain at Bicentennial Park](#) also recirculates its water so that it does not need to be continually refilled.²⁶

Additionally, signs and infographics regarding water recycling and water conservation should be displayed at fountains, splash pads, pools, or ponds that have implemented these practices; this may be achieved through the educational campaign outlined in N13. CRPD is currently developing a Sustainability Framework, which will focus on Resource Management (energy efficiency, waste reduction, air and water quality), Planning, Design and Construction Practices, Land Use, Parks, Open Space and Habitat Conservation, and Social Equity and Operations and Maintenance. CRPD should continue to research best management practices as they relate to water use in parks as part of this Sustainability Framework.

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