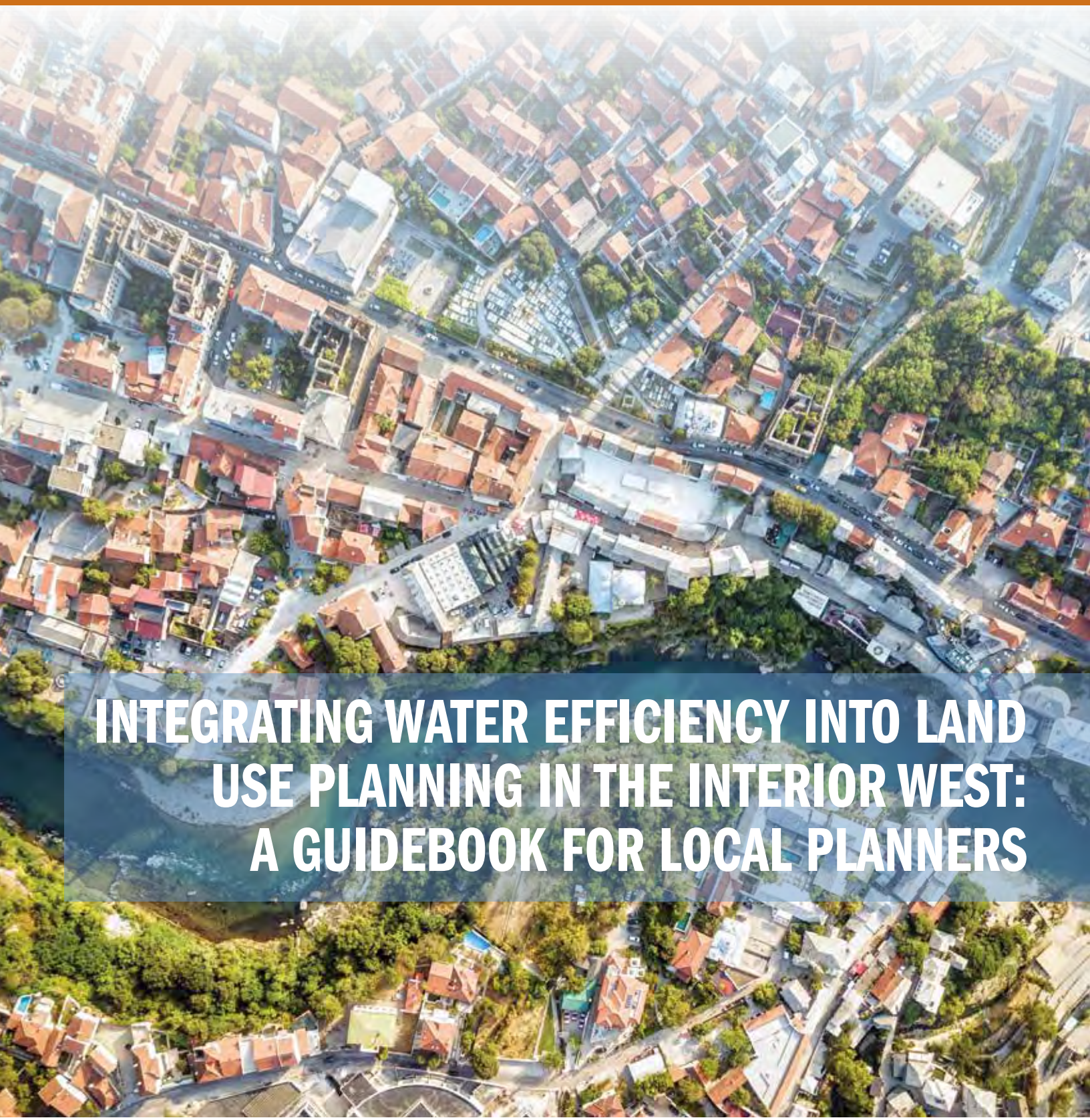

INTEGRATING WATER EFFICIENCY INTO LAND USE PLANNING IN THE INTERIOR WEST: A GUIDEBOOK FOR LOCAL PLANNERS

LAND USE LAW CENTER
PACE LAW SCHOOL

WESTERN RESOURCE ADVOCATES

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ABOUT WESTERN RESOURCE ADVOCATES

For three decades, Western Resource Advocates has been protecting the West's land, air, and water. We use law, science, and economics to ensure that vibrant communities are in balance with nature. Our expert staff work throughout seven interior Western states (Arizona, Colorado, Montana, New Mexico, Nevada, Utah, and Wyoming) to implement solutions within three core conservation program areas: Clean Energy, Healthy Rivers, and Western Lands. For more information, visit https://westernresourceadvocates.org/.

ABOUT LAND USE LAW CENTER

Established in 1993, the Land Use Law Center is dedicated to fostering the development of sustainable communities and regions through the promotion of innovative land use strategies and collaborative decision-making techniques, as well as leadership training, research, education, and technical assistance. Through its many programs, the Center offers communities, land use leaders, citizens, advocates, planners, attorneys, real estate industry leaders, and other land use professionals assistance that enables them to achieve their development and conservation goals. Its activities provide opportunities for students of Pace University's Elisabeth Haub School of Law to gain in-depth, practical experience that allows them to become practice-ready attorneys serving private, public, and non-governmental clients. The Land Use Law Center is the preeminent center of its kind, offering extensive research and consulting services; conferences, seminars, and clinics; law school courses; practitioner and citizen-leader training programs; continuing legal education programs; multimedia resources; and frequent publications on sustainable land use, community development, and environmental issues.

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List of abbreviations

af..... Acre-feet

af/du/yr..... Acre-feet per dwelling unit per year

ADU..... Accessory dwelling unit

AWE..... Alliance for Water Efficiency

AWWA..... American Water Works Association

CC&Rs..... Conditions, Covenants, and Restrictions

DOE..... Department of Energy

DPR..... Direct potable reuse

EPA..... Environmental Protection Agency

ESC..... Erosion and sedimentation control

FAR..... Floor-area-ratio

gpc..... Gallons per cycle

gpcd..... Gallons per capita per day

gpf..... Gallons per flush

gpm..... Gallons per minute

HERS..... Home Energy Rating System

HOA..... Homeowners association

IAPMO..... International Association of Plumbing and Mechanical Officials

IBC..... International Building Code

ICC..... International Codes Council

IEBC..... International Existing Building Code

IGA..... Intergovernmental agreement

IgCC..... International Green Construction Code

IPC..... International Plumbing Code

IPR..... Indirect potable reuse

IRC..... International Residential Code

IWRP..... Integrated Water Resource Planning

LEED..... Leadership in Energy and Environmental Design

LULA..... Land Use Leadership Alliance

mgd..... Million gallons per day

MPD..... Master planned development

MPO..... Metropolitan Planning Organization

NSPC ..... National Standard Plumbing Code

ODP ..... Official development plan

PACE..... Property Assessed Clean Energy

PAD..... Planned area development

PDR..... Purchase of development rights

PUD ..... Planned unit development

RCD ..... Rural conservation development

RESNET..... Residential Energy Services Network

ROI..... Return on investment

RWU ..... Recommended water use

SFE ..... Single-family equivalent

SIR..... Sustainable infill redevelopment

SITES ..... Sustainable Sites Initiative

STAR ..... Sustainability Tools for Assessing & Rating

TDR ..... Transfer of Development Rights

TND..... Traditional neighborhood development

TOD..... Transit-oriented development

UGB ..... Urban growth boundary

UPC..... Uniform Plumbing Code

USGBC ..... United States Green Building Council

WCFZ ..... Water conservation floating zone

WISE ..... Water Infrastructure and Supply Efficiency Partnership

WRF ..... Water Research Foundation

PART I:
BACKGROUND AND GETTING STARTED

1. Introduction and Overview

For over 20 years, the Land Use Law Center has been conducting training programs with local leaders — chief elected officials, community organizers, board members, departmental staff, religious leaders, and many others involved in the community development process — on a wide range of topics that relate to the land and the way we live and grow on it. We call our four-day, intensive training program the Land Use Leadership Alliance (LULA). In 2013, we conducted our first LULA program on the topic of integrating water and land use planning in partnership with Western Resource Advocates, with support provided by the Gates Family Foundation and the Walton Family Foundation. At the table were representatives from five local governments in the Colorado Front Range of the Rocky Mountains and their water providers. A year later, we held a second training with another five communities from the Front Range. As part of these two LULAs, we analyzed the existing plans and codes for the participating communities to search for evidence of water integration. We looked for areas that could be strengthened and searched for communities across the country that might have examples of how to meet the challenges that these communities faced. What we found was quite remarkable and ranged from troubling and misguided to inspiring, exciting, and inventive. This Guidebook began as a way to share with more communities what was taught and what we learned during these LULAs focused on integrating water and land use planning. The Guidebook has grown to something much broader, covering a full suite of topics and case studies that could not have been covered in only four days. We hope sharing them here will inspire and guide more communities to continue the important work of preparing our growth patterns for a world in which water is scarce and unreliable.

a. The Problem (Why to Use this Book)

The U.S. population is growing at an unprecedented level, with the Census Bureau predicting the largest increase targeted for the Western U.S.: nearly 46% between 2000 and 2030.[1] At the same time, these states are facing increasingly limited water supplies.[2] Chapter 2 of this Guidebook, *Water Issues in the Interior West: A Call to Action*, expands upon this tension between increased growth and decreased water.

Further complicating this situation is the historic disconnect between land use development decisions and water-supply decisions.[3] At a time when a significant number of land use decisions will be made to accommodate future growth, it will also be necessary to make decisions that conserve water. The decisions made by land use planners have an undeniable and significant effect on future water demand, but water supply is projected and planned for by water planners and there is often a serious missing link between

1 Michelle Bryan Mudd, *A Next, Big Step for the West: Using Model Legislation to Create a Water-Climate Element in Local Comprehensive Plans*, 3:1 Wash. J. Envtl. L. & Pol'y 1, 3 (2013)

2 A. Dan Tarlock & Sarah B. Van De Wetering, *Western Growth and Sustainable Water Use: If There are No "Natural Limits," Should We Worry About Water Supplies?*, 27 Pub. Land & Resources L. Rev. 33, 39 (2006).

3 A. Dan Tarlock & Lora A. Lucero, AICP, *Connecting Land, Water, and Growth*, 34 Urb. Law. 971, 972 (2002).

these two processes. Left unaddressed, this disconnect can negatively impact the ability of Western states to accommodate growth while maintaining adequate water supply.[4] Chapter 3 of this Guidebook, *Working Together: A Primer for Planners*, discusses further the need for integration, cross-education, and the value of regional planning and improved communication. The more that land use and water planners can participate in decision-making processes together, the more they will be able to guide and influence outcomes that can result in quality development and reliable water supply.

b. The Purpose of This Guidebook (When to Use this Book)

The goal of this Guidebook is to provide an informative compendium of land use techniques that can reduce water use in new and existing development and to target this information to local land use planners. The specific techniques that can be used to integrate water efficiency into local land use documents are not always known to local planners, and the knowledge base of techniques is both nascent and growing. A host of land use policies can be used to address water demand — all of which may be implemented across multiple plans and codes that shape the way we develop the land. Addressing settlement form through the comprehensive master plan, densities and building types through the zoning code, clustering through subdivision regulations, green plumbing through the plumbing code, water recycling through the building code, and landscaping requirements through site-plan regulations are just a few of the methods discussed in this guide.

This Guidebook is the culmination of several years of research and in-depth workshops aimed at facilitating more rapid adoption of water-saving practices in practical and useful ways, emphasizing collaboration and integration. By providing instructional guidance illustrated by case study examples, the Guidebook aims to serve as a reference manual to walk communities through the process of integrating water efficiency into the plans and regulations that shape the way their land is developed — creating sustainable growth that reduces per capita water demand.

Communities should note that this Guidebook focuses exclusively on addressing water *quantity* issues. It acknowledges the importance of balancing supply and demand, maintaining water quality, and other elements that contribute to a complete water-planning and regulatory framework, but those issues are beyond the scope of the guidance and examples it provides.

Based upon an examination of local plans and regulations from hundreds of communities around the country, this Guidebook includes a collection of community best practice examples that seek to address the goal of encouraging land use patterns and development policies that decrease per capita water use. While the Guidebook's narrative discusses what *can* be done, the community examples show what *has* been done. While not all communities selected may match your community in a demographic or economic sense, each example can be appropriately scaled for success in many environments. Some examples provided may not deal directly with water conservation. Where they do not, they are offered because of the transferability of the mechanism or technique to address water conservation issues. Where examples of important techniques could not be found, sample language is offered as the relevant illustration.

c. The Audience (Who Should Use this Book)

4 Michelle Bryan Mudd, *A Next, Big Step for the West: Using Model Legislation to Create a Water-Climate Element in Local Comprehensive Plans*, 3:1 Wash. J. Envtl. L. & Pol'y 1, 3 (2013); A. Dan Tarlock & Sarah B. Van De Wetering, *Western Growth and Sustainable Water Use: If There are No "Natural Limits," Should We Worry About Water Supplies?*, 27 Pub. Land & Resources L. Rev. 33, 39 (2006); A. Don Tarlock & Lora A. Lucero, AICP, *Connecting Land, Water, and Growth*, 34 Urb. Law. 971, 972 (2002).

Planning for water-smart development requires the efforts of dedicated people from across multiple fields and organizations. Although this Guidebook advocates for an integrative process, with particular emphasis on partnerships between land use planners and water planners and providers, the Guidebook is targeted to land use planners. All recommendations anticipate that water planners and others (from multiple levels of government) will be involved in the process, but the calls to action are written for local land use planners to take the lead. Chapter 4 of this Guidebook, *Getting Started: How to Engage the Process or Lead it*, expands further on whom to bring together, what to review, and what to discuss.

This Guidebook is intended for use by communities in the Interior West (also sometimes referred to as Mountain States or Mountain West), which is typically defined as those states in the U.S. Census Bureau's Mountain Division: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. The community best-practice illustrations provided throughout, however, come from many states across the country, and therefore, readers should consult with local legal counsel to be sure the techniques discussed are available in their particular community.

d. User's Guide (How to Use This Book)

While users should read all of Part I, *Background and Getting Started*, Parts II and III of this Guidebook are written to be used selectively as a reference manual. The style of this Guidebook assumes that users will read chapters in whatever order and to whatever extent best suits their needs. To ensure that relevant examples are considered regardless of whether each chapter is read, portions of the narrative and case study examples that pertain to multiple topics have been repeated in each applicable chapter.

After reading Part I of this Guidebook, most readers will likely turn to Chapter 5, *The Comprehensive Master Plan*, which begins Part II, *Integrating Water Efficiency Into Land Use Documents*. This Chapter encourages communities to begin by integrating water efficient land use patterns and strategies into their comprehensive master plans in a number of ways, enabling the Plan to most effectively serve as a blueprint for future land use decisions and setting the stage for the code additions and amendments discussed elsewhere in this Guidebook.

Chapter 6, *Sustainability Plans and Programs*, addresses integrating water efficiency into stand-alone sustainability plans and programs. Although this Guidebook encourages communities to first consider amending their comprehensive plans to foster sustainability, rather than adopting a separate plan, it also acknowledges that sustainability plans can be valuable endeavors and are frequently used with great success. This Chapter provides guidance on how such plans have been and can be used to achieve water conservation.

Once plans have been amended, the visions set forth may be implemented through changes to existing codes, regulations, and programs. Chapter 7, *The Zoning Code*, provides specific guidance and examples that communities may consider for fostering water conserving land use patterns through zoning, including:

- Incorporate water conserving land uses into as-of-right permitted uses
- Condition rezonings on water conserving practices
- Incentivize water conservation through bonus density zoning
- Use overlay zoning to designate areas appropriate for conservation and those prioritized for growth.

The Zoning Code begins this discussion with techniques that permit water efficient land uses in areas targeted for development, discourage development in areas targeted for conservation, and foster building types and landscapes that minimize the use of water. The Chapter also addresses communities with limited room to

grow and provides guidance on how they can modify systems to accommodate higher densities and infill development.

In Chapters 8 and 9, *Subdivision Regulations* and *Site-Plan Regulations,* this Guidebook makes recommendations on integrating water efficiency considerations into the regulations governing the design and approval of development sites — such as through water-supply adequacy requirements, pre-application meetings, application requirements, and clustered development.

In Part III, *Additional Strategies*, this Guidebook presents strategies for integrating water conserving measures into the land development system beyond standard land use plans and codes. It begins with Chapter 10, *Building and Plumbing Codes*, which provides guidance and examples that communities may consider for enhancing local building and plumbing codes, such as local modifications, "reach codes," and noncode standards, as well as advice on the process and potential pitfalls. Chapter 11, *Supplemental Regulations*, addresses landscaping restrictions, water-use benchmarking requirements, water-demand offset policies, and similar water conserving provisions that communities could adopt in a number of places depending on local preference: as part of the zoning code, utility code, subdivision regulations, site-plan standards, or adopted as separate, stand-alone regulation. Chapter 12 on *Development Moratoria* will be helpful to communities facing a water shortage where it may be necessary to temporarily prevent development while establishing the appropriate regulatory framework. Chapter 13, *Development Agreements*, provides guidance on using agreements to give more certainty to the development process while ensuring that the public interest in matters such as water conservation is accommodated. In Chapter 14, *Non-Zoning Incentives*, this Guidebook lays out a broad range of popular and successful incentive strategies beyond bonus density zoning (discussed in Chapter 7, *The Zoning Code*), including:

- Financial incentives (such as fee rebates, reductions, or waivers; grants; loans; and tax credits, abatements, or exemptions)
- Process incentives (such as an expedited review/streamlined permitting process, guaranteed timelines, and priority inspections)
- Assistance, education, and marketing incentives (such as workshops, educational programs, and communication networks; monitoring and direct assistance; information dissemination; award programs; and marketing assistances).

Finally, Chapter 15 on *Post-Occupancy Enforcement* addresses how a local government can enforce the continuation and maintenance of water efficient landscaping and other water conservation techniques after the initial development stage. The best practices contained in this Chapter can be applied to new developments or to existing developments with retrofitted landscapes, or these practices can encourage the conversion of landscapes to more water efficient designs.

2. Water Issues in the Interior West: A Call to Action

a. Increasing Population Growth

From 1980 to 2006, the Western U.S.[5] experienced a population growth of over 26 million people (a 60.5% increase), while the rest of the country experienced a 25.5% growth.[6] During that same period, five of the nine states with the fastest-growing populations were located in the arid Interior West.[7] Prospects for the future are similar: demographers project that by the year 2039, the population of the U.S. will have swelled to over 400 million, a dramatic increase of 100 million people since 2006. These additional residents will create a tremendous demand for additional housing and nonresidential development. By 2040, it is projected that the U.S. will add 93 million new homes and 137 billion square feet of nonresidential construction to accommodate growth and replace obsolete buildings.[8] A large percentage of this residential and nonresidential construction will take place in the Interior West.

Census Bureau reports put the Interior West in the "fastest-growing" category, containing half of the top ten fastest-growing states between 1995 and 2025, with a projected percentage change in population (births minus deaths plus net migration) of over 40%. More specifically, New Mexico, Arizona, and Nevada all have projected growth of over 50%; Idaho, Utah, and Wyoming have projected growth rates of over 40%; Colorado is close behind with 39%; and Montana has a 29% projected increase in population change — still higher than the national average, with more than half of states having a projected population increase of under 25% between 1995 and 2025.[9]

b. Decreasing Water Supply

While population continues to grow, available surface and groundwater supplies are increasingly strained due to numerous confounding factors.[10] Water availability has become a serious concern for many communities in the Interior West. Surface water supplies near population centers are fully appropriate, if not over-appropriated, and many communities depend upon nonrenewable groundwater. Water of acceptable quality is increasingly hard to find because local sources are allocated to prior uses, depleted by over-pumping, or diminished by drought stress.[11] Climate change is also contributing to water-supply issues and experts warn that the regions that are now experiencing the most growth in the country are likely to suffer the most from a warming climate.[12] Not only is climate change predicted to lead to more frequent and destructive precipitation-related disasters — including floods, mudslides, and droughts —

5 Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

6 Don E. Albrecht, Western Rural Development Center, Population Brief, Trends in the Western U.S., The Changing West: A Regional Overview (2008) https://wrdc.usu.edu/files-ou/publications/pub__5817878.pdf.

7 These five states are Arizona, Colorado, Idaho, Nevada, and Utah. Don E. Albrecht, Western Rural Development Center, Population Brief, Trends in the Western U.S., The Changing West: A Regional Overview (2008), https://wrdc.usu.edu/files-ou/publications/pub__5817878.pdf.

8 *See* Arthur C. Nelson, University of Utah, American Mega Trends (Oct. 28, 2009), http://www.arch.utah.edu/cgi-bin/wordpress-metroresearch/wp-content/uploads/2012/publications/presentations/Nelson_-_American_Mega_Trends_10-28-09.pdf.

9 Paul Campbell, Census Bureau, Current Population Reports, Population Projects (May 1997), https://www.census.gov/prod/2/pop/p25/p25-1131.pdf.

10 A. Dan Tarlock & Sarah B. Van De Wetering, *Western Growth and Sustainable Water Use: If There are No "Natural Limits," Should We Worry About Water Supplies?*, 27 Pub. Land & Resources L. Rev. 33, 39 (2006).

11 Mark T. Anderson & Lloyd H. Woosley, Jr., U.S Geological Survey Circular 1261, Water Availability for the Western United States – Key Scientific Challenges 1 (2005), http://pubs.usgs.gov/circ/2005/circ1261/pdf/C1261.pdf.

12 Sarah Bates, *Bridging the Governance Gap: Emerging Strategies to Integrate Water and Land Use Planning*, 52 Nat. Resources J. 61, 66 (2012), https://digitalrepository.unm.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1078&context=nrj.

but it is also predicted to decrease snowpack, increase winter rain, and further reduce flows in rivers and streams at low-flow periods due to increased evaporation.[13]

Current drought conditions are a major problem in the Interior West, which has had a significant impact on the flow of the 1,450-mile Colorado River and its water-storage reservoirs.[14] The Colorado River Basin touches six of the eight states in the Interior West,[15] provides drinking water to nearly 40 million Americans,[16] and produces 15% of the nation's food.[17] According to the U.S. Department of the Interior, "since 2000, the Colorado River Basin has been experiencing a historic, extended drought that has impacted regional water supply and other resources, such as hydropower, recreation, and ecologic services. During this time, the Basin has experienced its lowest 16-year period of inflow in over 100 years of record keeping, and reservoir storage in the Colorado River system has declined from nearly full to about half of capacity"[18] and experts predict that the basin will keep getting drier.[19]

While the Interior West faces significant population growth and development, coinciding with numerous drought years, it is no surprise that many communities already struggle to provide sufficient water to meet residential demands. Exacerbating this water-availability dilemma is that Western communities have some of the highest rates of per capita water use in the nation.[20] Lack of precipitation combined with residential landscaping preferences for high-water-demand vegetation contributes to per capita water rates that far exceed, and in some cases double, the national average of 179 gallons per day.[21]

In the Colorado River Basin as a whole, population growth and the impacts of climate change are projected to result in a long-term imbalance between water supply and demand of about 3.2 million acre-feet per year by 2060[22] — enough water to serve nearly 30 million people each year. As water-supply projections decrease, water-demand projections increase, and future water-supply uncertainty grows throughout the Interior West, a significant imbalance is inevitable without additional future water-management actions.

13 Bobbie Klein & Douglas S. Kenney, *Land Use Planning, Water Resources & Climate Change Adaption Connection: Challenges and Opportunities*, Natural Res. Law Ctr., Univ. of Colo. Law Sch. 3 (2009), http://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1130&context=books_reports_studies; UNESCO, Water for People Water for Life: The U.N. World Water Development Report 17 (2003), http://unesdoc.unesco.org/images/0012/001295/129556e.pdf.

14 Michael Wines, *Colorado River Drought Forces a Painful Reckoning for States,* N.Y. TIMES (Jan. 4, 2014), http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html.

15 The Colorado River Basin extends into the Interior West states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. The Basin does not extend into Idaho and Montana.

16 Bureau of Reclamation, U.S. Department of the Interior, Reclamation: Managing Water in the West, Colorado River Basin Water Supply and Demand Study Executive Summary ES-1 (2012), https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Executive%20Summary/Executive_Summary_FINAL_Dec2012.pdf.

17 Michael Wines, *Colorado River Drought Forces a Painful Reckoning for States,* N.Y. TIMES (Jan. 4, 2014), http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html.

18 Reclamation: Managing Water in the West, Colorado River Basin Water Supply and Demand Study, Executive Summary (2012), https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Executive%20Summary/Executive_Summary_FINAL_Dec2012.pdf.

19 Michael Wines, *Colorado River Drought Forces a Painful Reckoning for States,* N.Y. TIMES (Jan. 4, 2014), http://www.nytimes.com/2014/01/06/us/colorado-river-drought-forces-a-painful-reckoning-for-states.html.

20 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 2 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

21 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 2 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

22 Reclamation: Managing Water in the West, Colorado River Basin Water Supply and Demand Study, Executive Summary (2012), https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Executive%20Summary/Executive_Summary_FINAL_Dec2012.pdf.

c. Sprawling Development Pattern

In many localities in the Interior West, comprehensive plans and land use regulations do not specifically address water supply and conservation. In other locations, they include only general references to assured water-supply requirements. Meanwhile, the way that communities choose to plan and regulate development will have a significant effect on per capita water-use rates and long-term water-supply reliability, not to mention the obvious effect on a community's ability to absorb growth.

Careful planning for population growth is increasingly important in areas that face water-supply challenges. Finding ways to decrease water demand and increase alternative water supplies (such as greywater, green infrastructure, and onsite water recycling) is a task that happens most effectively in the land development process, not once a building is already in place. This presents an opportunity for communities in the Interior West to embrace growth while planning for water conservation by integrating land use and water planning and promoting water efficient land development patterns. Land use plans and development codes will not be able to influence precipitation, but they certainly can influence water consumption and conservation.

While plumbing fixture efficiency and landscaping composition have a significant impact on water-use, land development patterns (lot size and development density) play an enormous role that is often overlooked and, unlike fixtures and landscaping, are very difficult to alter once development is already in place. Large-lot, low-density, dispersed developments have higher water-infrastructure costs, higher onsite water use, higher variability in water-use trends, and higher rates of water loss than more compact developments do. Developments built according to the principles of Smart Growth can substantially reduce these factors and improve water efficiency and conservation.[23] One study by the Transportation Research Board and National Research Council estimates that more compact growth could save $4.77 billion, or 6.5% of water-infrastructure costs, from 2000–2025.[24] The compact development forms inherent in Smart Growth generally require less water per household than single-family housing, and the infrastructure requirements of both types of development are quite different. Planners in Utah have determined that the daily per capita water demand of development at a density of two units per acre is reduced by *half* at a density of five units per acre.[25] It has also been shown that increasing residential density by 20% can yield a 10% per capita water savings.[26] A study of household water use in Sacramento, CA, showed 20%–30% less water use in a new compact single-family development than in typical (large-lot) suburban developments.[27] A study from Portland State University suggests that an increase in one household per acre is associated with a decrease of water use by 411,000 gallons per year when controlling for demographic factors.[28] The study also observed that areas with more than five households per acre provide for highly predictable water-use trends, while those with neighborhoods

23 Western Resource Advocates, New House New Paradigm: A Model for How to Plan, Build, and Live Water-Smart 5 (2009), https://westernresourceadvocates.org/publications/new-house-new-paradigm.

24 Robert W. Burchell et al., Transit Cooperative Research Program Report 74: Costs of Sprawl—2000 (2002), http://www.trb.org/Main/Public/Blurbs/160966.aspx.

25 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 3 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

26 Center for Systems Integration, Colorado Review: Water Management and Land Use Planning Integration 68 (2010), http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=139880&searchid=c5b7f207-ff18-4096-9a70-035a47b9cb1b&&dbid=0; *see also* CWCB Draft Technical Memorandum: Calculating Per Capita Water Demand Savings from Density Increases to Residential Housing for Portfolio and Trade-off Tool 1 (2010), http://cwcb.state.co.us/public-information/publications/Documents/ReportsStudies/DRAFTDensityTechnicalMemo.pdf.

27 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 3 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

28 Vivek Shandas, *Water and Land Use Planning: A Case for Better Coordination*, Or. Planners J., Mar.-Apr. 2010, at 6, http://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1075&context=iss_pub.

with lower densities have greater variability.[29] Compact development therefore increases a community's ability to plan for water needs. Townhouse and multifamily housing development reduce per capita water demand even more. This can be seen in the Northern California Water Association's *Land Use/ Water Supply Analysis Guidebook*.[30] A table demonstrating the typical ranges of water demand based on residential density in Central Valley, California, showed that the total water demand for low-density, single-family residential development is 0.70–1.10 acre-feet per dwelling unit per year (af/du/yr), while medium-density, townhouse development falls to 0.35–0.65 af/du/yr; high-density apartment residential is only 0.25–0.45 af/du/yr.[31] Landscaping demands are the main differentiator between single-family and multifamily housing and between large-lot and small-lot homes.

Variables such as lot size, development density, landscape composition, and irrigation efficiency all play roles in water-consumption rates. The literature supports the idea that single-family homes will generally use more water than multifamily homes due primarily to landscape water-use differences.[32] A 2006 Environmental Protection Agency (EPA) report states definitively: "No matter where they are, areas with low-density, large lots, and large lawns require more water than areas with high-density, small lots, and small lawns."[33] Moreover, reduced landscaping not only reduces overall per capita water demands, it can also reduce peak flow rates from summer watering.

Compact development is also associated with reduced water losses in the distribution system. The aforementioned EPA report explains the effect that the level of sprawl has on water loss: "highly dispersed communities will need longer systems and incur greater loss overall than would more compact communities, regardless of where the main pumping system is located."[34] The American Water Works Association's water audit methodology emphasizes system pressure and length as the factors most affecting unavoidable real loss.[35] A 2015 report from the EPA and the Water Research Foundation (WRF) examined the quality of this methodology and the levels of water loss across the country and found that top among the most noteworthy trends was that a system's real losses increase as average operating pressure increases.[36] Because operating pressure tends to increase as development spreads outward, system length can be a key factor affecting water loss. In the same EPA/WRF study, 2012 data from the California Urban Water Conservation Council indicated median real losses per mile, per day of 3,979 gallons, which translates into almost 1.5 million gallons per year.[37]

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29 Vivek Shandas, *Water and Land Use Planning: A Case for Better Coordination*, Or. Planners J., Mar.-Apr. 2010, at 6, http://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1075&context=iss_pub.

30 Sacramento Valley, Land Use/ Water Supply Analysis Guidebook, Northern California Water Association (2007), http://www.norcalwater.org/res/docs/NCWA-guidebook-final.pdf.

31 Sacramento Valley, Land Use/ Water Supply Analysis Guidebook, Northern California Water Association 6, Table 2-1 (2007), http://www.norcalwater.org/res/docs/NCWA-guidebook-final.pdf.

32 Bobbie Klein & Douglas S. Kenney, The Land Use Planning, Water Resource, and Climate Change Adaptation Connection: Challenges and Opportunities 3 (2009), http://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1130&context=books_reports_studies.

33 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 3 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

34 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 5 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

35 Unavoidable Annual Real Loss (gallons/day) = P x (5.4Lm + 0.15Nc + 7.5Lp) where P is the average pressure (in psi) in the system, Lm is the length (in miles) of water mains, Nc is the number of service connections, and Lp is the total length (in miles) of private pipe (measured as Nc x average distance from curbstop to customer meter). AWWA notes that it is not necessary that systems set this level as a target unless water is unusually expensive, scarce or both. American Water Works Association, IWA/ AWWA Water Audit Method (2012), https://www.awwa.org/Professional-Development/Water-Loss-Control.

36 Environmental Protection Agency and Water Research Foundation, Water Audits in the United States: A Review of Water Losses and Data Validity 46 (2015), http://www.waterrf.org/PublicReportLibrary/4372b.pdf.

37 Environmental Protection Agency and Water Research Foundation, Water Audits in the United States: A Review of Water Losses and Data Validity 24 (2015), http://www.waterrf.org/PublicReportLibrary/4372b.pdf.

Because of these significant effects, the link between land use patterns and water conservation needs to be clearly understood and better addressed in the planning phases of new development. Similarly, water providers can consider these effects in their financial planning models and pass along savings (through reduced tap fees or rates) for compact growth by internalizing these notions of cost recovery. Very few planning strategies can do more to reduce water consumption than focusing on this interconnection.

Moreover, water-smart development doesn't come just from plans and codes that foster a more compact development pattern, but also from other planning and regulatory measures such as distribution systems for recycled water, water-wise landscaping codes, plumbing codes that require water efficient fixtures and appliances, and subdivision regulations with assured water-supply requirements. In almost all cases, it is far more cost-effective to implement these alternative water-supply options and water conservation practices at the beginning of development as compared to retrofitting them at a later date. These techniques lock in water savings and provide flexibility in times of need.[38]

Those professionals whose work touches the land and shapes the way our communities develop must craft solutions for the Interior West to thrive in spite of mounting water scarcity. With all of the challenges that water scarcity brings, especially when faced with pressure to quickly accommodate growth, this inspired group must recognize the importance of their own collaboration, communication, and shared understandings to answer this call.

38 Western Resource Advocates, New House New Paradigm: A Model for How to Plan, Build, and Live Water-Smart iv (2009) https://westernresourceadvocates.org/publications/new-house-new-paradigm.

3. Working Together: A Message to Planners

a. The Need for Cross-Education

In many instances, water planners have only a vague idea of who their land use planners are, the complexity of what they do, and the tools at their disposal, and vice versa. This is exacerbated in situations where water is provided by a special district or private entity (while land use is controlled by the local government). To manage land use, the legal system often requires diverse and disconnected agencies to work with one another. Planning for the water supply of new development, in most states, is done by local or regional water suppliers, who are subject to a differing array of statewide water-planning and regulatory requirements. The land use planning that drives future water demand, however, is done predominantly at the local level by counties, cities, and towns. For proper planning to occur, these legally distinct agencies and actors must be connected effectively. Among other things, water providers need to understand the growth and development patterns anticipated by land use planners and consider that information when projecting water demands, and land use planners need to understand how development patterns affect water use and water loss and consider what rate and style of growth is possible given water-supply availability.

This disconnect is not new or unique to water efficiency and land use. Other examples of this type of disconnection are many. They include, among others:

- Transportation planning, where state and federal agencies invest in transportation and transit infrastructure while local land use planners determine what is built on the land that will need to be serviced by roads, highways, transit, or some combination. (Add to this that, under federal law, local actors in urban areas participate in regional Metropolitan Planning Organizations).[39]
- Open space acquisition funding and planning at the state level, with local governments zoning for the development of open spaces.
- Federal and state standards for habitat and wetlands protection, with localities planning and zoning for development that may adversely impact these natural resources.
- EPA development of stormwater management standards under the Clean Water Act, with local governments funding and managing stormwater sewers and approving development projects that exacerbate stormwater runoff.

These and many more examples make it clear that existing legal frameworks and procedures seldom guarantee the type of coordination that is necessary for the local land use planning and regulatory system to work effectively to plan, regulate, and service development properly. Just as other stakeholders have overcome challenges in their fields, water planners and land use planners need to develop creative and common sense ways of working together.

39 Metropolitan Planning Organizations (MPOs) are responsible for creating short- and long-term transportation spending budgets. In some regions, the MPOs stimulate some connectivity between local land use planning and regional transportation planning, but this is the exception.

EXAMPLE OF THE WATER-LAND USE PLANNING DISCONNECT

Lakewood, Colorado[40]

In an effort to permit "mother-in-law" apartments and quickly accommodate additional density while maintaining community character, the City of Lakewood amended its zoning code to allow for accessory dwelling units (ADUs).[41] The City's ordinance permits a primary single-family dwelling unit on a lot of at least 9,000 square feet to have one accessory unit so long as either the primary or accessory unit is occupied by the property owner and so long as the accessory unit is located to the side or rear of the primary unit, with no more than one bedroom, a maximum of 700 square feet of gross floor area, a maximum height of 30 feet (if detached), and an exterior that is similar in appearance to the primary unit and maintains the residential character of the property. If located on a second floor or above a garage, the accessory unit may have a separate external stairway that is not on the street-facing façade.

As homeowners began to avail themselves of this new accessory dwelling unit provision, they would contact the water provider to expand their existing tap only to discover that the non-City water provider intended to charge a tap fee as if the accessory unit were a new home, regardless of whether the structure and infrastructure were already existing, effectively making the project cost-prohibitive for most homeowners.[42] As a result, since Lakewood's code amendment, the City has received and approved significantly fewer accessory units than anticipated and has not been able to accommodate growth in the way it planned.

Successful efforts to bridge these gaps typically begin with education. Land use planners need to learn what water planners do and vice versa. These practitioners operate in completely different contexts and have not been exposed to their respective practices. As a result, the benefits of cooperation are not readily evident and often, too little effort to work together is made. Initial educational efforts could include a review for water-supply planners of basic land use regulation tools (zoning, subdivision, building permits, and others) as well as state-specific land use laws and, for land use planners, a review of water-resource planning for supply, wastewater, stormwater, integrated systems, water quality, water-rates setting, system development charges and especially water conservation. Once this education occurs, the next step is to create some type of procedure for regular contact. Next, these discussions should result in coordinated planning based on a deeper understanding of the interdependence of both systems and how they can be leveraged for greater effect. Finally, after senior decision makers have learned the benefits of coordinated efforts, these informal procedures can be institutionalized.

40 Lakewood, CO, Municipal Code §17.4.3.1(A) Purpose and Applicability (2015), http://www.lakewood.org/City_Clerk/Codes_and_Laws/Municipal_Code/Title_17_-_Zoning/Article_4_-_Uses_and_Supplemental_Standards/17_4_3_-_Supplemental_Standards/2147506011/.

41Lakewood Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015); Email from Henry Hollender, HVS Engineering, to author (April 11, 2016) (on file with author).

42 Lakewood Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

EXAMPLES OF LOCAL DEPARTMENTS WORKING TOGETHER

Aurora, Colorado[43]

Collaboration is integrated into Aurora's organizational structure, especially when it comes to water. Whenever code changes are proposed, the City's departments work together to ensure that water conservation is part of the conversation. This collaboration began in earnest in 2009 when the City updated its Comprehensive Plan.[44] As the comprehensive planning process began, the City's Water Department and Planning and Development Services Department came together and have maintained a high level of communication ever since. The Comprehensive Plan itself contains language calling for the water conservation division to use a multifaceted approach including programs for peer agency collaboration and outreach.[45] Much of the reason the collaboration continues is due to the creation of City's Integrated Water Master Plan,[46] which operates in a way that necessitates a conversation when water and land use decisions are made. The process and requirements that have been put in place require the water department's planning and engineering group (along with their conservation group) to work closely with not only the planning department but also with other departments to determine how the City will grow. This process provides the water department with the information it needs to adequately plan for the City's future water-supply needs.

In addition, the City's water department uses technology to share water-use information with the planning department. Similarly, the planning department shares data to enable the water department to plan for infrastructure needs. Through modeling software, the departments work together to examine how water use changes under various land use development scenarios. The City also created an Office of Development Assistance — a division within the City Manager's office — to facilitate the development process with staff members that cross all boundaries. Collaboration is now also a priority in the City's hiring process — making sure new hires are people who thrive in a face-to-face, cooperative approach.

Throughout the initiatives discussed here, other departments have also been heavily involved in the dialogue surrounding land use planning and water demand, including Public Works; the Office of Development Assistance; Parks, Recreation, and Open Space; and others. As a result of the City's focus on interdepartmental collaboration, staff has a significantly fuller picture of what is going on in City operations and what actions could raise red flags for other departments. It has also helped employees recognize that they are on one team as opposed to eight separate departments. Services are more efficient, customers are more informed, and the City has seen higher-quality development.

43 Telephone interview with Lyle Whitney, Water Conservation Supervisor, City of Aurora, and Karen Hancock, Long-Range Planner & Environmental Program Supervisor, City of Aurora (Aug. 5, 2016).

44 City of Aurora, CO, 2009 Comprehensive Plan (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

45 City of Aurora, CO, 2009 Comprehensive Plan, G: Developing and Protecting Water and Other Natural Resources 5 (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

46 City of Aurora, CO, Aurora Integrated Water Master Plan, Draft Final (2016).

Santa Fe, New Mexico[47]

The City of Santa Fe adopted a Sustainable Santa Fe Plan in 2008. The Plan lays out Proposed Actions organized under ten main topics, one of which is Water Conservation. The Water Conservation chapter contains a Proposed Action to develop a Water Conservation Strategic Plan, which should, among other things:

- "Better integrate (for planning purposes) the various functions currently managed by separate entities within City government, including Water Conservation, Long- Range Water Supply, Planning and Land Use, Billing Division, etc."
- "Address the harder questions regarding water conservation, particularly the interconnections between conservation, land use, and growth — all within the context of climate change."

San Jose, California[48]

Adopted in 2011, Envision San Jose 2040 General Plan is the City's comprehensive plan. The Plan incorporates various land use and water conservation methods — including many of the incentives addressed throughout this Guidebook — to reach the City's goals. Many of the Plan's chapters include collaborative language related to water conservation.

The Plan's Land Use and Transportation chapter calls for many water conserving land uses and for requiring new developments to incorporate measures to minimize water consumption. As part of its goal to "establish a land use pattern that fosters a more fiscally and environmentally sustainable safe, and livable city," the Plan includes an implementation action to "collaborate with appropriate external agencies with land use authority or regulations in the City. Consider applicable Airport Land Use Commission, Water District, Local Area Formation Commission, and other policies from outside agencies when reviewing new or expanded uses."

The Plan's Environmental Leadership chapter emphasizes the importance of developing effective local, regional, and statewide partnerships and governance structures that enable sustainable water management. As part of its goal for responsible management of the water supply, the Plan includes an implementation action calling for the City to "review and provide input to Urban Water Management Plans prepared by water suppliers to ensure that they maximize water conservation and reuse to fulfill the City's water-supply needs. Consider projected water supplies in updated Urban Water Management Plans as part of each Major Review of the *Envision General Plan*."

Golden, Colorado

In 2008, Golden established the Community Sustainability Advisory Board (CSAB) to assist the City in achieving its sustainability goals.[49] In 2015, the City updated its Sustainability Strategic Plan, composed of seven measures, including green buildings and water. According to the Plan, the CSAB works directly with other boards and commissions within the City to facilitate and track progress within the set sustainability goals.[50]

47 City of Santa Fe, NM, Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

48 City of San Jose, CA, Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

49 *Boards and Commissions,* City of Golden, http://www.cityofgolden.net/government/boards-commissions/ (last visited Jul., 19, 2016).

50 City of Golden, CO, 2015 City of Golden Sustainability Strategic Plan 4, 7 (2015), http://www.cityofgolden.net/media/SustainabilityStrategicPlan.pdf.

Among the City's goals are to revise its land use code every three years to reflect the best practices in sustainability; reduce the City's per capita water use by 15% in 15 years; and increase the efficiency of the water-delivery system (water infrastructure from reservoir to plant and to end-user). Among others, the Plan's strategies to implement some of these goals include:

- Having the CSAB work with the City Council, Public Works, Communications Department, and the general public to develop an advanced metering program
- Having the City partner with the local Center for Resource Conservation to promote outdoor water conservation
- Having the CSAB work with the Planning Commission to research innovations and ideas to minimize outdoor water use in new and redevelopment projects (in order to eventually adopt regulations to reduce such water use)

b. The Water-Planning Process

The intended audience of this Guidebook is land use planners. Accordingly, this section provides an overview of typical water-planning processes. The size, needs, and institutional structure of water utilities varies widely, and therefore, so do the respective planning processes. The information provided here is generally applicable to many water providers but will likely not entirely apply to any individual provider.

Historically, water planning has been handled by the water utility without much collaboration with outside entities. Traditionally, the role of the water utility has been to provide all the water needed for new development. If supplies are short, their job is to obtain more. However, the ability of water providers to obtain and develop new water supplies in the West is increasingly difficult as water supplies are more limited, more costly and time-consuming, and more contentious with every new water development proposal. This has given rise to more integrated planning processes that help to address the demand side of the equation. The remainder of this section will focus on the water-planning process, with a particular focus on integrated water-resource planning and water efficiency planning.

i. Types of Water Plans

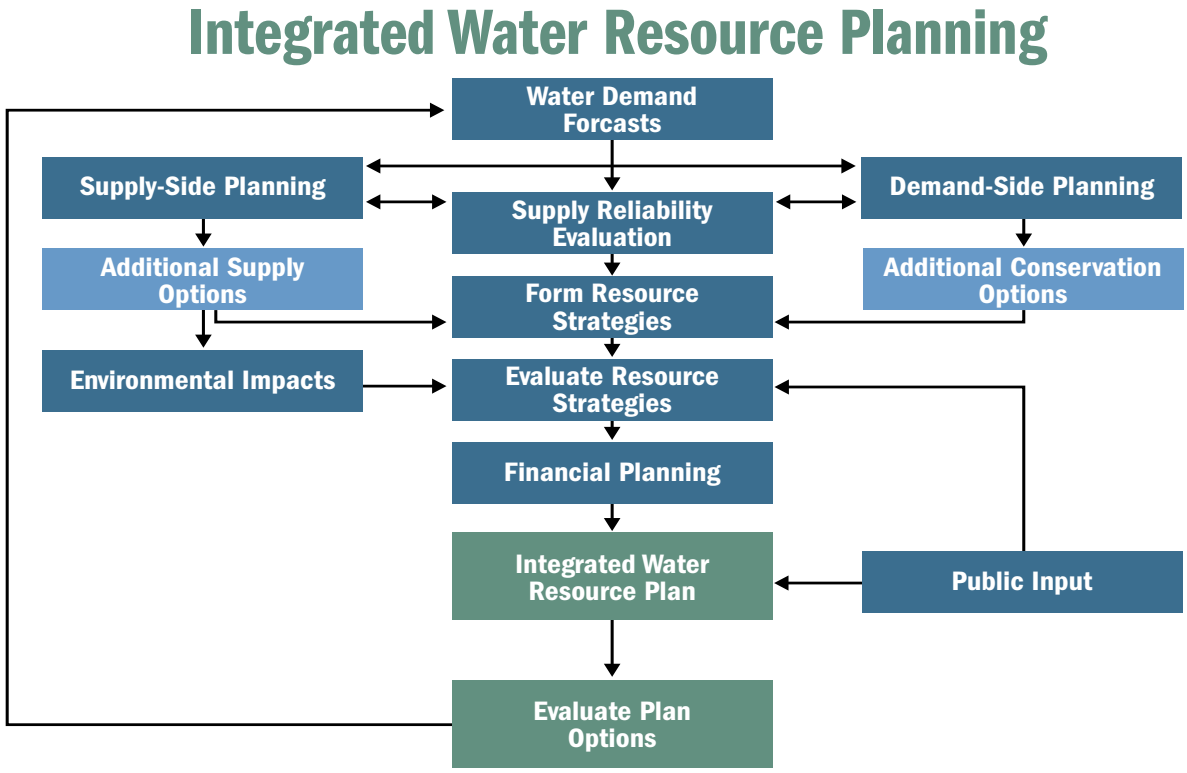
There are a number of water plans that a water utility, special district, or local government can create to suit their water-management needs. Plans can be written separately for water supply, wastewater, storm water, water quality, and water efficiency (among others) or can be combined into one integrated plan.

The goals and issues examined in any plan will vary with the nature of the community, its management responsibilities, and its water-resource management challenges or opportunities. Some communities might not control all utilities within their political boundaries, such as a separate wastewater enterprise that covers multiple communities. Another example would be older communities that may focus more on infrastructure repair/replacement while growing communities may focus more on acquisition of new water supplies.

But virtually every water plan has a set of goals that define the actions to be taken to manage the water resource to its full potential while planning for uncertainty and variability. Further, whatever suite of water plans exist in a community, there is an important and necessary link that should be made explicitly between these water plans and the land use planning efforts of the community.

The following figure is adapted from Water Resources Planning: American Water Works Association (AWWA) Manual of Water Supply Practices, M50, second edition. It provides a graphical representation of the Integrated Water Resource Planning (IWRP) process, which takes into consideration future water demands, current and future supply options, and financial strategies to meet water objectives; it also includes public input as an important part of the process to ensure that a variety of perspectives are considered and addressed. Much as a community comprehensive master plan should include a water-resource component, a community's IWRP process should also include land use elements, and this may occur in the demand forecasting stage, the water-supply planning stage, and even the public process stage. The comprehensive and flexible approach of the IWRP lends itself to the inclusion of a variety of factors that can be considered when evaluating water-management plan options.

Figure 1. Integrated Water Resource Planning Diagram, from AWWA M50 Manual of Water Supply Practices, p. 318.



ii. Water Demand Forecasts

One of the most important aspects of water planning is demand forecasting. Demand forecasting varies in complexity from just multiplying future population projections by current per capita water use, to highly complex econometric models that factor in demand trends by customer type and development projections. Demand projection models can be used to define a range of potential future demands, which can then be used to anticipate new infrastructure needs and assess supply reliability.

One challenging aspect of demand forecasting can be accounting for water efficiency savings and incorporating them into future demand scenarios. Some water savings can be viewed as "passive" —

brought on by the natural replacement of indoor fixtures with more efficient ones — whereas "active" water savings are the result of public education and water efficiency incentive programs. As a result of federal regulations regarding water-fixture standards, state planning efforts, local incentive programs, and the increasing cost of water, per capita water use is declining across the U.S.[51] A key issue to examine is whether or not water-demand planning takes into account changing land use patterns and what impact that is likely to have on future water demands.

iii. Water Efficiency Planning Process

Water efficiency planning is sometimes captured in a stand-alone document and sometimes integrated into larger planning documents. In some states, utilities are required to submit conservation plans to a state agency for approval or to gain access to state funds; in other states, these plans are used exclusively at the local level. Typically, some of the background or context of the water efficiency plan is derived from other water plans already in existence, such as master supply plans or demand studies.

These plans often reflect the current state of water use by customer types or per capita and usually include a goal for water reductions in a certain time period (for example, a 10% reduction in per capita water use in 15 years). In addition, these plans will typically specify the suite of actions and activities that can or will be taken to achieve the stated goal and provide some analysis of the associated costs.

EXAMPLE OF WATER EFFICIENCY PLANNING

The following is an overview of the water efficiency planning process in Colorado and is excerpted from Colorado Water Conservation Board's Municipal Water Efficiency Plan Guidance Document, which outlines the information that water utilities must gather and submit to the state (if they are a large enough water provider above a certain threshold).[52]

The five steps of the water efficiency planning consist of the following:

- Step 1: Profile of Existing Water-Supply System – Collection and development of supply-side information and historical supply-side water efficiency activities
- Step 2: Profile of Water Demands and Historical Demand Management – Collection and development of demand data and historical demand management activities
- Step 3: Integrated Planning and Water Efficiency Benefits and Goals – Identification of how water efficiency will be incorporated into future water-supply planning efforts and development of water efficiency benefits and goals
- Step 4: Selection of Water Efficiency Activities – Assessment, identification, screening, and evaluation process to select and fully evaluate a portfolio of water efficiency activities for implementation
- Step 5: Implementation and Monitoring Plans – Development of an implementation and monitoring plan

51 U Dieter, C.A., and Maupin, M.A., 2017, Public supply and domestic water use in the United States, 2015: U.S. Geological Survey Open-File Report 2017–1131, 6 p., https://doi.org/10.3133/ofr20171131.

52 Colorado Water Conservation Board & AMEC, Municipal Water Efficiency Plan Guidance Document 11-13 (2012). http://cwcb.state.co.us/technical-resources/water-conservation-plan-development-guide/Pages/main.aspx.

iv. Supply Reliability Evaluation

One of the primary functions of water-supply planners is to ensure that their water system reliably provides clean and abundant water 24 hours per day, every day of the year. Not only does this include quantifying existing water supplies in their community throughout the year, but it also quantifies the reliability of those supplies. Many factors affect the reliability of existing water resources, such as climate change, drought, sedimentation in reservoirs, and outstanding legal issues. A safety factor is usually included in any supply projections to ensure that a system can withstand disruptions and emergency shortages.

Several options are available to address supply reliability issues, including water importation from other parts of the state, expanding existing infrastructure, water efficiency, water reuse, and regional partnerships, among others. Water efficiency programs, for example, may focus on indoor or outdoor measures, target residential or nonresidential customers, or involve whole water-system management such as water-loss management. By examining all these options equally, the utility approaches the management of the resource in an inclusive manner that can determine the most cost-effective and community-appropriate water-supply and demand alternatives.

v. Financial Planning

Water-resource strategies are evaluated on reliability, environmental impact, public acceptance, cost, and return on investment (ROI). In order to provide high-quality drinking water and maintain a sustainable business model, a water utility must evaluate existing infrastructure, the capacity of treatment facilities, and the costs associated with maintaining and expanding various components in light of future demands. Setting appropriate rates and tap fees to recover cost of service is an important and complex process. Declining per capita use and the need to recover the high fixed costs inherent to the water industry make rate-setting essential and challenging. Financial planning within the water-planning process is crucial to the financial sustainability and health of the utility.

A specific area that transcends water and land use planning is the idea of recovering costs for new water infrastructure based on how compact the new development is and how much infrastructure is required to service that new development. This could be viewed as a density bonus of a kind that incentivizes more compact development versus more far-flung development. This would be a very different and more granular way to look at water infrastructure costs and land use patterns. Financial planning is an area where land use and water planning affect each other directly in many ways and should be considered together when planning for a sustainable financial water future.

vi. Scenario Planning

Scenario planning is a powerful tool that ensures that multiple futures are taken into consideration so as not to commit all resources toward one uncertain future. Uncertainty in water-supply reliability and demand forecasting can be integrated into a scenario planning process, a complex process that is used by only a select number of utilities currently, but one that is increasingly popular among utilities grappling with high levels of population growth and uncertainty in water supply and demand.

EXAMPLE OF SCENARIO PLANNING

Colorado Water Conservation Board[53]

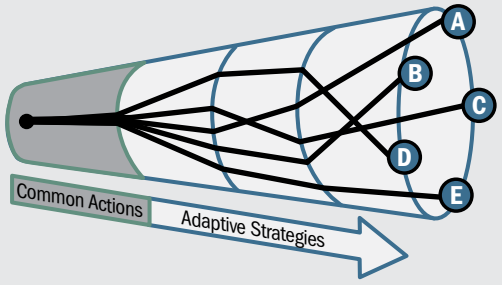
Given the uncertainties of future water supply and demands, the Colorado Water Conservation Board (CWCB) adopted a planning approach used by many major water planners across the West: scenario planning.[54] The use of scenario planning assumes that the future is unknown and provides a flexible framework for responding to various future conditions.[55] That is, rather than trying to predict the future by looking only at the past, scenario planning allows us to identify and account for key uncertainties operating within the planning period and to develop responses appropriate to multiple scenarios.

The CWCB explored the implications of multiple plausible futures with stakeholders in a multiyear process. Given the unpredictability of factors driving Colorado's future, such as climate change, economic and population growth, and social values, the ability to plan for multiple scenarios presents a much more comprehensive approach for preparing for Colorado's future. Descriptions of several futures were developed and subsequently used to identify projects and policies that would be relevant to multiple scenarios. These common actions could then be prioritized, while still monitoring the uncertainties that would impact future scenarios.

By implementing projects and policies that are helpful across multiple scenarios ("common actions"), decision makers can have greater confidence that any investments made in the near term will also be viable in the longer term. Scenarios can be reevaluated and updated based on the status of predetermined "signposts" or decision points that help to reveal whether past uncertainties now have more clarity (Figure 1), which can lead to a revised set of action ("adaptive strategies").

For water in Colorado, these uncertainties include water needs, water supply, and Colorado's social values. Use of scenarios enables planners to respond and adapt to still- emerging issues and to explore the opportunities and challenges that each possible future presents without reducing options available going forward.[56]

Figure 2- Scenario Planning Identifies Successive Set of Common Actions that Apply to Multiple Futures



Adapted from Marra and Thomure, 2009

53 Colorado Water Conservation Board. 2015. Colorado's Water Plan. https://www.colorado.gov/pacific/cowaterplan/plan.

54 Kees van der Heijden, SCENARIOS: THE ART OF STRATEGIC CONVERSATION (John Wiley & Sons eds., 2nd ed. 2005).

55 PETER SCHWARTZ, THE ART OF THE LONG VIEW 3 (Doubleday, 1991).

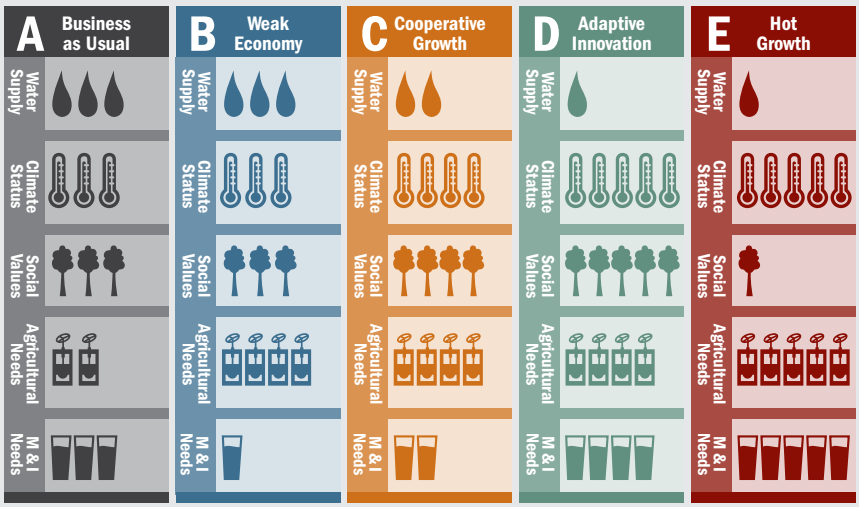
56 Kees van der Heijden, Scenarios: The Art of Strategic Conversation 1 (John Wiley & Sons eds., 2nd ed. 2005).

Potential changes in future municipal and industrial (M&I) water demand and available water supply were among the most important drivers considered when developing various portfolios. Nine high-impact drivers were identified that should be factored into the scenario development process:

- Population/Economic Growth
- Social/Environmental Values
- Climate Change/Water-Supply Availability
- Urban Land Use/Urban Growth Patterns
- Energy Economics/Water Demand
- Level of Regulatory Oversight/Constraint
- Agricultural Economics/Water Demand
- Municipal & Industrial Water Demands
- Availability of Water Efficient Technologies

Using these drivers, five scenarios were developed that represent plausible futures. The scenarios, visualized in summary form below, represent how Colorado's water future might look in 2050 even though the actual future at that time will likely contain a mixture of multiple scenarios.[57] Each scenario (A–E, across) indicates to what extent each driver (down) will impact urban water demands and water-supply availability. For example, in the "hot growth" scenario, climate status becomes more of a driver, whereas "social values" (which in this case is willingness to protect the environment and stream recreation) becomes less of a driver.

Figure 3 – Possible Scenarios



The five scenarios collectively capture a broad range of future supply-and-demand possibilities and uncertainty. Of the five scenarios, "Business as Usual" is the most conventional while "Adaptive Innovation" and "Hot Growth" are the most difficult to prepare for because of high water demands combined with the effects of climate change. The challenge is not to pick the most likely or attractive future; rather, it is to develop the capacity to be prepared for all of them. This style of scenario planning provides a roadmap in an uncertain future and will necessarily remaining a living document as time goes on.

57 COLORADO WATER CONSERVATION BOARD, IBCC ANNUAL REPORT, 7-8 (2013), http://www.sjwcd.org/wp-content/uploads/2013/11/Rprt-IBCC-13.pdf.

vii. Additional Water-Planning Process Resources

The information presented in this section provides a brief overview of typical water-planning processes. As noted in the beginning of this section, however, the specifics of an individual water utility's planning process will be context dependent and will be different from utility to utility. The following resources provide specific examples of planning processes:

- New Mexico Office of the State Engineer — Interstate Stream Commission. 2009. *Overview of Water Planning in Western States.*[58]
- Stratus Consulting and Denver Water. 2015. *Embracing Uncertainty: A Case Study Examination of How Climate Change is Shifting Water Utility Planning*. Prepared for the Water Utility Climate Alliance (WUCA), the American Water Works Association (AWWA), the Water Research Foundation (WRF), and the Association of Metropolitan Water Agencies (AMWA) by Stratus Consulting Inc., Boulder, CO (Karen Raucher and Robert Raucher) and Denver Water, Denver, CO (Laurna Kaatz). May 12.[59]
- City of Phoenix—Water Services Department. 2011. *Water Resource Plan*.[60]
- Salt Lake City Department of Public Utilities. 2014. *Salt Lake City Water Conservation Master Plan*.[61]
- Albuquerque Bernalillo County Water Utility Authority. 2016. *Water 2120: Securing Our Water Future*.[62]

c. The Value of Regional Collaboration

The jurisdiction of most[63] local governments runs only to their boundaries, making land use planning highly parochial in nature.[64] The disadvantages of this are obvious when considering that water exists and freely flows across political boundaries. For example, groundwater resources typically underlie multiple jurisdictions, and surface water systems are virtually always intergovernmental resources where upstream users greatly affect the quality and quantity of water available for downstream users. Compounding this disconnect is the reality that "all politics is local" and communities tend to guard their legal independence and power. As a result, most states do not require intermunicipal/intergovernmental planning — either

58 Interstate Stream Commission, New Mexico Office of the State Engineer, Overview of Water Planning in Western States (2009), http://www.ose.state.nm.us/Planning/SWP/PDF/WesternStatesWaterPlanningOverview-2009-02.pdf.

59 Karen Raucher & Robert Raucher, Embracing Uncertainty: A Case Study Examination of How Climate Change is Shifting Water Utility Planning (2015), https://www.wucaonline.org/assets/pdf/pubs-uncertainty.pdf.

60 Water Services Department, City of Phoenix, 2011 Water Resource Plan (2011), https://www.phoenix.gov/waterservicessite/Documents/wsd2011wrp.pdf.

61 Department of Public Utilities, Salt Lake City, 2014 Salt Lake City Water Conservation Master Plan (2014), http://www.slcdocs.com/utilities/PDF%20Files/2014%20SLC%20Water%20Conservation%20Master%20Plan.pdf.

62 Water Utility Authority, Albuquerque Bernalillo County, Water 2120: Securing Our Water Future (2016), http://www.abcwua.org/uploads/files/Water_2120_Volume_I.pdf.

63 Alhough the jurisdiction of local governments *typically* runs only to their boundaries, some local governments (for example in New Mexico) have extraterritorial powers to regulate subdivision or other specific types of land use actions within a stated distance outside their borders.

64 State enabling statutes delegating land use planning and regulation to local governments in the Interior West: Ariz. Rev. Stat. Ann. § 9-461.01 (2016); Colo. Rev. Stat. §§ 29-20-101, 102 (2016); Idaho Code § 50-301 (2015); Mont. Code Ann. § 76-2-101 (2015); Nev. Rev. Stat. §§ 268.098-.099, .105 (2015); N.M. Stat. Ann. § 3-19-1 (2016); Utah Code Ann. § 10-9a-102 (LexisNexis 2016); Wyo. Stat. Ann. §§ 15-1-502, -601 (2016).

in general or with respect to water.[65] Where states or the federal government do create regional planning agencies, they are often voluntary organizations and have little effective control over local decision-making.[66]

At the same time, the legal system in most states permits and encourages intergovernmental cooperation and regional planning.[67] Local governments are more likely to take advantage of these enabling laws where a lack of joint planning would result in serious problems and where they can decide outcomes through a process of intergovernmental or regional interaction. States can induce localities to plan together by making such planning a prerequisite for funding local projects or by giving local governments a competitive advantage for state funding if they work together on common problems. A distinct advantage of this type of coordinated regional planning is that it tends to capture and reconcile the interests of the relevant communities within water districts and agencies, which often have service areas covering all or part of more than one local government. Local governments could therefore increase the efficiency of planning and regulating for water conservation by coordinating efforts with adjacent local governments that have shared issues and resources and using intergovernmental cooperative measures to institute a framework for improved water conservation and land use integration. Communities with the power to cooperate under state law can often create and adopt a Memorandum of Understanding that stipulates the process of joint planning. Often, they can also share related costs on an equitable basis (for example, one or more staff members could be engaged to enforce post-occupancy requirements related to water).[68] Funding of planning across local government lines not only makes water and land use planning more effective, but it can also reduce costs through economies of scale.

65 A notable exception to this in the Interior West—though not specific to water—is the State of Nevada, which requires that in counties with populations of 700,000 or more, the board of county commissioners and the city council of at least the three largest cities in the county must establish a regional planning coalition. Nev. Rev. Stat. § 278.02514 (2015). The State of New Mexico also does not "require" intergovernmental or regional planning, but does require binding intergovernmental agreements if local governments wish to take advantage of State funding made available for regional water planning. To be eligible for funding, a proposed water planning region must, among other things, "contain sufficient hydrological and political interests in common to make water planning feasible;" if there is more than one party, the parties must "have demonstrated political and economic interests in common by entering into a binding intergovernmental agreement for carrying out the planning process;" and no entity can be made a part of a proposal without consent. Since the program's creation in 1987, 16 water planning regions have been created covering the entire State. N.M. Stat. Ann. § 72-14-44 (2016); *Interstate Stream Comm'n: Reg'l Water Planning,* N.M. Office of the State Eng'r, http://www.ose.state.nm.us/Planning/regional_planning.php (last visited Sept. 27, 2017); *see also Interstate Stream Comm'n: Reg'l Water Planning in N.M. Frequently Asked Questions (FAQ),* N.M. Office of the State Eng'r, http://www.ose.state.nm.us/Planning/RWP/rwpnm-pamphlet.php (last visited Sept. 27, 2017). The State of Colorado does not "require" intergovernmental or regional planning but does require that each local government create a Master Plan for the physical development of the municipality and that Plan must "make careful and comprehensive surveys and studies of present conditions and future growth of the municipality, with due regard to its relation to neighboring territory." Colo. Rev. Stat. § 31-23-207 (2016).

66 One notable exception to this in the Interior West is the State of Nevada. In 1969, the State created the Nevada Tahoe Regional Planning Agency as a result of a compact with California. The Agency is mandated to protect the environment of the Lake Tahoe Basin through land use regulations and is one of the few watershed-based regulatory agencies in the country. Lake Tahoe and the adjacent parts of Carson City and the counties of Douglas and Washoe all fall under the Agency's jurisdiction. Powers granted to these local governments that have also been granted to the Agency are subordinate to the Agency's powers and may be exercised only to the extent that their exercise does not conflict with any ordinance, rule, regulation, or policy adopted by the Regional Planning Agency. Nev. Rev. Stat. §§ 278.780-.828 (2015). Also, in 1989, Nevada established regional planning commissions in counties with populations between 100,000 and 700,000, each tasked with developing "a comprehensive regional plan for the physical development and orderly management of the growth of the [county's] region for the next 20 years" Nev. Rev. Stat. §§ 278.026-.029 (2015).

67 Arizona, Ariz. Rev. Stat. Ann. § 11-952 (2016) (authorizing public agencies, including cities, towns, counties, and any other political subdivision, to work together); Colorado, Colo. Rev. Stat. § 30-28-105 (2016) (giving counties the authority to cooperate in the creation of a regional planning commission), Colo. Rev. Stat.,§ 31-23-227 (2016) (allowing municipalities to enter into intergovernmental agreements with their own counties "for the purposes of joint participation in land use planning..."); Idaho Code §§ 67-2326-2328 (2015) (authorizing public agencies, including cities, counties, and any other political subdivisions of the state to cooperate to their mutual advantage and specifying that any power, privilege, or authority held individually may be exercised jointly with any other public agency having the same powers); Mont. Code Ann. §§ 76-1-112, 601 (2015) (authorizing cities, towns, and counties to form a consolidated planning board, charging planning boards with the duty of preparing and proposing a growth policy for their entire jurisdiction, and authorizing them to propose ordinances or resolutions for adoption by the governing body or bodies); Nevada, Nev. Rev. Stat. §§ 278.02514, .026 (2015) (requiring regional planning in counties with populations of 100,000 or more); N.M. Stat. Ann. § 3-56-2 (2016) (authorizes and outlines conditions under which a regional council may be formed) and N.M. Stat. Ann. § 72-14-44 (2016) (authorizes funding for regional water planning, requiring a binding intergovernmental agreement to demonstrate common political and economic interests); Utah Code Ann. § 11-13-201 (LexisNexis 2016) (authorizes regional / intermunicipal planning through its Interlocal Cooperation Act); Wyo. Stat. Ann. § 16-1-104 (2016) (Wyoming Joint Powers Act, permitting counties, municipal corporations, and other agencies to exercise powers jointly with another agency that has similar powers, privileges, or authorities).

68 It is possible that, even where the state law allows cooperation, some Interior West states may not permit local governments to contract or bind themselves or others through voluntary intergovernmental actions. Communities should be sure to consult with their municipal attorney before taking such action.

Communities lacking the authorization for intergovernmental cooperation or those interested in a less formal approach can consider organizing regional discussions. This is likely within the purview of the regional planning agency, if one exists, which may have greater technical information and resources than the individual jurisdictions that decide to cooperate. Because many communities have only a vague idea of what neighboring communities are doing regarding land use and water, there is significant value in simply sharing lessons.

EXAMPLES OF LOCALLY INITIATED REGIONAL PARTNERSHIPS REGARDING WATER-SUPPLY PLANNING AND MANAGEMENT

San Jose, California[69]

Adopted in 2011, the City's comprehensive plan, Envision San Jose 2040 General Plan, incorporates various land use and water conservation methods to reach the City's goals. The Plan's Environmental Leadership chapter emphasizes the importance of developing effective local, regional, and statewide partnerships and governance structures that enable sustainable water management. Specifically, the Plan sets forth a goal for responsible management of the City's water supply and, as part of this goal, includes an implementation action to "create partnerships and governance structures that allow for a comprehensive approach to water-supply management that improves the reliability of local and imported water supplies, explores new sources of water, and thereby protects and enhances the Sacramento-San Joaquin River Delta ecosystem."

Boulder, Colorado[70]

In 1977, the City of Boulder and Boulder County approved an intergovernmental agreement and the Boulder Valley Comprehensive Plan (updated many times since) to concentrate urban development in the City and to preserve lands outside the City service area. (To the extent that there is any conflict, the joint plan supersedes the County plan.) The Boulder Valley 2010 Comprehensive Plan lists sustainability as the first core value and uses it as a unifying framework to meet environmental, economic, and social goals. Section 1.1 emphasizes that effective regional or statewide cooperation and solutions are necessary to attain these goals and calls for an active pursuit of cooperative planning opportunities, intergovernmental agreements, broader information exchanges and communication, collaborative initiatives, and closer cooperation with entities in the region and state. In addition, Section 3.24 of the comprehensive plan states that to ensure water quality, there will be special emphasis on regional efforts such as watershed planning, and that priority will be placed on pollution prevention over treatment.

The Plan's Natural Environment chapter emphasizes that the City and County will promote water-resource conservation through a combination of protection, public education, monitoring, and policies that promote appropriate water usage; the City will endeavor to minimize water waste and reduce water use during peak demand periods and will encourage new development and redevelopment that is designed to conserve water. The chapter also includes specifications on efforts related to water-resource planning and acquisition and the impacts of land development on surface and groundwater.

69 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

70 City of Boulder, CO, Boulder Valley Comprehensive Plan (2010), https://www-static.bouldercolorado.gov/docs/boulder-valley-comprehensive-plan-2010-1-201410091122.pdf.

Aurora, Colorado

The City of Aurora enters into intergovernmental agreements (IGAs) with neighboring jurisdictions to address issues of mutual concern. Examples include the city's agreement with the Metro Wastewater Reclamation District for treatment of its sewage flows[71] and a variety of IGAs in the past with neighboring counties to address land use matters.

The City cooperated in the creation of master plans for two watersheds and entered into IGAs with the City and County of Denver, the Urban Drainage Flood Control District, the Gateway Regional Metropolitan District, and the Town Center Metropolitan District that set forth responsibilities and financial commitments with respect to implementation of elements of the master plans.[72]

Aurora entered into a Memorandum of Understanding[73] (MOU) in 2008 with the City and County of Denver and the South Metro Water Supply Authority (the Authority), constituted by approximately a dozen municipal water providers that, through cooperation, sought to develop new surface water supplies that would decrease reliance on limited and nonrenewable groundwater supplies. Under the MOU, Aurora and Denver agreed to include the Authority in their current initiative to identify and investigate water resources that may be available through a regional effort. The MOU also included the potential investigation of a regional reverse osmosis treatment facility; exploration of ways in which the joint acquisition of infrastructure, water rights, or other assets may be mutually beneficial; and cooperation in the development and implementation of a strategy for outreach activities.

In 2013, the same parties entered into a Water Infrastructure and Supply Efficiency (WISE) Partnership Water Delivery Agreement regarding joint use of infrastructure and delivery of water.[74] The Agreement was intended to help the Authority's members reduce their reliance on nonrenewable groundwater and partially meet long-term water demands by using the periodic, underused capacity in Aurora's Prairie Waters Project (water collection, conveyance, storage, and treatment system that delivers water from the South Platte River) and the construction or acquisition of additional infrastructure, combined with water supplies to be made available by Aurora and Denver Water. As part of the Agreement, the Authority acknowledged that they cannot rely upon WISE deliveries as their sole source of water supply, and they agreed to require member communities to acknowledge in their IGA the need to maintain existing water supplies, develop new water supplies, or have adequate storage available to meet their demands when WISE deliveries are interrupted.

71 *Metropolitan Wastewater Reclamation District Board*, City of Aurora, CO, https://www.auroragov.org/city_hall/boards___commissions/metropolitan_wastewater_reclamation_district_board (last visited Sep. 21, 2017).

72 Urban Drainage and Flood Control District, City and County of Denver, CO, & City of Aurora, CO, *Agreement Regarding Implementation of the Second Creek Drainage Basin Master Plan*, Agreement No. 04-03.10 (Aug. 8, 2006); *Agreement Regarding Implementation of Portions of the First Creek Watershed Master Plan*, Agreement No. 99-03.11 (Jan. 25, 2001).

73 City and County of Denver, CO, City of Aurora, CO & South Metro Water Supply Authority, *Memorandum of Understanding: Cooperative Water Resource Study* (Nov. 20, 2008).

74 City and County of Denver, CO, City of Aurora, CO & South Metro Water Supply Authority, *Amended and Restated WISE Partnership – Water Delivery Agreement* (Dec. 2013).

d. When Water Providers Take the Lead

Because this Guidebook is written predominantly for land use planners, the calls to action throughout are directed at the land-planning — not water-planning — community. This is also the case because it is more typical for a local government entity with land use regulatory powers to lead the charge in coordinating an effort to better integrate land use and water planning and because many communities reading this guide will not be their own water provider. Water providers, however, sometimes do take the lead and local governments should be sure to explore whether their water provider has done so, as certain initiatives may not have been brought to the local governments' attention.

EXAMPLES OF WATER PROVIDER-LED LAND USE ACTION

East Bay Municipal Utilities District, California[75]

The East Bay Municipal Utilities District (EBMUD), which serves customers in and around Oakland, California, faced water-supply availability challenges for a number of years. In response, it developed Service Rules to govern those connecting to its system. Under these rules, starting in 2008, EBMUD conditions turning on the water service to a new home (or for expanded service) on whether the home meets certain standards, such as high-efficiency indoor fixtures and water conserving landscapes. Applicants for standard service must get approval from EBMUD's Water Conservation Division. Customers applying for water meters to serve two or fewer residential units must complete a Water Efficiency Requirements Checklist and certify that the subject property meets the specified water efficiency requirements.[76] Those applying for water meters to serve three or more residential units or for nonresidential projects must supply plumbing and landscaping plans for review.

Southern Nevada Water Authority, Nevada[77]

Shortly after a severe drought in the early 2000s, the Southern Nevada Water Authority (SNWA) decided that the absence of effective landscape standards in local land use regulations (and the predominant use of turf grass in front yards) was a missed opportunity to reduce potable water use. Alhough it lacks direct land use authority, SNWA subsequently developed a model landscape code limiting the use of water-intensive vegetation and other provisions. Through partnerships and work with local land use planners and decision makers within its service area, SNWA won support for its landscape standards, with every local community adopting the code as part of its land use regulatory framework. Homes built before the landscape regulations used an average of 226 gallons per capita per day (gpcd); those built after the regulations used 141 gpcd – a 38% reduction.[78]

75 *Regulations,* East Bay Municipal Utility District, https://www.ebmud.com/customers/new-meter-installation/regulations/regulations-governing-water-service/ (last visited Jul. 25, 2016).

76 *Water Efficiency Requirements Checklist,* East Bay Municipal Utility District, https://www.ebmud.com/customers/new-meter-installation/standard-water-service/applying-water-service-existing-main/.

77 Drew Beckwith interview with Doug Bennet, Conservation Program Manager, Southern Nevada Water Authority (March 2012, 2016). *See also, Turf Limits,* Southern Nevada Water Authority, https://www.snwa.com/importance-of-conservation/restricting-outdoor-water-use/index.html (last visited Jul. 25, 2016) (SNWA's webpage with specific information on each community's turf limits as well as information on the Authority's Water Smart Landscape rebate program).

78 Based on data provided to Drew Beckwith by K. Scovocool, Southern Nevada Water Authority (2009).

SNWA also created a Water Smart Landscape Rebate program, a Pool Cover Instant Rebate program, a Water Efficient Technologies program, and a Water Smart Homes program, which have also contributed significantly to a reduction in per capita daily water usage despite a significant population increase.[79]

South Metro Water Supply Authority, Denver, Colorado

In 2004, the Douglas County Water Resource Authority brought together other smaller water entities in south Denver and formed the South Metro Water Supply Authority (SMWSA) to act as a regional body to address the water needs of the communities it serves.[80] Today, there are 13 member water providers working together to implement planning projects and programs such as the Water Infrastructure and Supply Efficiency partnership (WISE). WISE is a partnership between SMWSA, Aurora Water, and Denver Water to connect and use existing infrastructure to reduce reliance on nonrenewable groundwater resources for the region, while maximizing the use of existing water assets.[81]

Eagle River Water and Sanitation District, Colorado[82]

The Eagle River Water and Sanitation District is a special district with a service area covering several communities — the second largest water provider on Colorado's Western Slope — giving them multiple land use authorities to work with. The District provides water directly to Vail, Colorado, and manages and operates the water supply for the remaining communities in its service area. In the past, the District did not require an explicit commitment from a developer that water use would stay within the amount of water rights provided by the developer. The subsequent excessive water use by some property owners reduced the water reserved for other future customers and forced the District to pay for costly expansion of infrastructure. As a result, the District started entering into water-service agreements with developers. The agreements include a calculation of how much water the project should reasonably use, state that water use is limited to the amount documented (Total Demand Limit), and charge the developer an impact fee based on that usage. This approach gives applicants control of the up-front costs for water influencing developer decisions related to water efficiency and design. Developers who use water conserving measures (such as high-efficiency fixtures and low-water-use landscaping) would have a lower demand and therefore a reduced impact fee. The agreements are then recorded and run with the property in perpetuity, establishing that water use cannot be exceeded without renegotiating the service agreement. The District tracks and reviews customer water use annually and notifies customers of any excess use. This structure gives the District greater certainty in the amount of water committed and provides the District with a way to hold customers accountable to the amount of water that was paid for and agreed upon.

79 *Responding to Drought*, Southern Nevada Water Authority, https://www.snwa.com/importance-of-conservation/responding-to-drought/index.html (last visited Oct. 9, 2017).

80 *About*, South Metro Water Resource Authority, http://southmetrowater.org/about/ (last visited Jul. 19, 2016).

81 *Wise Partnership*, South Metro Water Resource Authority, http://southmetrowater.org/wise-partnership/ (last visited Jul. 19, 2016).

82 Telephone interview with Jason Cowles, P.E., Engineering Department, Eagle River Water and Sanitation District (Mar. 2, 2017); Upper Eagle Regional Water Authority, *Memorandum Re: January 22, 2015, Regular Board Meeting* (Jan. 14, 2015), http://216.172.166.67/~erwsd/wp-content/uploads/OO-GOV-UER-Board-Meeting-Packet-Jan22.pdf; *Eagle River Water and Sanitation District Moves Toward Water Budgeting*, Special District Association of Colorado, https://www.sdaco.org/news/eagle-river-water-and-sanitation-district-moves-toward-water-budgeting (Jul. 2015).

The remaining problem for the District, however, is that, if excess use continues, the District's only real enforcement recourse is the drastic option of denying water service. Further, the District has no real way to ensure that the agreed-upon efficiency measures are implemented during construction beyond monitoring the resulting water use. To solve this problem, the District is working on developing standard language for local governments to insert into Planned Unit Development (PUD) ordinances that would require incorporation of irrigation and fixture efficiency standards at the sketch plan level. When a developer submits a preliminary plan, the District would then consider the plan's efficiency features in determining the water-dedication requirement and would make the service commitment (the District's ability to serve) contingent upon those features. By including this language in the local code, these efficiency measures could be enforced by local land use authorities — during the inspection process or otherwise — who have more enforcement mechanisms available.

Local land use policy can benefit from water planners who take the lead in this effort to coordinate. Where water planners develop water efficiency and conservation practices, these techniques can be incorporated into land planning and regulation in a number of ways. These include adding them to the comprehensive land use plan, putting them directly into the zoning code, incorporating them in subdivision or site-plan regulations, using them to draft development agreements with Planned Unit Development sponsors, and adding them to building or plumbing codes. (See the *Table of Contents* for chapters containing guidance on all of these topics.)

Although population growth in the Interior West has had and will continue to have a substantial impact on an increasingly strained water supply (as discussed at length in Chapter 2, *Water Issues in the Interior West: A Call to Action*), the situation could be far worse if water providers had not already begun independent efforts to reduce water use as described in this Section. One study of communities in the Colorado River Basin documents that for nearly 30 water agencies, while the population increased by over 40% between 1990 and 2008, actual total water use declined over that same time period.[83] Effectively, these communities have "decoupled" their water use from population growth, which is an amazing testament to the effectiveness of water conservation actions.

83 The study—which included 68 water agencies with population and water delivery data for both 1990 and 2008, and 32 additional providers with limited data—indicated that, while the population that was served increased by over 40%, 29 water agencies in the study withdrew and delivered less water in 2008 than they had in 1990. For *all* communities in the study, taken together, total municipal water deliveries from the Colorado River basin increased by over 600,000 acre-feet, but this increase is mainly attributed to population growth, although commercial development and climatic variability also contributed. The 600,000 acre-feet rate of increased delivery, however, is actually much slower than population growth. "If water deliveries had increased at the same rate as population growth, they would have grown by almost two-million acre-feet—assuming that much additional water was even available for delivery." Michael J. Cohen, Pacific Institute, Municipal Deliveries of Colorado River Basin Water (June 2011), http://pacinst.org/wp-content/uploads/2013/02/crb_water_8_21_2011.pdf.

4. Getting Started: How to Engage the Process or Lead It

Communities in the Interior West are being called to action. Presented with the opportunity to embrace growth while planning for water conservation, communities can rise to the occasion by integrating land use and water planning and promoting water efficient land development patterns. To plan and integrate properly, however, a community must first understand where it is in order to determine where it needs to go. That is the purpose of this Chapter.

a. Whom to Bring Together

To perform this integration ably, a community must bring together a cross-section of individuals involved in both land use and water planning. As discussed previously in Chapter 3, *Working Together: A Primer for Planners*, it is critical that land use planners and water planners collaborate as they examine the assumptions and standards in their plans and laws.

Water providers need to develop water supply plans based upon realistic estimates of future water demand. This demand depends greatly on the land use types planned for (such as multifamily, small-lot, or large-lot residential development), as denser developments with less landscaping demand significantly less water than larger lot single-family homes (discussed further in Chapter 3, *Working Together*). In other words, it is not just the amount of growth that affects water demand, but also the development pattern for that growth. In order for water providers to develop realistic and reliable estimates of future demands for water-supply planning (versus basing projections on historical demands), then land use plans need to ensure that factors that directly affect demands are enforceable through the platting process. Water-supply planners normally generate conservative demand estimates, but if there is a strong basis to assume that land use codes will result in reduced demand, they can plan differently. Collaboration between water planners and land use planners will help to accurately estimate, monitor, and enforce land use provisions directly affecting future water demands.

Water providers across the Interior West also develop water conservation or water efficiency plans (required for some, good business for others) that focus on a variety of conservation measures including allowed plant types, soil amendments, efficient irrigation system standards, tree sizes, turf limitations, water-harvesting practices, fixture efficiency standards, and many more. Many of these water conservation measures can be implemented by local governments through zoning and subdivision regulations and should be contained in the community's comprehensive plan. Land use planners can collaborate with water planners to foster and improve this integration.

As an organizing structure, communities could bring together land use and water planners (sometimes from multiple districts) to form a Water and Land Use Planning Integration Team. To accomplish adequate integration and implement strategies effectively over time, this team would also benefit from the involvement of additional departments — local and regional — charged with water supplies, water conservation, and infrastructure development and maintenance. Key to this effort will be the support and assistance from local decision makers. They must be brought in early on and asked to participate or, at the very minimum, be briefed periodically on the progress and direction of the group. Finally, just as in a typical planning charrette, a member of the Team should be selected to lead the assessment process and set an agenda for moving forward — someone to champion the effort and lead the charge. Most likely, this person will be the local land use planner.

b. What to Review

For a Water and Land Use Planning Integration Team, the first step toward integrating land use and water planning is to review its water supply and conservation plans and related code provisions and to assess the disconnect between these documents and the community's comprehensive plan; sustainability plan (should one exist); land use and other development codes (zoning, site plan, subdivision, building, plumbing); and other regulations and initiatives (including related supplemental regulations, incentives, development permits, development agreements, and post-occupancy enforcement measures). The Team could also review state-specific land use and water laws and any applicable regional plans or other efforts. This review, and the assessment discussed in the next section of this chapter, will make the benefits of cooperation clearer, as land use and water planners learn more about each other and the scope of services that each provides.

c. What to Discuss

The Water and Land Use Planning Integration Team can begin its assessment with an analysis of how much water conservation language is already present in the comprehensive plan, and whether that information is accurate and complete. Here, water planners can offer land use planners information on water demand, where it is likely to occur, and its variability and seasonality. The Team can then move on to evaluate whether the existing language establishes a concrete policy (or policies) and whether that policy includes ample recommendations for zoning and other strategies needed to implement actions that reduce water consumption. This could be followed by an assessment of opportunities to integrate water conservation language into the plan. For example, although water conservation may not be explicitly mentioned as part of a comprehensive plan goal or objective, consider whether the existing plan already presents strategies and implementation techniques that foster water efficient growth. Such strategies and techniques might be those related to a compact land use pattern, green building development, green infrastructure measures, cluster-development provisions, and the like. Where such strategies and implementation techniques exist, there is already an opportunity to integrate water conservation language into the plan's goals and objectives. The assessment should then evaluate the extent to which the local land use regulations, building code, plumbing code, and development approval process are consistent with the comprehensive plan policies on water conservation. Communities may use the Self-Assessment Questions provided in this Section as a guide through this process.

The Water and Land Use Planning Integration Team should also discuss the opportunity to integrate land use planning elements, such as demand projections that factor in anticipated land uses, into water-planning documents. These elements should ultimately be integrated for clarity and consistency, but are, of course, not regulatory. Land use documents can provide important information about a number of water-planning issues, including the following:

- Plans and regulations that are likely to affect demand projections
- Incentives that can be used to reduce demands
- Where in the distribution system expansion is likely to occur
- The magnitude and seasonality of those demands

Although changes to water-planning documents are beyond the scope of this Guidebook's remaining chapters, the Self-Assessment Questions provided here touch on this aspect of the discussion. A major benefit of this exercise is that it will educate the water community on intended land use and growth patterns while informing the land use community of water-supply issues and opportunities.

The Self-Assessment Questions should provide significant direction, making the opportunities available for improved integration more obvious. Readers should keep in mind when using these questions that, although a community should integrate water conservation throughout the existing elements of its comprehensive plan, it may also consider adopting a discrete water element within the plan. This is discussed further in Chapter 5, *The Comprehensive Master Plan*. The questions presented here contemplate both of these options, which are not mutually exclusive. Although the Self-Assessment Questions focus primarily on water *efficiency* (including conservation), they also acknowledge the importance of balancing supply and demand, maintaining water quality, and working toward other water goals and issues that contribute to a complete water element within a comprehensive master plan. Communities should keep in mind that a larger water element (or integrated water elements) could address these issues as well, even though they are beyond the scope of this Guidebook.

SELF-ASSESSMENT QUESTIONS[84]

(1) Does your comprehensive plan contain a discrete water element? (This element may be an entire chapter or a subsection of a chapter.)

(2) Is water deliberately integrated as a consideration throughout all relevant components of your comprehensive plan?

(3) Does your comprehensive plan identify water conservation goals and objectives?

(4) If yes, is the water conservation plan for your community consistent with these adopted goals and objectives?

(5) Does your comprehensive plan identify water conservation strategies and implementation techniques?

(6) If yes, is the water conservation plan for your community consistent with these adopted strategies and implementation techniques?

(7) Does your comprehensive plan identify known supplies of water for future development?

(8) Does your comprehensive plan incorporate water-supply availability projections?

(9) If yes, do these projections factor in conditions ranging from short-term drought to global climate change?

(10) Do your comprehensive plan and the water-supply plan from your water utility use the same growth projections and land use assumptions?

(11) Is the water element (or integrated elements) of your comprehensive plan consistent with the policies of your water utility?

(12) Is the land use element of your comprehensive plan consistent with the policies of your water utility?

84 Some of these questions are adapted from the University of Louisville's *Kentucky Wet-Growth Handbook;* others have been adapted from leading literature on the topic of land use and water planning integration; and others have evolved from on-the-ground training programs conducted by this Guidebook's authors. Craig A. Arnold, Carol Norton & Dustin Wallen, Wet Growth Tools for Sustainable Development 215-219 (University of Louisville Center for Land Use and Environmental Responsibility, 2009).

(13) If your comprehensive plan contains a discrete water element, is that element consistent with the growth projections and land use assumptions in other parts of your comprehensive plan?

(14) Does your comprehensive plan quantify the water demand that would result from projected population growth (i.e., demand forecasting)?

(15) If yes, how was this demand calculated? (i.e., What is the equation used? What are the factors considered?)

(16) As part of this demand calculation, were real water losses included and, if so, how was anticipated real loss calculated? (i.e., What is the equation used? What are the factors considered? What coefficients are used for each variable?)

(17) Also, if yes, did your planners develop water demands per land use under anticipated development patterns? (i.e., How much water per household, per capita, or per acre would be consumed for large-lot single-family residential, small-lot single-family residential, townhouse, multifamily, mixed-use, or other?)

(18) If yes (to 17), did this calculation quantify indoor water use, outdoor water use, and annual distribution losses per land use development pattern?

(19) Also if yes, does your comprehensive plan analyze how this demand will be met by available supplies (or how additional water will be obtained)?

(20) If yes (to 19), did your land use planners work in close cooperation with water planners on this exercise in long-term thinking?

(21) How does your water utility forecast annual demand/assess future water needs across the system as a whole? (i.e., What is the equation used? What are the factors considered?)

(22) When anticipating future per capita use rates as part of demand forecasting, does your water utility consider current/historical use rates or does it adjust these rates based on anticipated development patterns?

(23) If adjusted for anticipated development patterns, were various land use scenarios considered?

(24) Also if adjusted for anticipated development patterns, were the development patterns anticipated consistent with your community's comprehensive plan?

(25) Did your water utility work in close cooperation with your land use planners on this exercise in long-term thinking?

(26) How does your water-utility project unavoidable annual real losses from transmission? (What are the factors in the equation? What reference values are used for each factor?)

(27) How does your water utility calculate a project's impact fee (tap fee and/or water dedication requirement)? What are the components of the equation; the factors considered (such as land use, lot size, landscaped area, dwelling units, fixture efficiency, water loss, or other)?

(28) Is the water element (or integrated water elements) of your comprehensive plan consistent with any applicable regional or State water plans?

(29) Is the water element (or integrated elements) of your comprehensive plan consistent with land use patterns described in any applicable regional land use plans?

(30) Does your comprehensive plan provide for and encourage compact and infill development?

(31) If yes, does your water element cross-reference that portion of your comprehensive plan?

(32) Does your comprehensive plan provide for and encourage small-scale, single-family, limited landscape development?

(33) If yes, does your water element cross-reference that portion of your comprehensive plan?

(34) Does your community consider the water element of your comprehensive plan when making development decisions, infrastructure investment decisions, and budget expenditures?

(35) Does your comprehensive plan contain a strategy to ensure that proposed project rezonings, development approvals, and permits do not adversely affect water supplies and resources?

(36) Does your comprehensive plan include a strategy for your decision makers to condition development proposals to limit water use (perhaps by including requirements that are specific to project type, location, or likely impact if not conditioned or restricted)?

(37) Does your comprehensive plan include strategies for water efficient land use? (For example, urban growth boundary, cluster development, ADUs, and volume/demand-based tap fees.)

(38) If yes, does your comprehensive plan include implementation techniques to incorporate these strategies into land use regulations and building codes?

(39) Does the water element (or integrated elements) of your comprehensive plan include strategies for water conserving equipment? (For example, indoor fixture efficiency standards, and smart meters.)

(40) If yes, does your comprehensive plan include implementation techniques to incorporate these strategies into land use regulations and building/plumbing codes?

(41) Does the water element (or integrated elements) of your comprehensive plan include strategies for water efficient landscaping? (For example, soil quality improvements, low-water use plant lists, turf limitations, and irrigation system efficiency requirements.)

(42) If yes, does your comprehensive plan include implementation techniques to incorporate these strategies into land use regulations and building codes?

(43) Also, if yes, do these strategies or implementation techniques include that your public-works/ transportation policies should require that—as a component of any major street project — existing streets and related facilities be retrofitted with xeriscaping or other low-impact development methods?

(44) Does your comprehensive plan contain a strategy for your regulations and plans to allow or require narrower streets, sidewalks on only one side of the street, xeriscaped islands in culs-de-sac, pervious pavement, short or shared driveways, and other street layout alternatives that minimize impervious cover?

(Note: These are good tools to help water get back into the ground for ground water supply, but they must be done in consultation with emergency officials to address emergency vehicle access.)

(45) If yes, is this strategy contained within your plan's water element or is it otherwise tied to water?

(46) Does your comprehensive plan contain a strategy for your land use regulations and street design guidelines to allow or require green infrastructure such as rain gardens, vegetated swales, tree planters, pervious pavement, ponds, and other ground water infiltration projects?

(47) If yes, is this strategy contained within your plan's water element or is it otherwise tied to water?

(48) Does your comprehensive plan contain a strategy to incentivize landowners (through zoning bonuses, a streamlined development processes, or other tactics) to use water conserving, land use techniques that exceed those required by your land use regulations?

(49) If yes, is this strategy contained within your plan's water element or is it otherwise tied to water?

(50) Does your comprehensive plan contain a strategy or implementation technique for your subdivision regulations to include a requirement that developers provide proof of adequate water (or a will-serve letter) at the preliminary plat stage (especially through a professional assessment of water availability under various hydrologic conditions)?

(51) If yes, does this strategy or implementation technique include that the regulation require actual proof that an adequate water supply has been secured to meet the development's needs in order to obtain final plat approval?

(52) Does your comprehensive plan contain strategies for building water-use auditing programs such as a water-use benchmarking and disclosure program or a program for water efficiency audits and retro-commissioning for certain buildings?

(53) If yes, does your comprehensive plan include implementation techniques to fully realize these strategies?

(54) Does your comprehensive plan contain a strategy for water-neutral growth?

(55) If yes, does your comprehensive plan include implementation techniques to fully realize this strategy?

(56) Does your comprehensive plan contain a strategy for your land use regulations and building codes to include strong and effective post-occupancy enforcement provisions related to water conservation standards? (For example, maintenance guidelines, periodic inspections, and post-occupancy documentation.)

(57) If yes, does your comprehensive plan include implementation techniques to achieve these strategies?

(58) Are your land use regulations (zoning, site plan, and subdivision) consistent with your comprehensive plan and water conservation plan? (i.e., Have they been updated to implement the strategies outlined in your plans?)

(59) Are your water conservation regulations consistent with your comprehensive plan? (i.e., Have they been updated to implement the strategies outlined in your comprehensive plan?)

(60) Are your building and plumbing codes consistent with your comprehensive plan and water conservation plan? (i.e., Have they been updated to implement the strategies outlined in your plans?)

d. Where to Go Next

The Self-Assessment Questions should help highlight the opportunities available for improvement. The next clear step is to address any shortcomings revealed in the comprehensive plan. (See Chapter 5, *The Comprehensive Master Plan.*)

The Water and Land Use Planning Integration Team may find the following Matrix of Implementation Techniques (also provided in Chapter 5, *The Comprehensive Master Plan*) helpful in creating a road map for further work. This Matrix presents water conserving strategies and implementation techniques for the comprehensive plan and then indicates where they might ultimately be integrated in more detail within the community's zoning, subdivision, site plan, building, and plumbing codes. This provides both water and land planners a framework for drafting a comprehensive and inclusive water conservation element, which could then influence the addition of water conservation implementation techniques into the community's land use regulations.

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
LAND USE						
Urban growth boundary	✓					
Denser development (more homes/acre)	✓	✓	✓	✓		
Cluster development (reduce lot size)	✓	✓	✓	✓		
Mixed-use development	✓	✓	✓	✓		
Mixed housing types	✓	✓	✓	✓		
Compact mixed use	✓	✓	✓	✓		
Transit-oriented development (TOD)	✓	✓	✓	✓		
Infill zoning	✓	✓				
Overlay zone	✓	✓				
Floating zone	✓	✓				
Setback requirements	✓	✓				
Highway intersection overlay zones	✓	✓	✓	✓		
Open space dedication	✓	✓	✓	✓		
Open space preservation	✓	✓	✓	✓		
Demand-based tap fees	✓					
Other incentives	✓					

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
EQUIPMENT						
Green plumbing code	✓		✓	✓		✓
Indoor fixture efficiency standards	✓				✓	✓
Reuse of water	✓				✓	✓
Smart meters	✓				✓	✓
Submetering multifamily units	✓				✓	✓
Incentives	✓					
LANDSCAPE						
Landscape codes matched to land use type	✓		✓	✓		
Landscape plan requirements (xeriscaping)	✓	✓	✓	✓		
Soil quality requirements	✓		✓	✓		
Plant list/Allowable plants	✓		✓	✓		
Tree size requirement	✓		✓	✓		
Turf limitations (type and quality)	✓		✓	✓		
Artificial turf	✓		✓	✓		
Irrigation system efficiency requirements	✓		✓	✓		✓
Water waste rules	✓		✓	✓		
Rain sensors	✓		✓	✓		✓
Spray nozzles	✓		✓	✓		✓
Water harvest	✓		✓	✓		✓
Water harvesting into landscape irrigation	✓					✓
Fixture efficiency standards	✓					✓
Water loss limits	✓		✓	✓		✓
Positive shutoff	✓					✓
Incentives	✓					
MONITORING AND ENFORCEMENT						
Penalties – civil and criminal	✓	✓				
Post-occupancy violations	✓					
Intermunicipal inspections and prosecutions	✓					

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
OTHER						
Goal to be water wise	✓					
Percentage reduction in water use	✓					
Water fee based on size of structure and lot	✓					
EPA WaterSense standards	✓					
Model home requirements	✓					
Rebates	✓					
KEY: ✓ = Standard is applicable						

Once a review and amendment of the comprehensive plan are complete, communities should next use the remaining chapters of this Guidebook (Chapters 6–15) to perform a gap analysis on land use documents and related programs and processes. These documents should include, at a minimum, the zoning code, site-plan standards, and subdivision regulations, but may also include a sustainability plan, building code, plumbing code, non-zoning development incentive programs, development agreements, development moratoria, post-occupancy enforcement procedures, and the like.

The Water and Land Use Planning Integration Team could review these existing codes, programs, and processes for appropriate and effective strategies, use this Guidebook to identify those that are missing, and develop a process for amending each to include missing elements and eliminate barriers. While doing so, the Team should remember that, in order to facilitate water conserving growth, developers must know that local codes and development processes are clear, transparent, and predictable. The local approval process must be as expeditious as possible and allow developers the flexibility they need to meet market demands in a timely manner. Part of the integration and amendment process is to pay attention to and accommodate these concerns while achieving water conservation goals.

To implement water conservation strategies effectively over time, there are additional steps that should be considered:

1. The efficiency of integrating land use and water planning can be increased by coordinating these efforts in conjunction with adjacent local governments with shared issues and with regional organizations that have technical information and needed resources. (See Chapter 3, *Working Together: A Primer for Planners*.)
2. The integration discussed throughout this Guidebook ultimately comes down to a series of policy decisions and approvals by a community's local leaders. The Water and Land Use Planning Integration Team could consider whether local policy-makers understand the water-shortage issues, relationship between growth management and water supplies, and link between development patterns and water efficiency well enough to make informed decisions. If not, the Team could schedule work sessions to describe the purpose of and reasoning behind already established water conservation goals and present evidence from this Guidebook and other sources to enable informed decision-making when policy-makers are asked to approve amended plans and regulations.

3. Although a Water and Land Use Planning Integration Team may be established for this analysis and update effort, communities should be sure this process does not end after initial amendments. As noted in Chapter 3, *Working Together: A Primer for Planners*, local governments and water providers could establish procedures for ongoing, coordinated planning based upon their new, deeper understanding of the interdependence of both systems and how they can be leveraged for greater effect. These procedures may be institutionalized once senior decision makers have seen the benefits of coordinated efforts.
4. In order to ensure that new plans, regulations, and processes are properly implemented, the local staff and boards involved in the review and approval process must be trained regularly on the new specifications and policies.
5. Finally, throughout all of these steps, the public must have regular opportunities for involvement and engagement so that the credibility and transparency of local government is maintained and the water conservation tools and procedures implemented have strong and continuing public support.

PART II: INTEGRATING WATER EFFICIENCY INTO LAND USE DOCUMENTS

5. The Comprehensive Master Plan

The comprehensive master plan is a policy document, consistent with state law, that establishes a community's vision for the future and provides a roadmap for achieving that future by guiding land use regulations and development decisions. The comprehensive plan (sometimes called master plan or general plan) captures a community's character, provides a blueprint for its development, and can serve as the foundation for developing important indicators for quality of life.

When incorporating water conservation into the comprehensive plan, a community should be sure to also amend the plan's land use chapter (or element), to be sure it fosters a water efficient land use pattern — one that channels development to areas most suitable for growth. As discussed in more detail in Chapter 3, *Working Together*, compact, infill development carries water conservation benefits through reduced landscaping irrigation needs, increased infrastructure efficiency, reduced water loss, and the like. As such, the techniques and examples provided in this chapter focus not only on the ways in which comprehensive plans may incorporate water directly, but more importantly, also on how communities may entrench long-term water benefits into the plan by achieving a water conserving development pattern. For the comprehensive plan to provide the legal support needed for implementing water conserving land use objectives, it should contain specific zoning strategies so that zoning amendments, when adopted, are in conformance with the plan (sometimes required by state law but always advisable).[85] Conformance with the comprehensive plan helps insulate zoning amendments from charges that they violate due process and equal protection rights of land owners or that they constitute illegal spot zoning.

This Chapter guides communities through the process of developing or updating a comprehensive plan to develop goals, objectives, strategies, and implementation measures in a way that addresses water-quantity issues, including such actions as the following:

- Get started and build in ongoing coordination concerning water
- Draft a stand-alone water element for the comprehensive plan
- Integrate water efficiency measures throughout the comprehensive plan
- Encourage water conserving land use patterns

85 *See Generally*, Arizona, Ariz. Rev. Stat. § 9-462.01(F) "All zoning and rezoning ordinances or regulations adopted under this article shall be consistent with and conform to the adopted general plan of the municipality...."; Colorado, Colo. Rev. Stat. § 31-23-303 "Such [municipal zoning] regulations shall be made in accordance with a comprehensive plan..."; Idaho, Idaho Code § 67-6511(1) "The zoning districts shall be in accordance with the policies set forth in the adopted comprehensive plan."; Montana, Mont Code § 76-2-304(1)(a) "Zoning regulations must be made in accordance with a growth policy [master plan].....";
Nevada, Nev. Rev. Stat. § 278.0284 "Any action of a local government relating to development, zoning, the subdivision of land or capital improvements must conform to the master plan of the local government"; New Mexico, N.M. Stat. § 3-21-5(A) "The regulations and restrictions of the county or municipal zoning authority are to be in accordance with a comprehensive plan..."; and Wyoming, Wyo. Stat. § 15-1-601(d)(i) "All regulations shall be made: in accordance with a comprehensive plan...". Utah does not have an enabling statute *per se*, however, case law dictates zoning ordinances must be enacted pursuant to a 'comprehensive plan' under the City's police power" *Naylor v. Salt Lake City Corp.,* 398 P.2d 27, 28-9 (1965) *citing Marshall v. Salt Lake City,* 141 P.2d 704 (1942).

a. Get Started and Build in Ongoing Coordination Concerning Water

The first thing that a local government should consider when attempting to integrate land use and water conservation planning is to assess the extent to which water conservation is already incorporated into the community's comprehensive plan and the extent to which local land use regulations, building codes, and development processes are consistent with this element of the comprehensive plan. Land use planners should involve water planners in this process through the formation of a Water and Land Use Planning Integration Team (discussed further in Chapter 4, *Getting Started*). Communities may use the Self-Assessment Questions listed in Chapter 4 as a guide for this analysis. Although these questions focus primarily on water conservation and efficiency, they also acknowledge the importance of balancing supply and demand, maintaining water quality, and other actions that relate to water quantity and contribute to an overall water strategy within a comprehensive plan.

The comprehensive plan should contain a strategy or strategies to ensure that proposed project rezonings, development approvals, and permits do not adversely affect water supplies and resources. It is important for land use planners to be mindful of any relevant limits that might exist for developments of certain sizes based on the availability of water when planning for the future growth of a community. Depending upon state law, the developers who ultimately carry out the vision set forth in the comprehensive plan may be required to demonstrate an adequate water supply for the development before they can move forward with the project under an assured water-supply requirement (sometimes referred to as a "Show me the water law"). (For more on assured water-supply requirements, see Chapter H, *Subdivision Regulations*.) The comprehensive planning process is an opportunity to look at the issue of water adequacy well before the development permit stage, and at a macro scale. It is an opportunity to consider whether the community has an adequate water supply over the planning period to support the water needs of the land use pattern it is projecting. This is the real opportunity presented by comprehensive planning: bringing land use planners, water-resource managers, and the community together in this kind of discussion.

Similarly, one of the key components of the comprehensive plan relates to the infrastructure needed to sustain the current population and to support projected growth. Difficulties can arise with both water and wastewater infrastructure when implementing the type of water conserving, compact development pattern discussed in Chapter 3, *Working Together*. Significant costs can occur when implementing higher density development where onsite infrastructure costs may be lower but higher point source loads into a wastewater collection system can have unanticipated consequences downline. A community could spend millions of dollars upsizing the collection system to accommodate high-density redevelopment in areas where some of these upgrades are miles away from the development site. On the water side, dense development can have smaller streets, making it difficult to site mains and connections to buildings with enough room for maintenance and access. Further, the desire to meter each unit or use separately can be problematic in mixed-use development because of the number of meters and limited area to install them. All of these issues are solvable, but the discussion should occur before or when planning for development rather than after development plans are set.

It is essential, therefore, that land use planners have up-to-date water-supply projections from their water providers to be able to refer to the water infrastructure needed. Water planners can also contribute their knowledge regarding water conservation techniques, such as water efficient interior fixtures and water conserving landscapes, so that they and their impact on water demand can be addressed in the comprehensive plan. Likewise, the comprehensive plan could also contain strategies for ongoing input by and coordination with water providers.

EXAMPLES OF COMPREHENSIVE PLAN STRATEGIES INVOLVING WATER PROVIDER INPUT REGARDING FUTURE INFRASTRUCTURE NEEDS

San Jose, California

The City's comprehensive plan, Envision San Jose 2040 General Plan, sets forth several policies related to the need for future coordination with water providers.

The Infrastructure section of the Plan's Environmental Leadership chapter contains a goal to "provide water supply, sanitary sewer, and storm drainage infrastructure facilities to meet future growth planned within the City…" To implement that goal, the Plan sets forth a policy to "work with water retailers to provide water supply facilities that meet future growth within the City's Urban Service Area and assure a high-quality and reliable supply of water to existing and future residents."[86]

The Infrastructure section also sets forth a goal to "provide and maintain adequate water, wastewater, stormwater, water treatment, solid waste and recycling, and recycled water infrastructure to support the needs of the City's residents and businesses." One policy laid out to achieve this goal — which will take careful coordination and conversation between water and land use planners — is to "ensure that public facilities and infrastructure are designed and constructed to meet ultimate capacity needs to avoid the need for future upsizing. For facilities subject to incremental upsizing, initial design shall include adequate land area and any other elements not easily expanded in the future. Infrastructure and facility planning should discourage over-sizing of infrastructure which could contribute to growth beyond what was anticipated in the *Envision General Plan*."[87]

Aurora, Colorado[88]

Collaboration is integrated into Aurora's organizational structure, especially when it comes to water. Whenever code changes are proposed, the City's departments work together to ensure that water conservation is part of the conversation. This collaboration began in earnest in 2009 when the City updated its Comprehensive Plan.[89] As the comprehensive planning process began, the City's Water Department and Planning and Development Services Department came together and have maintained a high level of communication ever since. The Comprehensive Plan itself contains language calling for the water conservation division to use a multifaceted approach, including programs for peer agency collaboration and outreach.[90] Much of the reason the collaboration continues is due to the creation of City's Integrated Water Master Plan,[91] which

86 City of San Jose, CA, Envision San Jose 2040 General Plan, 55 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

87 City of San Jose, CA, Envision San Jose 2040 General Plan, 53 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

88 Telephone interview with Lyle Whitney, Water Conservation Supervisor, City of Aurora, and Karen Hancock, Long-Range Planner & Environmental Program Supervisor, City of Aurora (Aug. 5, 2016).

89 City of Aurora, CO, 2009 Comprehensive Plan (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

90 City of Aurora, CO, 2009 Comprehensive Plan, G: Developing and Protecting Water and Other Natural Resources 5 (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

91 City of Aurora, CO, Aurora Integrated Water Master Plan, Draft Final (2016).

operates in a way that necessitates a conversation when water and land use decisions are made. The process and requirements that have been put in place require the water department's planning and engineering group (along with their conservation group) to work closely with not only the planning department but also with other departments to determine how the City will grow. This process provides the water department with the information it needs to adequately plan for the City's future water-supply needs.

In addition, the City's water department uses technology to share use information with the planning department. Similarly, the planning department shares data to enable the water department to plan for infrastructure needs. Through modeling software, the departments work together to examine how water use changes under various land use development scenarios. The City also created an Office of Development Assistance — a division within the City Manager's office — to facilitate the development process with staff members that cross all boundaries. Collaboration is now also a priority in the City's hiring process by making sure new hires are people who thrive in a face-to-face, cooperative approach.

Other departments have also been heavily involved in the dialogue surrounding land use planning and water demand, including Public Works; the Office of Development Assistance; Parks, Recreation, & Open Space; and others. As a result of the City's focus on interdepartmental collaboration, staff has a significantly fuller picture of what is going on in City operations and what actions could raise red flags for other departments. It has also helped employees recognize they are on one team, as opposed to eight separate departments. Services are more efficient, customers are more informed, and the City has seen higher-quality development.

Westminster, Colorado

The City of Westminster owns its water supply and, under its Comprehensive Plan,[92] the extent of water use is a key consideration in the location, type, and intensity of land uses and development.[93] The City's Water Division regularly updates its Comprehensive Water Supply Plan (CWSP),[94] which evaluates the current water-supply projection and projected water demands based on the Comprehensive Plan in order to quantify any expected deficits or surpluses. The Comprehensive Plan notes that, as such, new development will be evaluated based on projected impacts to the City's water supply.[95] Because the City's water-supply projections are so closely linked to its designated land uses, the City must identify the potential change in water demand that would result from any proposed decision to change a land use from what is currently permitted under zoning.[96]

92 City of Westminster, CO, Comprehensive Plan (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

93 City of Westminster, CO, Comprehensive Plan 28 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

94 Because water use is so affected by weather, the City tries not to react to changes in a specific year but rather turns to five- or six-year Citywide use reviews when updating its Comprehensive Water Supply Plan. Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

95 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

96 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

b. Draft a Water Element for the Comprehensive Plan

Once a community has assessed the extent to which water conservation is already incorporated into the comprehensive plan as part of the Self-Assessment, the next step is to decide whether to add a discrete water element to the plan (which could be a stand-alone chapter or a subsection of a chapter), or whether to move directly to integrating water conservation language throughout the existing plan chapters (if the latter option is chosen, skip to Section 5(c) of this Chapter). One benefit of adding a stand-alone water element in lieu of revising the comprehensive plan completely is that focusing the discussion on adding a water conservation element, particularly when water shortages are acute, provides an opportunity for a clear-headed, non-ideological discussion of land use patterns generally and the designation of areas most appropriate for growth, density, infill, and other types of development that tend to be met with opposition.

A stand-alone element should establish goals for water conservation with objectives, strategies, and techniques in sufficient detail to be useful as a guide in making future land use planning decisions. Although our discussion here is limited to water conservation, communities should be mindful that a water element could contain additional components, such as water quality, supply, demand, reuse, and many more. Based upon a typical framework for comprehensive planning, a water element might contain the following components:

A. Introduction — including the purpose of the element, relevant findings, and related data that define the need for the element.

SAMPLE INTRODUCTION FOR A COMPREHENSIVE PLAN WATER ELEMENT

Communities may use this brief, sample introduction as a guide when adding a comprehensive plan water element.

Based on recent data and studies, it is clear that the limited supply of potable water available to support new populations and jobs in the (town/city/county) of _____ requires that incentives and standards for new development result in lower per capita water use than is fostered by the current zoning, land use regulations, and codes of our community. *[Community should insert data and metrics that make this point.]* While decreases in per capita use can accommodate more population, the overall water use may increase. This overall water use is the most important factor because this is the total amount of water that a community will have available in the future. Focusing on both of these metrics is important, but maintaining or reducing overall water use at planned levels should be the goal. The types of developments and urban forms that achieve lower per capita water use are also the types that are desired by the households now seeking housing and jobs in our market area. Demographic change indicates that the market for large-lot single-family homes is declining, while demand for small-lot single-family homes, multifamily residences, and dwelling units in compact, mixed-use neighborhoods is increasing. In general, these types of development use less water on a per capita basis than large-lot single-family housing. Significant water conservation can be achieved by increasing the number of units allowed per acre in single-family zones and increasing the acreage in the community that is zoned for denser and mixed-use development. *[Community should insert data that make this point.]* In addition, there are a number of strategies available that reduce

water use in individual homes and buildings. These include requiring water efficient plumbing fixtures and exterior landscaping as well as other practices. Many of these practices can improve water efficiency in existing buildings as well through the use of incentives, education, and appropriate regulation. For these measures to be effective over time, there must be strong monitoring and enforcement programs.

B. Goal(s) — Listing one or more long-term water conservation goals for reducing the use of limited supplies of water for the community's anticipated population growth. Such goals could include the following:

- To provide an adequate and reliable water supply for the existing and future population of the community.
- To ensure that future water demands and supplies are in balance.
- To ensure that local land use planning and regulation are closely coordinated with local water planning and regulation.
- To optimize the use of water through innovative and cost-effective delivery measures.
- To absorb the market demand for new housing and economic development while lowering the per capita consumption of water by new residents and workers.
- To impose as little regulation as possible that increases costs on new development by employing incentives and adopting regulations that achieve long-term cost savings for residents and property owners, particularly savings achieved through lower water use.
- To ensure that local land use planning and water planning both inform and conform to regional and state land use and water conservation plans and programs, where appropriate. (This will make it more possible that state and federal financial and technical support can be received, including financial assistance for needed local water and related infrastructure improvements.)
- To cooperate with adjacent local governments on strategies that reduce the cost of water conservation, including the monitoring and enforcement of standards imposed or encouraged by regulations and incentives.

C. Objectives — Including several shorter-term objectives or targets for achieving stated goals. Such objectives could include the following objectives:

- To reduce per capita annual water consumption by ___% from baseline.
- To reduce (or, at minimum maintain) total volume of water consumed by ____% from baseline.
- To recycle or beneficially reuse ___% of the City's wastewater supply, including the indirect use of recycled water as part of the potable water supply.
- To reduce the purchase of imported water by ___% by 20__.[97]
- To meter ___% of all water accounts by 20___.
- To convert ___ million square feet of impermeable surface into pervious surfaces every year.
- To ensure that new developments employ interior and exterior best practices for water efficiency that reduce consumption.
- To ensure that tap fees and water rates reinforce water efficiency goals.
- To achieve ___ million square feet [or ___%] of new or retrofitted green buildings by 20__.
- To establish a water-use efficiency baseline for existing land use patterns.

97 This suggested objective may seem in opposition to the stated goals to provide adequate water for future growth and the strategy to identify potential water supplies. The authors of this Guidebook wish to note that these are all simply options from the field from which communities may choose. As with any decision, the community will have to run a cost-benefit analysis as to whether it is the right decision for them. It would not be appropriate to do so in this Guidebook, since one would need to know the cost of new supply, cost of new transmountain diversion (if any), cost per acre feet saved for water conservation measures implemented, cost of treatment, cost of capital improvements, etc.

- To revise local land use patterns so that the supply of housing is adjusted to provide the market with the mix of housing types it demands, in a manner consistent with future water supply-and-demand projections.
- To develop a future land use plan that relies upon accurate growth projections using concrete data.
- To ensure that at least ___% of new dwelling units constructed by 20__ are located within 1,500 feet of a transit station or stop.
- To evaluate the impacts of existing and planned land use patterns on water supply and demand.
- To minimize and coordinate the impact on existing infrastructure (water, wastewater, or other)
- To time infrastructure repair and development appropriately so as to ensure reliable and cost-effective water supplies without disruption, delay, or inconvenience to the public.
- To achieve and maintain Sustainability Tools for Assessing & Rating Communities (STAR) certification, with a 5-STAR Community rating by 20__. (The STAR rating system has 44 objectives, many of which involve water.)[98]
- Emphasize regional, statewide, and intergovernmental coordination and engagement to further water conserving initiatives.

D. Strategies — Mentioning the methods that the community will use to achieve each objective. Such strategies could include:

- To calculate the water demands of land uses and development intensities recommended by the comprehensive plan.
- To track planned and actual water demands within the comprehensive plan so that the overall trend of water use can be seen compared to any long-term water budget.
- To provide developers with a water budget for a specific project, which will permit them to be creative while meeting development guidelines.
- To identify and create an inventory of existing and potential new water supplies.
- To identify funding sources for infrastructure improvements.
- To allocate funding for maintaining and updating the urban growth boundary.
- To amend local zoning to provide for more small-lot single-family homes, multifamily housing, and mixed-use, compact developments that result in water conservation and meet market needs.
- To amend zoning to increase densities in areas prioritized for growth.
- To amend subdivision regulations to permit cluster development.
- To amend building, plumbing, zoning, subdivision, and site-plan regulations to require use of water conserving best practices for the interior and exterior of new development (such as high-efficiency plumbing fixtures and xeriscaping) in order to minimize the amount of water used to meet the needs of new residents.
- To encourage existing residents to lower their water usage by emphasizing effective educational programs and incentives and emergency water conservation ordinances, where needed.

98 The STAR rating system's 44 objectives include, among others: community water systems, resource-efficient buildings, resource-efficient public infrastructure, water in the environment, green infrastructure, public spaces, natural resource protection, compact and complete communities, and infill and redevelopment. Star Communities, *Star Framework,* http://www.starcommunities.org/rating-system/framework/ (last visited May 4, 2016).

- To increase the percentage of certified green buildings[99] each year.
- *Communities could also list strategies on regional, statewide, and intergovernmental coordination and engagement, such as:*
    - Work with the local water and sewer providers to coordinate conservation efforts, programs, and policies
    - Work with the State to support the goals and strategies in State water plans
    - Align local water planning with that of the State to qualify for State support, including funding
    - Use intergovernmental agreements with neighboring jurisdictions to address land use issues of mutual concern

E. Implementation techniques — Listing and generally explaining all tools and techniques that will be adopted to carry out each strategy. Refer to the Matrix of Implementation Techniques (also provided in Chapter 4, *Getting Started*) for a list of water conservation measures and the associated plans and codes that could be amended to implement them.

- For example, to implement the strategy listed above that reads: *"To amend building, plumbing, zoning, subdivision, and site-plan regulations to encourage use of water conserving best practices for the interior and exterior of new development in order to minimize the amount of water used to meet the needs of new residents,"* a community could, through reference to the Matrix, include the following implementation technique in the comprehensive plan: Amend building and plumbing codes to require smart meters and submetering for multifamily units.

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
LAND USE						
Urban growth boundary	✓					
Denser development (more homes/acre)	✓	✓	✓	✓		
Cluster development (reduce lot size)	✓	✓	✓	✓		
Mixed-use development	✓	✓	✓	✓		

99 Green buildings may be certified under many programs, almost all of which contain water efficiency standards. The most popular of such programs is the Leadership in Energy and Environmental Design (LEED) rating systems created by the U.S. Green Building Council (USGBC). (Other popular green building certification programs include Green Globes, Passiv Haus, BREEAM, and Living Buildings.) Although LEED has several rating systems available to different types of developments, the most relevant here are the LEED for New Construction and Major Renovations Rating System (LEED-NC), which applies to commercial and multi-family projects, and the LEED for Homes rating system, which applies to single-family and multi-family projects up to eight stories. Water conservation elements contained in the LEED-NC rating system include provisions for a water conserving development pattern, such as use of a previously developed site, compact development, and clustering/providing a high ratio of open space to development footprint. LEED-NC also includes points for high-efficiency fixtures and fittings as well as water conserving landscape features and systems such as the use of water efficient landscaping, installation of innovative wastewater technologies, and employing strategies that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline, not including irrigation (20% is a prerequisite—reduction beyond that earns points incrementally: 2 points for a 30% reduction, 3 points for a 35% reduction, and 4 points for a 40% reduction). *See*, USGBC, *LEED 2009 for New Construction and Major Renovations Rating System*, https://www.usgbc.org/resources/leed-new-construction-v2009-current-version (last visited May 21, 2016). Water conservation elements contained in the LEED for Homes rating system include provisions for a water conserving development pattern such as infill development, use of a previously developed site, compact development, and use of existing infrastructure. LEED for Homes also includes points for high-efficiency fixtures and fittings as well as water conserving landscape features and systems such as the use of drought-tolerant turf (if any turf), drought-tolerant plants, permeable paving, impermeable surfaces directed to infiltration features, rainwater harvesting, greywater reuse systems, use of municipal recycled water system, use of high-efficiency irrigation system (such as that designed by a WaterSense certified professional, submetering, drip irrigation, automatic timers/shutoff, moisture sensor, etc.), and a reduction in overall irrigation demand by 20%–45%. *See* USGBC, *Checklist: LEED v4 for Homes Design and Construction*, http://www.usgbc.org/resources/leed-v4-homes-design-and-construction-checklist (last visited September 25, 2018).

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
Mixed housing types	✓	✓	✓	✓		
Compact mixed use	✓	✓	✓	✓		
Transit-oriented development (TOD)	✓	✓	✓	✓		
Infill zoning	✓	✓				
Overlay zone	✓	✓				
Floating zone	✓	✓				
Setback requirements	✓	✓				
Highway intersection overlay zones	✓	✓	✓	✓		
Open space dedication	✓	✓	✓	✓		
Open space preservation	✓	✓	✓	✓		
Demand-based tap fees	✓					
Other incentives	✓					
EQUIPMENT						
Green plumbing code	✓		✓	✓		✓
Indoor fixture efficiency standards	✓				✓	✓
Reuse of water	✓				✓	✓
Smart meters	✓				✓	✓
Submetering multifamily units	✓				✓	✓
Incentives	✓					
LANDSCAPE						
Landscape codes matched to land use type	✓		✓	✓		
Landscape plan requirements (xeriscaping)	✓	✓	✓	✓		
Soil quality requirements	✓		✓	✓		
Plant list/Allowable plants	✓		✓	✓		
Tree size requirement	✓		✓	✓		
Turf limitations (type and quality)	✓		✓	✓		
Artificial turf	✓		✓	✓		
Irrigation system efficiency requirements	✓		✓	✓		✓
Water waste rules	✓		✓	✓		
Rain sensors	✓		✓	✓		✓
Spray nozzles	✓		✓	✓		✓
Water harvest	✓		✓	✓		✓
Water harvesting into landscape irrigation	✓					✓
Fixture efficiency standards	✓					✓

MATRIX OF IMPLEMENTATION TECHNIQUES

Water Conservation Measures	Comp Plan	Zoning Regs	Subdivision Regs	Site Plan	Building Code	Plumbing Code
Water loss limits	✓		✓	✓		✓
Positive shutoff	✓					✓
Incentives	✓					
MONITORING AND ENFORCEMENT						
Penalties – civil and criminal	✓	✓				
Post-occupancy violations	✓					
Intermunicipal inspections and prosecutions	✓					
OTHER						
Goal to be water wise	✓					
Percentage reduction in water use	✓					
Water fee based on size of structure and lot[100]	✓					
EPA WaterSense standards	✓					
Model home requirements	✓					
Rebates	✓					
KEY: ✓ = Standard is applicable						

All agreed-upon strategies and techniques should be mentioned in the comprehensive plan water element, but the details should be left for inclusion in other land use documents, such as zoning, subdivision and site-plan regulation, and building and plumbing codes.

100 The idea here is to say that a strong water element of a comprehensive plan would have all of these techniques, but it is not meant to imply that all implementation would involve solely municipal action. In this case, the Guidebook is suggesting putting water connection fee language into the comprehensive plan—working with water provider to do so. The implementation would be carried out, however, on the water provider side of the equation. The water provider would assess the proper water connection fee based on landscaped area or size of lot or structure (in the case of a single-family home vs. high rises).

EXAMPLES OF COMPREHENSIVE PLANS WITH A STRONG WATER ELEMENT

San Jose, California[101]

Adopted in 2011, *Envision San Jose 2040 General Plan* is the City's comprehensive plan. The Plan includes a robust water element within its Environmental Leadership Chapter called "Water Supply, Conservation, Recycling, and Quality."

The Plan's section on Water Supply, Conservation, Recycling, and Quality contains, among others, the following goals related to water conservation:

- Water Conservation:
  - Demonstrate environmental leadership through responsible and fiscally and environmentally sustainable management of water to restore the environment, enhance quality of life, and provide an adequate water supply to meet present and future community needs.
  - Continuously improve water conservation efforts in order to achieve best-in-class performance. Double the City's annual water conservation savings by 2040 and achieve half of the Water District's goal for the County on an annual basis.
- Water Recycling: Recycle or beneficially reuse 100% of the City's wastewater supply, including the indirect use of recycled water as part of the potable water supply.
- Water Resources: Protect water resources because they are vital to the ecological and economic health of the region and its residents.

The Plan's section on Water Supply, Conservation, Recycling, and Quality contains, among others, the following targets (objectives) related to water conservation:

- Double the City's annual water conservation savings by 2040 and achieve half of the Water District's goal for the County on an annual basis.
- Reduce citywide per capita water consumption by 25% by 2040 (from 2010 baseline).
- Achieve 50 million gallons per day of water conservation savings by 2040 by reducing water use and increasing water-use efficiency (from 2008 baseline).
- Recycle or beneficially reuse 100% of the City's wastewater supply (100 million gallons per day), including the indirect use of recycled water as part of the potable water supply.

The Plan's section on Water Supply, Conservation, Recycling, and Quality contains a significant number of water-related strategies and implementation actions, which are summarized here:

- *Water Conservation and Quality*: The Plan includes strategies related to developing and maintaining policies, ordinances, guidelines, and programs that do the following:
  - Promote water efficient landscaping for residential and nonresidential uses
  - Increase groundwater infiltration (by minimizing impervious surfaces)
  - Reduce the use of potable water through various technologies such as water efficient fixtures and appliances that are WaterSense-certified, Energy Star® rated, or equivalent and through the use of captured rainwater, greywater, or recycled water as the preferred source for nonpotable water needs such as irrigation and building cooling
- *Responsible Management of Water Supply*: The Plan includes strategies related to managing the limited water supply, including the following:

101 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

- Encouraging sustainable development practices such as low-impact development, water efficient development, and green building techniques
- Expanding use of recycled water, channeling development into areas within the vicinity of the recycled water system, and limiting water consumption for new development outside the recycled water-service area
- Working with local, regional, and state entities (including local water districts) to establish policies and partnerships that allow for a comprehensive approach to water-supply management, promote water-use efficiency programs, ensure that plans provide for adequate water supplies and maximize water conservation and reuse, and communicate with the public about the importance of responsible water management to quality of life

- *Water Conservation*: The Plan includes strategies related to adopting citywide policies and programs that increase the efficiency of water use, reduce potable water demand, reduce per capita water consumption (by 25% by 2040), and reduce the City's need for imported water (50 million gallons per day of water conservation savings by 2040). The strategies include the following:
  - Encouraging or requiring new and existing development to incorporate such measures
  - Encouraging the creation and use of new technologies
  - Encouraging or requiring water efficient design, landscape, and irrigation
  - Encouraging stormwater capture, onsite rainwater catchment, and greywater use (in areas that do not impact groundwater quality)
  - Working with local, regional, state, and other public and private entities to take these steps: develop codes and standards for stormwater capture and greywater reuse; incentivize water conservation by developing cost-sharing agreements on rebates and other incentive programs; engage the community in an ethic of efficient water use and the use of water efficient practices and technologies; and encourage state legislation (such as plumbing code, greywater code, and green building policy) to increase water efficient development
- *Water Recycling*: The Plan includes strategies related to expanding the City's recycled water system and the use of recycled water by encouraging such steps as these:
  - Developing incentives
  - Providing technical assistance and supporting research
  - Adopting recycled water use codes and standards
  - Requiring new buildings in the vicinity of the recycled water pipeline to be constructed in a manner suitable for connection to the system
  - Requiring new and existing developments to use recycled water wherever feasible and cost-effective
  - Requiring new development to contribute to the cost of system expansion
  - Improving recycled water treatment so that it can be used to help augment streams and recharge groundwater aquifers that provide a portion of the City's potable water supply
  - Working with local, regional, state, and other public and private agencies to develop statewide laws, policies, and incentives that facilitate recycled water use; educate the community about the benefits, reliability, and quality of recycled water; and involve the community in development of strategies to promote the value of recycled water as an important part of a fiscally and environmentally sustainable urban water use portfolio

- *Water Resources*: The Plan includes strategies related to water quality and quantity. The following strategies focus on quantity:
  - Using water resources in a manner that does not deplete the supply of surface or groundwater or cause overdrafting of the underground water basin
  - Protecting groundwater recharge areas, particularly creeks and riparian corridors

Southern California Association of Governments[102]

The Regional Comprehensive Plan adopted by the Southern California Association of Governments (SCAG) includes a robust Water Chapter that highlights a Water Action Plan, featuring best practices for SCAG and voluntary local government best practices. The table provided in the plan lists each action, indicates whether it is a best practice, and also indicates any potential for direct or indirect benefits (such as land use, transportation, air quality, energy, and open space). Some notable best practices listed as voluntary local government actions with potential benefits include the following:

- Green Plumbing Code
  - Amend building codes to require dual plumbing in new construction and provide incentives for plumbing retrofits in existing development to enable the safe and easy use of recycled water in toilets and for landscaping.
- Incentives
  - Use both market and regulatory incentive mechanisms to encourage "water wise" planning and development, including streamlining and prioritizing projects that minimize water demand and improve water-use efficiencies
  - Incentivize the use of recycled water through pricing structures that make it an attractive alternative to fresh water in nonpotable situations
- Water Waste Rules
  - Develop and implement tiered water-pricing structures to discourage water waste and minimize polluting runoff
- Goal to be Water Wise
  - Use both market and regulatory incentive mechanisms to encourage "water-wise" planning and development, including streamlining and prioritizing projects that minimize water demand and improve water-use efficiencies

102 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, Water Chapter, 60 (2008), https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf.

Aurora, Colorado[103]

Aurora's Comprehensive Plan has a strong element titled *Developing and Protecting Water- and Other Natural Resources*. Specific language in that chapter includes the following water conservation techniques:

- **Percentage reduction in water-use**
  - "Aurora's conservation goals are to reduce per capita demand by at least 10% over the next 20–25 years. It is assumed that the conservation program will assist in maintaining these savings and in providing a significant measure of drought preparedness should additional drought conditions be experienced. The current program targets savings at 100–150 acre-feet (AF) per year."
- **Indoor Fixture Efficiency Standard**
  - Enhance the reliability of the water system by creating continual water savings through efficiency.
- **Reuse of water**
  - The city will continue to take full advantage of its current water resources through irrigation reuse and expanded water recapture through the Prairie Waters Project.
  - The city will increase the percentage of water reused for irrigation as economically feasible opportunities are available.
  - The city will expand wastewater reuse capacity and increase the percentage of water reused for irrigation.
- **Landscape Plan requirements (xeriscaping)**
  - Water stewardship is a responsibility that Aurora has taken very seriously. With the development of the city's first Water Management Plan in 2003, city staff rewrote Aurora's landscape ordinance to ensure that future landscapes will be sustainable during dry periods and drought. The current ordinance limits the use of high-water-usage, cool-season grasses; requires the use of xeriscape and drought-tolerant plant materials; and regulates artificial turf.
- **Plant List/Allowable Plants**
  - Aurora developed the Recommended Xeriscape Plant List, residential lot landscape standards consisting of options for turf and xeriscape applications and buffer width reductions in conjunction with xeriscape landscaping.
- **Irrigation System Efficiency Requirements**
  - Aurora also codified its first Irrigation Ordinance that is currently administered by Aurora Water. The ordinance regulates the design, installation, and operation of all irrigation systems that connect to the city's potable and/or nonpotable water supply.
- **Enforcement**
  - Through the Waste Management Plan, seasonal water monitors are given the authority to enforce the adopted drought stage and all management programs that are associated with a given drought stage. This includes prescribed day of the week watering, hours of allowed irrigation, and water-waste enforcement.
- **Goal to be Water Wise**
  - The Goal to be Water Wise includes the following strategies:

103 City of Aurora, CO, Comprehensive Plan 2009 (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

- Use this plan and the capital improvement program to direct the extension of water-system infrastructure in a cost-effective manner. Plan for necessary facilities in the developing areas.
- Promote multiple use of public land and facilities.
- Continue to develop and implement a water-management program consisting of aggressive water acquisition, conservation, protection, and reuse.
- Continue to cooperate with adjacent counties to encourage new development to occur by annexation to Aurora. This will promote growth of the city's renewable water and wastewater services rather than using an aquifer source that is rapidly declining.

Westminster, Colorado

Westminster's Comprehensive Plan[104] is highly detailed and is adopted by ordinance,[105] not by resolution, making compliance with the Plan a legal requirement.[106] (In Colorado, a comprehensive plan can be a binding regulatory document if the local legislature adopts it as such by way of land development regulations, a practice that does not happen often.[107]) The City relies heavily on its Plan and takes compliance with the Comprehensive Plan seriously. As noted in the Plan, the City's Water Division regularly updates its Comprehensive Water Supply Plan (CWSP),[108] which evaluates the current water supply projection and projected water demands based on the Comprehensive Plan in order to quantify any expected deficits or surpluses. Further, the Comprehensive Plan notes that new development will be evaluated based on projected impacts to the City's water supply.[109] Based on the Plan's assumptions for water consumption by land use, it is expected that the City's existing and planned water supply will meet the needs of projected development through the Plan horizon of 2035.[110]

104 City of Westminster, CO, Comprehensive Plan (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

105 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 9.1, https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

106 In Colorado, a comprehensive plan can be a binding regulatory document if the local legislature adopts it as such by way of land development regulations, which does not happen often. Colo. Rev. Stat., §§ 30-28-106(2)(a), 31-23-206(1).

107 Colo. Rev. Stat., §§ 30-28-106(2)(a), 31-23-206(1).

108 Because water use is so affected by weather, the City tries not to react to changes in a specific year but rather turns to five- or six-year Citywide use reviews when updating its Comprehensive Water Supply Plan. Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

109 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

110 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

Westminster focuses heavily on acquiring water rights itself before development pressures arise in a given area in order to prevent the sudden spike in land values that could occur. The City's approach of buying its own water allows it to take the lead on making economic decisions about how to plan for and pay for the City's needed additional water, a factor that also influences development decisions. Much of the City's water supply is based on surface water, which means they have to plan more carefully for severe droughts than communities relying on groundwater. Under the Plan, therefore, the extent of water use is a key consideration in the location, type, and intensity of land uses and development within the City.[111] Because the City's water-supply projections are so closely linked to its designated land uses, the City must identify the potential change in water demand that would result from any proposed decision to change a land use from what is currently permitted under zoning.[112]

The City's Plan incorporates water conservation throughout but also provides focused coverage of the issue under its "Public Utilities and Services" chapter, which contains subsections focused on Water Supply, Waste Water System, and Stormwater Quality. The section on Water Supply notes that "with Colorado's arid environment, the City aggressively works to protect existing water supply and ensure sufficient supply to meet future needs." This section also highlights the usefulness of reclaimed water for use as an irrigation source, while preserving potable drinking water for human consumption and reducing the burden on the City's potable water system.[113] Further, it states the following regarding water conservation: "In addition to efforts to expand recycled water availability to city water customers, the City also employs conservation efforts to address water supply and demand. Water conservation programs directed toward the consumer are focused on both indoor and outdoor water demands. Programs intended to reduce indoor water consumption promote water efficient fixtures and appliances through regulations and education. Outdoor water conservation is promoted through landscape regulations requiring water-wise landscapes and smart, efficient irrigation technology as well as offering free irrigation audits to existing customers that target water savings. The City's supply-side conservation measures are directed toward increasing water efficiency both before and after customer use. These strategies include improvements within the city's raw water collection and treated water distribution systems in terms of leak detection and repair, pipe replacement, and corrosion control."[114]

Specific water-related goals from the chapter include the following:[115]

- Ensure a safe and reliable water supply.
- Strive to provide exceptional water and wastewater services at reasonable costs to City customers.

111 City of Westminster, CO, Comprehensive Plan 28 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

112 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

113 City of Westminster, CO, Comprehensive Plan, Reclaimed Water 170 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

114 City of Westminster, CO, Comprehensive Plan, Water Conservation 171 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

115 City of Westminster, CO, Comprehensive Plan, Public Utilities and Services, Goals and Policies 187 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

Associated water-supply policies from the chapter include the following:[116]

- Conduct annual analysis of projected water supply and demand to ensure that the City maintains a balance between supply and demand. Provide an annual water and infrastructure balance report to City Council to document progress and highlight decisions that have integrated land use and development decisions with water-supply planning.
- Ensure that new development does not result in water demand that exceeds the City's existing water supply. Proposed developments that exceed the water demand associated with the property's Comprehensive Plan land use designation will be evaluated on a case-by-case basis to ensure that the City's water supply is not impacted.
- Coordinate with the City's Planning Division in growth management competition evaluation of new development and long-range planning efforts to ensure that land use planning is in concert with water-supply availability.
- Maintain existing levels of water service for current and future development by preserving and improving infrastructure, replacing water mains as necessary, and improving water treatment facilities.
    - Work with the Planning Division to identify and evaluate areas where intensification of land use is anticipated to occur to identify potential deficiencies in capacity or level of service.
    - Update the Capital Improvement Program to identify priority improvements.
- Ensure that resource supply, infrastructure, and operational resources remain at sufficient levels to meet the City's needs during fires, emergencies, and severe drought conditions.
- Continue to expand the reclaimed water system and encourage existing and new development to connect to and utilize the system.
- Provide high-quality potable and reclaimed water to customers that meets or exceeds all standards established by the federal Safe Drinking Water Act and State regulations.
- Continue efforts to reduce water use in municipal buildings and City operations.
- Encourage water conservation in new and existing construction through education, regulation, and incentives when appropriate. Measures may include, but are not limited to:
    - Educational programs
    - Indoor and/or outdoor audits
    - Fixture and appliance incentives
    - Rates and fees
    - Requirements by the Municipal Code or regulation
- Establish water-saving and conservation standards for new development. Standards may include but are not limited to:
    - Efficient water fixtures and appliances
    - Landscape design (see Westminster Landscape Regulations)
    - Irrigation technology and performance
    - Water efficient processes and equipment

116 City of Westminster, CO, Comprehensive Plan, Public Utilities and Services, Goals and Policies 187-189 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

Related Stormwater Quality policies from the chapter include:[117]

- Encourage development of consolidated facilities to support a higher-intensity use of land in urban, high-density areas.
- Encourage low-impact development measures to reduce water runoff for site improvement and construction activities.

Finally, just as the Plan incorporates water conservation throughout other sections, it also incorporates land use into its Water Supply section, making the following point regarding the importance of coordinating land use and water supply: "As the Front Range of Colorado continues to develop, sources of new water supply are becoming limited within the water basins on which the City relies. As such, the Comprehensive Plan reflects a balance of land uses that will allow the City to grow and evolve within a limited water supply. As the City becomes more densely developed, maintaining the balance between demand for water by new development and the City's water supply will be a significant factor in land use decisions. New development will be evaluated based on projected impacts to the City's overall water supply. This coordination of planning efforts between land use and water supply will be augmented by Plan policies aimed at water conservation, expansion of reclaimed water use, and periodic monitoring to ensure the City can continue to provide high quality water service into the future."[118]

c. Integrate Water Efficiency Measures Throughout the Comprehensive Plan

Whether or not a community chooses to include a discrete water element in the comprehensive plan, many water conservation and land use development issues may (and should) be addressed by integrating water into existing sections throughout the plan. When doing so, it is important that the community has first assessed how much water conservation language is already present in the comprehensive plan (e.g., by using the Self-Assessment Questions from *Chapter 4*), and then assesses where there are opportunities to integrate water conservation language into the plan. For example, although water conservation may not be mentioned as part of a goal or objective, it is important to understand if the existing plan presents strategies and implementation techniques that foster water efficient growth. Such strategies and techniques might be those related to a compact land use pattern, green building development, green infrastructure measures, clustering provisions, and the like. Where such strategies and implementation techniques exist, there is opportunity to integrate water conservation language into the plan's goals and objectives. The Matrix offered in Section 5(b) can also be helpful in this effort to identify where various water conservation strategies might best be incorporated.

117 City of Westminster, CO, Comprehensive Plan, Public Utilities and Services, Goals and Policies 190 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

118 City of Westminster, CO, Comprehensive Plan, Future Water Supply 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

EXAMPLES OF WATER INTEGRATION THROUGHOUT THE COMPREHENSIVE PLAN

The following case studies provide examples of water conservation language that can be integrated throughout different elements of the comprehensive plan. These examples provide guidance not only on water conservation language but also on where to integrate such language into the comprehensive plan.

Pinedale, Wyoming

The goals and policies section of the Master Land Use Plan of the Town of Pinedale, Wyoming, includes water-resource management.[119] One goal is "To conserve water and to relate water resources and development to desired land use." The Plan lists three policies to achieve this goal:

- Not extending water services to subdivision or property owners that are not adjacent to existing mains
- Encouraging water conservation through installation of water meters
- Developing a system to install meters in areas without meters

Chico, California

The Open Space and Environment chapter in the General Plan of the City of Chico, California, includes a goal "to conserve water resources and improve water-quality." The Plan then lists policies and actions to achieve this goal; among them is a policy to encourage water conservation and the reuse of water through limiting the use of turf on landscape medians and common areas, requiring water efficient landscape irrigation, and implementing a water conservation program.[120]

Thornton, Colorado

The Transportation and Utilities chapter of Thornton, Colorado's Comprehensive Plan incorporates a goal to be water-wise. The Plan states, "The City of Thornton has historically maintained one of the lowest residential daily per capita water consumption rates among cities in the Front Range. This is a result of numerous efforts that Thornton has pursued to create and instill water conservation ethics throughout the community. Water conservation is also an essential component of the City's long-term water supply planning strategy and will ultimately reduce the amount of water that the City must develop in order to meet its build-out demand."[121] Particular to preservation and conservation, the Plan states that "the City could further encourage preservation of the natural environment and conservation of resources including water and energy. A healthy community is a sustainable community where preservation of the natural environment is a priority."[122]

119 Town of Pinedale, WY, Town Code § 275: Master Land Use Plan, http://ecode360.com/9228050#9228050.

120 City of Chico 2030 General Plan, Chapter 10, Open Space and Environment Element 21 (2011), http://www.chico.ca.us/document_library/general_plan/documents/10.OpenSpaceandEnvironmentElement.pdf.

121 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 4.2 Water and Wastewater Utilities, 9 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sec_4_transportation_final.pdf.

122 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 7: Healthy City with Great Amenities, 7.5 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sect_7_great_amenities_final.pdf.

Also contained within its Transportation and Utilities chapter, Thornton's Plan features language related to indoor fixture efficiency standards:

- The City should continue its effective conservation program which includes rebates for water efficient toilets, washing machines and irrigation systems, community education about water efficiency, and plumbing inspections.[123]
- The City has been leading by example through efforts to increase energy efficiency in City Hall, obtaining Leadership in Energy and Environmental Design for Existing Buildings (LEED-EB) Certification for the Margaret W. Carpenter Recreation Center for energy and water-use reduction, and installing photovoltaic panels on both of these buildings.[124]
- The City should also encourage builders and homeowners to use sustainable and green building practices that decrease the use of energy, water, and natural resources; create less waste; and create a more comfortable environment for occupants.[125]
- The City should continue its effective conservation program which includes rebates for water efficient toilets, washing machines and irrigation systems, community education about water efficiency, and plumbing inspections (under EPA WaterSense Standards).[126]

Aurora, Colorado

Aurora, Colorado's Comprehensive Plan contains language in its Sustainability Plan element that includes a goal to be water wise:

- "Drought conditions in Colorado have focused Aurora's effort to seek innovative solutions to capture and conserve this precious natural resource. Conserving water is conserving energy. The City of Aurora is committed to providing a socially, environmentally and economically sustainable water supply."[127]

Similarly, the Plan's element on Maintaining Regional Leadership contains language that supports strong water enforcement measures, including intermunicipal inspections:

- Continue to monitor, anticipate, and influence new regulatory requirements, especially related to land use, water quality, and environmental issues[128]
- Overall, the city continues to influence federal, state, and regional policy on a wide variety of subjects, including water development, for the betterment of Aurora citizens[129]

123 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 7: Healthy City with Great Amenities, 7.24 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sect_7_great_amenities_final.pdf.

124 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 7: Healthy City with Great Amenities, 7.24 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sect_7_great_amenities_final.pdf.

125 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 7: Healthy City with Great Amenities, 7.25 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sect_7_great_amenities_final.pdf.

126 City of Thornton 2012 Comprehensive Plan, Transportation and Utilities, sec. 7: Healthy City with Great Amenities, 7.24 (2012), https://www.cityofthornton.net/government/citydevelopment/planning/Documents/comprehensive-plan/sect_7_great_amenities_final.pdf.

127 City of Aurora 2009 Comprehensive Plan, Chapter II, Sustainability Plan 18 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

128 City of Aurora 2009 Comprehensive Plan, Chapter IV, N: Maintaining Regional Leadership 5 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

129 City of Aurora 2009 Comprehensive Plan, Chapter IV, N: Maintaining Regional Leadership 1 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

Westminster, Colorado

The City of Westminster relies heavily on its Comprehensive Plan,[130] which is highly detailed and adopted by ordinance,[131] making compliance mandatory[132] — a legal requirement that the City takes seriously. As noted in the Plan, the City's Water Division regularly updates its Comprehensive Water Supply Plan (CWSP),[133] which evaluates the current water-supply projection and projected water demands based on the Comprehensive Plan in order to quantify expected deficits or surpluses. As set forth in the Comprehensive Plan, the City evaluates new development based on projected impacts to the City's water supply.[134] The City's Plan has a strong water element within its Public Utilities and Services chapter, but water conservation is also incorporated throughout other sections of the Plan.

The Plan's Land Use chapter notes that a majority of the City's land area is zoned as a PUD,[135] under which all proposed uses must conform to the Comprehensive Plan.[136] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[137] The agreed-upon standards are written into the PUD's Official Development Plan,[138] making them the legal requirements for that project.[139] Through the planned unit development (PUD) process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. Likewise, because the City owns its own water and has done such a good job of tying together land use and water-supply projections, they can negotiate and mandate from a much stronger position, thus requiring more conservation elements.

130 City of Westminster, CO, Comprehensive Plan (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

131 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 9.1, https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

132 In Colorado, a comprehensive plan can be a binding regulatory document if the local legislature adopts it as such by way of land development regulations, which does not happen often. Colo. Rev. Stat., §§ 30-28-106(2)(a), 31-23-206(1).

133 Because water use is so affected by weather, the City tries not to react to changes in a specific year but rather turns to five- or six-year Citywide use reviews when updating its Comprehensive Water Supply Plan. Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

134 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

135 City of Westminster, CO, City Zoning Map (2010), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/2-2_Land%20Use%20Diagram.pdf.

136 City of Westminster, CO, Comprehensive Plan, Land Use Classification 40 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

137 *Regulations and Design Guidelines*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview. Because the State of Colorado recently (as of the writing of this Module) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

138 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

139 City of Westminster, CO, City Code, § 11-3 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-1FI.

The Land Use chapter also notes, as new opportunities for redevelopment and infill arise beyond what is currently identified in the Plan, that planning for water resources and utilities, among other things, will continue to be reevaluated as future development potential is identified in subsequent Comprehensive Plan updates.[140] The chapter includes the following related policy:

- Ensure that adequate infrastructure and public services are available for new development. Evaluate the impact of new development to the City's future water supply, considering land use, intensity, and proposed conservation measures.[141]

The Plan's City Identity and Design chapter includes a section on Sustainable Design, which emphasizes that "through the City's landscape and stormwater management regulations, developments are encouraged to design sites to reduce water consumption and increase onsite mitigation of stormwater. Regulations encourage minimizing impervious surfaces on a site and employing low-impact design measures like increased planting and groundcover to increase onsite infiltration. The City's landscape regulations also encourage use of native planting that reduces the need for potable or reclaimed water for irrigation."[142] The Sustainable Design section also highlights the City's focus on green buildings, including the use of high-efficiency water fixtures and the city's intention to continue to support and encourage sustainable design throughout the community with City-led building and planning efforts serves as an example for private development.[143]

The chapter includes the following water-related goal:[144]

- Encourage sustainable design practices in all aspects of physical planning in the city, with a focus on site, landscape, and building design.

Water conserving policies from the chapter include:[145]

- Develop cohesive streetscape plans, which should consider, among other things: unified landscape treatments, medians, and plantings that minimize water use and runoff.
- Incorporate sustainable site planning, development, and maintenance standards and procedures as part of updates to the Westminster Municipal Code, Landscape Regulations, and design guidelines.
- Reduce the amount of stormwater runoff that reaches the City's storm drain system. Maximize permeable area and minimize the amount of runoff flowing toward impermeable areas.
- Design public parks, plazas, and streetscapes with plantings and features that reduce water use and maximize onsite treatment of stormwater.

140 City of Westminster, CO, Comprehensive Plan, Development Potential 59 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

141 City of Westminster, CO, Comprehensive Plan, Land Use, Policies 70 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

142 City of Westminster, CO, Comprehensive Plan, Sustainable Design 146 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

143 City of Westminster, CO, Comprehensive Plan, Sustainable Design 146-147 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

144 City of Westminster, CO, Comprehensive Plan, City Identity and Design, Goals 148 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

145 City of Westminster, CO, Comprehensive Plan, City Identity and Design, Policies 149-153 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

- Require new development to connect to the City's reclaimed water system wherever possible for landscape irrigation. Ensure that landscape plans address stormwater runoff and reduce water consumption.
- Encourage new developments to…utilize green building techniques and materials.
- Incorporate green building principles and practices to the extent practicable and financially feasible into the planning, design, construction, management, renovation, operations, and demolition of all facilities that are constructed, owned, managed, or financed by the City.

Castle Rock, Colorado

The Natural Resources chapter of Castle Rock's Comprehensive Master Plan encourages environmental building standards calling for indoor fixture efficiency standards. Policy NR-7.1 states that "the Town shall study and consider adoption of building standards for our public facilities in order to maximize energy and water efficiency, construction, reuse and recycling, use of low toxic paints and sealants, certified wood, recycled building materials, and onsite storm water and erosion control. The Town shall encourage similar building practices in new construction, redevelopment projects and retrofitting existing structures."[146]

The Plan's chapter on Community Services calls for the reuse of treated wastewater for irrigation to reduce potable water demand.[147] Similarly, it also calls for the development of a reuse water policy for irrigation.[148] It includes strategies for landscape plan requirements (xeriscaping), such as "develop appropriate landscape design guidelines to correlate to our semi-arid climate"[149] and "implement water conserving principles related to landscape design, installation and maintenance."[150] Finally, the Community Services chapter also includes a goal to be water wise: "Manage water demand to minimize infrastructure investments required to meet peak demands, to conserve the finite Denver Basin aquifer resource."[151]

Palo Alto, California

The City of Palo Alto Comprehensive Plan includes within its Natural Environment chapter a policy to further fixture efficiency standards. Policy N-20 states: "Maximize the conservation and efficient use of water in new and existing residences, businesses and industries: Water should be regarded as a limited natural resource. A variety of economic and financial incentives can be used to encourage its conservation. In addition, water-saving appliances, drought-tolerant landscaping, recycled wastewater, and other measures can encourage its efficient use."[152] The Plan's Natural Environment chapter also contains Program N-26: "Implement incentives for the use of drought-tolerant landscaping and recycled water for landscape irrigation."[153]

146 Castle Rock 2020 Comprehensive Master Plan, Natural Resources, 11-6 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

147 Town of Castle Rock 2020 Comprehensive Master Plan, Community Services, 7-3 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

148 Town of Castle Rock 2020 Comprehensive Master Plan, Community Services, 7-14 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

149 Town of Castle Rock 2020 Comprehensive Master Plan, Community Services, 7-14 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

150 Town of Castle Rock 2020 Comprehensive Master Plan, Community Services, 7-3 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

151 Town of Castle Rock 2020 Comprehensive Master Plan, Community Services, 7-3 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

152 City of Palo Alto Comprehensive Plan, Sec. 5: Natural Environment 14 (2007), http://www.cityofpaloalto.org/gov/topics/projects/landuse/compplan.asp.

153 City of Palo Alto Comprehensive Plan, Sec. 5: Natural Environment 14 (2007), http://www.cityofpaloalto.org/gov/topics/projects/landuse/compplan.asp.

Parker, Colorado

In the Land Use chapter of its comprehensive plan, *Parker 2035: Changes and Choices*, Parker, Colorado encourages landscape plan requirements to promote water conservation practices. Strategy 7.A. states that to achieve this goal, the town should "implement responsible creation of landscaping that utilizes the seven Xeriscape principles."[154] The Public Services and Facilities chapter further states that "Parker Water continues to develop other programs and projects to reduce our impact on the aquifers including actively pursuing additional renewable water rights, metering, xeriscape education and reuse of wastewater for irrigation."[155] The Public Services and Facilities chapter also includes language to "actively encourage the conservation of water and the reuse of wastewater."[156] Finally, the chapter also includes a goal to be water wise: "Coordinate with the Parker Water and Sanitation District and other special districts that serve Parker residents and businesses to ensure a sustainable water supply and adequate sanitation systems."[157]

San Jose, California[158]

Adopted in 2011, *Envision San Jose 2040 General Plan* is the City's comprehensive plan. As discussed in Part I of this Chapter, the Plan includes a strong stand-alone water element within its Environmental Leadership Chapter (called "Water Supply, Conservation, Recycling, and Quality"). The plan also, however, does an excellent job of incorporating various water conservation methods into other chapters and subsections.

The Plan's introductory chapter sets forth 12 major strategies that inform the Plan's goals, policies, and implementation actions. Among these strategies are "Focused Growth" and "Measurable Sustainability/Environmental Stewardship." The Focused Growth strategy concentrates new growth into designated growth areas that surround the City's regional employment center and maximize use of the transit systems within the region. This approach reflects the City's built-out nature, desire to preserve established neighborhood character outside these growth areas, and the Plan's emphasis on reducing environmental impacts while fostering transit use and walkability. The Measurable Sustainability/Environmental Stewardship strategy furthers the City's multiple policies[159] that support the implementation of environmental best practices, especially those that minimize waste, efficiently use natural resources, and manage and conserve resources for use by present and future generations.

The Plan's chapters and subsections contain, among others, the following goals related to water conservation (beyond those contained in the water-specific section):

- Goals for green buildings include the following:
  - Demonstrate local and global environmental leadership through progressive use of green building policies, practices, and technologies to achieve 100 million square feet of new or retrofitted green buildings by 2040

THE SEVEN XERISCAPE PRINCIPLES

1. *Proper planning and design*
2. *Irrigation systems (e.g., Netafim)*
3. *Use of mulches to reduce evaporation*
4. *Use of soil amendments*
5. *Grouping of plant materials of similar water needs together (e.g., hydrozoning)*
6. *Limiting of turf areas*
7. *Appropriate maintenance of the landscape*

154 Parker 2035: Changes and Choices, Town of Parker, Colorado, 12.6, http://www.parkeronline.org/DocumentCenter/View/21759.

155 Parker 2035: Changes and Choices, Town of Parker, Colorado, 11.6, http://www.parkeronline.org/DocumentCenter/View/21759.

156 Parker 2035: Changes and Choices, Town of Parker, Colorado, 11.16, http://www.parkeronline.org/DocumentCenter/View/21759.

157 Parker 2035: Changes and Choices, Town of Parker, Colorado, 11.16, http://www.parkeronline.org/DocumentCenter/View/21759.

158 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

159 Such as the Green Vision, the Greenhouse Gas Reduction Strategy, the Green Building Policies, the Stormwater Management Plan, the Hydromodification Management Policy, the Riparian Corridor Policy, and the Habitat Conservation Plan. *See*, Envision San Jose 2040 General Plan, 48 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

- Maximize the use of green building practices in new and existing development to minimize use of potable water and to reduce water pollution

- Land Use and Transportation goals include the following:
  - Establish a land use pattern that fosters a more fiscally and environmentally sustainable, safe, and livable city
  - Meet the housing needs of existing and future residents by fully and efficiently utilizing lands planned for residential and mixed-use and by maximizing housing opportunities in locations within a half mile of transit, with good access to employment areas, neighborhood services, and public facilities
  - Focus new growth into identified Growth Areas to protect the quality of existing neighborhoods while establishing new mixed-use neighborhoods with a compact and dense form that is attractive to the City's projected demographics (i.e., young and senior population) and that supports walking, provides opportunities to incorporate retail and other services in a mixed-use format, and facilitates transit use
  - Respect the designated growth boundaries to preserve the beauty and natural resources and non-urban character of lands outside the Urban Growth Boundary, to maintain the fiscal health of the City, to direct private and public investment within identified growth areas, and to preclude development in areas subject to natural hazards

The Plan's chapters and subsections contain, among others, the following targets (objectives) that directly or indirectly relate to water conservation (beyond those contained in the water-specific section):

- Green buildings will achieve 50 million square feet of new or retrofitted green buildings by 2022 and 100 million square feet by 2040. (An estimated 40% of the community's total energy use and 16% of its water goes into buildings.)
- Land use and transportation will foster a water conserving land use pattern to achieve 75% of residents who can access 25% of their retail/service needs within a 20-minute walk and 50% of residents who can access 50% of their retail/service needs within a 20-minute walk.

The Plan's chapters and subsections contain, among others, the following strategies and implementation actions that relate to water conservation (beyond those contained in the water-specific section):

- Green buildings goals include the following:
  - Foster the construction and retrofit of new or existing commercial and residential buildings to achieve green building standards
  - Operate and maintain those buildings to reduce waste, conserve water, and meet other environmental objectives
- Land use and transportation include the following:
  - Collaborate with appropriate external agencies with land use authority or regulations in the City. Consider applicable Airport Land Use Commission, Water District, Local Area Formation Commission, and other policies from outside agencies when reviewing new or expanded uses
  - Review criteria in the Zoning Ordinance and update it as appropriate to reflect Land Use goals, policies, and implementation actions in this Plan

- Incorporate appropriate land use policies developed as part of the Water Pollution Control Plant Master Plan process into the *Envision General Plan*, to more clearly identify the distribution of jobs in that area
- Provide significant job and housing growth capacity within strategically identified "Growth Areas" in order to maximize use of existing or planned infrastructure (including fixed transit facilities), minimize the environmental impacts of new development, provide for more efficient delivery of City services, and foster the development of more vibrant, walkable urban settings
- Develop residential- and mixed-use-designated lands adjacent to major transit facilities at high densities
- Respect the designated growth boundaries to preserve the beauty, natural resources, and non-urban character of lands outside the Urban Growth Boundary. To this end, limit all new development on lands outside the boundary as follows:
  - Do not provide urban services to new development outside the boundary
  - Require that new development projects cause no significant increase in public services or infrastructure and are non-urban in terms of, among other things, wastewater generation rates; the extent of grading, vegetation removal, drainage modifications or other alteration of the natural environment; and water consumption, excluding the environmentally beneficial use of recycled water
  - Distinguish between urban and non-urban uses in terms of water usage by limiting water consumption for new development to use of non-urban sources, including onsite well water and rainfall catchment. Use of recycled water may be allowed.
- For all non-residential uses allowed outside the Urban Growth Boundary, other than agricultural and single-family residential land uses, preserve open space through dedication of an open space or conservation easement
- Preserve the non-urban character of lands outside the Urban Growth Boundary by locating and, if possible, clustering new development within the minimum area necessary to accommodate it, in order to avoid or reduce the need for improvements and minimize any potential environmental impacts

Arvada, Colorado

Arvada's Comprehensive Plan contains a chapter on the City's "Visions, Goals, and Policies." There, the City sets forth several actions furthering water conservation:

- **Indoor Fixture Efficiency Standards**
  - The City will use demonstration projects to encourage energy and water conservation and will incorporate energy and water-saving methods in public projects.[160]
  - The City will encourage new developments to incorporate energy-efficient materials and design and water-saving measures.[161]
  - The City will encourage the development of buildings utilizing materials and design that reduces energy and resource consumption and impacts on the environment.[162]

160 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 24 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

161 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 24 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

162 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 24 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

- **Landscape Plan Requirements (xeriscaping)**
  - The City will encourage and require, where appropriate, new developments to incorporate water-saving measures, such as using xeriscape (drought-tolerant) landscape.[163]
  - The City will promote and educate the public about the use of xeriscape and "natural" landscaping for new parks. The City will also use drought-tolerant landscape materials and convert non-drought-tolerant landscape turf wherever possible.[164]
  - Site materials should consist of open or unobtrusive fencing, natural drought-tolerant landscaping, and low-level lighting.[165]
- **Goal to be Water Wise**
  - Additional water is required to meet the increased water demand brought on by development on vacant lands and redevelopment areas. This Plan recommends a combination of increased water storage and conservation activities to ensure an adequate water supply for the future.[166]
  - The City will continue to promote water conservation.[167]

Yavapai County, Arizona[168]

The Water Resources element of Yavapai County's Comprehensive Plan includes several strategies intended to integrate water harvesting into landscape irrigation:

- Promote approved methods of recharge or rainwater harvesting for new development
- Educate the public about rainwater harvesting and land contouring to create catchment basins
- Promote greywater harvesting, efficient plumbing and other methods of water harvesting, such as rainwater catchments, catchment basins, and passive water harvesting in cases where technologically feasible

Douglas County, Colorado

Douglas County's *Comprehensive Master Plan 2035* lays out several policies related to water conservation. Among them is a turf limitations policy in the Water Supply chapter to "limit the size and location of irrigated landscapes, such as turf grass areas."[169] The Plan's Rural Communities chapter includes a policy for rain sensors and other water conserving fixtures: "Support water conservation through such means as low-flow toilets and shower heads, xeric landscaping, sensor-based sprinkler systems, and greywater reuse."[170]

163 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 23 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

164 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 18 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

165 City and Community of Arvada, 2005 Comprehensive Plan, ch.4 Community Development Principles, 6 (2005), http://static.arvada.org/docs/12096657852005_Comp_Plan_CH_4.pdf.

166 City and Community of Arvada, 2005 Comprehensive Plan, ch.2 Arvada Issues, 10 (2005), http://static.arvada.org/docs/11298500352005_Comp_Plan_CH_2.pdf.

167 City and Community of Arvada, 2005 Comprehensive Plan, ch.3 Visions, Goals, and Policies, 23 (2005), http://static.arvada.org/docs/11298499632005_Comp_Plan_CH_3.pdf.

168 Yavapai County Comprehensive Plan, IV Water Resources Element, 55 (2012), http://www.yavapai.us/Portals/34/Reference%20Materials/YavapaiCountyComprehensivePlan.pdf.

169 Douglas County Colorado, Comprehensive Master Plan 2035, Sec. 8 Water Supply, 1-2 (2014), http://www.douglas.co.us/documents/full-cmp.pdf.

170 Douglas County Colorado, Comprehensive Master Plan 2035, Sec. 4 Rural Communities, 10 (2014), http://www.douglas.co.us/documents/full-cmp.pdf.

Sample[171]

Below is sample language that communities may incorporate throughout the comprehensive plan in appropriate places to promote water conservation. These sample provisions are offered here because such provisions were not discovered in local case study examples but are important for communities to consider.

- **Demand-based tap fees:** *Calibrate water connection, or tap, fees to ensure that new development pays for the full capital cost of its impact on our community's current and proposed water-supply infrastructure. Conduct studies of these full costs and adjust tap fees to impose costs on new development based on projected water use given the building and lot sizes and land uses involved.*
- **Soil Quality Requirements:** *The type and quality of soil used in new developments relates directly to the amount of water used to sustain the landscape. The [City, Town, County] will encourage and require, where appropriate, new developments to utilize water conserving soil types and soil amendment/installation practices.*
- **Artificial Turf:** *The use of artificial turf can significantly reduce onsite water use and is consistent with a high-quality visual environment when installed in certain locations. The [City, Town, County] will encourage and require, where appropriate, the use of artificial turf in new developments.*
- **Water Loss Limits:** *New and existing developments should be discouraged from engaging in any type of practice or using any type of equipment that causes water waste from over-watering, leakages, water pooling, or other issues. These types of practices and equipment include: [Local land and water planners should insert a list of these practices and equipment here.] Where appropriate, these practices and equipment should be added to regulations and codes, including enforcement sections where sanctions should be added.*
- **Penalties – Civil and Criminal:** *Zoning, land use regulations, and code provisions should be enforced by the [insert title of local official], who shall be responsible for monitoring and enforcing all zoning, land use regulation, and code provisions that relate to water conservation, including conditions imposed on developments by any local land use board or by the staff charged with administrative approvals. Monetary penalties for violations of any of these provisions should be set at a high enough level to ensure compliance and not become just an affordable cost of doing business. Civil penalties should be set so that each day's violation after notice is given constitutes a separate violation. Criminal penalties (imprisonment) should be provided in the case of extended periods of violation.*

171 This example was developed by the authors of this Guidebook to offer additional sample language for consideration.

- **Post-Occupancy Violations:** *Experience indicates that many required building and site improvements are not maintained by building owners over time. To combat this tendency, the [City's, Town's, County's] code must provide for post-occupancy inspections, agreed to by the developer upon issuance of the certificate of occupancy. These inspections should be carried out regularly for several years after the certificate of occupancy is issued. New owners should be given a maintenance checklist, informing them of the standards imposed on their buildings and sites and also instructed regarding how to maintain them. Inspectors charged with monitoring should be legally permitted to inspect both the interior of buildings and exterior site conditions and facilities and to issue cease-and-desist orders where water conserving standards are violated. Civil and criminal fines and penalties for post-occupancy violation should be imposed where such orders are ignored or complied with only in part. In order to reduce the cost of monitoring and enforcement, post-occupancy, the [City, Town, County] should explore the possibility of retaining inspectors in conjunction with neighboring local governments and sharing the costs of inspection and enforcement with those local governments on a ratable basis.*
- **Model Home Requirements:** *Education is an effective method of convincing home owners to invest in water conserving fixtures and landscaping. To further this end, developers will be encouraged (or required where appropriate) to build a model home that utilizes all available, cost-effective interior and exterior equipment, fixtures, facilities, and practices. Prospective buyers will then be shown the model to learn about the benefits, costs, and cost savings of such improvements and practices.*
- **Rebates:** *The [City, Town, County] should provide cash rebates to owners of existing buildings to encourage them to replace grass with drought-resistant native plants, convert to drip irrigation, and adopt other exterior water conserving practices that involve capital expenditures. The costs of these conversions will be incentivized by the rebate, which must be paid back if these practices are discontinued. Funding should be sought for this program from regional and state agencies. The rebate program should be accompanied by a robust educational effort to inform residents of the need to conserve water and to prepare for droughts. These incentives and initiatives should help to change residents' expectations and practices regarding exterior landscaping and watering.*

d. Foster a Water Conserving Land Use Pattern

Whether or not a comprehensive plan contains a stand-alone water element or incorporates water conservation throughout, communities concerned with water supply-demand imbalances should undoubtedly encourage a water efficient land use pattern within the plan so that it can most effectively serve as a blueprint for the community to make future water-conscious land use decisions. By calling for more compact, infill development within existing service areas, paired when possible both land use and water conservation plans set the stage for significant water savings and a reduction in infrastructure costs. (See Chapter 3, *Working Together*, for a more detailed discussion of the link between such development patterns and water conservation, as well as the importance of regional collaboration.)

Both land use and water conservation plans could be amended to make a strong, clear link between land use patterns and water conservation. When doing so, it is useful to document the potential water savings that can be achieved through increasing density in existing neighborhoods to accommodate growth instead of spreading growth outward into lesser developed areas or, where greenfield development is necessary, taking a cluster approach. Providing supporting data for water-savings claims will also bolster

the plan as a guiding document (see Chapter 3 for references). Incorporating relevant data on limited water resources or delivery capacity and the potential savings that can be achieved by the listed strategies and techniques will make the plan stronger and can advance the public debate about appropriate water policies.[172]

Among the strategies and techniques for encouraging water efficient land use patterns are:

- Designate priority areas for growth and areas for conservation
- Designate an urban growth boundary
- Promote cluster development
- Prioritize infill development
- Allow for multifamily and attached housing
- Plan for green infrastructure

i. Designate Priority Areas for Growth and Areas for Conservation

The critical task for the comprehensive plan is to delineate areas prioritized for growth, where water can be provided most efficiently, and conservation areas, where development could be discouraged or minimized. (For communities with limited room to grow, the task is a bit different and is addressed more directly later in this section.) As described in more detail in Chapter 2, *Water Issues in the Interior West: A Call to Action*, compact, infill development generally requires less water per household than single-family housing, and the infrastructure requirements of both types of development are quite different. In areas prioritized for growth, multifamily buildings, attached housing, small-lot development, along with clustered and mixed land uses should predominate. In areas designated for conservation, open space and natural resource preservation should be the objective, as well as maintaining existing community character.

Additional benefits of concentrating development in priority growth areas include:[173]

- More compact development allows for shorter transmission systems, lessening the cost of water and sewer infrastructure and ongoing water-loss measures, reducing leak losses, and reducing energy needs for pumping and pressurization.
- Infill development leverages taxpayers' investment in existing water-delivery systems and other infrastructure.
- A smaller footprint per household reduces overall impervious surfaces on a regional scale. This generates less surface runoff overall, minimizing the pollution of surface and groundwater recharge areas that receive the runoff.
- Higher-density and mixed-use development can be designed to increase walkability, lessen car dependency, save transportation costs, and lower air pollution.
- Changing demographics are lowering the demand for large-lot, single-family housing and increasing real property values in neighborhoods that have mixed uses, available transit, shops, services, and amenities and are lively and livable.

In some localities, the idea that select areas of the community might be designated for conservation will be unpopular. It is through the comprehensive planning process that a productive conversation about this can be held. At issue is not only water consumption, but also infrastructure costs, local taxes, and environmental integrity. Fragmented landscapes simply cannot provide the ecosystem services offered by

172 Clarion Associates, The Keystone Center, Colorado Water and Growth Dialog 26 (Mar. 2015), http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=194475&&dbid=0.

173 *See generally,* Environmental Protection Agency, Smart Growth: Our Built and Natural Environments : A Technical Review of Interactions between Land USE, Transportation, and Environmental Quality (2001), https://www.epa.gov/sites/production/files/2014-03/documents/our-built-and-natural-environments.pdf.

connected natural areas, which in some cases would cost less to purchase and conserve than to replace those services (for example, by constructing a water-filtration plant), even when accounting for the economic benefits of build-out. By focusing comprehensive plan citizen participation sessions on this topic, a community can involve stakeholders representing all views about these issues. In the process, the pros and cons of concentrating development in some areas while minimizing it in others can be discussed and accommodations reached. In most communities, land use plans must embrace growth, but there is no reason that it cannot be water-smart growth.

EXAMPLES OF COMPREHENSIVE PLAN PROVISIONS DESIGNATING AREAS FOR GROWTH AND CONSERVATION

New Paltz, New York

The Town of New Paltz recognizes the value of its existing open space for food production, tourism, the environment, and the economy. The Town's Comprehensive Plan includes the Future Land Use Plan, the major focus of which is the Town Growth Region, a focused area of development with the intention of concentrating high-quality development in one appropriate area of the Town, while preserving the character, open space, farmlands, and natural resources throughout the rest of New Paltz. The Town Growth Region accounts for less than 5% of all land in the Town and comprises a mix of industrial, commercial, residential, and recreational opportunities, in compatible development patterns.[174] Under the Future Land Use Plan, more than one half of the special area of the Town is set aside for agriculture, protected open space, conservation, and parks, which recognizes that taking steps to conserve these resources will benefit the Town in many ways, including economically. The Town's Open Space Plan,[175] which is incorporated by reference into the Comprehensive Plan, was created as a framework to ensure that locally valued open space is identified clearly and comprehensively, with a plan of action for aiding in its conservation. The Open Space Plan states that conservation of open space will guide new development to the best locations so that it does not result in drastically increased municipal costs for roads, sewer, water, school, police, and fire services. The Plan outlines many strategies for the community to pursue including the following:

- A purchase of development rights program
- Permanent and term conservation easements
- Agricultural district benefits
- Agricultural assessment
- Lease of development rights
- Right of first refusal
- Assistance for farm business corporations
- Resource-based or character-based conservation design guidelines
- Town-financed conservation easement transaction costs and easement monitoring stewardship costs
- Cooperative land conservation planning
- Open space incentive zoning
- Coordinated area-specific master planning

174 Town of New Paltz, NY, Comprehensive Master Plan, 2.5 Future Land Use Plan, 36-40 (2010), https://www.villageofnewpaltz.org/download/archives/master_plans/Town-of-New-Paltz-Comprehensive-Plan-Feb-2010.pdf.

175 Town of New Paltz, NY, Open Space Plan (2006), http://www.townofnewpaltz.org/building/pages/open-space-plan-2006.

Based upon a significant study on the economic benefits of their open space and what the economic benefits would be of a build-out under the existing zoning, the Town of New Paltz obtained the votes to approve a $2 million bond for a purchase of development rights (PDR) program, which is responsible for securing thousands of acres of open space. As part of the PDR program, the Town created a Preservation and Investment Fund, as well as a Clean Water and Open Space Commission that guides the acquisition of development rights in farmland and open space and stewardship of those lands.[176]

Castle Rock, Colorado

Castle Rock Comprehensive Master Plan includes a policy that promotes high-density development in certain interchange districts. Policy LU-8.1 states that "the desired higher density urban level development will be required to protect significant natural drainage ways by creating opportunities for natural design and added value; to protect the Plum Creek Corridor and its tributaries; to protect the designated floodplains and designated mouse habitat protection areas; and to integrate water conservation and water-quality design concepts into the proposed land use plans."[177]

Westminster, Colorado[178]

The City of Westminster's Comprehensive Plan is highly detailed. The Plan designates five focus areas, selected for their large potential for growth and change. The focus areas comprise both new and existing activity centers near major crossroads and transit stations — locations that will serve as key opportunities for gateway development, establishing a strong City identity and fostering economic vitality.[179]

The City also has a regularly updated Comprehensive Water Supply Plan,[180] which evaluates the current water-supply projection and projected water demands based on the City's detailed Comprehensive Plan in order to quantify any expected deficits or surpluses.[181] Because the majority of the City's land area is zoned as a PUD[182] — which requires submittal of a development plan into which agreed-upon design standards are incorporated[183] — the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement.

Likewise, because the City owns its own water and has done such a good job of tying together land use and water-supply projections, they can negotiate and mandate from a much stronger position, thus requiring more conservation elements.

176 Town of New Paltz, NY, Chapter 44, Agriculture and Open Space Preservation and Acquisition (2007), https://ecode360.com/9166301.

177 Town of Castle Rock 2020 Comprehensive Master Plan, 5A Interchange Districts, 7 (2002), https://co-castlerock2.civicplus.com/DocumentCenter/View/238.

178 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

179 City of Westminster, CO, Comprehensive Plan 77 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

180 Because water use is so affected by weather, the City tries not to react to changes in a specific year but rather turns to five- or six-year Citywide use reviews when updating its Comprehensive Water Supply Plan. Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

181 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

182 City of Westminster, CO, City Zoning Map (2010), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/2-2_Land%20Use%20Diagram.pdf.

183 City of Westminster, CO, City Code, § 11-5-4 Preliminary Development Plan (PDP) Requirements (2015), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH5DEPRRE_11-5-4PRDEPLPDRE.

This process further influences development decisions because Westminster ties its PUD-based growth management program to water.[184] Annually, the City allocates a certain number of service commitments (water taps), based upon available water supply, into competitive and noncompetitive categories; the competitive categories are all residential.[185] The City uses a point system, the scoring criteria for which is adopted periodically through City Council resolution, which sets forth what weight to give to various standards and criteria based on their impact on the City's utility system and the health, safety, and welfare of the Community. The Council may establish a minimum number of points to be obtained in the award criteria.[186] The points themselves are found in the City's design guidelines, which include water efficiency requirements.[187] The system is set up so that each proposal is essentially competing against each other. Proposals receive points in the competition for doing something above and beyond code requirements. Those with the most points are awarded the service commitments. Developers must submit a Preliminary Development Plan and Official Development Plan (ODP), bringing the project into compliance with City Design Guidelines. All commitments made by an applicant as a condition of the Service Commitment award must be reflected in these plans.[188] If the project cannot meet the minimum and incentive design requirements and other requirements included within its ODP, it will be subject to Planning Commission review and approval or denial.[189]

Sample[190]

Below is sample language for highway intersection base or overlay zones that communities may incorporate into the comprehensive plan to designate such an area as appropriate for development. This sample provision is offered here because it was not discovered in local case study examples.

Our community contains several undeveloped or partially developed highway intersections that are appropriate for higher density development. In each of these intersection areas, an overlay zone should be created that does not change the current underlying zoning, but contains standards including higher-density, mixed-use, water conservation techniques, and design provisions that allow developers to propose developments that are needed by the market and supported by existing financing sources. [As an alternative to an overlay zone, the base zoning district may be changed to achieve this same end.]

184 "The City Council further finds that, although the City has implemented water conservation techniques and programs within the City, has entered into a water reuse program, has taken other steps to maximize the efficient use of the resources available to the City, because of the elements set forth in [the Findings] above, it is essential for the preservation of the health, safety, and welfare of the citizens of Westminster that the City maintain and modify, from time to time, a growth management program which balances growth and the ability of the City to effectively and safely absorb and serve such growth." City of Westminster, CO, City Code, § 11-3-1 Growth Management Program, Findings (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-1FI.

185 Service Commitment awards do not guarantee approval of a project. Service Commitments that are allocated but are not awarded to new development during the year are returned to the water supply figures for use in future years. City of Westminster, CO, Comprehensive Plan 195 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

186 City of Westminster, CO, City Code, § 11-3-5 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-5MAUSWACO.

187 *Regulations and Design Guidelines*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview. Because the State of Colorado recently (as of the writing of this Module) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

188 City of Westminster, CO, City Code, § 11-3 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-1FI.

189 City of Westminster, CO, City Code, § 11-3-2 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-2ADIMCOCOPL.

190 This example was developed by the authors of this Guidebook to offer additional sample language for consideration.

ii. Designate an Urban Growth Boundary

One strategy for designating areas of development and conservation is to create an urban growth boundary, which may be modified over time as needed. An urban growth boundary (sometimes called an urban service area or — in a nonurban context — town boundary or village curtilage) is a boundary delineating for a lengthy period of time the limit beyond which urban development and services will not be extended.[191] Growth boundaries may include multiple jurisdictions; where they do, the state or regional government may create a special urban planning agency to manage the boundary.[192]

Growth boundaries are used by local governments to phase growth and guide land use decisions. They help direct growth and development into compact and efficient patterns by capitalizing on vacant or underused sites and by carefully considering the expansion of the urban center, reducing the encroachment of cities upon rural land or other land less suitable for development due to the environmental impact or the cost of extending public services. Sprawl has a large impact on water consumption, as it consists of dispersed, large-lot, low-density development separated from the urban center, resulting in higher total water use. (See Chapter 3, *Working Together*, for more information on this.) Communities could consider designating an urban growth boundary to demarcate the area or areas with existing infrastructure or the high potential for cost-effective infrastructure investments, which is where water can be provided most efficiently for anticipated population growth over the next few decades. In the Interior West, it is not unusual for larger communities to base their urban planning area on the future water-service area boundary (especially in Montana where the state requires the adoption of local growth policies). Such a basis also helps provide logical and defensible criteria for identifying land to be included in an urban growth boundary.

The State of Montana advises local governments through its Growth Management toolkit[193] that growth boundaries "work best when coupled with a larger comprehensive growth policy and/or subarea plans." It is also important to have an up-to-date assessment of existing public infrastructure and services, as well as to have the "technical resources sufficient to project the locations and rates of future growth, to identify suitable locations for urban growth boundaries, and to develop infrastructure and funding plans to support the desired growth." Communities might consider related comprehensive plan objectives and strategies such as clearly defining the local development review process for projects within the boundary; ensuring a streamlined and consistently applied review process; and allocating funding for maintaining and updating the growth boundary.

191 American Planning Association, Smart Codes: Model Land-Development Regulations 153 (2010), https://www.planning.org/pas/reports/archive.htm.

192 *Urban Growth Boundary*, Wikipedia, https://en.wikipedia.org/wiki/Urban_growth_boundary (last visited February 22, 2017).

193 *Growth Management – Urban Growth Boundaries*, State of Montana, http://www.mdt.mt.gov/research/toolkit/m1/pptools/gm/ugb.shtml.

EXAMPLES OF COMPREHENSIVE PLAN URBAN GROWTH BOUNDARY LANGUAGE

Boulder, Colorado[194]

Boulder's history with growth boundaries dates back to 1959, when the City's voters approved a "Blue Line" charter amendment that limited water service from being used to further urban development up into the foothills in order to preserve the mountain backdrop. Guided by the City's success, the County of Boulder also began growth management planning in 1974. The Comprehensive Plan for Boulder County, which became effective in 1978, was guided by several fundamental concepts, including that development requiring urban services should occur only within incorporated cities.[195] In 1977, the City and County approved an intergovernmental agreement and the Boulder Valley Comprehensive Plan (which has been updated many times since) to concentrate urban development in the City and to preserve lands outside the City service area. (To the extent that there is any conflict, the joint plan supersedes the County plan.)

Guided by 25-year growth projections, the Boulder Valley Comprehensive Plan contains a section on Community Identity/Land Use Pattern, which prioritizes the City's preference for redevelopment and infill in order to create a compact community and prevent service area expansion, as well as the City and County's intention to preserve lands with open space values. The Plan's Natural Environment chapter emphasizes that the City and County will promote water-resource conservation through a combination of protection, public education, monitoring, and policies that promote appropriate water usage; the City will endeavor to minimize water waste and reduce water use during peak demand periods and will encourage new development and redevelopment that is designed to conserve water. The chapter also includes specifications on efforts related to water-resource planning and acquisition, and the impacts of land development on surface and groundwater.

The City also has a robust open space program, which has guided zoning and acquisition of a significant amount of open space beyond its urban growth boundary. As part of any land purchases made under the open space program, the City also purchases the water rights associated with the land, as well as additional water rights to ensure minimum stream flows in the streams that flow through the open space and to provide irrigation for farming and ranching activities on the open space land.[196]

194 City of Boulder, CO, Boulder Valley Comprehensive Plan (2010), https://bouldercolorado.gov/bvcp/2010-boulder-valley-comprehensive-plan.

195 Joseph N. de Raismes, III, et al., Growth Management in Boulder Colorado: A Case Study 9 (1999), http://livableboulder.org/wp-content/uploads/2015/04/Growth-Management-In-Boulder-Colorado-a-Case-Study-.pdf.

196 Joseph N. de Raismes, III, et al., Growth Management in Boulder Colorado: A Case Study 25 (1999), http://livableboulder.org/wp-content/uploads/2015/04/Growth-Management-In-Boulder-Colorado-a-Case-Study-.pdf.

Bozeman, Montana[197]

The City of Bozeman based the planning area for its Bozeman Community Plan on the 20-year sewer service boundary contained in the City's 2007 Wastewater Facilities Plan. This same planning area boundary was used for other City facility plans, including the Parks, Recreation, Open Space and Trails Plan, the Water Facilities Plan, and the Stormwater Facilities Plan. To ensure that the City grows in a logical and orderly manner, the Plan includes land use designations for areas outside the City that might reasonably expect to be annexed to the City during the 20-year time period. Although the land use designations are not binding until the land is annexed, pre-designating the land use classifications for lands outside the City prior to annexation lends predictability to the land development process. Landowners and developers who are interested in annexing land to the City know ahead of time what their land use designation will be and the sorts of uses they can expect to make of their land. Pre-designation also provides landowners and developers with a sense of timing for development of their property. Some land designations with fewer infrastructure constraints are considered appropriate for annexation and development in the near term. The Plan also includes objectives to "promote the efficient use of water, energy, land, human resources, and natural resources, and protect water supply quantity and quality," and to "promulgate the efficient use of the municipal water supply," among others, acknowledging that the quantity and quality of water is a major force shaping the City and is becoming of utmost importance as the West becomes increasingly warmer and drier and water-supply issues arise.

Kalispell, Montana [198]

The City of Kalispell established their potential utility service area based upon the City's Water, Sewer and Storm Drainage System Facility Plan and used it to anticipate future development potential of land within that area to which City services can be provided.

Sample[199]

Below is sample language that communities may incorporate into the comprehensive plan to promote the use of urban growth boundaries for the purpose of conserving water. The following sample language relies upon the recommendations of the Denver Regional Council of Governments but may be tailored to serve community-specific needs with a citation to a similar report or recommendation applicable to a community's particular location.

- *The MetroVision plan of the Denver Regional Council of Governments (DRCOG) recommends that development in its region be concentrated within urban growth boundaries and lists the benefits of such concentration.[200] For similar reasons, the [City's/Town's/County's] zoning and land use regulations should create land use patterns that avoid expensive extensions of infrastructure, including water supply and waste water infrastructure, indicating where new populations should be supported by land use policy and infrastructure investments. As zoning is reformed in conformance with the provisions of this element of the comprehensive plan, it should accommodate new market demands and create water conserving land use patterns that effectively define the boundaries of urban growth.*

197 City of Bozeman, MT, Bozeman Community Plan 2-2, 3-9, 9-7, A-11 (2009), https://www.bozeman.net/Home/ShowDocument?id=1074.

198 City of Kalispell, MT, Growth Policy 2020 (2010), http://www.kalispell.com/DocumentCenter/View/465/Kalispell-Growth-Policy-Plan-It-2035-PDF?bidId=.

199 Where strong examples of important techniques could not be found, this Guidebook offers sample language for consideration.

200 Denver Regional Council of Governments, Metro Vision 2035 Plan 17 (2011), https://drcog.org/documents/MetroVision2035FinalPlanIntro-Ch%202.pdf.

San Jose, California[201]

Envision San Jose, the City's comprehensive plan, sets forth a policy to ensure that development is planned and built in a manner consistent with the fiscally and environmentally sustainable use of current and future water supplies by encouraging sustainable development practices, including low-impact development, water efficient development, and green building techniques. The policy also calls for supporting the location of new development within the vicinity of the City's recycled water system and limiting residential development outside the Urban Service Area, therefore encouraging density within the locations that can accommodate it with the greatest level of water efficiency. For residential development outside the Urban Service Area, water usage should be restricted "to well water, rainwater collection, or other similar environmentally sustainable practice." The Plan also states that, to maximize the efficient and environmentally beneficial use of water outside of the Urban Service Area, water consumption should be limited for new development so that it does not diminish the water supply available for projected development in areas planned for urban uses.

The Comprehensive Plan sets forth 12 major, overarching strategies for the City, the third of which is "Focused Growth." The City has a "Greenline" Urban Growth Boundary (UGB) — with an Urban Service Area — beyond which lands are preserved for primarily open space, habitat, parkland, or agricultural activities. The Focused Growth strategy aims to channel growth into identified Growth Areas within the UGB, "while the majority of the City is not planned for traditional growth or intensification." The City's scheme creates small growth areas within a larger urban growth boundary. This approach promotes growth within designated Growth Areas and "strictly limits new residential development through neighborhood infill outside of these Growth Areas" in order to reduce environmental impacts and strengthen the City's UGB, among other things. Behind this approach is the situation that infill development within some of the City's residential neighborhoods within the UGB has been at a density and form inconsistent with existing neighborhood patterns and therefore disruptive to neighborhood character. The City's approach of designating focused growth areas within the UGB in a way that supports a significant amount of new job and housing growth capacity "will help protect the quality of existing neighborhoods while also enabling the development of new Urban Village areas with a compact and dense form." Through this plan, "most new housing development will be achieved through higher-density redevelopment within existing urbanized areas," especially through the conversion of older commercial areas to mixed-use. The Plan sets forth specific amounts of job and housing growth capacity for each of the identified growth areas.

As part of the Plan's goal to "provide housing that minimizes the consumption of natural resources and advances [the] City's fiscal, climate change, and environmental goals," the Plan sets forth a policy to "design high-density residential and mixed residential/commercial development, particularly development located in identified Growth Areas, to…allow residents to conduct routine errands close to their residence, especially by walking, biking, or transit."

iii. Promote Cluster Development

Cluster development is similar to the concept of priority growth and conservation areas, but is applied

201 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

at a site-specific level. It may involve the extension of services (which increases water-loss potential) and increase impervious coverage, but it is an effective tool where such greenfield development is necessary. Clustering is a form of land development in which principal buildings and structures are grouped together on a site, thus saving the remaining land area for open space, conservation, stormwater infiltration, aquifer recharge, agriculture, recreation, or public uses.[202] According to the American Planning Association, "cluster development has a number of distinct advantages over conventional subdivision development. A well-planned cluster development concentrates dwelling units on the most buildable portion of the site and preserves natural drainage systems, vegetation, open space, and other significant natural features that help control stormwater runoff and soil erosion."[203] Over the past 20 years, cluster development has moved from a rare and little- understood form of site and subdivision layout to one that is encouraged, incentivized, and sometimes required as the preferred form of raw land development in many communities.

Cluster development supports smaller lot, compact development, which reduces water demand. The key aspect of conserving water in cluster developments is that there must be some nonirrigated areas. If a cluster development has the same number of units and irrigated area as a traditional development, there most likely will not be much water savings. Cluster development also promotes greater preservation of open space and permeable surfaces than traditional development patterns, which is crucial to promoting proper groundwater recharge. Implementation techniques calling for cluster development in a community's comprehensive plan can aid efforts to increase permeable surfaces, allowing water to percolate through to recharge overdrawn aquifers; other techniques call for the preservation of native grasses and plants, which increases water conservation.[204] The impervious coverage that multiplies with traditional full-parcel subdivision development damages the environment and prevents percolation of rainfall into the groundwater aquifer.

Communities may use the comprehensive plan to provide for future growth that promotes water conservation by including objectives and strategies that call for cluster development and the preservation of open space. Under clustering provisions, development can vary from the traditional subdivision plat, where lots must conform to all the lot size and coverage requirements of the zoning district in which the property is located. Comprehensive plans can include implementation techniques to develop a local cluster law, which would allow the property owner to create lots that are smaller and buildings that are closer together than zoning would otherwise allow in return for conserving more open space than would otherwise be required of the subdivision. Used in this way, cluster development can be much like using priority growth and conservation areas, but on a smaller, site-based scale. Clustering is also more cost-effective due to the more efficient servicing of developments with utilities, roads, and other services. A community might discuss these advantages as part of a comprehensive plan objective or strategy for clustering.

Clustering does not always allow the developer to build additional dwelling units (although bonuses can be built in and do increase participation in the program), but it does permit the local government to approve smaller residential lot sizes, which in turn reduces the size of lawns and the water needed to maintain them. In this way, clustering provides an optional method to achieving the smaller homes on smaller lots that is proven to lower per-household water consumption. (See Chapter 3, *Working Together*, for more on the relationship between development size and water use.)

202 American Planning Association, Smart Codes: Model Land-Development Regulations 117 (2010), https://www.planning.org/pas/reports/archive.htm.

203 American Planning Association, Smart Codes: Model Land-Development Regulations 118 (2010), https://www.planning.org/pas/reports/archive.htm.

204 NRCS, Wildlife Habitat Management Institute, Native Warm-Season Grasses and Wildlife (2005), http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_010044.pdf ("Modern development continues to change the landscape and destroy natural grasslands. The deep root systems of native grasses hold soil in place, reducing erosion and decreasing runoff, which helps keep waterways healthy and recharges ground water.")

Instead of, or in addition to, offering implementation techniques that would rezone areas from large-lot, single-family homes to small-lot houses, comprehensive plans could recommend the amendment of permitted land uses or dimensional standards in residential zoning districts to include cluster development by-right. Doing so provides a procedural incentive for developers to opt for cluster development over a conventional subdivision that would have to go through a conditional use permitting process.

EXAMPLES OF COMPREHENSIVE PLAN CLUSTER-DEVELOPMENT LANGUAGE AIMED AT NATURAL RESOURCE PRESERVATION

Larimer County, Colorado

Larimer County's Master Plan provides the basic framework for land use development patterns in unincorporated Larimer County in its Land Use chapter. The chapter strongly emphasizes cluster development as a way to preserve the county's character and preserve open space, stating:

"The basic concept of Rural Conservation Development (RCD) is to require that all new subdivisions outside designated urban areas be clustered and designed based on the characteristics of the specific site .... Rural Conservation Development will generally include a minimum of 80% open space, and maximum allowed housing units will be determined by dividing the gross developable land area by the minimum lot size of the existing zoning district. Open space is achieved by allowing housing to be clustered on lots smaller than would otherwise be allowed by the existing zoning .... The proposed design must be consistent with applicable principles of the Master Plan including preservation of open character, protection of sensitive natural areas, neighborhood compatibility and efficient provision of utilities and services."[205]

Southern California Association of Governments

The Southern California Association of Governments' Regional Comprehensive Plan includes provisions under its land use and transportation policies that call for cluster development to aid in improving water quality and conservation. The plan states:

"The RCP encourages development strategies that promote compact growth patterns. Concentrated or clustered development will help to reduce impervious surfaces, conserve energy used for water conveyance, and provide a greater level of overall water-quality protection. Concentrated development protects the watershed by leaving a larger percentage of the watershed in its natural condition. It reduces urban and agricultural runoff that can contain significant volumes of pollutants from entering surface waters, reducing future impacts on surface and groundwater quality and supply. Compact growth also requires less water and less energy for water transport and water treatment than a diffuse, sprawling pattern."[206]

205 Larimer County Master Plan, Chapter 3, 3.2.1: Rural Conservation Development (1997), https://www.larimer.org/sites/default/files/uploads/2017/larimer_county_master_plan_2.pdf.

206 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 56 (2008), http://www.scag.ca.gov/rcp/pdf/finalrcp/f2008RCP_Complete.pdf.

Chico, California

The Open Space and Environment chapter in the General Plan of the City of Chico, California, includes a *goal* "to conserve water resources and improve water quality." One *policy* listed to achieve this goal is to "protect groundwater and aquifer recharge areas to maintain groundwater supply and quality." The plan then lists an *action* to support this policy that focuses on protecting recharge areas that states: "avoid impacts to groundwater recharge areas through open space preservation, runoff management, stream setbacks and clustering of development."[207]

Fowler, Colorado[208]

The Fowler Comprehensive Plan sets forth a vision for the Town to become one of the most sustainable communities in Colorado. In the Plan, Fowler aims to grow while maintaining both economic development and environmental benefits. To do this, the Plan focuses on cluster developments that reserve significant open space with any residential project. In order to meet these objectives, the Plan sets forth that the Town will revise its Municipal Code to allow for rural cluster developments to provide greater areas of conservation. Within this revision, the Town will require any residential development to be in the form of rural clusters in order to preserve the farmland community and natural amenities while not overextending community services or resources.

iv. Prioritize Infill Development

On average, new residents and employees occupying infill development consume less water per capita than those who occupy new buildings constructed in a more dispersed development pattern.[209] (See Chapter 3, *Working Together*, for more information on this.) To promote water efficient land use patterns, a community could consider amending its comprehensive plan to encourage such infill, which involves the development of vacant, partially developed, or underutilized sites and structures surrounded by or in close proximity to areas that are substantially or fully developed. Infill development minimizes outdoor water use and leverages a community's current investment in infrastructure, including water systems and wastewater treatment.

The opportunities for targeted development areas in many communities include those with existing infrastructure — unused or underused retail spaces, failing commercial corridors, and overlooked institutional sites. In these areas, infill development can meet much of the demand for housing and commercial land uses, pulling that development away from needed open space or sprawling, low-density areas. In some of these communities, a high percentage of development permits are already for replacement buildings or expansion of existing structures. Where this happens, the water use per household and the cost of water infrastructure, in most cases, are much less than that required in single-family, larger lot housing development.[210]

The call for infill development is typically contained within a plan's objectives or strategies; these objectives or strategies could be associated with a water conservation goal, among others. The community

207 City of Chico, California, 2030 General Plan, Chapter 10, Open Space and Environment Element 20 (2011), http://www.chico.ca.us/document_library/general_plan/documents/10.OpenSpaceandEnvironmentElement.pdf.

208 Town of Fowler, Colorado, 2035 Comprehensive Plan 26 (2009), http://www.fowlercolorado.com/Notices/Final_Fowler_Comp_Plan.pdf.

209 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 3 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

210 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 8, 10, 18 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

may then further amend the plan to include implementation techniques using a number of the following mechanisms that can be geared toward promoting infill:

Goal: Reduce per capita water consumption

- Objective: Reduce water use and leverage current investments in infrastructure by encouraging residential and commercial development in existing developed areas.
    - Strategy 1: Amend the land development code and zoning map to add methods for achieving infill development in areas where such development will achieve increased per capita water conservation.
    - Implementation techniques:
        - Rezone underutilized commercial lands [*specify identified areas*] in areas appropriate for growth to promote infill development through small-lot single-family, attached or row housing, multifamily, three- and four-plex residences, mansion apartments, co-housing, and mixed-use development. [*Select the most appropriate of these for each selected area.*].
        - Work with water planners to closely link water supply plans with projected growth based on land use and development patterns anticipated in the comprehensive plan.
        - For any proposed application for rezoning, identify and consider the potential change in water demand that would result from any decision to rezone.
        - In the face of a supply-demand gap, work with water provider to develop mechanisms for accommodating growth and rezoning requests within existing water budgets.
        - Create an Infill/Redevelopment zoning district or overlay zone, which should allow for a mix of uses in existing denser neighborhoods and along major streets.
        - Identify single-family residential neighborhoods where street, electricity, water, and wastewater infrastructure have been in place for a minimum of ___ years[211] and amend the zoning code to permit ADUs in these neighborhoods.
        - Work with water provider to adjust fee- and rate-setting financial models to account for the water conserving benefits of infill and other compact development patterns.
        - Create incentives for the rehabilitation of existing buildings.
        - Create a water conservation floating zone to promote water conserving, compact, mixed-use development with increased density and to secure the benefits of water-conscious development, including the adaptive reuse of existing buildings, sites, and infrastructure. Floating zone language should restrict its application to developed areas with existing infrastructure that are most appropriate for infill. (For more details on this, see Chapter 7 Section 7(g) Create a Water Conservation Floating Zone.)
- Strategy 2: Amend site-plan and subdivision requirements to add methods for achieving infill development in areas where such development will achieve per capita water conservation.
- Implementation techniques:
    - Amend site-plan and subdivision requirements to include approval criteria encouraging or requiring site selection measures for development projects that include the following:
        - Locate in an infill site
        - Locate in a brownfield redevelopment area
        - Locate outside a drinking water protection area
        - Incorporate one or more historic buildings in the project and/or rehabilitate the

211 The length of time provided here is important; some communities use 25 years. The point is to use the life of the infrastructure as the time period and direct development into established areas.

building(s) in compliance with local or federal standards

- Amend subdivision requirements to establish site selection measures for single- and two-family home development projects that include locating homes as infill on existing streets that do not require extensive new infrastructure, or where street, electricity, water, and wastewater infrastructure have been in place for a minimum of 25 years.
- Amend site-plan and subdivision requirements to restrict developments from locating on greenfield sites, defined as a parcel of land not previously developed beyond that of agriculture or forestry use.
- Amend the administrative procedures for site-plan or subdivision approval to provide a streamlined approval procedure for projects that are located in infill areas.

EXAMPLES OF COMPREHENSIVE PLAN INFILL DEVELOPMENT LANGUAGE

Aurora, Colorado

In setting out the City's vision, Aurora, Colorado's Comprehensive Master Plan states that "when the goals of the City are achieved Established areas of the City remain quality places to live and work. Change occurs at a measured pace. Infill and redevelopment projects contribute to neighborhood livability."[212] The plan also calls for a strategy to phase the extension of water and sewer lines in the most cost-effective manner.[213] The Plan's "Building Urban Activity Centers" chapter lays out planning principles for compact development surrounding transit nodes. One of the principles set forth in the Plan is "promoting sustainability," which reads: "Compact development promotes efficiency in infrastructure, and may require innovative approaches to detention and water quality. Buildings account for a significant amount of energy usage and the use of sustainable or 'green' buildings requires less water and energy." This principle then lays out several strategies, including encouraging the development of green buildings — which include water efficiency measures — and a reduction in the amount of impervious surfaces by using methods such as landscaped curb extensions, drainage swales, permeable paving, street trees, and green roofs.[214]

212 City of Aurora, CO, Comprehensive Master Plan § A, Managing the Geography of Growth, (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

213 City of Aurora, CO, Comprehensive Master Plan § 146-732, Developing and protecting Water and Other Natural Resources, (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

214 City of Aurora 2009 Comprehensive Plan, Chapter IV, K: Building Urban Activity Centers 6-10 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

Westminster, Colorado

Westminster's Comprehensive Plan[215] is highly detailed and is adopted by ordinance, not by resolution, making compliance with the Plan a legal requirement.[216] (In Colorado, a comprehensive plan can be a binding regulatory document if the local legislature adopts it as such by way of land development regulations, which does not happen often.[217]) Under the Plan, the extent of water use is a key consideration in the location, type, and intensity of land uses and development within the City.[218] The City's Comprehensive Water Supply Plan (CWSP) evaluates the current water-supply projection and projected water demands based on the Comprehensive Plan in order to quantify any expected deficits or surpluses and the Comprehensive Plan notes that, as such, new development will be evaluated based on projected impacts to the City's water supply.[219] Because the City's water supply projections are so closely linked to its designated land uses, the City must identify the potential change in water demand that would result from any proposed decision to change a land use from what is currently permitted under zoning.[220]

Colorado Springs, Colorado

Colorado Springs has many corridors along major arterial streets and state highways with commercial auto-oriented uses. According to the Comprehensive Plan, these corridors include "Mature/Redevelopment Corridors," which historically have been developed as commercial strips along older arterial streets, with multiple curb cuts, individual parking lots, cluttered signage, and small lots, and which include significant infill and redevelopment opportunities.[221]

The Plan's Land Use Chapter devotes a section to Infill and Redevelopment.[222] The objective in this section encourages infill projects, acknowledging their efficient use of the City's infrastructure, which includes water and wastewater. The Plan's strategies for furthering this objective include:

- *Identify Infill and Redevelopment Opportunities and Target Public Investments* – Identify major infill and redevelopment opportunities and target infrastructure improvements to the preferred infill development and redevelopment areas.
- *Provide Incentives to Foster Private Reinvestment* – Utilize incentives to encourage infill and redevelopment. Regulatory incentives can be used to expedite the development approval process. Available financial incentives, such as rehabilitation loans/grants, if targeted and strategic, should be used to support additional investment in the community, as well as to assist existing residents to remain in areas that are redeveloping.

215 City of Westminster, CO, Comprehensive Plan (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

216 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 94 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

217 Colo. Rev. Stat., §§ 30-28-106(2)(a), 31-23-206(1).

218 City of Westminster, CO, Comprehensive Plan 28 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

219 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

220 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

221 City of Colorado Springs, Colorado, Comprehensive plan, Chapter 1 – Land Use, 2 (2000), https://coloradosprings.gov/sites/default/files/planning/comp_plan-chap_1.pdf.

222 City of Colorado Springs, Colorado, Comprehensive plan, Chapter 1 – Land Use, 9-10 (2000), https://coloradosprings.gov/sites/default/files/planning/comp_plan-chap_1.pdf.

- *Establish Design Guidelines and a Review Process that Support Infill and Redevelopment* – Adopt design guidelines and standards to ensure that infill and redevelopment projects are compatible with existing neighborhoods in terms of scale and design. Incorporate them in the development review process for infill and redevelopment proposals.
- *Adopt Zoning Standards and Apply Building Codes that Support Infill and Redevelopment* – Adopt flexible zoning standards to encourage infill and redevelopment projects. Ensure that public health and safety considerations are addressed through the appropriate building codes and standards. Apply building codes and standards to infill and redevelopment projects in a uniform and consistent manner.

The chapter also promotes infill development within its section on Commercial Development,[223] calling for the following strategies — all of which encourage a water efficient land use pattern:

- *Redevelop Obsolete Commercial Areas as Activity Centers* – Redevelop commercial areas that are obsolete or underutilized either as community activity centers, commercial centers, or employment centers, depending on their size, location and primary function.
- *Redevelop and Infill Commercial Uses in Mature/Development Corridors to Form Activity Centers* – Redevelop and infill commercial uses in mature/redevelopment corridors to support the formation and evolution of new activity centers. Coordinate the formation of new activity centers with the redevelopment of the entire corridor.
- *Support and Encourage the Evolution of Existing Commercial Areas into Activity Centers* – Support and encourage the evolution and transformation over time of existing commercial areas from their exclusive auto orientation and single-use functions into activity centers with mixed uses, pedestrian and transit orientation, and better relationships to the surrounding residential areas.

San Jose, California[224]

"Focused Growth" is one of the 12 major strategies in the City of San Jose's Comprehensive Plan, Envision San Jose. This strategy aims to channel growth into identified Growth Areas within the City's larger Urban Growth Boundary (UGB), "while the majority of the City is not planned for traditional growth or intensification." The City's approach of designating focused growth areas within the UGB in a way that supports a significant amount of new job and housing growth capacity "will help protect the quality of existing neighborhoods while also enabling the development of new Urban Village areas with a compact and dense form." Through this plan, "most new housing development will be achieved through higher-density redevelopment within existing urbanized areas," especially through the conversion of older commercial areas to mixed-use. The Plan sets forth specific amounts of job and housing growth capacity for each of the identified growth areas.

223 City of Colorado Springs, Colorado, Comprehensive plan, Chapter 1 – Land Use, 12-13 (2000), https://coloradosprings.gov/sites/default/files/planning/comp_plan-chap_1.pdf.

224 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

The Plan calls for supporting the location of new development within the vicinity of the City's recycled water system and limiting residential development outside the Urban Service Area, therefore encouraging density within the locations that can accommodate it with the greatest level of water efficiency. The Plan also states that, to maximize the efficient and environmentally beneficial use of water outside the Urban Service Area, water consumption should be limited for new development so that it does not diminish the water supply available for projected development in areas planned for urban uses. As part of the Plan's goal to "provide housing that minimizes the consumption of natural resources and advances [the] City's fiscal, climate change, and environmental goals," the Plan sets forth a policy to "design high-density residential and mixed residential/commercial development, particularly development located in identified Growth Areas."

As part of a call for infill development within the comprehensive plan, a community might consider examining established third-party standards when creating objectives and strategies. Several popular programs contain mandatory or optional standards for infill development, also sometimes paired with additional water efficiency requirements. A few common third-party standards that incorporate infill include but are not limited to:

- LEED: The U.S. Green Building Council's (USGBC) suite of Leadership in Energy and Environmental Design (LEED) rating systems provide green building certifications for numerous development types. Although the standards vary by rating system/development type, most of the LEED rating systems contain prerequisites and credits that advance infill development and water conservation minimum requirements for LEED certification, depending upon the rating system, produce buildings that reduce outdoor water used for landscaping; use water efficient indoor plumbing fixtures; install water meters; are located within or near existing communities (such as sites served by existing water and wastewater infrastructure, infill sites, or in areas of high connectivity); and are designed to meet minimum density requirements. The rating systems also contain optional credits to build toward certification for going beyond the prerequisite level requirements and taking additional actions related to water efficiency, as outlined in the rating system.[225]
- STAR Communities: The STAR Communities certification rating system has 44 objectives, which include among others: community water systems, resource-efficient buildings, resource-efficient public infrastructure, water in the environment, green infrastructure, public spaces, natural resource protection, compact and complete communities, and infill and redevelopment.[226]
- Walk Score: Walk Score measures the walkability of an address, neighborhood, or city, measured by average walking distance to amenities (across multiple categories) and pedestrian friendliness based upon factors such as population density, block length, and intersection density.[227]

225 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction (July 8, 2017), https://www.usgbc.org/sites/default/files/LEED%20v4%20BDC_07.2.18_current.pdf. U.S. Green Bldg. Council, LEED v4 for Neighborhood Development (July 8, 2017), https://www.usgbc.org/sites/default/files/LEED%20v4%20BDC_07.2.18_current.pdf.

226 *Understanding Star,* Star Communities, http://www.starcommunities.org/rating-system/framework/ (last visited May 4, 2016).

227 *Walk Score Methodology,* Walk Score, https://www.walkscore.com/methodology.shtml (last visited Jan. 5, 2018).

EXAMPLES OF COMPREHENSIVE PLAN REFERENCES TO INFILL-FOCUSED THIRD-PARTY STANDARDS

Lakewood, Colorado[228]

Infill connected to water conservation is included in the City of Lakewood's 2015 Sustainability Plan. The Plan sets a target to reduce citywide water use by 20% (from the 2007 baseline) by 2025. To further this and other sustainability goals, the Plan aims to increase the percentage of certified green buildings (new construction and renovations receiving occupancy permits) each year from 2015 to 2025 and to use the LEED rating systems — which include infill and water efficiency requirements — to achieve certification for both public and private development. The LEED rating systems for building design and construction include among their credits that projects may earn points for infill locations. Further, within the LEED for Neighborhood Development rating system, projects are required to locate within or near existing communities (such as sites served by existing water and wastewater infrastructure, infill sites, or in areas of high connectivity). Relatedly, the City's Plan also calls for increasing the number of housing units within a designated Complete Neighborhood by 25% by 2025. As part of the Plan's strategy to "develop an index for assessing the completeness of neighborhoods," it refers to complete neighborhood programs in Eugene, OR, and Portland, OR, which focus on walkability, a "20-minute neighborhood," and providing residents with access to services without an automobile — all models based on an infill strategy to growth.

Los Angeles, California[229]

LA's 2015 "Sustainable City pLAn" establishes a set of visions for 14 topic areas to transform the City. The Plan includes a vision for LA to lead the nation in water conservation over the next 20 years and source the majority of its water locally. Other targets and strategies within the Plan include the following:

- Increasing the City's average Walk Score® to 75 by 2025. Walk Score measures the walkability of an address, neighborhood, or city, measured by average walking distance to amenities (across multiple categories) and pedestrian friendliness based upon factors such as population density, block length, intersection density — all factors closely tied to an infill development strategy.[230]
- Achieving and maintaining a STAR Communities certification, with a 4-STAR Community rating by 2017 and a 5-STAR Community rating by 2017 and a 5-STAR Community rating by 2025. STAR includes objectives directly related to water conservation and infill development, including community water systems, resource-efficient buildings, resource-efficient public infrastructure, water in the environment, green infrastructure, public spaces, natural resource protection, compact and complete communities, and infill and redevelopment.[231]

228 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

229 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

230 *Walk Score Methodology,* Walk Score, https://www.walkscore.com/methodology.shtml (last visited Jan. 5, 2018).

231 *Understanding Star,* Star Communities, http://www.starcommunities.org/rating-system/framework/ (last visited May 4, 2016).

v. Allow for Multifamily and Attached Housing

Promoting the development of a wide variety of multifamily and attached housing in a community's comprehensive plan is another means of conserving water through land use. In the Northern California Water Association's *Land Use/Water Supply Analysis Guidebook*, a table demonstrating the typical ranges of water demand based on residential density in Central Valley, California, showed that the total water demand for low-density, single-family residential development is 0.70–1.10 af/du/yr, while medium-density townhouse development falls to 0.35–0.65 af/du/yr, and high-density apartment residential is only 0.25–0.45 af/du/yr.[232] A study from Portland State University observed that areas with more than five households per acre provide for highly predictable water-use trends, while those with neighborhoods with lower densities have greater variability.[233] Because higher density development reduces water consumption and increases a community's ability to plan for water needs, the comprehensive plan could promote this type of development as a means for reducing per capita water consumption.

EXAMPLE OF COMPREHENSIVE PLAN MULTIFAMILY HOUSING LANGUAGE FOR WATER CONSERVATION

Southern California Association of Governments

The Southern California Association of Governments' Comprehensive Plan chapter on land use and housing focuses on the multiple benefits that certain development policies can provide. Specifically focusing on the benefits of these policies on water supply, the plan states: "Greater emphases on multi-family and non-traditional housing and green building practices help reduce per capita water consumption, particularly for residential irrigation use."[234]

San Jose, California[235]

Envision San Jose, the City's comprehensive plan, sets forth a policy to ensure that development is planned and built in a manner consistent with the fiscally and environmentally sustainable use of current and future water supplies by encouraging sustainable development practices, including low-impact development, water efficient development, and green building techniques.[236] As part of the Plan's goal to "provide housing that minimizes the consumption of natural resources and advances [the] City's fiscal, climate change, and environmental goals,"[237] the Plan sets forth a policy to "encourage development of higher residential densities in complete, mixed-use, walkable and bikeable communities..."[238] Similarly, the Plan includes a policy to "design high-density residential and mixed residential/commercial development, particularly development

232 Sacramento Valley, Land Use/ Water Supply Analysis Guidebook, Northern California Water Association 6, Table 2-1 (2007), http://www.norcalwater.org/res/docs/NCWA-guidebook-final.pdf.

233 Vivek Shandas, *Water and Land Use Planning: A Case for Better Coordination*, Or. Planners J., Mar.-Apr. 2010, at 6, http://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1075&context=iss_pub.

234 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 15 (2008), http://www.scag.ca.gov/rcp/pdf/finalrcp/f2008RCP_Complete.pdf.

235 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

236 Envision San Jose 2040 General Plan 3-19 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

237 Envision San Jose 2040 General Plan 4-32 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

238 Envision San Jose 2040 General Plan 4-33 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

located in identified Growth Areas, to ... allow residents to conduct routine errands close to their residence, especially by walking, biking, or transit."[239]

Commerce City, Colorado[240]

The Commerce City Comprehensive Plan includes a goal to monitor the location of newly constructed single and multifamily dwellings to ensure that new neighborhoods contain a mix of housing types, styles, and densities, with higher-density housing located near collector and arterial streets, transit stations, and services.

vi. Plan for Green Infrastructure

Land use patterns that channel growth into targeted areas promote water conservation and result in less impervious coverage on a regional scale, which generates less surface runoff overall than would be generated for the same amount of growth under a more dispersed, low-density development pattern.[241] Within growth areas, however, imperviousness may increase as infill occurs, which could result in increased stormwater runoff within growth areas. A typical city block, for example, generates more than five times the stormwater runoff produced on a woodland area of the same size.[242] This stormwater will need to be managed to avoid overwhelming pipe networks and negatively impacting water quality (which in the aggregate can diminish usable quantity) as it travels over the land's surface, picking up contaminants such as oil, fertilizer, and other chemicals, then flows either directly into streams and ponds, or into storm sewers that discharge into these same water bodies. Further, increasing impervious surface directly reduces the amount of possible water infiltration that is essential for recharging groundwater supplies.

Communities may address and mitigate these issues by including objectives and strategies within the comprehensive plan to increase the use of green infrastructure in growth areas. Green infrastructure refers to using and enhancing natural systems to absorb and filter pollutants from the air and water, protect communities from flooding and storm surges, reduce erosion, and create healthier, more sustainable environments. Using green infrastructure in developed areas might include such site-specific practices as green/vegetated roofs, bioswales, tree planters, pervious pavement, ponds, and rain gardens among others. Some green infrastructure techniques require more space than others and may be more appropriate when paired with a clustered subdivision, rather than in a city or town center style development where accommodating them could compromise the desired level of density or present vector control problems. Green infrastructure measures are especially effective at conserving water when they incorporate additional strategies such as low-water use vegetation and rainwater capture (where permitted) and, most importantly, when they do not increase the amount of irrigated open space. (See Chapter 11, *Supplemental Regulations*, for information on landscape codes and design guidelines.)

Some green infrastructure strategies, such as green roofs, for example, are sometimes not thought of as water conserving — the thinking being that water is used to grow the new "green" vegetation. That

239 Envision San Jose 2040 General Plan 4-32 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

240 Commerce City Comprehensive Plan Indicators, 27 (2014), https://www.c3gov.com/home/showdocument?id=736.

241 Environmental Protection Agency, Smart Growth: Our Built and Natural Environments : A Technical Review of Interactions between Land USE, Transportation, and Environmental Quality (2001), https://www.epa.gov/sites/production/files/2014-03/documents/our-built-and-natural-environments.pdf.

242 U.S. Envtl. Prot. Agency, Nonpoint Source Control Branch, EPA 841-F-03-003, Protecting Water Quality from Urban Runoff (2003), https://www3.epa.gov/npdes/pubs/nps_urban-facts_final.pdf.

said, green roofs reduce heat island effect, which conserves energy. The production of energy requires a tremendous amount of water, while treatment and distribution of water is dependent on readily available low-cost energy.[243] In addition, green infrastructure measures also filter contaminants from site runoff, improving stormwater quality, which preserves the quantity of drinkable water.

It is important that a community's comprehensive plan lays the foundation for encouraging and implementing green infrastructure as a mechanism for promoting maximum water quantity and quality. Green infrastructure–based objectives and strategies may include, for example:

- Implement site-based green infrastructure through landscaping codes
- Create design guidelines that maximize pervious surface area in existing urbanized areas to protect water quality and allow for groundwater recharge
- Amend building code to permit the use of pervious paving materials
- Create community gardens in parks and on lots where plants can displace traditional bluegrass or other higher water-use vegetation
- Adopt a water-neutral growth ordinance that requires or incentivizes residential and commercial developments to offset their projected additional water demand (which could encourage offset measures such as stormwater capture in swales and ponds)
- Foster clustering in subdivisions and require the use of green infrastructure in place of gray infrastructure
- Encourage best management practices by minimizing and treating stormwater at its source, including the use of grass swales, rain gardens, and green infrastructure techniques
- Train staff and bolster the development review process so that staff can dedicate time to working with applicants on incorporating green infrastructure
- Support developers who proactively initiate green infrastructure (through expedited processes or other methods)
- Amend land development code to minimize impervious cover (such as allowing for narrower streets, sidewalks on only one side of the street, xeriscaped islands in the center of culs-de-sac, and short or shared driveways)

When creating comprehensive plan objectives and strategies for green infrastructure, a community might consider examining established, third-party standards focused on sustainable landscapes. The most well-known of these programs is the Sustainable Sites Initiative's SITES Rating System, which certifies the design, construction, and maintenance of sustainable landscapes with or without buildings. Under SITES, projects are required to, among other things, manage and retain or treat precipitation on-site from the 60th percentile precipitation event (as defined by the EPA) with strategies such as using rainwater harvesting systems. Related optional credits in the rating system include further onsite retention or treatment, using functional stormwater features as amenities (such as bioswales), and conserving and installing native plants and plant communities that receive a minimum score of 20 from the SITES native plants calculator.[244]

243 City of Aurora 2009 Comprehensive Plan, Chapter II, Sustainability Plan 17-19 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

244 Sustainable Sites Initiative, SITES v2 Rating System 26-47 (2014), http://go.usgbc.org/SITES-Rating-System-and-Scorecard-Registration.html.

EXAMPLES OF COMPREHENSIVE PLAN GREEN INFRASTRUCTURE LANGUAGE FOR WATER CONSERVATION

Southern California Association of Governments

The Southern California Association of Governments' Comprehensive Plan chapter on Water sets forth the following policies related to green infrastructure, which the Plan recommends as near-term, feasible policies that stakeholders should consider for implementation:[245]

- Implement green infrastructure and water-related green building practices through incentives and ordinances.[246]
- Encourage Low-Impact Development and natural spaces that reduce, treat, infiltrate, and manage runoff flows caused by storms and impervious surfaces.[247]
- Maximize pervious surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation.[248]

Newburgh, New York

The City of Newburgh, New York includes a goal in its Comprehensive Plan to reduce impervious cover and promote stormwater management best practices. The Plan lists specific actions that the City should take to achieve this goal:

- "The City wants to reduce impervious cover and promote stormwater management best practices (Municipal Services Goal 3) by:
  - Allowing the use of permeable surfaces for driveways and parking areas in residential and commercial developments; and
  - Encouraging best management practices by minimizing and treating stormwater at its source, including the use of grass swales, rain gardens and green infrastructure techniques."

Aurora, Colorado

The City of Aurora's comprehensive plan contains a chapter focused on sustainability, which includes, among other initiatives, a green infrastructure/landscaping program that includes the following features:

- Community gardens in partnership with a regional group (using plants that displace and use less water than traditional bluegrass)
- Tree planting program
- Xeriscape standards

245 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 10 (2008), https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf.

246 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 60 (2008), https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf.

247 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 60 (2008), https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf.

248 Southern California Association of Governments, Final 2008 Regional Comprehensive Plan, 61 (2008), https://www.scag.ca.gov/Documents/f2008RCP_Complete.pdf.

- Existing parks and open space (as contributors to green infrastructure)
- Xeriscape demonstration gardens at the City's main municipal building[249]

The Plan's sustainability chapter also describes the following:

- Community Gardens: Plants sequester carbon, and new gardens that displace traditional bluegrass can reduce water needs by 30%. A burgeoning movement is underway to provide incentives to local residents to grow their own food and expand the number of urban gardens throughout the city.
- The Role of Water: The City is committed to providing a socially, environmentally, and economically sustainable water supply. The Plan's chapter on Developing and Protecting Water and Other Natural Resources discusses in detail the City's "Prairie Waters" project to provide a sustainable water supply and the City's water reclamation efforts. That chapter also describes recently codified regulatory measures and the City's ongoing commitment to water conservation.
- Green Infrastructure: The Plan describes that the City's zoning code has incorporated several green infrastructure features over the years, including development and water incentives for native plant material or xeriscape landscaping and an extensive park and open space trail and greenway system. Staff dedicates a significant portion of development application review to working with applicants to incorporate green infrastructure and support developers who proactively initiate green infrastructure elements.[250]

249 City of Aurora 2009 Comprehensive Plan, Chapter II, Sustainability Plan 11 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

250 City of Aurora 2009 Comprehensive Plan, Chapter II, Sustainability Plan 17-19 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

6. The Sustainability Plan

Communities today face a new set of challenges in the face of a rapidly changing environment: natural resource limitations, changing weather patterns, pollution, public health concerns, evolving housing preferences, and significant population shifts. The sustainability plan is a policy document developed with the community and approved by the local legislative body that acts as a roadmap for creating a more sustainable community — setting forth a vision for how to prosper in this changing environment. Such plans typically identify threats to long-term sustainability, resources necessary to be maintained (and obtained), and opportunities for collaboration; they also define action steps outlining how to achieve this vision and track success.

Sustainability plans begin by acknowledging what sustainability means for the adopting community. In doing so, they often refer to the widely accepted definition of sustainability stemming from the 1987 Brundtland Commission Report, "Our Common Future," which stated that sustainable development is about meeting the needs of the present without compromising the ability of future generations to meet their own needs.[251] They also provide insight on the cultural values that will guide how the community wishes to move forward to address the issues it is facing. Thorough sustainability plans address not just the environment, but also its intersection with issues relating to equity and the economy — together referred to as the three Es of sustainability (also sometimes called the three Ps of sustainability, for "planet, people, and profit"). Through doing so, the plan gives the community an opportunity to consider the impacts of future decisions and behaviors so it may achieve a balance between the natural environment, social values, and economic prosperity.[252] It is no surprise, then, that water must be an integral part of any local sustainability plan.

The compact, infill development associated with sustainability and smart growth also carries water conservation benefits through reduced landscaping irrigation needs, increased infrastructure efficiency, reduced water loss, and the like. As such, the techniques and examples provided in this Chapter focus not only on the elements of sustainability plans that directly incorporate water, but also on those that have indirect water conserving benefits from the type of land use pattern encouraged. For more on what constitutes a water efficient development pattern, see Chapter 2, *Water Issues in the Interior West: A Call to Action*.

This Chapter guides communities through the process of developing or updating a sustainability plan in a way that addresses water quantity issues, such as how to accomplish the following:

- Use the comprehensive plan to foster sustainability where a separate sustainability plan is not used, or to incorporate the elements of a separate sustainability plan
- Structure a sustainability plan to address local water issues
- Establish appropriate water-related sustainability goals
- Set realistic targets to reach water conservation goals
- Develop strategies and implementation actions to achieve water conservation
- Identify opportunities for collaboration
- Build training and education components into a sustainability program

251 World Comm'n on Env't & Dev., *Report of the World Commission on Environment and Development: Our Common Future,*, ¶ 27, U.N. Doc A/42/427 (Aug.4, 1987), http://www.un-documents.net/our-common-future.pdf.

252 *See,* City of Lakewood Sustainability Plan , 7 (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

a. Consider Using the Comprehensive Plan

As discussed in Chapter 5 of this Guidebook, comprehensive plans, like sustainability plans, guide future actions and provide a process for identifying community resources, needs, and visions. A community interested in taking a broad look at its own sustainability might then consider the merits of having a separate sustainability plan when these same ends can be achieved through an update to the local comprehensive plan. This Guidebook encourages communities to first consider amending their comprehensive plans to foster sustainability, rather than adopting a separate plan.

EXAMPLE OF COMPREHENSIVE PLAN WITH STRONG SUSTAINABILITY FOCUS THAT INCLUDES WATER

San Jose, California[253]

Adopted in 2011, the Envision San Jose 2040 General Plan is the City's comprehensive plan. This Plan is organized in a framework stemming from the three Es of sustainability (environment, equity, and economy), with the addition of a separate land use and transportation component. Specifically, its chapters address the following issues:

1. Envision San Jose 2040 (an introduction and overview)
2. Thriving Community, which deals primarily with the economy
3. Environmental Leadership, which specifically addresses water resources, among other things
4. Quality of Life, which deals with community identity, neighborhoods, housing, education, and recreation
5. Interconnected City, which displays and explains the City's "land use and transportation diagram"
6. Land Use and Transportation, which sets forth the goals and policies that further the diagram
7. Implementation

The Plan incorporates various land use and water conservation methods in reaching the City's sustainability goals. The introductory chapter sets forth 12 major strategies that inform the Plan's goals, policies, and implementation actions. Among these strategies are:

- "Focused Growth," which concentrates new growth into designated growth areas that surround the City's regional employment center and transit systems — an approach that reflects the City's built-out nature, desire to preserve established neighborhood character outside these growth areas, and emphasis on reducing environmental impacts.
- "Measurable Sustainability/Environmental Stewardship," which furthers the City's multiple policies[254] that support the implementation of environmental best practices, especially those that minimize waste and efficiently use and conserve natural resources.

253 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

254 Such as the Green Vision, the Greenhouse Gas Reduction Strategy, the Green Building Policies, the Stormwater Management Plan, the Hydromodification Management Policy, the Riparian Corridor Policy, and the Habitat Conservation Plan. *See*, Envision San Jose 2040 General Plan, 48 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

The Plan's Environmental Leadership chapter contains a significant array of goals, policies, and implementation actions related to water conservation. Discussed in more detail in the later sections of Chapter 5 of this Guidebook, these goals, policies, and actions cover a wide range of water-related measures, including green buildings, water conservation, water quality, stormwater management, wastewater treatment and water reclamation, water recycling, and water-resource protection.

The Plan's Land Use and Transportation chapter also sets forth goals, policies, and implementation actions that further water conservation, which call for zoning changes to reflect the initiatives described within the Plan, including the creation of planned development zones and the promotion of land use policies that focus growth into identified growth areas while protecting open space areas, which create a land use pattern that fosters greater water conservation. The land use chapter also calls for requiring new developments to incorporate measures to minimize water consumption.

As an alternative to amending the entire comprehensive plan to incorporate sustainability throughout, communities might also consider adding a distinct chapter on sustainability or a chapter incorporating a local sustainability plan.

EXAMPLE OF COMPREHENSIVE PLAN INCORPORATING A SUSTAINABILITY PLAN THAT INCLUDES WATER

Aurora, Colorado[255]

Aurora's Comprehensive Plan incorporates, as Chapter 2, the City's Sustainability Plan, which was developed through a separate process. The Chapter lays out the community's vision for success; defines sustainability; describes the development of the Sustainability Plan; lays out the impact of global climate change (recognizing its effect on weather patterns that impact the water cycle); connects to the State's Climate Action Plan; describes the City's baseline carbon footprint and how it compares to the regional, state, and national averages; lists the City's current sustainability projects and programs; and describes opportunities for change and the benefits of those changes.

Among the initiatives and opportunities mentioned, the Plan includes the following water conservation elements:

- Green Buildings: Requiring new City buildings to be built to the LEED Gold-level standards for new construction and existing City buildings to be upgraded to meet LEED for Existing Buildings standards, both of which include water efficiency requirements
- Community Gardens: Encouraging locally grown food and acknowledging that new gardens that displace traditional bluegrass can reduce water needs by 30%

255 City of Aurora, CO, Comprehensive Plan 2009, 17-45 (2010), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf.

- The Role of Water: Highlighting water's important connection to national security, economic health, and especially energy production ("the production of energy requires large volumes of water while treatment and distribution of water is dependent on readily available, low-cost energy") and focusing on the City's efforts to seek innovative solutions to capture and conserve water and its commitment to providing a socially, environmentally, and economically sustainable water supply
- Green Infrastructure: Highlighting the City's existing code that incorporates green infrastructure features, including development and water incentives for native plant material or xeriscape landscaping
- Energy Efficiency and Conservation Block Grant: Cataloguing projects proposed to DOE that, upon approval, the City would implement, including studying ways to make the City more energy and water efficient

However preferable it is to incorporate sustainability directly into the comprehensive plan, separate sustainability plans can be valuable endeavors. First and foremost, the process of developing such a plan, and adherence to the plan itself, can strengthen community buy-in and understanding of the importance of sustainability. Second, unlike comprehensive plans, which serve as a guide for future regulations and development decisions and typically focus on land use pattern and development, sustainability plans sometimes take a broader approach, including topics such as building and plumbing code updates (to achieve green buildings); municipal operations policies (such as sustainable purchasing policies, green fleets, or LED bulb replacement programs); cultivating a zero-waste culture (such as plastic bag bans or household and commercial waste management efforts); and many other topics that are not typically included in a comprehensive plan. Most practically, sustainability plans are here to stay, so this Guidebook would be remiss in not addressing how they have been and can be used to achieve water conservation, regardless of whether this end can also be achieved through the comprehensive plan.

b. Structure the Sustainability Plan to Address Water

Should a local government choose to proceed with a stand-alone sustainability plan over integrating sustainability into the comprehensive plan, then it may want to consider next how to structure the sustainability plan and, specifically, where within the plan water should be addressed. Almost all sustainability plans address water conservation in a water-specific chapter. Sustainability plans will also directly address water in chapters related to green buildings (which often include a water efficiency component), open space and natural systems (which often include a green infrastructure component), and municipal operations (which often include actions for the municipal government to lead by example on water conservation and other issues). Sustainability plans can address water conservation indirectly when they foster water efficient land use patterns typically found in chapters related to land use development, transportation, economic development, and urban ecosystems. Some sustainability plans also recognize the interconnectedness of water use and energy production (i.e., that the production of energy requires a tremendous amount of water, while water treatment and distribution depends on readily available low-cost energy), addressing water efficiency within a discussion on energy efficiency.

EXAMPLES OF HOW SUSTAINABILITY PLANS ARE STRUCTURED TO INCLUDE WATER

Los Angeles, California[256]

The City of Los Angeles adopted its first-ever "Sustainable City pLAn" in April 2015. Written in response to the City's environmental and drought concerns, the pLAn lays out Targets, Strategies, and Priority Initiatives that address current and future climate change impacts. The pLAn is organized into three main sections: Environment, Economy, and Equity, but within these three sections, the pLAn establishes a set of visions for 14 topic areas to transform the City over the next 20 years:

1. Local Water
2. Local Solar
3. Energy-Efficient Buildings
4. Carbon & Climate Leadership
5. Waste & Landfills
6. Housing & Development
7. Mobility & Transit
8. Prosperity & Green Jobs
9. Preparedness & Resiliency
10. Air Quality
11. Environmental Justice
12. Urban Ecosystem
13. Livable Neighborhoods
14. Lead by Example

Of the 14 topic areas, several address water conservation directly and indirectly. The Chapter on the City's Local Water vision deals with water conservation most directly. Other chapters that address water directly or indirectly (by fostering a water efficient land use pattern) include the chapters on Energy-Efficient Buildings, Housing & Development, Urban Ecosystem, and Lead by Example.

Santa Fe, New Mexico[257]

The City of Santa Fe adopted its Sustainable Santa Fe Plan in 2008. The Plan — which is centered primarily on greenhouse gas emissions but addresses all elements of sustainability, including water — is careful to acknowledge that, in order to truly assess progress, the City will need to conduct a baseline emissions inventory. In the absence of such an inventory, however, the City set forth this Plan to begin implementing measures that would move the community in the right direction, with the intention of updating the Plan as needed when more knowledge and resources are available.

256 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

257 Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

Given its smaller initial scope, the 2008 Plan lays out only Proposed Actions, organized under 10 main topics (in addition to chapters on "Education and Outreach" and "Implementation"). For some of the Proposed Actions, "issues to address" before or while implementing the actions are included. Each chapter also details "What is Being Done" so far in each of these topic areas and what the "Expected Outcomes" will be of undertaking the proposed actions. The 10 main topics are:

1. Greenhouse Gas Emissions Inventory
2. City Operations
3. Green Building Code
4. Development and Zoning Code
5. Clean Renewable Energy
6. Transportation
7. Ecological Adaptation
8. Water Conservation
9. Solid Waste Reduction
10. Food Systems

Water conservation is, of course, addressed directly in the Plan's Water Conservation chapter. Other chapters furthering water conservation directly or indirectly include City Operations, Green Building Code, Development and Zoning Code, and Ecological Adaptation.

Lakewood, Colorado[258]

In 2015, the City of Lakewood adopted a Sustainability Plan — modeled after that of Surrey, British Columbia — setting forth Goals, Targets, Objectives and Indicators, and Implementation Strategies, as well as Supporting Strategies and Cross-Cutting Strategies. The Sustainability Plan includes water conservation measures to help encourage development that values the natural environment and public safety. Many of the Plan's initiatives would have low upfront costs and long-term financial benefits for residences and business. The Plan is divided into seven chapters dealing with these issues:

1. Climate Change and Adaptation
2. Energy, Water, and the Built Environment
3. Sustainable Economy
4. Zero Waste
5. Community Cohesion and Public Health
6. Natural Systems
7. Transportation

Water conservation initiatives are included throughout the Plan but are addressed most heavily in the chapter on "Energy, Water, and the Built Environment."

258 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

Chicago, Illinois[259]

In 2012, Chicago launched its Sustainable Chicago 2015 Action Agenda to aid the City in becoming sustainable while enhancing neighborhoods and supporting economic opportunities. The plan outlines seven Themes, 24 Goals, and 100 Key Actions, and offers a roadmap for how residents and businesses can contribute to the City's sustainability goals.[260] The plan's chapters follow its seven Themes:

1. Economic Development and Job Creation
2. Energy Efficiency and Clean Energy
3. Transportation Options
4. Water and Wastewater
5. Parks, Open Space, and Healthy Food
6. Waste and Recycling
7. Climate Change

The Action Agenda most directly addresses water conservation within its chapter on Water and Wastewater where, under this theme, the City plans to decrease water use by 2% (14 million gallons per day) annually. The Agenda also addresses water indirectly by fostering a water conserving land use pattern in its chapters on Economic Development and Job Creation; Energy Efficiency and Clean Energy; Transportation Options; and Parks, Open Space, and Healthy Food.

c. Establish Water Conserving Goals

At the outset, a community may integrate water into a sustainability plan's priorities by first establishing overarching goals with direct water conservation benefits. These goals may pertain to both the private and public sector and sometimes range from very general to more specific. Suggested water conservation goals include those related to the following issues:

- Overall water use and conservation (such as "continuously improve water conservation efforts," "provide an adequate water supply to meet present and future community needs," or "decrease water use by [a given percentage] annually")
- Buildings (such as "significantly enhance resource efficiency in buildings to minimize use of potable water and to reduce water pollution" or "increase the number of new or retrofitted green buildings")
- Locally sourced water (such as "source the majority of water locally")
- Water recycling (such as "recycle or beneficially reuse 100% of the community's wastewater supply, including the indirect use of recycled water as part of the potable water supply")
- Water quality and resource protection (such as "protect water quality" or "enhance stormwater management to reduce sewer overflows and minimize the adverse effects on ground and surface water quality and protect property and natural resources from stormwater runoff")

A community may further ingrain water into a sustainability plan's priorities by establishing overarching goals that foster a water efficient land use pattern. Such goals may range from very general to more specific:

259 Sustainable Chicago 2015 Action Agenda (2012), http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf.

260 *Sustainable Chicago 2015*, http://www.cityofchicago.org/city/en/progs/env/sustainable_chicago2015.html (last visited May 5, 2016).

- Establish a land use pattern that fosters a more environmentally sustainable city
- Concentrate development in certain areas to increase infrastructure efficiency while providing for open space with infiltration benefits in other areas
- Focus new growth into identified growth areas to protect the quality of existing neighborhoods while establishing new mixed-use neighborhoods with a compact and dense form that is attractive to the community's projected demographics and supports walking, provides opportunities to incorporate services, and facilitates transit use
- Meet housing needs of existing and future residents by fully and efficiently utilizing lands planned for residential and mixed-use and by maximizing housing opportunities in locations within a half mile of transit, with good access to employment areas, neighborhood services, and public facilities
- Respect the designated growth boundaries to preserve the beauty and natural resources and nonurban character of lands outside the Urban Growth Boundary, to maintain the fiscal health of the community, to direct private and public investment within identified growth areas, and to preclude development in areas subject to natural hazards

EXAMPLES OF WATER-FOCUSED GOALS WITHIN SUSTAINABILITY PLANS

Los Angeles, California[261]

In response to environmental and drought concerns, Los Angeles adopted its "Sustainable City pLAn," which establishes a set of Visions (or Goals) for 14 topic areas to transform the City. One of these topic areas is Local Water, which sets forth goals for the City to lead the nation in water conservation over the next 20 years and to source the majority of its water locally. Another topic area is "Lead by Example," which sets forth a goal for the City to have a municipal government that leads by example throughout every department; this goal includes targets and strategies to significantly reduce water consumption.

Chicago, Illinois[262]

Chicago's Sustainable Chicago 2015 Action Agenda outlines 24 goals across seven themes and offers a roadmap for how residents and businesses can contribute to the City's sustainability goals.[263] The Plan's chapter on Water and Wastewater includes goals to decrease water use by 2% (14 million gallons per day) annually and to protect water quality. Several goals within the Economic Development and Job Creation and the Energy Efficiency and Clean Energy chapters of the Plan call for improving building energy efficiency through strategies that include increasing the number of LEED-certified buildings. Because the LEED rating systems also have water efficiency requirements, these goals further water conservation as well.

San Jose, California[264]

The Envision San Jose 2040 General Plan incorporates various land use and water conservation methods in reaching the City's sustainability goals. The Plan's Environmental Leadership chapter contains, among others, the following goals related to water conservation:

261 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

262 Sustainable Chicago 2015 Action Agenda (2012), http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf.

263 *Sustainable Chicago 2015*, http://www.cityofchicago.org/city/en/progs/env/sustainable_chicago2015.html (last visited May 5, 2016).

264 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

- Green Buildings: Demonstrate local and global environmental leadership through progressive use of green building policies, practices, and technologies to achieve 100 million square feet of new or retrofitted green buildings by 2040. Maximize the use of green building practices in new and existing development to minimize use of potable water and to reduce water pollution.
- Water Conservation: Demonstrate environmental leadership through responsible and fiscally and environmentally sustainable management of water to restore the environment, enhance quality of life, and provide an adequate water supply to meet present and future community needs. Continuously improve water conservation efforts in order to achieve best in class performance.
- Water Recycling: Recycle or beneficially reuse 100% of the City's wastewater supply, including the indirect use of recycled water as part of the potable water supply.
- Water Resources: Protect water resources because they are vital to the ecological and economic health of the region and its residents. (The local water resource system — which is supplemented by the importation of water from external sources[265] — consists of watershed lands, underground aquifers, groundwater recharge areas, recycled water, reservoirs, canals, streams, rivers, creeks, and the riparian vegetation associated with them.)

The Plan's Land Use and Transportation chapter works in tandem with a chapter on the "Interconnected City," which displays and explains the City's "land use and transportation diagram" but contains no direct goals, policies, or implementation actions. The Land Use & Transportation chapter sets forth the goals and policies that implement the diagram. Specific goals contained within the Land Use and Transportation chapter that further a water conserving land use pattern include:

- Establish a land use pattern that fosters a more fiscally and environmentally sustainable, safe, and livable city
- Focus new growth into identified growth areas to protect the quality of existing neighborhoods while establishing new mixed-use neighborhoods with a compact and dense form that is attractive to the City's projected demographics (i.e., young and senior populations), supports walking, provides opportunities to incorporate retail and other services in a mixed-use format, and facilitates transit use
- Meet the housing needs of existing and future residents by fully and efficiently utilizing lands planned for residential and mixed-use and by maximizing housing opportunities in locations within a half mile of transit, with good access to employment areas, neighborhood services, and public facilities
- Preserve the valuable natural resources of the hillsides and protect their aesthetic and habitat amenities to enhance the rural character of these areas
- Respect the designated growth boundaries to preserve the beauty and natural resources and nonurban character of lands outside the Urban Growth Boundary, to maintain the fiscal health of the City, to direct private and public investment within identified growth areas, and to preclude development in areas subject to natural hazards

265 Water is imported to Santa Clara County by the Santa Clara Valley Water District (SCVWD) from state and federal water systems that flow through the Sacramento-San Joaquin Delta, and by the San Francisco Public Utilities Commission (SFPUC) from the Sierra Nevada mountain range. *See*, Envision San Jose 2040 General Plan, 161 (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

d. Set Targets Related to Water Conservation

For each water conservation goal, the community will want to include several objectives, often referred to as "targets" in sustainability plans. Targets are statements of attainable, quantifiable, intermediate-term achievements that help accomplish each goal. To set realistic targets, the community should carefully assess the resources available to address each issue. Including the entire community in the planning process and consulting with outside agencies are important methods of identifying such resources so that issues may be dealt with effectively.

First, communities could consider using *established guideposts* in setting targets. For example, the sustainability plan could incorporate a regional agreement that calls for a reduction in water use by X% by Y-year. Or the plan could call for the community to sign onto (or expand existing involvement in) a state, national, or international initiative that involves commitment to a water-related targets, such as "advance the Governor's goal of reducing statewide water use by X% by Y-year" or "expand application of the City's pledge under the Better Buildings Challenge[266] (to demonstrate X% water savings in buildings by Y-year) to new sectors, including to the City's affordable housing stock."

Communities may also consider setting achievable, *interim targets* as a way to stay on track and deliver on positive milestones, such as the following:

- For overall water use: Reduce average per capita potable water use by 20% by X-year, 22.5% by Y-year, and 25% by Z-year; lead by example by reducing local government water use at municipal facilities by at least 20% by X-year, 25% by Y-year, and 30% by Z-year
- For buildings: Achieve X million square feet of new or retrofitted green buildings by Y-year and 2X million square feet by Z-year
- For locally sourced water: Reduce the purchase of imported water by 50% by X-year and source 50% of water locally by Y-year, including 150,000 acre-feet per year of stormwater capture
- For water efficient land use patterns: Increase density near transit by ensuring that the proportion of new housing units built within 1,500 feet of transit is at least 57% by X-year and 65% by Y-year

Further, communities will want to consider establishing *baselines* from which to measure progress. For example, "reduce annual community-wide water use by X% (from the baseline year) by Y-year" or "achieve X million gallons per day of water conservation savings (over the baseline year) by Y-year by reducing water use and increasing water-use efficiency." A baseline not only provides a point from which progress may be tracked; it also helps to distinguish the most harmful or counterproductive activities and to identify low-hanging fruit.

266 The Better Buildings Challenge is a national competition lead by the U.S. Dept. of Energy calling for building owners and leaders (including local government leaders) to publicly pledge to reduce the energy use of their entire building portfolios. The Challenge includes water conservation as part of its energy savings program, recognizing that the efficient use of water resources results in lower operating costs, a more reliable water supply, and improved water quality, and—because energy is required to transport and treat water—that saving water also saves energy. *Water Savings*, U.S. Dep't of Energy, Better Buildings Challenge, https://betterbuildingsinitiative.energy.gov/challenge/water-savings (last visited Jan. 5, 2018).

EXAMPLES OF WATER-FOCUSED TARGETS WITHIN SUSTAINABILITY PLANS

Lakewood, Colorado[267]

Water conservation initiatives are included throughout the City of Lakewood's 2015 Sustainability Plan but are addressed most heavily in the chapter on Energy, Water, and the Built Environment, which includes targets to reduce citywide water use by 20% (from the 2007 baseline) by 2025 and increase the percentage of certified green buildings (new construction and renovations receiving occupancy permits) each year from 2015 to 2025. Other chapters within the Plan set targets that can lead to a more water efficient development pattern. For example, the Sustainable Economy chapter includes a target to increase the number of housing units within a designated Complete Neighborhood by 25% by 2025, and the Community Cohesion and Public Health chapter includes a target to certify 12 neighborhoods as "Outstanding Sustainable Neighborhoods" in the City's Sustainable Neighborhoods program (an established, resident-driven, district-scale sustainability program) by 2025.

Los Angeles, California[268]

L.A.'s 2015 "Sustainable City pLAn" establishes a set of visions for 14 topic areas to transform the City. Its "Local Water" topic area includes a vision for LA to lead the nation in water conservation over the next 20 years and source the majority of its water locally. To achieve this vision, the pLAn establishes several targets with milestones, including:

- Reduce average per capita potable water use by 20% by 2017, 22.5% by 2025, and 25% by 2035
- Expand recycled water production by at least six million gallons per day by 2017 and expand customer use of recycled water
- Reduce the purchase of imported water by 50% by 2025 and source 50% of water locally by 2035, including 150,000 acre-feet per year of stormwater capture
- Produce at least six million gallons per day of advanced reuse recycled water at the City's Terminal Island facility
- Reduce potable water use by 10% in City parks

Other topic areas within the pLAn set targets with direct water conservation benefits as well as targets with indirect water benefits by fostering a more water efficient pattern of land development, including:

- Energy-Efficient Buildings: Expand the City's Better Building Challenge to 60 million square feet. (The Better Buildings Challenge is part of a national competition to demonstrate reductions in energy and water use across an entire building portfolio by 20% over 10 years.[269] L.A. took up the challenge to demonstrate 20% energy and water savings in existing buildings by 2020.[270])

267 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

268 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

269 *Water Savings,* U.S. Dep't of Energy, Better Buildings Challenge, https://betterbuildingsinitiative.energy.gov/challenge/water-savings (last visited Jan. 5, 2018).

270 *LA Better Buildings Challenge,* City of Los Angeles, CA, http://la-bbc.com (last visited Jan. 5, 2018).

- Housing & Development: Ensure that the proportion of new housing units built within 1,500 feet of transit is at least 57% by 2025 and 65% by 2035. By 2017, issue 17,000 permits for new housing units within this distance of transit.
- Livable Neighborhoods: Increase the City's average Walk Score to 75 by 2025.
- Lead by Example:
  - Reduce municipal water use at City facilities and proprietary departments by at least 20% by 2017, 25% by 2025, and 30% by 2035.
  - Achieve and maintain STAR Communities certification, with a 4-STAR Community rating by 2017 and a 5-STAR Community rating by 2025. (STAR includes objectives for, among others: community water systems, resource-efficient buildings, resource-efficient public infrastructure, water in the environment, green infrastructure, public spaces, natural resource protection, compact and complete communities, and infill and redevelopment.)[271]
  - Regional leadership: Work with 10 cities in the county to adopt a sustainability plan by 2025 and 40 cities by 2035 (Which is relevant because these plans would have water conservation initiative as well.)

Chicago, Illinois[272]

The Sustainable Chicago 2015 Action Agenda outlines seven themes, 24 goals, and 100 actions.[273] Although the plan does not specifically indicate "targets," several of the Plan's goals and actions serve as such and are relevant examples for other communities considering what targets to set in their own plans. The target-like goals and actions with direct or indirect water conservation benefits include:

- Energy Efficiency and Clean Energy chapter: Double the number of LEED-certified private and public buildings by 2015.
- Parks, Open Space, and Healthy Food chapter: Increase the City's park district acreage by more than 180 acres by 2015.
- Water and Wastewater chapter:
  - Decrease water use by 2% (14 million gallons per day) annually.
  - Meter 50% of all water accounts by 2015.
  - Replace 320 miles of water main by 2015 and 900 miles by 2022.
  - Convert 1.5 million square feet of impermeable surface into pervious surfaces every year.

While establishing baselines for targets can be a hurdle for some communities — perhaps due to limitations on staffing, finances, or technology — this needn't be a barrier to accomplishing water conservation goals and laying out effective strategies. Where setting a baseline is not feasible, the plan can use more general targets, noting that the corresponding baseline will be established when more resources are available. The community might then lean on established and successful best practices from peer communities in order to prioritize objectives and implementation actions with proven track records.

271 *Understanding Star,* Star Communities, http://www.starcommunities.org/rating-system/framework/ (last visited May 4, 2016).

272 Sustainable Chicago 2015 Action Agenda (2012), http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf.

273 *Sustainable Chicago 2015*, http://www.cityofchicago.org/city/en/progs/env/sustainable_chicago2015.html (last visited May 5, 2016).

Similarly, communities could specify that a target will be established after completion of some other strategy that serves as precursor to establishing a baseline (such as "specific targets related to reducing water loss may be established after completion of X-strategy to undertake a three-year water audit, determine median real losses per mile, and establish a plan to reduce real annual water loss"). Communities could go slightly further and set targets within the plan while specifying a method for determining the baseline along the way. For example, instead of "reduce Citywide water consumption by 20% from 2007 baseline by 2025," the target could say "reduce Citywide water consumption by 20% by 2025, using last year's Urban Water Management Plans of the City's water retailers as the data source to determine the baseline water conservation savings level."

EXAMPLES OF WATER TARGETS ESTABLISHED PRIOR TO SETTING BASELINES

San Jose, California[274]

As part of the Envision San Jose 2040 General Plan, the City incorporated initiatives from its previously adopted 15-year "Green Vision," which outlined 10 ambitious measurable goals for economic growth and environmental sustainability intended to be met by 2022. In doing so, the City retained Green Vision's 2022 benchmarks for these incorporated measures. Consistent with Green Vision, the General Plan's Environmental Leadership chapter calls for tracking success by evaluating achievement of Water Conservation targets as part of each General Plan annual review process, including a water conservation target to "achieve by 2040, 50 Million gallons per day of water conservation savings by reducing water use and increasing water efficiency." Although the Plan does not provide a baseline from which to evaluate progress, it does specify that it will use the City's 2008 Water Conservation Plan as the data source to determine the baseline water conservation savings level. Similarly, the Plan includes a target to reduce citywide per capita water consumption by 25% by 2040 from a baseline established using the 2010 Urban Water Management Plans of water retailers in the City. As the method for tracking progress toward the Green Vision target of achieving 50 million square feet of green buildings in San Jose by 2022 and 100 million square feet by 2040 (note that an estimated 40% of the community's total energy use and 16% of its water goes into buildings), the Plan specifies that the City will document all green building new construction and retrofits. The chapter also contains target-like goals, policies, and actions with direct water conservation benefits to "double the City's annual water conservation savings by 2040 and achieve half of the Water District's goal for the County on an annual basis" and "recycle or beneficially reuse 100% of the City's wastewater supply (100 million gallons per day), including the indirect use of recycled water as part of the potable water supply." Other chapters within the Plan contain target-like goals, policies, and actions with indirect water conservation benefits stemming from the type of land use pattern they foster. For example, the Land Use and Transportation chapter sets a target to achieve 75% of residents who can access 25% of their retail/service needs within a 20-minute walk and 50% of residents who can access 50% of their retail/service needs within a 20-minute walk.

274 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

Santa Fe, New Mexico[275]

The City of Santa Fe adopted its Sustainable Santa Fe Plan in 2008. The Plan – which addresses all elements of sustainability, including water – is careful to acknowledge that the City will need to conduct a baseline inventory in order to truly assess progress. The City set forth this Plan despite the absence of an inventory, however, in order to begin implementing measures that – as seen from experiences in other communities – would move the City in the right direction. The Plan is therefore seen as a living document, to be updated as needed when more knowledge and resources are available. Indeed, in 2015, Santa Fe passed a resolution to draft a new comprehensive 25-year sustainability plan and to reestablish the Sustainable Santa Fe Commission by redefining its scope, purpose, and responsibilities.[276]

e. Develop Strategies and Implementation Actions to Achieve Water Conservation

Once water conservation goals and targets are established, the community will want to develop corresponding strategies and implementation actions (sometimes called "implementation techniques" or "implementing policies"). Strategies and implementation actions are undertaken to achieve specific targets (and therefore advance each goal). In each case, one or more actions may be established to attain the target.

Communities should consider that many sustainability plans reference *third-party standards* when establishing strategies and implementation actions (and occasionally targets as well). For example, "update City's green building ordinance to require installation of WaterSense-labeled fixtures and appliances," "integrate key elements of the SITES rating system into the City's site planning standards," or "require new City buildings to be built to LEED Gold-level certification." A few of the common third-party standards and their direct and indirect water conservation benefits worth considering include, but are not limited to:

- WaterSense: The EPA's WaterSense program offers labeling and certification for water efficient, high-performance products and homes, and water efficiency professionals and programs.[277]
- LEED: The U.S. Green Building Council's (USGBC) suite of Leadership in Energy and Environmental Design (LEED) rating systems provides green building certifications for numerous development types. Although the standards vary by rating system/ development type, all of the LEED rating systems, including those for new construction, existing buildings, homes, and neighborhood development contain prerequisites and credits that advance water conservation either directly or through the resulting land use pattern. Minimum requirements for LEED certification, depending upon the rating system, produce buildings that reduce outdoor water used for landscaping; use water efficient indoor plumbing fixtures; install water meters; are located within or near existing communities (such as sites served by existing water and wastewater infrastructure, infill sites, or in areas of high connectivity); and are designed to meet minimum density requirements set forth in the rating system. The rating systems also contain optional credits to build toward certification for going beyond the prerequisite level requirements and taking additional actions

275 Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

276 City of Santa Fe, NM, Resolution No. 2015-57: A Resolution Repealing Resolution No. 2007-31 Regarding the Membership, Duties and Responsibilities of the Sustainable Santa Fe Commission; Reestablishing the Sustainable Fe Commission by Redefining the Scope, Purpose and Responsibilities of the Sustainable Santa Fe Commission (2015), http://www.santafenm.gov/archive_center/document/13025.

277 Environmental Protection Agency, WaterSense Program Guidelines Version 5.3 (December 2016), https://www.epa.gov/sites/production/files/2017-02/documents/ws-program-guidelines.pdf.

related to water efficiency, as outlined in the rating system.[278]

- SITES: The Sustainable Sites Initiative's "SITES" Rating System certifies the design, construction, and maintenance of sustainable landscapes with or without buildings. Projects, at a minimum, are required to (among other things) manage and retain or treat precipitation on site from the 60th percentile precipitation event, as defined by the EPA; reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond the establishment period or by reducing the project's landscape water requirement by at least 50%; and use only plant species suitable for site conditions, climate, and design intent. Related optional credits in the rating system, available to achieve certification, include further onsite retention or treatment, further reductions in outdoor water use, and conserving and installing native plants and plant communities that receive a minimum score of 20 from the SITES native plants calculator.[279]
- STAR Communities: The STAR Communities certification rating system has 44 objectives, which include, among others, community water systems, resource-efficient buildings, resource-efficient public infrastructure, water in the environment, green infrastructure, public spaces, natural resource protection, compact and complete communities, and infill and redevelopment.[280]
- Walk Score: Walk Score measures the walkability of an address, neighborhood, or city, measured by average walking distance to amenities (across multiple categories) and pedestrian friendliness based upon factors such as population density, block length, and intersection density.[281]

When creating strategies to achieve water-related goals and targets, communities will necessarily focus on strategies with direct water conserving benefits, as well as strategies that foster a water efficient development pattern (both addressed in Subsection i of this Section 6(e)). Going further, communities often also include strategies and implementation actions that foster collaboration and communication among staff, the public, and government entities at the local, regional, and state level (addressed in Subsection ii of this Section 6(e)). Finally, communities also include strategies for education and training at all levels to ensure the long-term sustainability of water efficiency and conservation initiatives (addressed in Subsection iii of this Section 6(e)).

i. Focus on Water and Land Use Strategies

In establishing water conservation strategies, communities can think broadly to accomplish goals and targets — from further planning initiatives, information gathering/tracking, partnerships, and education programs, to infrastructure and maintenance upgrades, government policies, and incentive programs. Equally as important as the water-specific strategies and implementation actions will be those that entrench long-term water benefits on the community by achieving a water conserving development pattern.

Possible water conservation strategies include the following:

- Planning initiatives, such as "develop a water conservation strategic plan"
- Benchmarking and tracking, such as "report and benchmark water use," "meter X% of all water accounts," "adopt an improved billing system to better track supply-side infrastructure and water use by customers as well as to validate the effectiveness of new conservation measures," and "track and publish water use in government facilities"

278 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

279 Sustainable Sites Initiative, SITES v2 Rating System 26-47 (2014), http://go.usgbc.org/SITES-Rating-System-and-Scorecard-Registration.html.

280 *Understanding Star,* Star Communities, http://www.starcommunities.org/rating-system/framework/ (last visited May 4, 2016).

281 *Walk Score Methodology,* Walk Score, https://www.walkscore.com/methodology.shtml (last visited Jan. 5, 2018).

- Building and infrastructure maintenance and upgrades, such as "proactively plan and run tests to identify leaks and replace leaking water pipes," "expand purple pipe infrastructure," "convert road medians and parkway strips to low- or no-water-use landscaping," and "identify and retrofit water-intensive existing government buildings and adjacent landscapes to improve water conservation — by upgrading fixtures and appliances, fixing leaks, capturing rainwater, installing water-wise landscaping, and using other water conserving technologies, as appropriate — and assemble customized tools, resources, and financing mechanisms for efficiency upgrades"
- Adopting government policies such as "reduce watering to two times per week at government facilities," "wash municipal vehicles only at facilities with 100% recirculated water," "increase the use of treated effluent," "convert X% of public golf course acreage to recycled water," "increase the green building standard for new municipal construction," and "encourage the development of new water efficiency, conservation and reuse technologies by providing opportunities for pilot testing and evaluation"
- Creating incentive programs such as "develop more water and wastewater rate tiers to encourage conservation," "expand financial support for water conservation activities," "implement rebate and incentive programs—including turf replacement incentive—that address indoor and outdoor water use in the residential, government, commercial, and industrial sectors," "assess options for a private-sector policy to incentivize or require green building certification for new construction and major renovations," and "initiate a program to encourage stormwater capture and, when feasible cost-effective, onsite rainwater catchment for new and existing development"

Possible strategies to consider related to creating a water efficient land use pattern include, among others:

- Review and update zoning code to target housing and job density within identified growth areas in order to maximize use of existing or planned infrastructure, minimize environmental impacts of new development, provide for more efficient delivery of government services, and foster the development of more vibrant, walkable urban settings
- Preserve the nonurban character of lands outside the identified growth areas by allowing for cluster development, requiring that new development outside the growth areas cause no significant increase in public services or infrastructure, and requiring that such development is nonurban in terms of water consumption (excluding use of recycled water)
- Utilize a PUD or other flexible zoning technique to tailor such regulations as allowed uses, site intensities, and development standards to a particular site in circumstances where a PUD or flexible zoning process will better conform to the plan's goals than may be practical through implementation of a conventional zoning district

Finally, the sustainability plan's strategies should include a call to review and update the community's comprehensive plan, zoning ordinance, building and plumbing codes, and other documents to reflect the vision and initiatives set forth in the plan. See Chapter 5, *The Comprehensive Plan*, for more on plan strategies to review and update codes to implement water conservation goals.

EXAMPLES OF WATER-FOCUSED STRATEGIES WITHIN SUSTAINABILITY PLANS

Lakewood, Colorado[282]

Water conserving strategies from Lakewood's 2015 Sustainability Plan pertain to both buildings and sites and are found throughout the Plan's seven chapters but are addressed most heavily in the chapter on Energy, Water, and the Built Environment. Related to buildings, the Plan calls for the City to use behavior-learning smart control technologies to increase resource efficiency in buildings and landscapes; identify water-intensive buildings and assemble customized tools, resources, and financing mechanisms for efficiency upgrades; retrofit and upgrade buildings with water conservation methods by fixing leaks, capturing rainwater, and using water-wise landscaping; increase the percentage of certified green buildings (new and renovated receiving occupancy permits) each year from 2015 to 2025; and use the LEED rating systems — which include water efficiency requirements — to achieve certification for both public and private development.

For sites, the Plan's strategies call for the City to integrate key elements of the Sustainable Sites Initiative — which includes required reductions in potable water use — into the City's site planning standards; conduct research to develop financial incentives for site designs such as variable stormwater fees dependent on landscaping and water-quality features onsite; create a green infrastructure network; and establish management areas and customize site development recommendations and standards that deal with water conservation, biodiversity, etc.283

To increase the scope and effectiveness of implementation, Lakewood's Sustainability Plan also calls for three "crosscutting strategies" that leverage the cross-benefits of multiple implementation strategies for water conservation. These crosscutting strategies include the creation of a Sustainable Energy and Water Resource Center to provide information and consulting services to residents and businesses (discussed in more detail later in this Section, see e(iii), *Include Training & Education Components)*, a Sustainable Business Hub that will, among other things, explore opportunities to integrate water systems and upgrades into appraisal, assessments, inspections, and property listings (additional strategies discussed in later in this Section, see e(ii), *Identify Collaborative Opportunities,* and e(iii), *Training & Education*); and a Sustainable Neighborhoods Program — a resident-driven, district-scale sustainability program (discussed in more detail later in this Section, see e(ii), *Identify Collaborative Opportunities*).

282 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

283 Lakewood Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015). *See also,* City of Lakewood Sustainability Plan , 126-128 (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

Los Angeles, California[284]

The Los Angeles' "Sustainable City pLAn" establishes a set of visions for 14 topic areas. Under its Local Water topic area, the City's vision is to lead the nation in water conservation over the next 20 years and source the majority of its water locally. To achieve this vision, the pLAn sets forth several strategies and priority initiatives, which include:

- Developing a comprehensive water strategy (a "One Water Plan")
- Investing in local water-supply development and infrastructure projects, including expanding the City's purple pipe infrastructure[285] and expanding recycled water production, treatment, and distribution to incorporate Indirect or Direct Potable Reuse
- Implementing programs and policies for the private sector, including expanding the City's rain barrel program; expanding water-department conservation initiatives (including the scope and financing of its turf replacement incentive program); benchmarking customer water use and recognizing innovative water-reduction initiatives; developing more water and wastewater rate tiers to encourage conservation; and revising the building code to encourage water use reduction, onsite water reuse, and water recycling
- Reducing municipal potable water use by, among other things, retrofitting municipal buildings and landscapes; publishing water use at City facilities; increasing the number of green infrastructure sites and green streets (e.g., bioswales, infiltration cut-outs, permeable pavement, and street trees); converting road medians and parkway strips to low- or no-water-use landscaping; using permeable pavement in large infrastructure projects (such as the airport); updating standard parkway design guidelines to include additional low-water-use and permeable materials; converting 85% of public golf course acreage to recycled water; washing City vehicles only at facilities with 100% recirculated water; and reducing watering to two times per week at City facilities

Beyond the strategies discussed as part of its Local Water vision, the pLAn discusses many strategies that further water conserving buildings, landscapes, and development patterns, including:

- Advancing green building efforts with strategies to expand the LA Better Building Challenge to new sectors, including the City's affordable housing stocks; increase participation in green business certification programs; assess options for a private-sector green building policy to incentivize or require LEED Silver or better for new construction and major renovations; and increase the green building standard for new municipal construction — all of which include water efficiency requirements.
- Emphasizing increased density and compact development with strategies to expand zoning capacity in key transit nodes and corridors; promote TOD and Transit Neighborhood Plans; revise the floor-area-ratio (FAR) in mixed-use zones on targeted commercial corridors; pilot new transitional height zones at key transit nodes; pilot new regulations governing second units and granny flats; create pathways for permanent sources of funding for TOD and affordable housing; streamline the construction of TOD and affordable housing; and leverage zoning, planning, and community vibrancy to move people closer to work and transit.

284 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

285 Purple pipes carry water that has been semi-treated (filtered and cleaned of some impurities), which is nonpotable but can be used for landscaping and toilet water.

Chicago, Illinois[286]

The Sustainable Chicago Action Agenda outlines seven themes, 24 goals, and 100 actions and offers a roadmap for how residents and businesses can contribute to the City's sustainability goals.[287] Under the Agenda's Water and Wastewater chapter, the City plans to decrease water use by 2% (14 million gallons per day) annually, and sets forth 20 actions, including the following:

- Launch a water conservation strategic plan
- Replace 320 miles of leaky, century-old water pipes (and 900 miles within the next decade)
- Collaborate on a greywater policy (including code updates to allow for expanded uses)
- Pilot water-reduction programs and technologies at City-owned facilities
- Track and report water use in City facilities
- Meter 50% of all water accounts
- Convert 1.5 million square feet of impermeable surface into pervious surfaces every year
- Explore partnerships with the Metropolitan Water Reclamation District to implement neighborhood-level green infrastructure pilots

The Agenda's other chapters set forth additional actions — some with direct water conservation benefits and some with indirect benefits that result from the type of land use pattern encouraged. These actions include doubling the number of LEED-certified private and public buildings (which requires water efficiency elements), including opening new LEED-certified field houses in at least two parks. The actions also include a call to amend the City's Zoning Ordinance by adding a definition for Transit Oriented Development (TOD) (to direct development to targeted areas most appropriate for increased density — near transit stations) and to ensure that bulk, density, and parking ratios of the Ordinance meet the needs of those developments. Since the plan's inception, Chicago has been focusing on energy efficiency, improving green infrastructure, and using land use techniques to encourage sustainable growth.[288] Among other things, the City has added the definition of TOD to its Zoning Ordinance, as outlined in the Agenda,[289] which will have the added effect of fostering a water efficient land use pattern.

Santa Fe, New Mexico[290]

The City of Santa Fe adopted its Sustainable Santa Fe Plan in 2008. The Plan is careful to acknowledge that, in order to truly assess progress, the City will need to conduct a baseline emissions inventory; however, in the absence of such an inventory, the City set forth this Plan to begin implementing measures that would move the community in the right direction. The Plan's Water Conservation chapter lays out the following proposed actions:

- Develop a Water Conservation Strategic Plan, which should, among other things, address the harder questions regarding water conservation, particularly the interconnections between conservation, land use, and growth — all within the context of climate change

286 Sustainable Chicago 2015 Action Agenda (2012), http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf.

287 *Sustainable Chicago 2015*, http://www.cityofchicago.org/city/en/progs/env/sustainable_chicago2015.html (last visited May 5, 2016).

288 *See,* Sustainable Chicago (2015), http://www.cityofchicago.org/content/dam/city/progs/env/Sustainable_Chicago_2012-2015_Highlights.pdf.

289 City of Chicago, IL, Amendment of Municipal Code Chapters 2-45, 17-3, 17-4, 17-8, 17-10, & 17-13 Regarding Transit Oriented Development Projects (2015), http://www.metroplanning.org/uploads/cms/documents/so2015-5334.pdf.

290 Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

- Expand rebates and incentive programs to address indoor and outdoor residential water use, as well as in the government, commercial, and industrial sectors[291]
- Adopt new technologies to better track water use and then help customers to conserve more easily, such as:
  - Implementing an improved billing system to better track supply-side infrastructure and water use by customers as well as to validate the effectiveness of new conservation measures
  - Monitoring water use with Fire Files and Kopy Caps
  - Broadening the use of, and consider requiring, a variety of water-saving appliances (for example, high-efficiency dishwashers, dual-flush toilets, pressure-regulation valves, site-specific rather than whole-house water heaters)
  - Reducing unnecessary public and private landscape watering through the
  - use of moisture sensors, rain sensors, evapotranspiration controllers; tightening existing requirements; and/or developing new programs for water reuse systems in commercial laundries and car washes, requiring individual household water budgets, or other strategies
- Proactively plan and run tests to identify leaks
- Expand existing residential leak investigation/survey program to include other water customer sectors
- Expand public outreach and education on water conservation
- Develop a strong compliance and enforcement program
- Expand financial support for water conservation activities
- Initiate a program to maximize water harvesting
- Initiate a program to process and utilize water for multiple purposes
- Continue and increase the use of treated effluent

The Plan's other chapters set forth additional actions — some with direct water conservation benefits and some with indirect benefits that result from the type of land use pattern encouraged. These actions include:

- City Operations chapter:
  - Review the City's purchasing manual and propose revisions that would reduce the impact of City purchases, including increased water harvesting
- Green Building Code chapter:
  - Implement performance-based Santa Fe Green Building Codes program that recognizes the need for phased-in mandatory minimums and offers incentives to builders for performance significantly above mandatory thresholds
  - Develop green building codes and incentive programs for existing building remodels and retrofits, commercial buildings, and new and existing structures in historical districts
- Development and Zoning Code chapter:
  - Amend the Development and Zoning Code to accomplish the following:

291 The Plan notes that each rebate considered should receive a cost versus water savings analysis and that one recent analysis conducted by staff seems to indicate that rain barrels are not a cost-effective expenditure. Sustainable Santa Fe Plan, 22 (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

- Encourage the use of greywater for landscaping and other uses such as toilet flushing
- Encourage the use of cisterns and other water-harvesting techniques that use rainwater to reduce the use of tap water for landscaping
- Require subdivisions to be laid out to enable the ability to use stormwater to reduce water demand
- Incorporate some aspects of performance zoning to allow for a greater variety of compatible uses that reduce the number and length of vehicle trips

- Ecological Adaptation chapter:
  - Create systems that maximize the use of rain and storm waters for plant support and groundwater recharge (such as increased pavement permeability)
  - Improve support for biodiversity with adaptation techniques, such as by revising existing City ordinances to encourage planting and site designs that maximize the diversity of adaptable plants, use a minimal amount of pavement or other hard surfaces to keep the site's permeability maximized, and eliminate inappropriate plants (high-water-use, low-heat tolerance, or others) that are not able to adapt

ii. Identify Collaboration Strategies

When crafting the water components of a sustainability plan, communities should remember that existing legal frameworks and procedures seldom guarantee the type of coordination that is necessary for local land use and water planners to effectively plan, regulate, and service development properly. (See Chapter 3, *Working Together*, for more on this.) The sustainability plan presents an opportunity to institutionalize the type of informed, coordinated planning and procedures needed to optimize water conservation efforts.

To do this, sustainability plans should emphasize the importance of collaboration, generally, and encourage the development of partnerships at a local, regional, and state level. They could establish the intent to create a regionally coordinated approach and recognize the benefit from the economy of scale afforded by such cooperation. Coordination might be laid out at the local, regional, and state levels, touching both the public and private sector. Going further, they could suggest key partners and describe how to create and maintain communication and cooperation. They might also identify specific opportunities for coordination and who will need to be involved to make each step successful.

When considering key partners, the importance of the public as a partner should not be overlooked. Sustainability plans often include strategies to work with the local community on water conservation actions, such as to pilot water efficiency programs; solicit ongoing recommendations on how to use water efficient technologies and practices in homes; identify public or private spaces in their neighborhoods suitable for water conserving site improvements; and establish an ongoing process to develop additional strategies to meet future water-supply challenges and minimize the need for imported water. Such engagement serves as an important educational component as well.

Most importantly, the strategies and implementation actions should specify working with the water community (planners, departments, providers, wholesalers, retailers, or others) to advance the plan's goals and targets.

EXAMPLES OF INTEGRATING COLLABORATION INTO SUSTAINABILITY PLANS

Santa Fe, New Mexico[292]

At the outset, the Sustainable Santa Fe Plan states that, as the City moves forward with the initiatives proposed in the Plan, the intention is to work in concert with the County and other entities within the region to create a regionally coordinated approach. The Plan recognizes that "many of the initiatives require a regional approach and many would benefit from the economy of scale afforded by such cooperation." Further, the Plan's Water Conservation chapter calls for the development of a Water Conservation Strategic Plan that, among other things, "better integrate[s] (for planning purposes) the various functions currently managed by separate entities within City government, including Water Conservation, Long Range Water Supply, Planning and Land Use, Billing Division, etc." The Plan's Education and Outreach chapter includes a proposed action to engage the public as a partner by developing "a cadre of informed community members from many community sectors that can effectively utilize the City's Community Climate Education session(s) to implement actions and programs within their respective groups."

Lakewood, Colorado[293]

Lakewood's 2015 Sustainability Plan sets forth a number of water conservation strategies focused on coalition building, including working with the State to support the goals and strategies in the State's Water Plan; the water and sewer providers coordinating conservation efforts, programs, and policies; and the Urban Drainage and Flood Control District coordinating water-quality efforts, programs, and policies. To increase the scope and effectiveness of implementation, the Plan also calls for several "crosscutting strategies" that leverage the cross-benefits of multiple implementation strategies for water conservation. These crosscutting strategies include, among others, a Sustainable Business Hub that will collaborate with the Sustainable Energy and Water Resource Center to share information and available resources and a Sustainable Neighborhoods Program — an established, resident-driven, district-scale sustainability program — under which the City will, among other things:

- Solicit recommendations and ongoing feedback from participating neighborhoods to strengthen the Sustainable Energy and Water Resource Center
- Work with neighborhoods to pilot resource-efficiency programs
- Solicit recommendations and ongoing feedback on how to utilize resource-efficient technologies and practices in homes
- Work with neighborhoods to identify public or private spaces in their neighborhood suitable for sustainable site improvements

292 Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

293 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

Los Angeles, California[294]

Los Angeles' "Sustainable City pLAn" contains a Lead by Example chapter, which includes a long-term target of working with 10 cities in LA County to adopt a sustainability plan by 2025 and with 40 cities by 2035.

San Jose, California[295]

The Environmental Leadership chapter of the Envision San Jose 2040 General Plan emphasizes the importance of developing effective local, regional, and statewide partnerships that enable sustainable water management. The chapter includes collaborative language related to water conservation, calling for the City to initiate the following actions:

- Create partnerships and governance structures that allow for a comprehensive approach to water-supply management that improves the reliability of local and imported water supplies, explores new sources of water, and thereby protects and enhances the Sacramento-San Joaquin River Delta ecosystem
- Partner with the Water District and other agencies to engage the public in an outreach program about the importance of water management to the City's quality of life and to develop strategies with the public on how the City can help meet future water-supply challenges and minimize the need for imported water by conserving local water supplies and using recycled water whenever appropriate
- Partner with other cities in the region to ensure that local, regional, and statewide plans provide adequate water supplies to serve the community and protect the environment
- Review and provide input on water management plans prepared by water suppliers to ensure that they maximize water conservation and reuse in order to fulfill the City's water-supply needs and consider projected water supplies in updated water management plans as part of each major review of the General Plan
- Encourage state legislation to improve water-use efficiency through statewide mandates and appropriate regulations to encourage water efficient development (for example, plumbing code, greywater code, and the green building policy)
- Work with local, regional, state, and other public and private agencies to increase water-use efficiency within the City and neighboring jurisdictions
- Partner with other agencies to incentivize water conservation by developing cost-sharing agreements on rebates and other incentive programs
- Partner with other agencies on education and outreach to engage the community in an ethic of efficient water use and the use of water efficient practices and technologies
- Participate in regional efforts to develop codes and standards for stormwater capture and greywater reuse in areas that do not impact groundwater quality as determined through coordination with local agencies
- Support local, regional, and statewide efforts to educate the community about the benefits, reliability, and quality of recycled water and the critical role it plays in the water supply
- Partner with the Water District and other appropriate agencies to establish an adaptive outreach program to involve the community in development of strategies to promote the value of recycled water as an important part of a fiscally and environmentally sustainable urban water-use portfolio

294 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

295 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

- Work with public and private water wholesalers and retailers to cost-effectively expand the water recycling distribution system to serve new nonpotable water demand with emphasis placed upon areas experiencing or planned for significant amounts of new development
- Lead through advocacy with local, regional, and state agencies to ensure the protection and enhancement of the quality of the City's water sources
- Work with local, regional, and state agencies to protect and enhance the watershed, including the protection of surface water and ground water supplies from pollution and degradation
- Work with water retailers to provide water-supply facilities that meet future growth within the City's Urban Service Area and assure a high-quality and reliable supply of water to existing and future residents

In furthering its goals related to parks, open space, and recreation, the Plan's Quality of Life chapter calls for the City to pursue joint-use projects with schools and colleges, the Water District, other public agencies, and private foundations. The Plan's Land Use and Transportation chapter calls for the City to further the chapter's initiatives — including the promotion of land use policies that focus growth into identified Growth Areas, protect open space areas, encourage mixed uses, and minimize water consumption — through collaboration with appropriate external agencies with land use authority or regulations in the City. It also directs the City to consider applicable Airport Land Use Commission, Water District, Local Area Formation Commission, and other policies from outside agencies when reviewing new or expanded uses. Similarly, the Plan's Implementation chapter emphasizes that the Plan should be used by other agencies as a policy tool to inform and guide their process when making decisions related to development within the City's sphere of influence. Specifically, the chapter states a goal to engage other agencies in the implementation of the Plan in order to achieve the Plan's goals and policies, and it then goes on to address instances where such agencies should apply the Plan, including by emphasizing that other public agencies and utility companies should consider the Plan's goals, policies, and Land Use/Transportation Diagram in planning the delivery of services to City residents and businesses.

iii. Include Training and Education Strategies

Education is essential in ensuring the efficacy of water conservation and efficiency efforts in sustainable development policies. The value of many water efficiency measures is diminished if departmental staff isn't properly trained on code updates, the public does not know how to optimally utilize them, or developers are wary of building in the community because they don't understand code changes or aren't aware of available resources. Education helps future owners make informed decisions to further water conserving efforts. Strategies like incentivizing developers to install water efficient plumbing fixtures or xeriscaping are of little use if residents/tenants replace them with more water-intensive versions because they don't fully understand the need or benefits, or if landscapers don't know how to properly maintain them. Education of the public at large, departmental staff, and the private sector is therefore a key strategy for achieving water conservation goals.

When developing the water components of a sustainability plan, the local government should identify training and education needs related to each of the plan's sections and recommend appropriate strategies. Education-related strategies to further water conservation objectives could include the following actions:

- Establishing certification requirements for staff or licensed professionals
- Offering technical training workshops to empower developers to build with water conserving techniques in mind

- Providing access to water efficiency experts
- Offering public and staff educational programs/classes
- Supporting existing local and regional educational initiatives
- Engaging the public to establish and implement strategies
- Engaging schools to have them accept water conservation as an important learning goal
- Creating communication networks (such as the creation of resource centers)
- Disseminating information (i.e., indirect assistance such as free resource lists, water efficiency product information made available on the government website, or signage regarding water efficient landscapes or building features at public facilities)
- Promoting awareness through initiatives such as demonstration projects/pilot programs, advertising campaigns, public recognition (such as celebrations and awards for innovative water-reduction initiatives or benchmark moments), and leading by example (such as publishing water-use statistics at government-owned facilities)
- Embracing technology to create opportunities for feedback and data sharing (such as providing real-time data on water usage; offering technology to assist property owners in tracking water usage; creating requirements or incentives to benchmark and report water use; and monitoring, periodically reviewing, and publicly reporting on progress toward achieving water-related goals and policies)
- Qualitatively tracking and periodically reviewing the education program itself (to monitor progress toward achieving educational goals) and adjusting the program as needed

Local governments may want to consider using collaborative opportunities and partnerships — such as those described in Section 6(e) of this Chapter — to develop and provide these educational offerings. Strong educational programs create an ethic of efficient water use and the use of water efficient practices and technologies.

EXAMPLES OF TRAINING AND EDUCATION COMPONENTS WITHIN SUSTAINABILITY PLANS

Lakewood, Colorado[296]

The Energy, Water, and the Built Environment chapter of Lakewood's 2015 Sustainability Plan sets forth several water conservation strategies related to education and information sharing, including these actions:

- Promote the importance of conserving water and develop specific communication strategies for various audiences throughout the community
- Promote the importance of both efficiency retrofits and behavior modification strategies
- Promote opportunities and strategies for water efficiency to neighborhoods through workshops, neighbor-to-neighbor challenges, DIY classes, partnerships, and other assorted resources
- Educate planners, plan reviewers, building inspectors, and developers on updates to building and energy codes and available design and green building resources
- Report and benchmark water use (including the use of submetering for effective management)

296 City of Lakewood Sustainability Plan (2015), http://www.lakewood.org/Documents/Sustainability/Sustainability_Plan/Lakewood_Sustainability_Plan_2015.aspx.

- Develop an interactive sustainability dashboard that will demonstrate progress toward water conservation goals by providing real-time data on water usage
- Utilize mobile and online technology to assist residents and property owners in tracking water usage

To increase the scope and effectiveness of implementation, Lakewood's Sustainability Plan also calls for three "crosscutting strategies" that leverage the cross-benefits of multiple implementation strategies for water conservation. These crosscutting strategies include:

- A Sustainable Energy and Water Resource Center to provide information and consulting services to residents and businesses, including to:
  - Gather and distribute information on available educational resources, assessments and audits, technical and design support, rebates, tax incentives, financing mechanisms, low-interest loan programs, and fee incentives for resource-efficiency retrofits and other related actions
  - Provide support services to facilitate the use of the resources gathered
  - Provide information on demand-side management programs from Denver Water
  - Provide tips and strategies for resource conservation through behavior modification
  - Provide consultation services for goal-setting and tracking
  - Provide information on green buildings and sustainable site design
- A Sustainable Business Hub that will accomplish such actions as:
  - Support successful district-scale sustainability efforts and share district-scale sustainability guidelines and successful practices
  - Celebrate and recognize achievements in resource efficiency, green building, and sustainable site design

Los Angeles, California[297]

To achieve the City's vision of leading the nation in water conservation over the next 20 years and source the majority of its water locally, the "Sustainable City pLAn" sets forth several strategies and priority initiatives related to education and information about water conservation, including to educate the public on the need for and benefits of indirect and direct potable reuse of water; educate and engage residents and businesses through ongoing awareness, social media, and action campaigns; benchmark customer water use and recognize innovative water-reduction initiatives; and publish water-use statistics at each City-owned facility.

Chicago, Illinois[298]

The Economic Development and Job Creation chapter of the Sustainable Chicago 2015 Action Agenda includes a strategy to support sustainability and green building education for the public through programming at the City's Center for Green Technology and other partnerships.

297 *See generally,* pLAn, Transforming Los Angeles (2015), http://plan.lamayor.org/.

298 Sustainable Chicago 2015 Action Agenda (2012), http://www.cityofchicago.org/content/dam/city/progs/env/SustainableChicago2015.pdf.

San Jose, California[299]

The Environmental Leadership chapter of the Envision San Jose 2040 General Plan contains the following education-based policies and implementation actions related to water conservation:

- Develop new and expand existing programs to educate the City's business and residential communities on the economic and environmental benefits of green building practices and promote environmentally responsible design, construction, operation and maintenance of residential and nonresidential buildings
- Continue programs to educate the community on water conserving landscaping methods and materials to discourage the use of turf when it is not required for a specific function
- Be a leader in educating the community about the challenges to the water-supply system and the need for responsible water management
- Partner with the Water District and other agencies to engage the public in an outreach program about the importance of water management to the City's quality of life and to develop strategies with the public on how the City can help meet future water-supply challenges and minimize the need for imported water by conserving our local water supplies and using recycled water whenever appropriate
- Qualitatively track the City's education program on the public use of water. Adjust the program as needed to meet *Envision General Plan* goals
- Partner with other agencies on education and outreach to engage the community in an ethic of efficient water use and the use of water efficient practices and technologies
- Support local, regional, and statewide efforts to educate the community about the benefits, reliability, and quality of recycled water and the critical role it plays in our water supply
- Partner with the Water District and other appropriate agencies to establish an adaptive outreach program to involve the community in development of strategies to promote the value of recycled water as an important part of a fiscally and environmentally sustainable urban water-use portfolio
- Review and publicly report on the achievement of water conservation and water recycling goals and policies on a regular basis to monitor and achieve success

Santa Fe, New Mexico[300]

The Water Conservation chapter of the City's Sustainable Santa Fe Plan includes a goal to expand public outreach and education. To this end, the Plan emphasizes the fundamental importance in having the City Parks Department — the most readily visible user of water — lead the water conservation effort by example. Strategies recommended to accomplish this goal include the following:

- Requiring City Parks staff, as well as residential landscapers and commercial landscapers, to obtain Irrigation Certification from the New Mexico Irrigation Association for some irrigation installations
- Improving the City's website to include water conservation information for residential and commercial customers that is both useful and interactive
- Creating and maintaining public demonstration gardens throughout the City, such as by establishing an annual/periodic xeriscape contest and a pilot stormwater reuse site

299 Envision San Jose 2040 General Plan (2011), https://www.sanjoseca.gov/DocumentCenter/Home/View/474.

300 Sustainable Santa Fe Plan (2008), http://www.santafenm.gov/media/files/Public_Utilities_Environmental_Services/SustainableSFweb.pdf.

The Plan's other chapters include several strategies related to training and education for sustainability, generally, which would include a focus on water conservation and the relationship of the built environment to water use. For example, the Plan's Implementation and Evaluation chapter states that City Government should be a model to its residents and to other cities, especially those within the region, including that every department must educate staff members, review current practices and functions, and begin the transition toward sustainability.

Similarly, the Plan's Education and Outreach chapter includes, at the outset, a recommendation to identify further training and education needs within each section of the Plan. The chapter also heavily focuses on the importance of K-12 teachers and students, including strategies for creating a "curriculum integration task group" of local K-12 schoolteachers and climate and sustainability education groups, which would, among other things, develop an integration plan for sustainability in the school system and establish incentives for integration of sustainability concepts into local schools. Related strategies include working with the public school system and the State Department of Education to have them accept sustainability as one of their primary learning goals and integrate sustainability as part of the K–12 Standards and Benchmarks and establishing an annual sustainability education conference for teachers, parents, and youth that focuses on the integration of sustainability and related topics into the school system. Beyond its focus on K-12 education, the Plan's education- and training-based strategies include:

- Identify informal educational resources for climate and sustainability education:
    - Conduct a community-wide asset mapping of organizations and resources for climate and sustainability education at all levels (e.g., informal and formal, K-12, and post-secondary and identify goals, objectives, funding sources and timeline for existence of such programs or assets within year one of this Plan)
    - Develop a resource guide or work with existing projects to provide a resource list to consumers of such information
- Develop both formal and informal (non-degree-seeking) education programs (which would include developing materials for community-based action that addresses climate change by working with a variety of resource organizations and others and develop a cadre of informed community members from many community sectors that can effectively utilize the City's Community Climate Education session(s) to implement actions and programs within their respective groups)
- Support local and regional educational initiatives that strengthen more local markets for sustainable products and services
- Direct City support and funding toward educational materials development and training, and when appropriate, toward organizations that offer needed solutions

7. The Zoning Code

Perhaps the most significant land use power that state legislatures delegate to local governments is the authority to adopt zoning laws. Through these laws, local governments divide their jurisdictions into zones or districts and prescribe the land uses and the intensity of development allowed within each district. By doing so, communities create a blueprint for future development, which may change as the local legislature rezones parcels and areas within the community.

In Chapter 5, *The Comprehensive Master Plan*, communities are encouraged to integrate water efficient land use patterns and strategies into their comprehensive plans. Once this is done, this vision can be implemented through changes to the zoning code that permit or require water efficient development in areas targeted for growth, discourage development in areas targeted for conservation, and foster building types and landscapes that minimize the use of water. Similarly, communities with limited room to grow can modify zoning to accommodate higher densities and infill development.

Higher density zoning uses may exist within a local government's code, but zoning standards may be based on a suburban model featuring buildings surrounded by parking. This is inappropriate for infill development and new construction in more developed areas where instead the focus would be better placed on contextual integrity rather than uniformity. Instead, new zoning standards can be adopted — ones that use different ratios regarding setbacks, lot coverage, open space, livability space, and parking, rather than those found in traditional residential zoning district provisions.

In this Chapter, we discuss several options for communities to consider for using zoning to foster water conserving land use patterns, such as how to accomplish the following:

- Incorporate water efficient uses and development patterns into as-of-right permitted uses
- Foster water efficient densities by permitting ADUs
- Incorporate water conserving land uses into conditionally permitted uses
- Conditionally permit water-intensive uses upon water conservation measures
- Condition rezonings on water conserving practices
- Incentivize water conservation through bonus density zoning
- Use PUD regulations to foster water conservation
- Create a water conservation floating zone
- Use overlay zoning to designate areas appropriate for conservation and those prioritized for growth
- Establish a transfer of development rights program with sending districts to preserve areas where it is difficult to provide water efficiently and receiving districts where water can be provided more efficiently

Which of these options to choose depends on a number of factors, including the current land use pattern and types of buildings in the community. The pattern of development fostered and types of buildings allowed by zoning should respect the current architecture and land development of the community and build gradually from that base. The biggest factors to consider are density, the use of present infrastructure, and the cost of needed additional infrastructure.

It should be noted before proceeding that for the comprehensive plan to provide the legal support needed for implementing water conserving objectives, it should contain zoning strategies so that zoning amendments, when adopted, are in conformance with the comprehensive plan (sometimes required

by state law but always advisable).[301] Conformance with the comprehensive plan insulates zoning amendments from charges that they violate due process and equal protection rights of land owners or that they constitute illegal spot zoning. Therefore, before proceeding with alterations to a local zoning code, communities should consider first their comprehensive plan and whether amendments should be made to bolster the techniques described in this Chapter. (This is discussed in more detail in Chapter 5, *The Comprehensive Master Plan*.)

In general, encouraging infill development helps conserve water because smaller lots tend to have less irrigated landscaping and accommodate smaller households that consume less water per dwelling unit (discussed further in Chapter 3, *Working Together*). Much of the following discussion focuses on tools to promote infill development because of this indirect linkage.

a. Incorporate Water Efficient Uses and Development Patterns into As-of-Right Permitted Uses

Traditionally, zoning districts permit certain land uses as-of-right (a.k.a., by-right); these are uses that cannot be denied unless they fail to meet standards contained in the zoning ordinance for each zone. The boldest and most obvious option for incorporating water conservation strategies into land use patterns is to amend zoning to allow, as-of-right, uses and development types that conserve water, directed toward existing infrastructure and, when possible, balanced with open space conservation.

i. Amend Zoning in Priority Growth and Conservation Areas

If a local government has amended its comprehensive plan as described in Chapter 5, *The Comprehensive Master Plan*, to delineate priority growth areas within the community where more water efficient forms of development should occur and conservation areas where further development should be discouraged or minimized, then the first step is to amend the zoning in those growth areas to reflect the desired uses and concentration of development. Communities may do this by creating a new zoning district, amending the requirements of an existing zoning district located within the area, or altering the zoning map to apply existing higher-density districts in growth areas and lower density districts in conservation areas. The same ends can also be accomplished through other techniques described later in this Chapter, such as overlay zones and floating zones.

Zoning in growth areas requires changing the uses and accompanying requirements in the applicable district to expand housing types allowed. This may include replacing or mixing uses, simplifying dimensional standards, adjusting parking requirements, reducing minimum lot and unit sizes, altering setbacks, and ensuring livability through features such as complete streets, access to services and shops, and pocket parks. This may be easier, particularly as an initial strategy, than more complicated and politically fraught rezoning in less-developed neighborhoods.

301 *See Generally*, Arizona, Ariz. Rev. Stat. § 9-462.01(F) "All zoning and rezoning ordinances or regulations adopted under this article shall be consistent with and conform to the adopted general plan of the municipality...."; Colorado, Colo. Rev. Stat. § 31-23-303 "Such [municipal zoning] regulations shall be made in accordance with a comprehensive plan..."; Idaho, Idaho Code § 67-6511(1) "The zoning districts shall be in accordance with the policies set forth in the adopted comprehensive plan."; Montana, Mont Code § 76-2-304(1)(a) "Zoning regulations must be made in accordance with a growth policy [master plan]....."; Nevada, Nev. Rev. Stat. § 278.0284 "Any action of a local government relating to development, zoning, the subdivision of land or capital improvements must conform to the master plan of the local government"; New Mexico, N.M. Stat. § 3-21-5(A) "The regulations and restrictions of the county or municipal zoning authority are to be in accordance with a comprehensive plan..."; and Wyoming, Wyo. Stat. § 15-1-601(d)(i) "All regulations shall be made: in accordance with a comprehensive plan...". Utah does not have an enabling statute *per se*, however, case law dictates zoning ordinances must be enacted pursuant to a 'comprehensive plan' under the City's police power" *Naylor v. Salt Lake City Corp.,* 398 P.2d 27, 28-9 (1965) *citing Marshall v. Salt Lake City,* 141 P.2d 704 (1942).

When altering a zone's bulk and area requirements to accommodate growth, communities might consider not just reducing lot sizes but also eliminating setbacks on one side of every lot. This technique, known as zero-lot-line development, has been recommended by the U.S. EPA as a method for reducing water use. According to the EPA, the same effect can be achieved by having the setback requirements on both sides of a lot, but the advantage of zero-lot-line regulations is in giving property owners responsibility for one side yard rather than two of half the size.[302] The benefits of this from a water conservation standpoint can include a reduction in total watering time needed for landscaped areas, reduction in the amount of water lost to evaporation, and reduction in irrigation runoff and overspray.

The list of land uses and development types to choose from when amending local zoning to achieve water conservation provides choices fitting nearly every context. In priority growth areas, zoning for multifamily buildings, attached housing, small-lot development, along with a mix of uses prioritizing infill should predominate. In conservation areas, open space and natural resource preservation should be the objective of the uses and lot specifications permitted under zoning. Codes can also be updated — whether for growth districts or conservation areas — to include requirements for water conserving landscaping and fixtures. (See Chapter 10, *Building and Plumbing Codes*, for more on fixture efficiency, and Chapter 11, *Supplemental Regulations*, for more on landscaping requirements.)

EXAMPLES OF NEW AND AMENDED ZONING DISTRICTS FOR TARGETED GROWTH

Denver, Colorado

Denver is a city where planners have long recognized the need to increase density in certain areas, especially in the context of transit-oriented development. It is also a city where, at least on its suburban periphery, there still exists a strong appetite for large lots. In 2010 Denver approved a new zoning code that lists "promoting conservation of land, energy, and natural resources" as one of its intents.[303] This new code seeks to preserve the character of Denver's diverse neighborhoods and also to encourage compact, pedestrian-friendly neighborhoods.[304] Among the details of the plan is a decrease in the minimum permitted lot size from 5,000 square feet to 3,000 square feet. It also removed the 600 square foot minimum unit size in apartment buildings.[305] Water savings associated with these changes to as-of-right uses have not been evaluated, but it is likely that increased density and decreased minimum lot sizes will have a positive impact on water use.

302 Environmental Protection Agency, Local Ordinances for Water Efficiency 13, (1993), http://goo.gl/qLyHgc.

303 City of Denver, CO, Denver Zoning Code § 1.1.2(P) (2010), https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/Zoning/DZC/Complete_Denver_Zoning_Code.pdf.

304 US.. Dep't of Housing & Urban Development, *Denver's New Code Targets Sustainable Growth* (Last Visited Jan. 16 2015), http://archives.huduser.org/rbc/archives/newsletter/vol10iss4_2.html.

305 *Zone District Descriptions & Definitions*, City and County of Denver (2017), https://www.denvergov.org/content/denvergov/en/community-planning-and-development/zoning/denver-zoning-code/zone-descriptions.html. See also Don Elliott, Now That We're Poor: The New Economics of Land Use (Mar. 2011), http://www.law.du.edu/documents/rmlui/conference/powerpoints/ElliottDNowThatWere-2.pdf.

Flagstaff, Arizona

In accordance with its General Plan, known as the Growth Management Guide, the City of Flagstaff amended its Land Development Code to provide for clustered and planned development residential uses. Under the Code (which has since been replaced by a new form-based code[306] but still proves illustrative), planned development was permitted by-right in all of the City's residential districts[307] and, as defined,[308] must include one or more of the following housing types, each carefully defined and illustrated within the Code: Lot Line House, Village House, Patio House, Z-lot House, Twin House, Duplex/Triplex, Atrium House, Weak-Link Townhouse, Townhouse, Deck Town House, Terrace House, Multiplex, and Apartment or Condominium Buildings.[309] Other housing types would also be considered as part of an integrated site planning process, subject to approval by the Planning Director. The City's addition of numerous small, compact housing types to the Code was motivated by the need for greater affordability but also fosters a more compact, water efficient development pattern. The Code provides for a site-specific density approach (with the maximum density of a site to be determined under the Code's performance standards), which is intended to recognize the ability to utilize a variety of housing types.[310]

Aurora, Colorado

Aurora, Colorado calls its approach "sustainable infill redevelopment" (SIR) and has adopted SIR zoning, incorporating sustainable infill redevelopment districts into its zoning map. Land use regulations in its SIR zone allow a mix of uses in existing denser neighborhoods and along major streets but outside existing single-family districts.[311]

Pima County, Arizona[312]

Pima County requires no minimum setback for the siting of dwelling units in at least seven of its zoning districts: Mixed Dwelling Type zone, Multiple Residence zone, Transitional zone, County Manufactured and Mobile Home zone, Multiple Use zone, Local Business zone, and General Business zone. In these districts, zero-lot-line siting of dwelling units on individual lots is permissible, subject to the County's building code requirements.

The opportunities for targeted development areas in many communities include those with existing infrastructure — unused or underused retail spaces, failing commercial corridors, and overlooked institutional sites. In these areas, infill development can meet much of the demand for housing and commercial land uses, pulling that development away from needed open space or sprawling, low-density areas. In some of these communities, a high percentage of development permits are already for replacement buildings or expansion of existing structures. Where this happens, the water use per

306 City of Flagstaff, AZ, Zoning Code (2017), https://www.flagstaff.az.gov/2998/Downloading-the-Zoning-Code.

307 City of Flagstaff, AZ, Land Development Code § 10-03-001-0003, Table of Permitted Uses, (2010) (repealed 2017), https://www.flagstaff.az.gov/DocumentCenter/View/14959.

308 City of Flagstaff, AZ, Land Development Code § 10-14-004-0001, Definitions, (2010) (repealed 2017), https://www.flagstaff.az.gov/DocumentCenter/View/14970.

309 City of Flagstaff, AZ, Land Development Code § 10-05-003, Bulk Standards for Other Dwelling Types and Residential Performance Standards for Steep Slope Areas, (2010) (repealed 2017), https://www.flagstaff.az.gov/DocumentCenter/View/14961.

310 City of Flagstaff, AZ, Land Development Code § 10-04-002-0003, Residential Performance Standards, (2010) (repealed 2017), https://www.flagstaff.az.gov/DocumentCenter/View/14960.

311 City of Aurora, CO, Building and Zoning Code § 146-732, Sustainable Infill Redevelopment (SIR) District, (2012), https://www.municode.com/library/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART7MIESPDI_DIV7SUINRESIDI_S146-732PU.

312 Pima County, AZ, Zoning Code §§ 18-27-030, -29-030, -31-030, -35-060, -37-060, -43-060, -45-060, (2005), https://library.municode.com/az/pima_county/codes/code_of_ordinances?nodeId=TIT18ZO.

household and the cost of water infrastructure, in most cases, are much less than that required in single-family, larger-lot housing development — the kind that would otherwise occur in a less-developed area of the community were it not for the types of zoning amendments mentioned here to channel development where it is most water efficient.[313]

ii. Cluster Development

Some zoning codes list cluster subdivisions as an as-of-right permitted land use in residential zoning districts. Although the water efficient development pattern discussed in this Guidebook encourages channeling growth toward more developed areas with existing services, where development rights must remain on undeveloped land, communities may require clustering of any residential subdivisions.

As a means of promoting flexible design and development that preserve natural resources, state laws may authorize local governments to either request or require a developer to cluster buildings together on a lot (maintaining open space in a common area around the buildings) to achieve water conservation.314 Over the past 20 years, cluster development has moved from a rare and little understood form of site and subdivision layout to one that is encouraged, incentivized, and sometimes required as the preferred form of raw land development in many communities.

Under cluster statutes, development can vary from the traditional subdivision plat where lots must conform to standard lot size and coverage requirements of the zoning district in which the property is located. A local cluster-development ordinance allows the property owner to create lots that are smaller and buildings that are closer together than zoning would otherwise allow in return for conserving more open space than would otherwise be required. Used in this way, cluster development can be much like pairing priority growth and conservation areas, but on a smaller, site-based scale. Clustering is also more cost-effective due to the more efficient servicing of developments with utilities, roads, and other services. Housing areas may be even further centralized by permitting attached housing development — allowing developers to eliminate side yards in favor of adjoining row houses.

Clustering does not always allow the developer to build additional dwelling units (although bonuses can be built in, as discussed later in this Section and in more detail in Section 7(e) on bonus density zoning), but it does permit the local government to approve smaller residential lot sizes, which in turn reduces the size of lawns and the water needed to maintain them. Smaller lots often contain smaller houses, which tends to reduce indoor water use. In this way, clustering provides an optional method to achieving the smaller homes on smaller lots that is proven to lower per-household water consumption. (See Chapter 3, *Working Together*, for more on the relationship between development size and water use.)

Instead of, or in addition to, rezoning areas from large-lot, single-family homes to small-lot houses, local governments can amend the schedule of permitted land uses in residential zoning districts to allow cluster development by-right. Doing so provides a procedural incentive to developers to opt for cluster development over a conventional subdivision that would have to go through a conditional use permitting process.

313 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 8, 10, 18 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

314 None of the states in the interior West explicitly prohibits cluster development laws. Typically, local governments may encourage or require clustering based upon state-enabling legislation giving them the general authority to pass zoning and subdivision regulations.

EXAMPLES OF CLUSTERING IN PERMITTED USES

Elk, Pennsylvania[315]

The Zoning Ordinance for Elk Township permits cluster development by-right in two of the Town's three residential districts, R-1 and R-2.

West Caln, Pennsylvania[316]

The Zoning Ordinance for West Caln Township permits cluster development by-right in its Site Responsive Residential (SRR) and Rural Residential (RR) districts. The stated purpose in both of these zones includes supporting the conservation of natural resources and providing greater design flexibility and efficiency in the provision of services and infrastructure, including the opportunity to reduce the amount of impervious surfaces related to new development. In accordance with this purpose, the Township permits clustering by-right, which allows for the greatest degree of innovative site design and open space retention. The RR district additionally provides that multifamily development may be developed in combination with the cluster option under the Ordinance's mixed residential use development option.

When using a cluster approach, local governments should be mindful that, while cluster development does reduce land consumption and lot size, one of the key water-consumption factors in residential land use is the amount of irrigated landscape — which could be the same, greater, or smaller, regardless of whether development is clustered or not. A smaller cluster lot with a large amount of irrigated turf could consume more water than a traditional lot with xeriscaping. As mentioned, clustering was designed to preserve open space and natural resources in general but must be thoughtfully implemented to achieve those goals. Included in its objectives, therefore, can be the conservation of water and the protection of water quality. The land preserved by clustering becomes an asset in water management, particularly if it is subjected to use controls or best-practice standards or is governed under a conservation easement or an HOA's covenants and restrictions. Local governments can incorporate the full range of water-quality practices into a cluster zoning ordinance.

EXAMPLES OF CONSERVATION OBJECTIVES IN CLUSTERING REGULATIONS

Pinal County, Arizona[317]

Pinal County, just south of Phoenix, has recently experienced tremendous suburban growth from the greater Phoenix-Mesa-Scottsdale Metropolitan Area. Pinal County's code allows for cluster zoning that provides for the voluntary, permanent conservation of open space and the protection of natural features including riparian areas, rock outcrops, and natural topography.

315 Elk Township, PA, Zoning Ordinance §§ 501, 601, Use Regulations, (2002), http://elktownship.org/wp-content/uploads/2015/03/Elk_Zoning.pdf.

316 West Caln Township, PA, Zoning Ordinance §§ 500-501, 600-601, Site Responsive Residential District, Rural Residential District, (2006), http://www.westcaln.org/files/125095913.pdf.

317 Pinal County, AZ Pinal County Development Services Code § 2.40.040 Cluster option (2012), http://www.codepublishing.com/az/pinalcounty/html/PinalCounty02/PinalCounty0240.html.

The code's purpose for cluster development is to preserve the significant natural open space areas without increasing overall residential densities and to encourage and provide incentives for site planning that is harmonious with the natural features and constraints of property. This development is also more cost-effective due to the more-efficient servicing of the development with utilities, roads, and other services.

Peterborough, New Hampshire

New Hampshire permits cluster development and encourages its use as an innovative land use control.[318] Under this State-granted authority, the Town of Peterborough adopted a cluster-development provision in its zoning code that seeks to "permit greater flexibility in the design of housing projects; discourage development sprawl; facilitate the economical and efficient provision of public services; [and] preserve more usable space, agricultural land, recreational areas, and scenic vistas."[319] Peterborough permits residential clustering as a special exception in its General Residence and Rural Districts and as-of-right in its Retirement Community District.[320] The maximum number of dwelling units permitted in a clustered development may not exceed the density allowed in the zoning district where the parcel is located. The town's cluster-development provision requires that a minimum of 30% of the total land area be dedicated as common open space. To ensure that the open space remains undeveloped, title to the open space must be deeded to a neighborhood association, the town, or to a conservation organization. The regulations require that the development be situated so as to minimize alteration of the parcel's natural features and to protect the surrounding landscape and the character of adjacent development.

Durango, Colorado[321]

The City of Durango's Land Use and Development Code stipulates that the layout of residential cluster neighborhoods should promote the character of the zone in which they are located and be designed to protect significant natural, historic, or archeological resources. Among other requirements, the cluster development must be designed to emphasize the protection of natural resources and meaningful open space, including that buildings shall be located to provide contiguity of common open space, resource protection areas, and agricultural lands (if present). Lot lines and lot areas must be established to provide for the most appropriate conservation of the open space areas of the development. Additionally, the provision's design standards include a requirement for cluster residential neighborhoods to have a defined conservation objective or combination of objectives based on either protecting priority resources (such as water) or providing a large common open space amenity (such as community gardens).

Cluster regulations also may encourage or require buildings to be closer to the street, which reduces the lengths of connecting utilities to serve them. These are design techniques that create water conserving

318 N.H. Rev. Stat. Ann. §674:21, http://www.gencourt.state.nh.us/rsa/html/lxiv/674/674-21.htm.

319 Town of Peterborough, N.H., Code §245-26(A) Open Space Residential Development, https://www.townofpeterborough.com/vertical/sites/%7B792D537E-D69C-464A-80FB-790917F72F17%7D/uploads/Chapter_245_Zoning_Ordinance_May_2018.pdf.

320 Town of Peterborough, N.H., Code §245-11.2, https://www.townofpeterborough.com/vertical/sites/%7B792D537E-D69C-464A-80FB-790917F72F17%7D/uploads/Chapter_245_Zoning_Ordinance_May_2018.pdf.

321 City of Durango, CO, Land Use and Development Code § 4-1-3-5 Cluster Development (2014), http://online.encodeplus.com/regs/durango-co/doc-viewer.aspx?secid=298#secid-298.

patterns and building types, reduce water infrastructure costs, and reduce water lost in delivery (as discussed in more detail in *Chapter 3, Working Together*). Some developers see financial advantages to cluster subdivisions because, by placing the buildings closer together and closer to infrastructure, there is a cost savings on expenditures for roadways, sidewalks, water and sewer extensions, and other onsite infrastructure. Such benefits to developers have been upheld by the courts as incidental and do not reduce the valid public purpose of providing for open space, water conservation, recreation, and a host of other community gains.

EXAMPLE OF REDUCING WATER INFRASTRUCTURE COSTS THROUGH CLUSTERING

South Brunswick, New Jersey

In response to an increasing number of housing developments, South Brunswick, New Jersey, adopted a cluster-development ordinance that was challenged in *Chrinko v. South Brunswick Township Planning Board*.[322] The ordinance allowed a subdivision developer to reduce a minimum lot size by 20% or 30% and minimum frontages by 10% or 20% if the developer deeded 20% or 30% of the subdivided tract for parks, school sites, and other public purposes. The purpose of this provision — innovative when it was first adopted — was to provide a method for development of residential land to preserve desirable open spaces, school sites, recreation and park areas, and land for other public purposes. The plaintiffs claimed that the ordinance was enacted to benefit the developer and not to accomplish the stated purpose of the zoning enabling statute. The court held that giving developers the option of using cluster development reasonably advanced the legislative goal of providing for open space even if the developer derives an incidental benefit — such as lower costs of development for street and utility installation.

State law varies widely regarding clustering. Some states do not allow localities to cluster at all; some allow it only if the developer volunteers to cluster; others permit incentives for developer compliance; and in others, clustering can be a requirement.[323] For example, some state statutes allow localities to provide applicants with an incentive for the clustering by increasing the otherwise allowable density in exchange for the provision of open space. Under this arrangement, if the developer would normally have been permitted to create 40 lots in a traditional plat, the applicant with a cluster plat may be able to site 44 lots. The local subdivision review agency, usually a planning board or commission, may impose conditions on its approval of a clustered subdivision regarding a variety of measures including water conserving landscaping and interior facilities. The use of bonus density incentives (discussed later in Section 7(e) "Incentivize Water Conservation through Bonus Density Zoning") can both encourage developers to use clustering, where it is not required, and to implement highly effective water conservation measures both on the land and inside the buildings.

322 Chrinko v. South Brunswick Twp. Planning Bd., 187 A.2d 221 (N.J. 1963).

323 None of the states in the interior West explicitly prohibit cluster development laws. Arizona, Nevada, New Mexico, Utah, and Idaho make no mention of clustering while Colorado, Colo. Rev. Stat. § 30-28-401, Montana, Mont Code § 76-3-509, and Wyoming, Wyo. Stat. § 18-5-402(a)(ii), explicitly allow cluster development.

EXAMPLE OF OPEN SPACE INCENTIVE IN CLUSTER ORDINANCE

Milton, New York

The Town of Milton's cluster subdivision ordinance offers an "open space incentive option" that authorizes the planning board to increase the maximum density in the Town's R-2 zoning district. The planning board may increase the number of permitted residences by 50% on properties greater than 10 acres if 50% of the land becomes permanently protected open space.[324]

iii. Create Standard Uses with Water Consumption Qualifiers

Communities might consider amending uses within their districts and schedule of permitted uses to include water conservation qualifiers, permitting such uses as-of-right in appropriate districts while requiring special permits for their nonconserving counterparts. For example, a community's schedule of permitted uses may include such uses as civic, recreational, personal and business services, and light manufacturing. The local government could separate its "personal and business services" use into two uses: "*personal and business services with an average daily water consumption of X gpcd or less*" and "*personal and business services, other*" and could require a special permit for the latter use in some districts.

EXAMPLE OF USES WITH WATER CONSUMPTION QUALIFIERS

Dutchess County, New York[325]

Dutchess County, NY, developed a Model Water Resource Management Zoning Ordinance for the protection of groundwater resources to be used by municipalities[326] within its jurisdiction as a complement to existing local water resource protection laws and to fill gaps in State or Federal programs in order to achieve full watershed management protection. Based on discussions with community members and legal and hydrologic experts, the ordinance is designed in two versions to be adopted either with equal protections community-wide (as in Version II) or with some general community-wide protections paired with heightened standards in high-priority areas (as in Version I, which requires the community to identify and map priority water protection areas — i.e., present or future high-capacity areas).

Under both versions of the model ordinance, any uses and land subdivisions where water consumption exceeds natural recharge are allowed only by special permit (except in the case of conflicting state or federal regulations, which control), leaving uses and land subdivisions where consumption is less than or equal to natural recharge to be permitted as-of-right based on the underlying zoning. The recharge rate is to be calculated using the ordinance's stipulated

324 Town of Milton, NY, Zoning Code §§ 180-30, Open Space Incentive Option, http://ecode360.com/9165132#9165132.

325 *Water and Wastewater Issues, Model Aquifer Protection Laws*, Dutchess County, NY, http://www.dutchessny.gov/CountyGov/Departments/Planning/16891.htm (last visited December 31, 2017).

326 Since its creation in 2009, the model ordinance has been adopted by four communities in Dutchess County, NY. The Town of Philipstown adopted the ordinance in full, while the towns of Dover, Amenia, and Pleasant Valley adopted modified versions. Telephone interview with the ordinance's author, Russell Urban-Mead, Principal, The Chazen Companies (May 10, 2018).

water budget methods. The ordinance sets forth conditions for the issuance of a special permit, including a requirement that projects demonstrate, as part of the required environmental review process, how the water budget and water-quality impacts will be mitigated. The ordinance also bolsters the community's existing special permit application requirements, adding that applicants must identify, among other things, the source of the water being used, water quantity required, water-use minimization measures to be implemented, water-recycling measures to be implemented, and measures used to enhance onsite recharge.

Although this example does not create a new water conserving use to be allowed as-of-right, as recommended by the narrative, but rather a water-intensive use requiring a special permit, it is offered because of its parallel nature to the concept recommended, displaying a local action to alter the classification of a use based upon its impact on water resources.

b. Foster Water Efficient Densities by Permitting Accessory Dwelling Units

ADUs are an important option for developed communities looking to increase density without altering neighborhood character. Some communities have adopted zoning provisions that allow single-family homeowners to establish a second, accessory living unit in their houses, under a variety of conditions.

Accessory uses, by definition, are uses of land that are found on the same lot as the principal use and are subordinate, incidental, or supplemental to the principal use and customarily found in connection with the principal use. Generally, zoning laws state that lot owners may use their land for a permitted principal use and for activities that are accessory to that use. By permitting uses customarily incidental and subordinate to the principal activity, zoning ordinances allow property owners additional beneficial use of their property. While there is no specific delegation of power to local governments to provide for accessory uses, they have authority under state enabling statutes to regulate land under the police power. This is a broad authority designed to promote public health, safety, morals, and general welfare. Zoning laws that regulate accessory uses are generally valid so long as they promote these goals (unless the state has explicitly restricted their ability to permit that accessory use). Since the regulation of accessory uses promotes harmony of land use within regulated districts, it is permissible pursuant to the police power.

Local governments may permit ADUs as-of-right in residential neighborhoods to foster an element of the land use patterns discussed in this Guidebook that conserve water, which include higher-density, single-family homes on small lots, directed toward existing infrastructure — all while maintaining compatibility with the surrounding neighborhood.

While some strategies in this Chapter assume that communities are able to balance density with open space, permitting ADUs is a way for communities with limited land to grow without sprawling outwards and while still maintaining neighborhood character. A zoning code amendment to this effect could permit an ADU as accessory to a primary, single-family unit with additional limitations to maintain residential character, such as:

- Owner occupancy of either the primary or accessory unit
- A limitation on the number of accessory units permitted per lot (typically one)
- A maximum floor area for the accessory unit
- A maximum height where the accessory unit is detached
- Standards regarding the placement and appearance of external stairways when needed to access the

accessory unit
- Standards related to the exterior appearance of the accessory unit, including a prohibition on exterior alterations that would affect the residential character of the property
- Standards related to parking and other exterior evidence of the accessory unit

Local governments should note that water providers might charge an additional tap connection fee instead of considering an accessory dwelling to be an expansion of an existing tap, even where the structure was existing and no new infrastructure is needed. This fee could make the accessory unit cost-prohibitive for the homeowner. Communities interested in encouraging ADUs as a method to increase density might consider working closely with water providers on this effort. Some water providers are moving toward conservation-oriented tap fees, which are linked to anticipated demand (annual volume) instead of only peak flow. These tap fees can then be connected to water budgets to ensure that the anticipated volume is adhered to. In anticipating demand, however, water providers currently consider factors such as anticipated water fixture efficiency and landscaping demands. For a water provider, setting appropriate rates and tap fees to recover cost of service is an important and complex process. Land planners can work with water planners to encourage consideration of other factors that affect their fee- and rate-setting financial models, such as the idea of recovering costs for new water infrastructure based on how compact the new development is and how much infrastructure is required to service that new development. Similarly, water providers can consider reduced water loss from compact development. Moreover, ADUs in existing structures create no additional landscaping requirements and those that are newly constructed on a previously landscaped area may actually reduce outdoor water use, which offsets the increased indoor use and, more importantly, reduces peak flow demands that would result from outdoor summer watering. ADUs present an opportunity for a water provider to bring in additional revenue from the moderately increased use (if any) at the site without significant additional costs for extending infrastructure or performing ongoing water loss control (such as infrastructure maintenance, auditing, loss tracking, leak repair) and with reduced real water loss (were those dwelling units accommodated in a less compact fashion). This reduced or waived tap fee could be viewed as a density bonus of a kind that incentivizes more compact development versus sprawl. (See Chapter 3, *Working Together*, for more information on the water savings from compact development.)

EXAMPLE OF INCREASING DENSITY THROUGH ACCESSORY DWELLING UNITS

Lakewood, Colorado[327]

The City of Lakewood amended its zoning code to allow for ADUs in an effort to permit "mother-in-law apartments" as well as to quickly allow for additional density while maintaining community character.[328] The City's ordinance permits a primary single-family dwelling unit on a lot of at least 9,000 square feet to have one accessory unit so long as either the primary or accessory unit is occupied by the property owner and so long as the accessory unit is located to the side or rear of the primary unit, with no more than one bedroom, a maximum of 700 square feet of gross floor area, a maximum height of 30 feet (if detached), and an exterior that is similar in appearance to the primary unit and maintains the residential character of the property. If located on a second floor or above a garage, the accessory unit may have a separate external stairway, so long as it is not on the street-facing façade.

Since the code amendment, the City has received and approved significantly fewer accessory units than anticipated, discovering that when homeowners would contact the water providers to expand their existing tap, the water providers would charge tap fees as if the accessory unit were a new home (regardless of whether the structure and infrastructure were already existing), making the project cost-prohibitive.[329] The City has numerous water providers and most require separate taps for separate structures.[330]

c. Incorporate Water Conserving Uses into Conditionally Permitted Uses and Conditionally Permit Water-Intensive Uses Upon Water Conservation Measures

Zoning also allows communities to single out some land uses that are allowed in designated zoning districts only after an individualized determination that they are compatible with the surrounding neighborhood based upon specified standards. These are called conditional uses and are permitted by the issuance of a special or conditional use permit. The zoning code sets forth the specific standards under which the use will be permitted. Local governments may use special-use permits to further water conservation in two main ways:

- First, if a local government is uncomfortable with allowing certain water conserving land uses as-of-right (in the manner described in Section 7(a) of this Chapter — *see* "Incorporate Water Efficient Uses and Development Patterns into As-of-Right Permitted Uses"), then it may designate them as conditional uses, which subjects them to more intense planning commission review and

327 City of Lakewood, CO, Municipal Code §17.4.3.1(A) Purpose and Applicability (2015), http://www.lakewood.org/City_Clerk/Codes_and_Laws/Municipal_Code/Title_17_-_Zoning/Article_4_-_Uses_and_Supplemental_Standards/17_4_3_-_Supplemental_Standards/2147506011/.

328 Lakewood Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015); email interview with Henry Hollender, Principal, HVS Engineering, Member-at-Large, Lakewood Planning Commission and Board of Adjustments (April 11, 2016).

329 Lakewood Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

330 Email interview with Henry Hollender, Principal, HVS Engineering, Member-at-Large, Lakewood Planning Commission and Board of Adjustments (Sept. 16, 2016).

the imposition of conditions that ensure that they are appropriate in the neighborhood. In existing single-family neighborhoods, for example, small-lot attached homes or small multifamily housing can be permitted as conditional uses, which gives the planning commission an opportunity to review each project more carefully and to impose specific conditions to mitigate any adverse impacts of the project on the surrounding neighborhood.

EXAMPLE OF CONDITIONALLY PERMITTING WATER CONSERVING USES

Richland, Washington[331]

Richland's residential zoning districts include a medium-density residential small-lot (R-2S) zone that permits higher densities and encourages small-lot development conducive to energy conservation and affordable housing units (and, incidentally, water conservation). In order to assure consistency with the R-2S district and to avoid potential negative effects of the rezoning or reclassification of land, an applicant must include in their application for preliminary plat approval a street landscaping plan, information showing the dimension and character of open space, and appropriate design solutions in modifying possible interference with the surrounding neighborhoods. The Planning Commission and City Council may impose requirements and conditions on the preliminary plat approval or rezoning classification that include, but are not limited to, architectural design parameters, screening and buffering treatments, and supplemental open space. In furtherance of this neighborhood design, multifamily zoning districts that abut a single-family zoning district must follow certain buffer, setback, and building-height regulations in order to blend in with the surrounding neighborhood.

Raleigh, North Carolina[332]

Raleigh has included Cluster Unit Developments as a conditionally permitted use in many of its residential districts. Defined as planned residential developments, the development may include townhouses, condominiums, group housing, and multifamily developments. The size of the development varies depending on the District's permitted density, but it may require a minimum of 10 or 20 acres of open space.

- Second, a local government could use special use permits to restrict water-intensive uses in order to examine a use's impact on a case-by-case basis before granting approval and to ensure that conditions will be met that reduce that impact. Examples of such conditions include limiting hours, days, and manner of certain operations; design features that minimize adverse environmental impacts; and requiring specific landscaping and drainage to reduce water waste.[333] Depending upon the district, communities might include the efficient use of water resources in the zone's stated objectives within the regulation, bolstering the imposition of conditions related to water.

331 City of Richland, WA, Municipal Code, § 23.18.20 Residential Zoning Districts, http://www.codepublishing.com/WA/Richland/mobile/?pg=Richland23/Richland2318.html#23.18.

332 City of Raleigh, NC *Permitted Land Uses In Zoning Districts*, https://library.municode.com/nc/raleigh/codes/unified_development_ordinance?nodeId=02-Raleigh-Residential (last visited January 13 2015); City of Raleigh, NC, Planning and Development/United Development Ordinance (UDO) §10-2101 Cluster Unit Development Regulations, https://www.raleighnc.gov/content/PlanDev/Documents/Inspections/Admin/TechnicalBulletins/Cluster%20DevelopmentTechBulletin.doc.

333 City of Bend, OR, Bend Development Code, § 4.4.400(c)(7) (2006), http://www.codepublishing.com/OR/Bend/html/BendDC04/BendDC0404.html.

EXAMPLES OF CONDITIONALLY PERMITTING WATER-INTENSIVE USES

Kiowa, Kansas[334]

The City of Kiowa, Kansas, classifies greenhouses, nurseries, and/or hydroponic farms operated as a retail business as conditionally permitted uses. As a result, they must be reviewed and must receive a conditional use permit. This allows the City to examine the impact the use will have and may allow the City to place certain restrictions on the operation of the facility.

Gray County, Kansas[335]

Gray County Kansas identifies certain conditionally permitted uses including strip malls and multifamily residential dwellings. These uses will be permitted if a review is conducted and it is demonstrated that there is adequate water and other infrastructure for the use.

Dutchess County, New York[336]

Under Dutchess County's Model Water Resource Management Zoning Ordinance — created for municipalities337 within its jurisdiction to adopt for the protection of water resources — any uses and land subdivisions where water consumption exceeds natural recharge are allowed only by special permit (except in the case of conflicting state or federal regulations, which control). The recharge rate is to be calculated using the ordinance's stipulated water budget methods. The ordinance sets forth conditions for the issuance of a special permit, including a requirement that projects demonstrate, as part of the required environmental review process, how the water budget and water-quality impacts will be mitigated. Mitigation measures may include identifying compensatory recharge to permanently prevent adverse impacts to the water supply. The ordinance also bolsters the community's existing special permit application requirements, adding that applicants must identify, among other things, the source of the water being used, water quantity required, water-use minimization measures to be implemented, water recycling measures to be implemented, and measures used to enhance onsite recharge.

d. Adopt Review Criteria for Rezonings Based on Water-Supply Impact

An alternative to broadly rezoning lands to one or more water conserving uses or to conditionally permitting those uses is to rezone parcels, one at a time, by using an adopted policy that conditions such rezonings on water conserving practices. The rezoning can be extraordinarily valuable for the landowner by providing more density and profit than the existing zoning. This value can be leveraged to accommodate the water conservation needs of the community. Such individual parcel rezoning should be

334 City of Kiowa KS Zoning Regulations, §§ 19-101-11(2011), http://www.kiowaks.org/wp-content/uploads/2018/07/Zoning-and-Subdivision.pdf.

335 Gray County, KS, Zoning Regulations Art. 14 §14-101, http://www.grayco.org/LinkClick.aspx?fileticket=qmNRAFuBWn4%3D&tabid=4741&mid=6896.

336 *Water and Wastewater Issues, Model Aquifer Protection Laws*, Dutchess County, NY, http://www.dutchessny.gov/CountyGov/Departments/Planning/16891.htm (last visited December 31 2017).

337 Since its creation in 2009, the model ordinance has been adopted by four communities in Dutchess County, NY. The Town of Philipstown adopted the ordinance in full, while the towns of Dover, Amenia, and Pleasant Valley adopted modified versions. Telephone interview with the ordinance's author, Russell Urban-Mead, Principal, The Chazen Companies (May 10, 2018).

done in conformance with the comprehensive plan to reduce the chance that it will be challenged as spot zoning.

Local governments can adopt review criteria for amendments to their official zoning map. Within these criteria, they can include a requirement to make findings related to a rezoning's impact on water resources and a requirement to mitigate that impact.

In some rezoning instances, such as changing from a nonindustrial, commercial use to a multifamily residential use, water demand for a site could increase. In most communities looking to accommodate growth, this change in a particular site's anticipated water demand should not be a deterrent to such zoning changes because the alternative, sprawling development pattern would be far more water intensive in terms of both onsite use and water loss. (See Chapter 3, *Working Together*, for more information on the water savings from compact development.) Communities facing a supply-demand gap, however, may have to more carefully consider the impact of a change in use, especially where their water-supply planning is closely linked to the specific growth anticipated by their comprehensive plan and zoning code. Where the water utility is under the control of the local government, communities could consider granting rezonings without adjusting a site's existing water budget. This method would essentially act as a performance-based approach — putting the onus on the property owner to innovate and determine how to reduce a project's demand in order to meet the water budget. Where the water utility is a separate entity, communities may work together to develop mechanisms for accommodating growth and rezoning requests within existing water budgets.

EXAMPLES OF CODE PROVISIONS INCORPORATING WATER AS A FACTOR IN REZONINGS

Española, New Mexico

Under the Española Zoning Code's "Review Criteria for Amendments to [the] Official Zoning Map," the Planning Commission and the City Council, in conjunction with applications to rezone properties, must make findings regarding the impact of the project on the community and may add conditions to the rezoning to ensure that those impacts are mitigated. In making these findings, consideration must be given to the existing and programmed capacity of onsite and off-site public services including water.[338]

Westminster, Colorado

Westminster's Comprehensive Plan[339] is highly detailed and is adopted by ordinance, not by resolution, making compliance with the Plan a legal requirement.[340] (In Colorado, a comprehensive plan can be a binding regulatory document if the local legislature adopts it as such by way of land development regulations, which does not happen often.[341]) Under the Plan,

338 City of Española, NM, Zoning Code § 404(3), Review Criteria for Amendments to Official Zoning Map, http://www.ecode360.com/14542582.

339 City of Westminster, CO, Comprehensive Plan (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

340 City of Westminster, CO, Ordinance No. 2475 (1997). *See also*, City of Westminster, CO, Comprehensive Plan 94 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

341 Colo. Rev. Stat., §§ 30-28-106(2)(a), 31-23-206(1).

the extent of water use is a key consideration in the location, type, and intensity of land uses and development within the City.[342] The City's Comprehensive Water Supply Plan (CWSP) evaluates the current water-supply projection and projected water demands based on the Comprehensive Plan in order to quantify any expected deficits or surpluses, and the Comprehensive Plan notes that, as such, new development will be evaluated based on projected impacts to the City's water supply.[343] Because the City's water-supply projections are so closely linked to its designated land uses, the City must identify the potential change in water demand that would result from any proposed decision to change a land use from what is currently permitted under zoning.[344]

Over the past decade, there has been a trend at the local level for communities to require new development and substantial renovations to comply with green development standards contained in third-party certification systems. Many of those systems have water conservation standards, which, if complied with, can yield points toward certification. Local governments can adopt rezoning policies requiring applicants for a rezoning to comply with the water conservation standards in these rating systems.

EXAMPLE OF GREEN BUILDING STANDARDS WITH WATER AS A FACTOR IN REZONINGS

Vancouver, British Columbia, Canada[345]

Vancouver's Green Buildings Policy for Rezonings requires all buildings applying for rezoning to meet requirements for one of two possible compliance paths: (1) Near Zero Emissions Buildings or (2) Low Emissions Green Buildings. Under the second compliance path, nonresidential buildings must commit to achieving Gold-level green building certification under the LEED Building Design + Construction (BD+C) rating systems, which include water efficiency requirements. In addition, all buildings (including residential) opting for the second compliance path must meet the City's requirements for Integrated Rainwater Management and Green Infrastructure.

Under the LEED Gold certification requirements, projects are required to, at a minimum: (A) reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period or by reducing the project's landscape water requirement by at least 30% from the baseline for the site's peak watering month (calculated with the EPA's WaterSense Water Budget Tool); (B) use indoor plumbing fixtures that are WaterSense–labeled (where eligible) and that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline; and (C) install permanent water meters

342 City of Westminster, CO, Comprehensive Plan 28 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

343 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

344 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

345 City of Vancouver, Green Buildings Policy for Rezonings (2017), http://guidelines.vancouver.ca/G015.pdf.

that measure the total potable water use for the building and associated grounds (and compile data summaries monthly and annually for five years). In addition to these prerequisites, projects must achieve 60–79 credits. Water conservation credits in the rating system include further reductions in outdoor water use; further reductions in indoor plumbing fixture and fitting water use (can be met by using alternative water sources); permanent water metering for two or more water subsystems (irrigation, indoor fixtures, reclaimed water, or others); and a potable water analysis for cooling towers and evaporative condensers.[346]

Under the City's requirements for Integrated Rainwater Management and Green Infrastructure, rezoning applicants must select and demonstrate measures for the management of the site's rainfall through integrated rainwater management and green infrastructure, as described in the Citywide Integrated Rainwater Management Plan (IRMP), which includes specific targets and examples of green infrastructure for rainwater management. City staff will work with the applicant early in the process to identify opportunities on private and public property for implementation of best practices and demonstration projects in proximity to the site. A completed site IRMP must include calculations by a qualified professional documenting how the planned gray and green measures perform compared to the Citywide targets. For projects pursuing LEED v4, the City considers project calculations created to demonstrate achievement of the Rainwater Management credit and reporting of the site design results, as acceptable to meet the intent of this requirement.[347]

e. Incentivize Water Conservation Through Bonus Density Zoning

Bonus density zoning can be used to accomplish a wide range of objectives and is appropriate for use in growth areas as well as conservation areas. As noted in Section 7(c) of this Chapter (*see* "Incorporate Water Conserving Uses into Conditionally Permitted Uses & Conditionally Permit Water-Intensive Uses Upon Water Conservation Measures"), developers can be awarded additional density over that allowed as-of-right in exchange for implementing water conservation practices such as xeriscaping, water efficient plumbing fixtures, or even water-recycling facilities. Additional density may come in the form of additional dwelling units, increased FAR, relaxed requirements for minimum lot size, lot width, setback, parking, height limitations, and the like — all of which can translate into significant additional profit for the developer. With multifamily residential, for example, the additional (bonus) units are cheaper to build because the cost of the land and the infrastructure serving the overall project is already absorbed by the as-of-right units. Part of the newly created additional profit can be redirected into the project by having developers pay for water conservation practices and capital facilities that they would normally resist, while still allowing the developer increased financial reward.

In addition, bonus density zoning can be used to increase the development potential on infill sites or parcels in priority growth districts. Such sites may bring with them the costs of upgrading existing water and other infrastructure or providing needed green infrastructure or other amenities off site to soften the impact of the higher density. State law may permit bonus densities to be used to incentivize developers

346 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction 51-63 (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

347 City of Vancouver, Green Buildings Policy for Rezoning – Process and Requirements (2017), http://bylaws.vancouver.ca/Bulletin/G002_2017April28.pdf.

to provide these off-site amenities or to pay a fee-in-lieu of providing them that can be used by the community to provide needed improvements in and around the affected buildings.

Bonus density zoning works in conjunction with the underlying zoning. In a multifamily zone, for example, allowing 20 dwelling units per acre, the bonus provision can give the developer a 10% bonus, or two additional units, in exchange for providing delineated water conserving benefits needed by the community. This means that the underlying zoning must permit land uses and building types that are water conserving and appropriate for the neighborhood. The first step in getting this done correctly is to adjust the underlying zoning, then to add additional density as a bonus for the kinds of water conserving measures desired.

EXAMPLES OF BONUS DENSITY ZONING TO INCREASE WATER EFFICIENCY

Ashland, Oregon[348]

The City of Ashland has five zones within its Croman Mill District: Neighborhood Commercial, Mixed Use, Office Employment, Compatible Industrial, and Open Space. Applicable within all of its Croman Mill District zones, the City's land use code includes requirements for a potable water-reduction and a compact development pattern and also offers density bonuses for green buildings (which include water efficiency standards).

Specifically, the district's site development and design standards require that development plans preserve water quality and natural hydrology. Conserving natural water systems, in addition to the requirements in the City's Water Resources Overlay, will be considered in the site design within the district. The standards also require that development plans provide water efficient irrigation designs that reduce the use of potable water used for irrigation by at least 50% of the baseline. Methods used to accomplish this requirement may include, but are not limited to, plant species selection; irrigation efficiency; proper scheduling; and use of captured rainwater, recycled water, greywater, and/or water treated for irrigation purposes and conveyed by a water district or public utility.

Finally, the standards allow density bonuses to be awarded for projects that will achieve LEED green building certification, with height allowance increased based upon the level of certification achieved (one-story bonus for LEED Silver and two stories for Gold, or a 40-foot height bonus for either Silver or Gold certification for projects within the City's Residential Buffer overlay). Under LEED certification requirements, projects are required to, at a minimum: (1) reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period or by reducing the project's landscape water requirement by at least 30% from the baseline for the site's peak watering month (calculated with the EPA's WaterSense Water Budget Tool); (2) use indoor plumbing fixtures that are WaterSense labeled (where eligible) and that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline; and (3) install permanent water meters that measure the total potable water use for the building and associated grounds (and compile data summaries monthly and annually for five years). In addition to these prerequisites, projects must achieve 50–59 credits for Silver level certification or 60–79 credits for Gold-level

348 City of Ashland, OR, Land Use Ordinance, §§ 18.3.2.060(C)(1), (8), (13), Croman Mill District Site Development and Design Standards (2011), https://ashland.municipal.codes/LandUse/18.3.2.060.

certification. Water conservation credits in the rating system include further reductions in outdoor water use, further reductions in indoor plumbing fixture and fitting water use (can be met by using alternative water sources), permanent water metering for two or more water subsystems (irrigation, indoor fixtures, reclaimed water, or others), and conducting a potable water analysis for cooling towers and evaporative condensers.[349]

Asheville, North Carolina[350]

Asheville, North Carolina, adopted requirements and zoning incentives for sustainable development projects, which the City allows by-right — subject to special requirements — in several of its zoning districts, including certain residential multifamily, office, business, institutional, and commercial industrial districts. The development incentives relax density, minimum lot size, lot width, setback, parking, and height requirements in exchange for sustainable development amenities, which include:

- A density bonus for projects that feature green building amenities (including water efficiency measures for the building and site), infill and brownfield development, proximity to mixed uses and housing types, proximity to transit, and several other specified features.[351] Density bonus size depends on the project's total accumulation of points from the City's "Sustainable Development Projects Bonus Evaluation Form" created by staff.
- A 30% reduction in minimum lot size, lot width, and setback requirements for single-family structures in a new single-family subdivision if the following is accomplished:
  - Dedicated community open space is provided at a minimum rate of 500 square feet per unit. Community open space areas must be maintained for the benefit of the entire community and must be accessible by all units in the community either directly or by a sidewalk or trail system, and/or
  - The subdivision is within 300 feet of a public park where a connection is provided by sidewalk or greenway.[352]
- A 25% reduction in off-street parking requirements if one of the following is accomplished:
  - At least 60% of the units are affordable (as defined by the City of Asheville) and if the City's traffic engineer and planning director determine that adequate on-street parking is available within a 100-foot radius to offset the balance of spaces needed.
  - At least 60% of the units are one-bedroom or efficiency apartments.[353]
- An extension of height maximums by an additional 10 feet if 100% of the units are affordable or the project achieves LEED Silver or higher.[354]

349 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction 51-63 (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

350 City of Asheville, NC, Code of Ordinances, § 7-16-1 et seq., Uses by Right, Subject to Special Requirements (2010), https://www.municode.com/library/nc/asheville/codes/code_of_ordinances?nodeId=PTIICOOR_CH7DE_ARTXVIUSRISUSPRECOUS_S7-16-1USRISUSPRE.

351 Affordable housing, on-site renewable energy systems, and/or energy efficiency technologies.

352 City of Asheville, NC, Code of Ordinances, § 7-16-1(F)(2), https://www.municode.com/library/nc/asheville/codes/code_of_ordinances?nodeId=PTIICOOR_CH7DE_ARTXVIUSRISUSPRECOUS_S7-16-1USRISUSPRE.

353 City of Asheville, NC, Code of Ordinances, § 7-16-1(F)(3), https://www.municode.com/library/nc/asheville/codes/code_of_ordinances?nodeId=PTIICOOR_CH7DE_ARTXVIUSRISUSPRECOUS_S7-16-1USRISUSPRE.

354 City of Asheville, NC, Code of Ordinances, § 7-16-1(F)(4), https://www.municode.com/library/nc/asheville/codes/code_of_ordinances?nodeId=PTIICOOR_CH7DE_ARTXVIUSRISUSPRECOUS_S7-16-1USRISUSPRE.

- A 30% reduction in lot size, lot width, and setback requirements if the project seeks no density bonus and meets Bronze (or higher) LEED certification or NC Healthy Built Homes certification.[355]

Water conservation elements contained in the LEED rating system at the time of the ordinance's adoption included the use of water efficient landscaping, installation of innovative wastewater technologies, and employment of strategies that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline (not including irrigation).

Suffolk, Virginia

The City of Suffolk, Virginia, uses incentive zoning to conserve natural resources. Located in the southeast corner of the state along the James River, the City contains extensive woods, lakes, rivers, and rolling terrain. Under Suffolk's incentive zoning ordinance, developers may receive density bonuses — in some instances up to 140% of the existing density — in exchange for providing a variety of public amenities. Density bonuses may be provided for the creation of public parks; the preservation of open space, agricultural land, or critical environmental areas; the construction of retirement housing; the redevelopment of existing commercial strip centers; the construction of traditional neighborhood development; or clustering. Determination of the density bonus is based upon a formula established under the City's Unified Development Ordinance.[356] This protection of open space combined with higher density in appropriate areas contributes to an overall development pattern that promotes water efficiency and resource protection.

Cranford, New Jersey[357]

Cranford's sustainable building standards ordinance applies green building measures to encourage the conservation of water and other resources. To accomplish this and other goals, the ordinance adopts the use of LEED for municipally funded facilities — whether they are existing buildings, new buildings, or major renovations, and it encourages potential developers seeking redeveloper status through a redevelopment agreement to also use the LEED rating systems. To encourage formal LEED certification, the ordinance:

- Establishes a Green Building Density Incentive Program that allows redevelopers to request the density incentive if the project is located in a statutorily created redevelopment area and anticipates LEED Certification at any level (Certified, Silver, Gold, or Platinum). The scale of the incentive varies based upon the project and the level of LEED certification sought.
- Requires that this program be incorporated in the Redevelopment Agreement, and that the redeveloper include a LEED Accredited Professional (LEED AP) on the project team.

Water conservation elements in the LEED rating system at the time of the ordinance's adoption included the use of water efficient landscaping, installation of innovative wastewater technologies, and employment of strategies that reduce water use by a minimum of 20%.

355 City of Asheville, NC, Code of Ordinances, § 7-16-1(F)(5), https://www.municode.com/library/nc/asheville/codes/code_of_ordinances?nodeId=PTIICOOR_CH7DE_ARTXVIUSRISUSPRECOUS_S7-16-1USRISUSPRE.

356 *See* City of Suffolk, VA, Unified Dev. Ordinance §31-409.

357 Township of Cranford, NJ, Code § 106 (2005), https://www.ecode360.com/11248541.

f. Use Planned Unit Development Regulations to Foster Water Conservation

PUDs offer great flexibility for local governments to negotiate project details with developers. As a general matter, they allow the local legislative body to rezone large parcels of land for various uses including those described in the introduction to this Chapter as water conserving: multifamily, attached homes, small-lot single-family, or any combination of those uses. In many states, including Colorado,[358] Nevada,[359] and Idaho,[360] PUDs are permitted under state statutes. These statutes prescribe what PUDs are and how they may be created. In some states, however, PUDs are not explicitly permitted by state statute but may be permitted by the general delegation of zoning authority. [361]

PUDs can advance a number of important smart growth and sustainability objectives by allowing degrees of flexible and creative planning and site design strategies. Encouragement of land use efficiency and high-density development in the creation of a PUD district may further advance water conservation and smart land use patterns and strategies.

EXAMPLE OF WATER EFFICIENT DEVELOPMENT PATTERNS IN PUD ZONING

Castle Rock, Colorado

Castle Rock's Planned Development District[362] establishes architectural, landscaping, design, building, use, and site development regulations that encourage compatible land uses and ensure higher quality development. These criteria encourage quality development through the use of a variety of design and site techniques while continuing to provide for a wide range of economic development. The ordinance specifically states the goal to preserve, to the greatest extent possible, the existing landscape features and amenities and to use features already provided in a harmonious fashion. The land use patterns that accompany the Planned Development can reduce water demand and be used as a tool to achieve water conservation goals. Among the listed purposes of the District are the following, which could be relied upon to encourage water efficient, mixed-use development in priority growth areas:

- To permit diversification and innovation in community development while maintaining public safety, convenience, health, and general welfare
- To preserve to the greatest extent possible the existing landscape features and amenities and to utilize such features in a harmonious fashion
- To promote the efficient use of land to facilitate a more economic arrangement of buildings, circulation systems, and utilities
- To promote flexibility in design and permit planned diversification in the location and use of structures
- To provide for necessary commercial, recreational, employment, and educational facilities conveniently located to housing

358 Colo. Rev. Stat. §§ 29-20-301 *et seq*.

359 Nev .Rev. Stat. § 278A.065 *et seq*.

360 Idaho Code § 67-6515.

361 Examples of the zoning enabling authority for states in the interior West can be found in: Arizona, Ariz. Rev. Stat. § 9-462.01; New Mexico, N.M. Stat. § 3-21-1; Utah, Utah Code §10-9a-501; Wyoming, Wyo. Stat. § 18-5-201; and Montana Mont. Code § 76-2-301.

362 Town of Castle Rock, CO, Municipal Code, § 17-32, PD Planned Development District, (2012), https://www.municode.com/library/co/castle_rock/codes/municipal_code?nodeId=TIT17ZO_CH17.32PDPLDEDI.

Generally, PUDs may be established by passing legislation that sets forth the standards, procedures, and conditions for a PUD in that jurisdiction. Local and county governments can integrate a wide variety of conservation measures into PUDs. As part of the approval process, they can negotiate a development guide, prepared by the developer, which could specify interior and exterior water conservation standards. PUDs can allow or require water conservation through features and design elements not required by existing zoning such as:

- Individual rainwater harvesting systems
- Enhanced open space
- Large-scale green infrastructure
- Xeriscape features
- Greywater systems

In addition to these traditional land use requirements, the local government could coordinate with its water provider(s) to facilitate further conservation. A PUD regulation or negotiated agreement could require additional conservation elements such as a particular kind of tap fee or water budget rate structure, but only if the utility has them in place first. Making a link to the water provider's finance tools could be a valuable step in fleshing out a community's PUD requirements to further water conservation.

PUDs also give the local government an opportunity to align development potential with available water supply (similar to subdivision standards, addressed in Chapter 8). Some states even mandate that local governments require a demonstration of adequate water supply for developments of a certain size — this requirement often applies to PUDs as well as other forms of development.

EXAMPLES OF ALIGNING PUDS WITH AVAILABLE WATER SUPPLY

Parker, Arizona[363]

Parker's code requires that the final development plan for Planned Area Development includes a certificate of assured 100-year water supply.

Eloy, Arizona

Eloy, Arizona has a PUD Overlay Zone,[364] as well as both a Master Planned Development (MPD) Overlay Zone[365] and a Planned Area Development (PAD) Overlay Zone,[366] which effectively act like PUDs.

Eloy's PUD Overlay Zone requires developers to have 160 acres to be eligible for application. The PUD ordinance requires enhanced open space. In addition, among the requirements for the developer's application are a water report and a water layout plan.

363 Town of Parker, AZ, Town Code § 10-10A-4(B) (6) Planned Area Development (PAD) Submittal Requirements (2005), http://sterlingcodifiers.com/codebook/index.php?book_id=810&section_id=516547.

364 City of Eloy, AZ, City Code § 15-5- Planned Unit Development Overlay Zone, (2004), http://www.sterlingcodifiers.com/codebook/getBookData.php?section_id=453936&keywords=water%20conservation.

365 City of Eloy, AZ, City Code §§ 21-111, 112, 113, 114, Master Planned Development (MPD) (2004), http://sterlingcodifiers.com/codebook/index.php?book_id=674&chapter_id=63719#s608409.

366 City of Eloy, AZ, City Code §§ 21-120, 121, 122, 123, Planned Area Development (PAD) (2004), http://sterlingcodifiers.com/codebook/index.php?book_id=674&chapter_id=63720#s608414.

The purpose of the MPD zone is to foster the design and community development of large or complex areas, where the platting is conducted in phased stages. First, the backbone infrastructure is designed, platted, and constructed. The individual parcel planning and development is conducted at a later date. The Master Planned Development is only available for areas over 320 acres. The Master Planned Development also requires that a minimum of 25% of the net acreage be preserved as open space. The code lists the required elements for the Master Planned Development application, including among other things a Master Water Plan, Master Wastewater and Sewer Plan, a Master Drainage Plan, and Master Open Space and Landscape Plan. The Master Water Plan must be preceded by a preliminary water report; both the report and final Plan must discuss the availability of water, required waterline extensions, and the layout for the water delivery and distribution infrastructure.

The purpose of the PAD zone is to provide for the development of land while permitting flexibility in the design and development of residential, commercial, and industrial buildings that could not be achieved by the traditional lot-by-lot development. The minimum size for these developments is 40 acres. Application of the PAD zone requires Preliminary Water and Drainage Reports, followed by Master Plans in the Final Development Planned Phase, which must describe the availability of water, the major water line extensions needed to service the property, and layouts for backbone delivery and distribution water throughout the development.

Westminster, Colorado[367]

The City of Westminster takes a different approach to a showing of adequate water supply. Westminster does not allow developers to bring their own water to the table because of the potential effect on the water market. The City's concern is that a developer working on a single project might be willing to pay much more than what the City would have paid because the developer is making that decision on a smaller scale. (In other words, the City's perceived value of the yield of various water rights establishes what it is willing to bid for new water rights, which might be different from a developer's perceived value for a specific project and its associated rights), resulting in the need for the City to compete for water in that elevated marketplace. Instead, Westminster focuses heavily on acquiring water rights itself before development pressures arise in a given area in order to prevent the sudden spike in land values that could occur. With Colorado's requirement that local governments make developers demonstrate an adequate water supply, most communities leave it to the developer to secure and document water availability. The communities may locate the water and assist in making the deal, but the developer then purchases it directly from the source. Westminster's alternate approach of buying its own water allows the City to take the lead on making economic decisions about how to plan for and pay for the City's needed additional water, a factor that also influences development decisions. Much of the City's water supply is based on surface water, which means they have to plan more carefully for severe droughts than communities relying on groundwater. The City regularly updates its Comprehensive Water Supply Plan,[368] which evaluates the current water-supply projection and projected water demands based on the City's detailed Comprehensive Plan

367 City of Westminster, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

368 Because water use is so affected by weather, the City tries not to react to changes in a specific year but rather turns to five- or six-year Citywide use reviews when updating its Comprehensive Water Supply Plan. Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

in order to quantify any expected deficits or surpluses.[369] Because the majority of the City's land area is zoned as Planned Unit Development[370] — which requires submittal of a development plan into which agreed-upon design standards are incorporated[371] — the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. Likewise, because the City owns its own water and has done such a good job of tying together land use and water-supply projections, they can negotiate and mandate from a much stronger position, thus requiring more conservation elements.

This process influences development decisions as well because Westminster ties its PUD-based growth management program to water.[372] Annually, the City allocates a certain number of service commitments (water taps), based upon available water supply, into competitive and noncompetitive categories; the competitive categories are all residential.[373] The City uses a point system, the scoring criteria for which is adopted periodically through City Council resolution, which sets forth what weight to give to various standards and criteria based on their impact on the City's utility system and the health, safety, and welfare of the Community. The Council may establish a minimum number of points to be obtained in the award criteria.[374] The points themselves are found in the City's design guidelines, which include water efficiency requirements.[375] The system is set up so that each proposal is competing against the others. Proposals receive points in the competition for doing something above and beyond code requirements. Those with the most points are awarded the service commitments. Developers must submit a Preliminary Development Plan and Official Development Plan, bringing the project into compliance with City Design Guidelines. All commitments made by an applicant as a condition of the Service Commitment award must be reflected in these plans.[376] If the project cannot meet the minimum and incentive design requirements and other requirements included within its ODP, it will be subject to Planning Commission review and approval or denial.[377]

369 City of Westminster, CO, Comprehensive Plan 172 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

370 City of Westminster, CO, City Zoning Map (2010), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/2-2_Land%20Use%20Diagram.pdf.

371 City of Westminster, CO, City Code, § 11-5-4 Preliminary Development Plan (PDP) Requirements (2015), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH5DEPRRE_11-5-4PRDEPLPDRE.

372 "The City Council further finds that, although the City has implemented water conservation techniques and programs within the City, has entered into a water reuse program, has taken other steps to maximize the efficient use of the resources available to the City, because of the elements set forth in [the Findings] above, it is essential for the preservation of the health, safety, and welfare of the citizens of Westminster that the City maintain and modify, from time to time, a growth management program which balances growth and the ability of the City to effectively and safely absorb and serve such growth." City of Westminster, CO, City Code, § 11-3-1 Growth Management Program, Findings (2010). https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=TITXILADEGRPR_CH3GRMAPRPEJA12011THDE312020_11-3-1FI.

373 Service Commitment awards do not guarantee approval of a project. Service Commitments that are allocated but are not awarded to new development during the year are returned to the water supply figures for use in future years. City of Westminster, CO, Comprehensive Plan 195 (2015), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

374 City of Westminster, CO, City Code, § 11-3-5 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-1FI.

375 *Development Review*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview (scroll down to "Development Project Types" header; then click "Design Guidelines" to expand the menu). Because the State of Colorado recently (as of the writing of this Guidebook) began requiring water-sense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

376 City of Westminster, CO, City Code, § 11-3 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA.

377 City of Westminster, CO, City Code, § 11-3-2 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA_11-3-2ADIMCOCOPL.

The PUD tool is very flexible. Localities can generally choose any types of land uses to include in their PUDs. While one community might establish multiple types of specific PUDs, each designated for a different type of land use (such as residential, commercial, industrial, mixed-use development), another community might establish one single type of PUD and define it broadly to mean a tract of land to be developed under a single development plan for any combination of land uses.

EXAMPLE OF LAND USE–SPECIFIC PUDS

Arvada, Colorado

The City of Arvada's zoning contains PUD zoning for just residences (PUD-R), for business and professional development (PUD-BP), for fully mixed-use development (PUD-BPR), and for industrial development (PUD-I).[378] The PUDs encourage innovative land use planning and design concepts that achieve environmental sensitivity, energy efficiency, aesthetics, and high-quality development by allowing for open space, allowing freedom to provide a mix of land uses in the same development, promoting quality urban design and environmentally sensitive development, and increasing base densities of FAR when increases can be justified by superior design or additional amenities such as public open space.

Once an application for a PUD has been completed and submitted, it will usually be reviewed by the local government's planning department staff, who will make a recommendation to the planning commission. The planning commission will hold a public hearing to review the application and its conformance with the local PUD regulations and will recommend approval or denial of the PUD to the governing body, which will then consider the PUD rezoning application at a public hearing. Please check your local government's specific rules and procedures for more detail.

In addition to laying out additional standards within PUD regulations, communities may require additional procedural steps for approval within PUD zones. For example, a community could require or recommend a pre-application meeting between planning staff and the applicant. Local governments can use this pre-application meeting to ensure that the list of topics to be covered includes a discussion of water supply. Further, they could include the water provider in this conversation. Communities may also require or offer post-occupancy inspections to ensure water conservation measures, such as xeriscaping, have been maintained as planned.

378 City of Arvada, CO, Land Development Code § 4.10, Planned Unit Development Districts, https://static.arvada.org/docs/Article_4_-_Zoning_Districts-1-201303191130.pdf.

EXAMPLES OF PUD PROCEDURES INCORPORATING WATER

Broomfield, Colorado[379]

Broomfield, Colorado, is its own water provider. The City's Planning Division offers and highly recommends a pre-concept plan review meeting with planning staff for any Planned Unit Development plans and Site Review plans in a PUD zoning district and, as part of that meeting, includes the Water Division.[380] Almost all applicants take advantage of this meeting. The Water Division's main focus at those meetings is on the utility system infrastructure component, but water conservation is tied in through the City's landscaping standards, which require soil amendments and limit the amount of turf grass for residential developments.

Westminster, Colorado

Westminster's Comprehensive Plan is highly detailed and is adopted by ordinance, not by resolution, making compliance with the Plan a legal requirement.[381] A majority of the City's land area is zoned as Planned Unit Development,[382] under which all proposed uses must conform to the Comprehensive Plan.[383] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[384] Through the PUD process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. As part of the PUD regulations, all land uses and negotiated standards must be reflected in the project's Preliminary Development Plan and ODP,[385] making them the legal requirements for that project.[386]

379 Broomfield Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015); Email interviews with Dave Shinneman, Community Development Director, City of Broomfield (Jan. 24, 2017) and David Allen, Director of Public Works, City of Broomfield (Jan. 25, 2017).

380 City of Broomfield, CO, Planning Division, Concept Plan Checklist (For Planned Unit Development Plans & Site Development Plans in a PUD Zone District), (2012), http://www.ci.broomfield.co.us/DocumentCenter/View/1568.

381 City of Westminster, CO, Ordinance No. 2475 (1997). *See also*, City of Westminster, CO, Comprehensive Plan 94, https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/COMPLETE%20Comp%20Plan_2015%20Update_WEB.pdf.

382 City of Westminster, CO, City Zoning Map (2010), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/2-2_Land%20Use%20Diagram.pdf.

383 City of Westminster, CO, City Zoning Map (2010), https://www.cityofwestminster.us/Portals/1/Documents/Government%20-%20Documents/Departments/Community%20Development/Planning/2-2_Land%20Use%20Diagram.pdf.

384 *Development Review*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview (scroll down to "Development Project Types" header; then click "Design Guidelines" to expand the menu). Because the State of Colorado recently (as of the writing of this Guidebook) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

385 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

386 City of Westminster, CO, City Code, § 11-3 Growth Management Program (2010), https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH3COPLGRMA.

The plans will include requirements relative to landscape compliance, in terms of the water-usage standards (referring back to the municipal code and landscape code) and planting requirements, including hydro-zone analysis and plant types (which correspond back to the City's planting palette).[387] After staff review, the preliminary plan goes to Council for approval. The final ODP may receive administrative approval (which typically occurs except in the case of very large projects).

The City's detailed comprehensive plan and mandatory PUD approach allows for more flexibility and fewer major approval steps. For example, if a developer decided mid-project to change from one type of commercial district to another (such as C-1 to C-2), in other communities, the developer would have to apply for a rezoning, while, in Westminster, the developer would simply amend the ODP. The City does have cautionary measures in place, however, for major changes between plans. For example, if a developer were to add any use that does not currently exist in the approved PUD, the City must hold a public hearing to add that use. Similarly, under the code, once an ODP amendment is requested, the City reevaluates the landscape water requirements and charges tap fees if the new use is higher.[388] In these ways, Westminster's approach differs from traditional zoning. It also differs from the more flexible zoning technique of floating zoning in that, with floating zones, once a project meets the requirements set out in the ordinance and the legislature acts to make the zone apply to the property, the zone's standards apply without further bargaining, while, with Westminster's approach, the City has much more room for negotiation.

The City of Westminster also has a robust inspection process as part of its PUD zoning. In addition to pre-occupancy inspections (which include a check to ensure the correct installation of water efficient landscaping), Westminster also has a post-occupancy inspection program under which the City periodically inspects landscapes to be sure what was listed in the ODP and originally installed still exists. The City has an ODP Inspector who manages this process. Commonly, this results in missing trees or other landscape areas needing replacement. The inspections do not occur on a regular, planned schedule. Rather, they are based upon observed violations or warranty inspections. Because continued compliance with the ODP is legally required by virtue of it being part of the zoning, alterations to water efficient landscaping are treated as code violations, as are any other violations of the ODP — the same way that another community might enforce a zoning violation where a single-family home was converted to a two-family home. The City can enforce these violations in the same way as any other code violation (as a misdemeanor, punishable by $2,000/day and/or 1 year in jail), although these punishments are rarely levied as the City's main concern is remedying the violation.

Westminster offers other post-occupancy inspections, which include inspections of the water system. The City's reclaimed irrigation customers (which currently include about 110 large properties) also receive an annual inspection that includes water use.[389] Similarly, the City tries to interest high-water-use irrigation customers in walk-through inspections. The cost associated with such high use is usually motivation enough for customers to limit their use, especially in commercial and homeowners association (HOA) customers. Often, Homeowners' Associations

387 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

388 Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

389 Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

will have little idea how to run their common area maintenance. The City attempts periodically to address this issue by working with the HOAs to encourage repairs and maintenance.[390] The City also tracks water use and sends out leak notices when accounts do not show any period of zero use within a day. Overall, the City has seen a tremendous reduction in its water use thanks to these and other initiatives.

Eagle River Water and Sanitation District, Colorado[391]

The Eagle River Water and Sanitation District is a special district with a service area covering several communities — the second largest water provider on Colorado's Western Slope — giving them multiple land use authorities to work with. The District provides water directly to Vail, Colorado, and manages and operates the water supply for the remaining communities in its service area. In the past, the District did not require an explicit commitment from a developer that water use would stay within the amount of water rights provided by the developer. The subsequent excessive water use by some property owners reduced the water reserved for other future customers and forced the District to pay for costly expansion of infrastructure. As a result, the District started entering into water service agreements with developers. The agreements include a calculation of how much water the project should reasonably use, state that water use is limited to the amount documented (Total Demand Limit), and charge the developer an impact fee based on that usage. This approach gives applicants control of the up-front costs for water, influencing developer decisions related to water efficiency and design. Developers who use water conserving measures (high-efficiency fixtures, low-water-use landscaping) would have a lower demand and therefore a reduced impact fee. The agreements are then recorded and run with the property in perpetuity, establishing that water use cannot be exceeded without renegotiating the service agreement. The District tracks and reviews customer water use annually and notifies customers of any excess use. This structure gives the District greater certainty in the amount of water committed and provides the District with a way to hold customers accountable to the amount of water that was paid for and agreed upon.

The remaining problem for the District, however, is that if excess use continues, the District's only real enforcement recourse is the drastic option of denying water service. Further, the District has no real way to ensure that the agreed-upon efficiency measures are implemented during construction, beyond monitoring the resulting water use. To solve this problem, the District is working on developing standard language for local governments to insert into Planned Unit Development (PUD) ordinances that would require incorporation of irrigation and fixture efficiency standards at the sketch plan level. When a developer submits a preliminary plan, the District would then consider the plan's efficiency features in determining the water dedication requirement and would make the service commitment (the District's ability to serve) contingent upon those features. By including this language in the local code, these efficiency measures could be enforced by local land use authorities — during the inspection process or otherwise — who have more enforcement mechanisms available.

390 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

391 Telephone interview with Jason Cowles, P.E., Engineering Department, Eagle River Water and Sanitation District (Mar. 2, 2017); Upper Eagle Regional Water Authority, *Memorandum Re: January 22, 2015, Regular Board Meeting* (Jan. 14, 2015), http://216.172.166.67/~erwsd/wp-content/uploads/OO-GOV-UER-Board-Meeting-Packet-Jan22.pdf; *Eagle River Water and Sanitation District Moves Toward Water Budgeting*, Special District Association of Colorado, https://www.sdaco.org/news/eagle-river-water-and-sanitation-district-moves-toward-water-budgeting (Jul. 2015).

Despite the flexibility and benefits of PUDs, it should be noted that some planners and attorneys criticize PUDs and the negotiations that surround their adoption and implementation as overly complex, requiring high administrative costs and lengthy processes, adding that they are too difficult to modify in the future.

g. Create a Water Conservation Floating Zone

The floating zone — typically used to incentivize a particular type of development — is an additional technique that departs from traditional zoning and offers flexibility to developers and communities in the application of its standards. Floating zones are often confused with overlay zones (discussed in Section 7(h) of this Chapter), which bear similarity but function differently. Floating zones, like overlay zones, do not necessarily conform to existing district boundaries — they might alight on parcels within one existing zone or cross over multiple zones (although this is less common than with overlay zones). Floating zones contain standards that typically supplant the underlying zoning, although they can be crafted to leave in place provisions of the underlying zone where it is consistent with the objectives of the floating zone. In creating a floating zone, the local code is amended to add a new zone classification, which is available for future use but is not yet placed on the zoning map. Rather, developers of sites deemed eligible (based upon minimum standards included in the zoning, such as lot size and location) are authorized to make an application to have the zone applied in a particular location. A locality can apply the floating zone to a particular area upon granting the petition of an applicant, at the local legislature's initiative, or upon the recommendation of the planning board or commission. Upon approval, the site is rezoned to reflect the new use and becomes a discrete zoning district. The zoning map is amended to apply the floating district to that parcel of land (i.e., the floating zone "lands" on that site), and the parcel's development is governed by the use, dimensions, and other provisions of the floating zone.

Flexible zoning districts, such as floating zones, must be authorized under state law, either under specific language in the zoning enabling act or under state court interpretations holding that these flexible zoning districts are legal. Initially, these techniques met resistance, as challengers argued in court that these zoning districts constitute spot zoning or violate the uniformity requirement in the original zoning enabling act. The courts in many states have declared that floating zoning is legal under the planning and zoning enabling acts, home rule statutes, local charters, or other land use laws adopted by the state legislature.[392]

Court decisions often are based on the conclusion that such zoning encourages the most appropriate use of the land and advances the general welfare. These are concepts that were embodied in the original zoning enabling act, which was used by most states when they first delegated authority to local governments to adopt zoning and other land use regulations. The enabling act contains a provision that authorizes district regulations to encourage the most appropriate use of the land. In states where the enabling acts are liberally construed, courts uphold these flexible zoning district options, particularly where they are adopted to achieve the objectives of the comprehensive plan or pursuant to a formally adopted special area plan. Local officials and planners should consult municipal counsel for assistance in determining the legality of these techniques under applicable state law.

Among other uses, floating zones can be used to permit any combination of water conserving zoning

392 Nearly thirty states explicitly authorize local floating or overlay zoning by case law or statute. Among those that have definitively authorized floating zoning are the interior West states of Colorado, *Carron v. Bd. of County Comm'rs*, 976 P.2d 359 (Colo. App. 1998); *Dillon Companies, Inc. v. City of Boulder*, 183 Colo. App. 117 (1973), and Idaho, *South Fork Coal. v. Bd. of Com'rs of Bonneville County*, 792 P.2d 882 (Idaho 1990). The legality of floating zoning has yet to be challenged in others.

techniques appropriate for the community. Further, the floating zone could be made available only in certain areas, such as priority growth or infill districts. They can also be drafted to include development incentives to encourage a property owner to apply for the floating zone or to offset the additional burdens imposed by the floating zone if it is applied through the initiative of the local planning commission or governing body.

EXAMPLES OF WATER CONSERVATION REQUIREMENTS IN FLOATING ZONES

Sample[393]

This sample purpose clause demonstrates how a "water conservation floating zone" (for example) can accomplish a variety of objectives, including reducing water use and protecting water quality.

- *The Water Conservation Floating Zone (WCFZ) district is created to secure the benefits of water-conscious development, which include reduction in potable water usage; preservation of existing natural resources including open space, water bodies, wetlands, and floodplains; recycling of waste water; the adaptive reuse of existing buildings and infill development; and the use of existing infrastructure. These needed benefits are consistent with the [City/Town/County] of [_____]'s commitment to enhancing public health, safety, and welfare, and they constitute the comprehensive planning rationale for the adoption of the WCFZ district.394*

As a threshold eligibility requirement, communities should permit the floating zone to alight in districts compatible with the goal of fostering water efficient development patterns (for example, areas with existing infrastructure that are appropriate for a compact development pattern and offer opportunities for infill development). Here is a sample applicability provision:

- *It is the intention of the Local Legislative Body to apply this district to areas that have characteristics compatible with the goal of fostering water-conscious development and to avoid its use in areas with conditions incompatible with these characteristics. As such, mapping of the WCFZ is not permitted within the [insert districts] districts, unless waiver is provided by the Local Legislative Body.*
- *Projects that comply with Section [insert reference to district standards] of this law are subject to modified and expedited site-plan and subdivision review (as provided in Section __ of this law) following rezoning and map amendment.*

In addition to permitting water conserving building types and densities, standards in a floating zone focused on water conservation could require eligible developers to take discrete steps to reduce water use and promote water quality. Here are two illustrative provisions, modeled from those contained in the LEED for Neighborhood Development rating system:

393 Where strong examples of important techniques could not be found, this Guidebook offers sample language for consideration.

394 *See* Neighborhood Development Floating Zone: A Model Ordinance to Foster Green Community Development Using the LEED for Neighborhood Development Rating System, 6 (2013), http://www.usgbc.org/resources/neighborhood-development-floating-zone.

- *Development proposals for the application to an individual parcel in a WCFZ must adopt water efficient landscaping to reduce the use of potable water. They must demonstrate how they reduce water consumption for outdoor landscape irrigation by 50% from a calculated midsummer baseline case (i.e., what the project would use if landscaped with conventional equipment and design practices typical to the region) by using water efficient strategies. These strategies include water efficient plant species, plant density, and irrigation efficiency. Additional practices include establishing planned water-use zones; shadow profiles of landscape areas; and a landscaping site map that shows, among other things, topography and sun and wind exposure. Developers must use climate-tolerant native or adaptive plants, mulch, and water efficient irrigation technology. Stormwater collection systems (such as cisterns and underground tanks) should also be considered to significantly reduce or eliminate potable water use for irrigation.395*
- *Applicants must create and implement an erosion and sedimentation control (ESC) plan for construction activities. The ESC must incorporate practices to control erosion and sedimentation in runoff from the entire construction site, including phasing, seeding, grading, mulching, filter socks, stabilized site entrances, and preservation of existing vegetation. The ESC must describe how the WCFZ project will preserve vegetation and mark clearing limits, establish and delineate construction access, control flow rates, install sediment controls, stabilize soils, protect slopes, protect drain inlets, stabilize channels and outlets, control pollutants, control dewatering, and maintain such practices. 396*

Portland, Oregon[397]

Portland's EcoDistrict Initiative, although not a floating zone, illustrates requirements that can be incorporated into a floating zone to promote water conservation and quality. It provides a Performance Areas Toolkit that includes vision, goals, targets, metrics, and potential strategies for seven performance areas in an EcoDistrict and provides direction, methods, and process for assessing performance. These could be incorporated into the standards for a community's water conservation floating zone. EcoDistrict targets and potential strategies related to the goal of reducing the rate of water consumption include the following:

- Reduction in the average per capita potable water demand by a certain percentage (determined by specific district plan) below current levels
- Achievement of water balance to meet healthy hydrologic conditions: managing a certain percentage of stormwater and building water discharge onsite to satisfy water demand and improve watershed health (percentage determined by specific district plan)
- Water reuse or reclaimed water systems
- Recycled water sources to satisfy nonpotable water demand
- Water efficient landscaping and vegetated infrastructure
- Onsite wastewater treatment
- Metering and submetering

395 *See* Technical Guidance Manual for Sustainable Neighborhoods, Section 3.13 Water efficient Landscaping, 74 (2012), http://www.usgbc.org/resources/technical-guidance-manual-sustainable-neighborhoods.

396 E&S Plan-GIB, LEED ND Built Project (2009), http://www.usgbc.org/credits/reqssp1r2-0.

397 *See* EcoDistricts Performance Areas Toolkit: Understanding District Impacts, Portland Sustainability Institute, https://ecodistricts.org/wp-content/uploads/2013/03/4_Toolkit_EcoDistrict_Assessment_v_1.12.pdf.

In addition to incorporating water-specific provisions within a floating zone, communities may use floating zones to foster, more generally, the type of compact land use patterns (discussed in Chapter 3, *Working Together*) that increase water efficiency.

EXAMPLE OF FLOATING ZONES FOR WATER EFFICIENT LAND USE PATTERNS

Lawrence, Kansas

The City of Lawrence adopted a form-based Mixed-Use district and Smartcode, which operate as floating zones citywide. Adopted in 2006, the floating Mixed-Use district allows compatible mixed uses in areas within one-quarter mile of a designated transit route near or adjacent to the intersection of arterial streets; within one-quarter mile of university campuses; within one-quarter mile of the downtown area; or immediately adjacent to a public park, open space, or an existing nonresidential development proposed for redevelopment.[398] The Mixed-Use district also includes development bonuses for providing public benefits. Promoting green infrastructure as well as sustainability standards and practices are among the goals that the development bonuses incentivize.[399]

The Smartcode was adopted in 2009 as an alternative to the City's development code, in an effort to facilitate Traditional Neighborhood Development (TND).[400] TND promotes pedestrian–oriented, compact neighborhoods that encourage walkability, resulting in reduced automobile use, related emissions, and general environmental impacts. The Smartcode also emphasizes the importance of distributing affordable housing and the use of green corridors to encourage greater neighborhood connectivity and opportunity.[401] A similar development bonus program to that of the Mixed-Use district is also applicable to the Smartcode.[402]

Although water conservation is not explicitly stated as a purpose in these floating zones, the examples are transferrable: "public benefits" provided by a developer could include water conservation; "sustainability standards and practices" could include water conservation requirements; green infrastructure increases percolation and groundwater recharge; and the type of compact development in appropriate areas called for in TND zoning increases water system efficiency.

Using a floating zone mechanism to permit water conserving building types has several advantages[403]:

- First, it allows the community to memorialize types of buildings and patterns of development thatmeet local needs in a single zoning district by incorporating them as zoning standards, which can be affixed to appropriate parcels.
- Second, because the floating zone contains eligibility requirements, the petition process requires less

398 City of Lawrence, KS, Land Development Code , 11.17 (2013), https://lawrenceks.org/assets/pds/planning/documents/DevCode.pdf.

399 City of Lawrence, KS, Land Development Code , 11.26 (2013).

400 City of Lawrence, KS, Smartcode, SC5 (2009), https://www.lawrenceks.org/assets/pds/planning/documents/SmartCode.pdf.

401 City of Lawrence, KS, Smartcode, SC5 (2009), https://www.lawrenceks.org/assets/pds/planning/documents/SmartCode.pdf.

402 City of Lawrence, KS, Smartcode, SC16-SC17 (2009), https://www.lawrenceks.org/assets/pds/planning/documents/SmartCode.pdf.

403 *See* Neighborhood Development Floating Zone: A Model Ordinance to Foster Green Community Development Using the LEED for Neighborhood Development Rating System, 5 (2013), http://www.usgbc.org/resources/neighborhood-development-floating-zone.

legislative deliberation than a typical rezoning and thus saves time and resources. Without such a mechanism at the ready, many developers are forced to apply for lengthier rezonings or variances in order to obtain full entitlements for infill or priority growth district projects. Similarly, there is time saved in avoiding lengthy negotiations because the floating zone already contains water conserving standards. By reducing the length of the approval process, costs to the developer are dramatically reduced (thereby further incentivizing water conserving development) and communities avoid creating dangerous precedent for future variances or rezoning.

- Third, if the floating zone allows developers greater densities than the underlying zoning in eligible districts, it prevents land price inflation that comes with as-of-right rezoning of such parcels. The developer can enter into a contingent sales contract with the landowner, with the parcel price set at market value under the current zoning, and develop at the higher density allowed if and when the floating zone is applied to the property. The developer can then put that cost savings into meeting the zone's water conserving requirements.

h. Use Overlay Zoning to Designate Areas for Conservation and Growth

Overlay zoning is a flexible zoning technique that allows a local government either to encourage or to discourage development in certain areas. An overlay zone is a mapped district superimposed on one or more established zoning districts. A parcel within the overlay zone will thus be simultaneously subject to two sets of zoning regulations: the underlying and the overlay zoning requirements. If the overlay zone provisions conflict with the underlying zoning, some communities provide that the more restrictive zoning applies, while others provide that the overlay district applies regardless of whether it is stricter or more permissive.

The overlay district is most often thought of, and is sometimes defined as, a technique for conserving a fragile natural resource area such as a wetland, watershed, or tidal basin. Notwithstanding this traditional definition, overlay districts are also used for identifying areas for development and providing incentives or additional standards to encourage growth there. A community may use either of these two forms of overlay zoning to foster water conservation. For example, a locality may adopt a conservation overlay district in one or more areas where water-intensive development should be discouraged. Likewise, a locality may adopt a development area overlay district in a transit station neighborhood to provide for greater density in appropriate locations and more cost-effective and water efficient development patterns.

EXAMPLES OF OVERLAY ZONES FOR GROWTH THAT INCORPORATES ENVIRONMENTAL CONCERNS

The following examples illustrate how overlay zoning can be used in an area targeted for growth to ensure the environmental quality of an area experiencing denser development.

Cincinnati, Ohio

Several decades ago, the Cincinnati City Council adopted an Environmental Quality District overlay zone with special standards designed to prevent businesses from locating in designated urban neighborhoods where the characteristics of the environment are of significant public value and are vulnerable to damage by development permitted under conventional zoning. Although this zone no longer exists in the City's code (even though the City now has several other overlays), it was upheld in court as accomplishing a valid public purpose of preserving the quality of this urban neighborhood.[404]

Today, the City of Cincinnati's Urban Design Overlay District[405] is meant to protect and enhance the physical character of business districts by preventing the deterioration of property; encouraging private investment to improve and stimulate economic vitality; and ensuring that infill developments do not adversely impact the physical character of the area. This district requires applicants to submit an Urban Design Plan that includes, but is not limited to, a description of the physical and environmental improvements necessary for revitalization, the location of the new buildings, and open space and landscaping plans.

Eugene, Oregon[406]

In 2005, Eugene, Oregon, adopted a variety of overlay zones including a Planned United Development Overlay Zone, Waterside Protection Overlay Zone, Water Quality Overlay Zone, and a Water Resources Conservation Overlay Zone. The purpose of these water protection zones is to protect the water quality in designated waterways, riparian areas, and adjacent wetlands by maintaining an undeveloped setback area between features and adjacent developed areas.

404 Franchise Developers, Inc. v. City of Cincinnati, 505 N.E.2d 966 (1987). This court decision cites to Chapter 34 § 3400.2 of the Cincinnati Municipal Code, which, at the time the case was decided in 1987, allowed for "environmental quality districts (EQDs) to assist in the development of land and structures to be compatible with the environment and to protect the quality of the urban environment in those locations where the characteristics of the environment are of significant public value and are vulnerable to damage by development permitted under conventional zoning building regulations."

405 City of Cincinnati, OH, Zoning Code, § 1437.01, Urban Design Overlay District (2004) https://www.municode.com/library/oh/cincinnati/codes/code_of_ordinances?nodeId=TIXIZOCOCI_CH1437URDEOVDI.

406 City of Eugene, OR, Code § 9.1040 ESTABLISHMENT and List of Overly Zones (2006), https://www.eugene-or.gov/DocumentCenter/View/2704.

EXAMPLES OF OVERLAY ZONES FOR CONSERVATION

The following examples demonstrate how overlay zoning can be used to protect land in conservation zones, hence limiting water-consuming types of development and preserving the quality of ground and surface water.

Brookfield, Wisconsin

The Upland Preservation Overlay district adopted by Brookfield, Wisconsin, is intended to preserve "all significant woodlands, wildlife habitat areas, areas of rough topography and related scenic areas."[407] In addition to maintaining "the natural beauty of the city," the overlay is intended to control erosion and sedimentation and maintain water quality. The ordinance contains a conservation deed restriction requirement for subdivision plats prohibiting the erection of structures, the removal of vegetation, and any filling or excavating of land within the overlay, which runs with the land in perpetuity.

Cincinnati, Ohio

Cincinnati's Hillside Overlay Zone[408] is located specifically on the hills right outside the City. The purpose of this zone is to establish standards of development and procedures for review for new developments to show that the development will not only be compatible with the natural environment, but will also respect the quality of the urban environment of the locations where hillsides are of significant public value. This zone is intended to prevent damage to the hillsides where there are sensitive environmental issues. Applications that are subject to review include new buildings larger than 600 square feet in area or 15 feet in height; permits for alterations, additions, and changes to the exterior of residential buildings that result in increase of dwelling units; and improvement costs that exceed $5,000.

Like PUDs, discussed in Section 7(f) of this Chapter, overlay zoning also gives the local government an opportunity to align development potential with available water supply (similar to subdivision standards, addressed in Chapter 8). Within their overlay district regulations, local governments may include requirements related to the quantity, quality, and dependability of a development's water supply. Where water is in short supply, or very expensive to provide, the community can adopt an overlay imposing stricter standards than it does elsewhere.

407 City of Brookfield, WI, Mun. Code §17.96, http://www.codepublishing.com/WI/Brookfield/.

408 City of Cincinnati, OH, Zoning Code, § 1433.01, Hillside District (2004), https://www.municode.com/library/oh/cincinnati/codes/code_of_ordinances?nodeId=TIXIZOCOCI_CH1433HIOVDI.

EXAMPLE OF ALIGNING OVERLAY ZONES WITH AVAILABLE WATER SUPPLY

Douglas County, Colorado[409]

The Douglas County Code provides for a Water Supply Overlay District that encompasses the entire area of Douglas County and applies to specified applicants (such as those for a rezoning, planned development, or use by special review). The district aims to ensure that development in all areas of Douglas County provides for a water supply that is sufficient in terms of quantity, quality, and dependability. The district divides the County into water-supply zones and it includes methods and provisions for accomplishing the following:

- Restricting the dependence on nonrenewable water sources
- Encumbering groundwater through the use of restrictive covenants
- Verifying water rights and adjudicating these rights
- Identifying minimum water demand standards
- Identifying minimum water-supply standards
- Identifying the land use process affected by these standards
- Providing an appeal process to prove water-supply sufficiency

This overlay zone also provides for minimum water-demand standards and also requires applicants to provide documentation for all applications proposing a water supply from an Existing District, either directly or through execution of an intergovernmental agreement with a New Special District.

In addition to laying out additional standards, communities may require supplemental procedural steps for approval within overlay zones. For example, a community could require a conditional use or other special permit to develop within an overlay zone. To obtain this permit, communities could require developers to submit a report from an acknowledged water expert regarding the probable effects of a development on water quality and quantity.

EXAMPLE OF CONDITIONALLY PERMITTING USES IN OVERLAY ZONES

Limington, Maine

Limington, Maine, includes an Endangered Species and Critical Areas Overlay in its zoning ordinance to protect plants, fish, and animals in areas identified by the state as habitat for endangered species and for certain waterfowl, wading birds, and shorebirds; as spawning areas for Atlantic salmon; and as deer wintering areas.[410] Except for nonintensive recreational uses, new structures and uses within the overlay require a conditional use permit. A report by a wildlife biologist on the probable effects of the proposed use on habitat and species may be required as part of the permit application.

409 Douglas County, CO., Zoning Resolutions, § 1801 *et seq* Water Supply Overlay District (2013), http://www.douglas.co.us/documents/section-18a.pdf.

410 Town of Limington, ME, Zoning Ordinance § 10.1 (2013), http://www.limington.net/documents/ZoningOrdinance%20rev.%2011.6.2012[1].pdf.

Using an overlay zone to limit water-consuming development naturally involves imposing additional restrictions on the development of private land. Local governments should be warned that this can occasionally lead to a lawsuit claiming that the restrictions constitute a regulatory taking. Often, this is accompanied with the claim that the regulation prevents the land owner from enjoying the highest and best use of the land. However, the U.S. Supreme Court has made it clear that regulations that diminish the market value of the land are not, for that reason alone, a regulatory taking. The extent of the diminution in value is a factor in a multifactor balancing test, where the Court also looks at the character of the regulation and the extent to which the regulation frustrates the investment-backed expectations of the owner.[411] In using these factors, the Court presumes the constitutionality of the regulation and places a heavy burden of proof on the challenger that the regulation is a taking. Only if all economically beneficial use of the land is prevented by the regulation can an owner be confident (with one or two exceptions) that the regulation constitutes a taking.[412]

EXAMPLE UPHOLDING WATER-PROTECTIVE OVERLAY ZONES DESPITE ECONOMIC IMPACT

Alachua County, Florida

Alachua County, Florida, designated the Cross Creek area as a "special study area." The county commissioners subsequently adopted an amendment to the Alachua County Comprehensive Plan creating specific development guidelines for the area. The guidelines categorized parcels within the area as wetland zones, exceptional upland habitat zones, hammock zones (wildlife habitats of secondary value serving as transitional buffers), or active use zones. Specific development requirements were created in each zone. In *Glisson v. Alachua County*,[413] affected property owners challenged the regulations arguing that the county was exercising eminent domain under the guise of its police power. The court held that the regulations were not facially unconstitutional and did not constitute a taking because landowners were not denied all beneficial use of their land, and the amendment was a valid exercise of the police power to address conservation concerns.

i. Establish a Transfer of Development Rights Program to Prioritize Development Where Water Can Be Provided Most Efficiently

The Transfer of Development Rights (TDR) zoning tool is often used to preserve critical environmental areas, farms, forests, or valuable open spaces and may be used in this way to protect water resources and encourage a water efficient development pattern.

There are three basic elements to a TDR Program:

1. The Sending District: The sending district is the area where the amount or intensity of development is being limited.

411 Penn Central Transportation Co. v. New York City, 438 U.S. 104 (1978).

412 Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992). Regulatory takings also exist in cases of physical invasion and adjudicative land use exactions, but those discussions are not applicable to the regulations discussed in this context. *See*, Lingle v. Chevron U.S.A., 544 U.S. 528 (2005).

413 Glisson v. Alachua County, 558 So.2d 1030 (Fla. App. 1983).

2. The Receiving District: The receiving district is located where additional density can be absorbed and supported with existing or expanded infrastructure.
3. The TDR credits: TDR credits are a legal representation of the abstract development rights that will be severed from a property located in the sending district and then grafted onto property in the receiving district.

TDR credits can be traded on the free market or monitored through TDR banks. When the TDR credit is purchased from a property owner in the sending district, the property owner records a deed restriction limiting or prohibiting development on the property. The TDR credit can then be applied to a property in the receiving district as a density bonus. In this way, TDR can be a more economically preferable alternative to overlay zoning. When overlay zoning is used to create areas for conservation and development, land owners in the conservation areas with newly restricted development rights may balk at a perceived loss in value of their land (as was the case in the Alchua example discussed in Section 7(h) of this Chapter). With a TDR program, landowners in the designated sending district (i.e., the conservation area) retain the value of their development rights to then sell to the TDR bank or to a property owner in the receiving district.

To conserve water, TDR may be used to avoid sprawl, an urban condition that is more water- intensive and exacerbates water loss. Communities should identify a receiving area with adequate existing infrastructure where infill development or development at increased densities can be encouraged and where water can be provided more efficiently. In turn, sending districts should be used to maintain open space, preserve farmland, and protect water resources or aquifer recharge areas and areas where it may be difficult to provide water efficiently. In this way, TDR can also promote economic growth and stability by promoting densities high enough to support mixed-use and commercial development while maintaining a community's most precious resources.

EXAMPLES OF TDR PROGRAMS TO PRESERVE GREEN INFRASTRUCTURE

Adams County, Colorado

Adams County revised its Comprehensive Plan to develop a voluntary TDR tool to help manage long-range development. The plan encourages development in areas with adequate infrastructure and preserves rapidly diminishing farmland and open space. Additionally, Adams County includes TDR in its cluster-development and PUD zoning code sections.[414] The code creates four designated sending areas, (including farmlands, floodplain areas, and the natural resource conservation overlay zones) and six different receiving areas. Under this TDR and PUD system, Adams County will not issue a building permit for a residential unit unless there are sufficient development rights attached to the property.

Los Ranchos, New Mexico[415]

The Village of Los Ranchos provides for the transfer of development rights to promote economic development, preserve agricultural character, preserve scenic views, and protect the commercial development of the Village. Los Ranchos is authorized to create a TDR bank, where development rights may be purchased and conveyed by the local government in order to stabilize the market and regulate the development of property.

414 Adams County, CO, Development Standards and Regulations, § 3-29-03-06 Cluster Development and Transfer of Development Right Standards, http://www.adcogov.org/development-standards-regulations.

415 Village of Los Ranchos, NM, Zoning Code §9.2.6, Transfer for Development Rights Regulations, http://static1.squarespace.com/static/508fe597e4b047ba54ddc41e/t/547f55c0e4b0e3ea0193b9a2/1417631168023/CHAPT+9+ART+2+SEC+6+Transfer+Development+Rights.pdf.

8. Subdivision Regulations

Subdivision approval is required when a parcel of raw land has not yet been divided into lots for development and is designed to ensure that the resulting lots all have adequate streets and utilities as well as direct access to a public street and that the lots and streets are designed to avoid sensitive lands such as floodplains, steep slopes, unstable soils, and sometimes wildlife habitat areas and historic/archeological resources. In addition, subdivision is often required when already platted lands are redesigned and the locations and alignments of streets are changed (usually before they are developed). If raw land is going to be divided for multifamily, commercial, mixed use, industrial, or institutional use, both subdivision and then site-plan approval may be required.

a. Draft a Statement of Purpose and Intent that Includes Water

The statement of purpose and intent for subdivision regulations could be drafted to clearly include the need to demonstrate the adequacy of water supply for drinking, household uses, and fire safety, as well as a water distribution system.

EXAMPLES OF WATER SUPPLY IN SUBDIVISION PURPOSE STATEMENTS

Star Valley, Arizona

The Intent section of Star Valley, Arizona's, subdivision regulations includes "to secure adequate provisions for water supply and distribution."[416]

Parker, Arizona

The intent section of the Parker, Arizona, purpose statement includes "To secure adequate provisions for water supply. . . ."[417]

b. Permit or Require Cluster-Development Subdivisions

As discussed further in Chapter 7, *The Zoning Code*, state statutes may authorize local governments to either request or require a developer to cluster buildings to promote flexible design and more efficient land use.418 Over the past 20 years, cluster development has moved from a rare and little-understood form of site and subdivision layout to one that is encouraged, incentivized, and sometimes required as the preferred form of raw land development in many communities. Cluster subdivisions can be an important technique for achieving water conservation objectives, particularly if they reduce the size of individual residential lots and outdoor water use.

416 City of Star Valley, AZ Municipal Code, § 1-1-1(C), Administrative and General Provisions: Authority (2006), http://sterlingcodifiers.com/codebook/index.php?book_id=451&section_id=168314.

417 City of Parker, AZ, Town Code § 11-1-1(A)(3), General Subdivision Provisions: Purpose and Intent, http://sterlingcodifiers.com/codebook/index.php?book_id=810&section_id=516622.

418 None of the states in the interior West explicitly prohibit cluster development laws. Typically, local governments may encourage or require clustering based upon state enabling legislation giving them the general authority to pass zoning and subdivision regulations.

Under cluster statutes, development can vary from the traditional subdivision plat, where lots must conform to all the lot size and coverage requirements of the zoning district in which the property is located, to the local cluster-development ordinance that allows the property owner to create lots that are smaller and buildings that are closer together than zoning would otherwise allow in return for conserving more open space than would otherwise be required.

Clustering does not always allow the developer to build additional dwelling units (although bonuses can be built in, as discussed later in this Section), but it does permit the local government to approve smaller residential lot sizes, which, in turn, reduces the size of lawns and the water needed to maintain them. Clustering, in this way, provides an optional method for achieving the smaller homes on smaller lots that is proven to lower per-household water consumption. (See Chapter 3, *Water Issues in the Interior West: A Call to Action*, for more on the relationship between development size and water use.)

Instead of, or in addition to, rezoning areas from large-lot, single-family homes to small-lot houses, local governments can amend subdivision regulations applicable to residential districts to allow cluster development.

EXAMPLE OF CLUSTERING IN PERMITTED USES

Raleigh, North Carolina[419]

Raleigh has included Cluster Unit Developments as a conditionally permitted use in many of its residential districts. Defined as planned residential developments, the development may include townhouses, condominiums, group housing, and multifamily developments. The size of the development varies depending on the District's permitted density, but it may require a minimum of 10 or 20 acres of open space.

When implementing cluster development, local and county governments should be mindful that clustering residential homes does not necessarily reduce irrigated landscaping — which is a key determinant of water use. A smaller, clustered lot with lots of irrigated turf could consume more water than a larger traditional lot with xeriscaping.

Clustering was designed to preserve open space and natural resources in general. Included in its objectives, however, can be the conservation of water and the protection of water quality. The land preserved by clustering becomes an asset in water management, particularly if it is subjected to use controls and best practice standards or governed under a conservation easement or an HOAs covenants and restrictions. Local and county governments can incorporate the full range of water conservation practices into a cluster subdivision ordinance or can require their inclusion in the subdivision's covenants and restrictions.

419 City of Raleigh, NC *Permitted Land Uses In Zoning Districts*, https://library.municode.com/nc/raleigh/codes/unified_development_ordinance?nodeId=02-Raleigh-Residential (last visited January 13 2015); City of Raleigh, NC, Planning and Development/United Development Ordinance (UDO) §10-2101 Cluster Unit Development Regulations, https://www.raleighnc.gov/content/PlanDev/Documents/Inspections/Admin/TechnicalBulletins/Cluster%20DevelopmentTechBulletin.doc.

EXAMPLES OF CONSERVATION OBJECTIVES IN CLUSTERING REGULATIONS

Pinal County, Arizona[420]

Pinal County, which is just south of Phoenix, Arizona, has recently experienced tremendous suburban growth from the greater Phoenix-Mesa-Scottsdale Metropolitan Area. Pinal County's code allows for cluster zoning that provides for the voluntary and permanent conservation of open space and the protection of natural features including riparian areas, rock outcrops, and natural topography. The code's stated purposes for cluster development are to preserve significant natural open space areas without increasing overall residential densities and to encourage and provide incentives for site planning that are harmonious with the natural features and constraints of property. This type of development is more cost-effective because it allows the development to be serviced with shorter utilities, roads, and compact layouts for other services.

Peterborough, New Hampshire

New Hampshire permits cluster development and encourages its use as an innovative land use control.[421] Under this State-granted authority, the Town of Peterborough adopted a cluster-development provision that seeks to, among other things, permit greater flexibility in the design of residential land uses, facilitate the economical and efficient provision of public services, discourage development sprawl, and preserve open space.[422] Peterborough permits residential clustering as a special exception in its General Residence and Rural Districts and as-of-right in its Retirement Community District.[423] The maximum number of dwelling units permitted in a clustered development may not exceed the density allowed in the district where the parcel is located. The town's cluster-development provision requires that a minimum of 30% of the total land area be dedicated as common open space. To ensure that the open space remains undeveloped, title to the open space must be deeded to a neighborhood association, the town, or a conservation organization. The regulations require that the development be situated so as to minimize alteration of the parcel's natural features and protect the surrounding landscape and character of adjacent development.

Durango, Colorado[424]

The City of Durango's Land Use and Development Code provides that the layout of residential cluster neighborhoods should promote the character of the zone in which they are located and be designed to protect significant natural, historic, or archeological resources. The cluster development must also be designed to emphasize the protection of natural resources and meaningful open space, including that buildings must be located to provide contiguity of common open space, resource protection areas, and agricultural lands (if present); lot lines and lot areas must be established to provide for the most appropriate conservation of the open space areas of the development. Additionally, the provision's design standards require cluster

420 Pinal County, AZ Pinal County Development Services Code, § 2.40.040 Cluster option (2012), http://www.codepublishing.com/az/pinalcounty/html/PinalCounty02/PinalCounty0240.html.

421 N.H. Rev. Stat. Ann. §674:21, http://www.gencourt.state.nh.us/rsa/html/lxiv/674/674-21.htm.

422 Town of Peterborough, N.H., Code §245-26(A) Open Space Residential Development, https://www.townofpeterborough.com/vertical/sites/%7B792D537E-D69C-464A-80FB-790917F72F17%7D/uploads/Chapter_245_Zoning_Ordinance_May_2018.pdf.

423 Town of Peterborough, N.H., Code §245-11.2, https://www.townofpeterborough.com/vertical/sites/%7B792D537E-D69C-464A-80FB-790917F72F17%7D/uploads/Chapter_245_Zoning_Ordinance_May_2018.pdf.

424 City of Durango, CO, Land Use and Development Code § 4-1-3-5 Cluster Development (2014), http://online.encodeplus.com/regs/durango-co/doc-viewer.aspx?secid=298#secid-298.

residential neighborhoods to have a defined conservation objective or combination of objectives, based on either protecting priority resources (such as water) or providing a large common open space amenity (such as community gardens).

Cluster regulations also may encourage or require buildings to be closer to the street, which reduces the lengths of connecting utility pipes/lines to serve them. These are design techniques that create water conserving patterns and building types, reduce water infrastructure costs, and reduce water lost in delivery (as discussed in more detail in *Chapter 3, Working Together*). Some developers see financial advantages to cluster subdivisions because, by placing the buildings closer together and closer to infrastructure, there is a cost savings on expenditures for roadways, sidewalks, water and sewer extensions, and other onsite infrastructure. Such benefits to developers have been upheld by the courts as incidental and do not reduce the valid public purpose of providing for open space, water conservation, recreation, and a host of other community gains.

EXAMPLE OF REDUCING WATER INFRASTRUCTURE COSTS THROUGH CLUSTERING

South Brunswick, New Jersey

In response to an increasing number of housing developments in South Brunswick, New Jersey, the planning board adopted a cluster-development ordinance that was challenged in *Chrinko v. South Brunswick Township Planning Board.*[425] The ordinance allowed a subdivision developer to reduce a minimum lot size by 20% or 30% and minimum frontages by 10% or 20% if the developer deeded 20% or 30% of the subdivided tract for parks, school sites, and other public purposes. The purpose of this provision — innovative when it was first adopted — was to provide a method for development of residential land to preserve desirable open spaces, school sites, recreation and park areas, and land for other public purposes. The plaintiffs claimed that the ordinance was enacted to benefit the developer and not to accomplish the stated purpose of the zoning enabling statute. The court held that giving developers the option of using cluster development reasonably advanced the legislative goal of providing for open space even if the developer derives an incidental benefit such as lower costs of development for street and utility installation.

State law varies widely regarding clustering. Some states do not allow localities to cluster at all, some allow it only if the developer volunteers to cluster, others permit incentives for developer compliance, and in others, clustering can be a requirement.[426] For example, some state statutes allow localities to provide applicants with an incentive for the clustering by increasing the otherwise allowable density in exchange for the provision of open space. Under this arrangement, if the developer would normally have been permitted to create 40 lots in a traditional plat, the applicant with a cluster plat may be able to site 44 lots. The local subdivision review agency, usually a planning board or commission, may impose conditions on its approval of a clustered subdivision regarding a variety of measures including

425 Chrinko v. South Brunswick Twp. Planning Bd., 187 A.2d 221 (N.J. 1963).

426 None of the states in the interior West explicitly prohibit cluster development laws. Arizona, Nevada, New Mexico, Utah, and Idaho make no mention of clustering while Colorado, Colo. Rev. Stat. § 30-28-401, Montana, Mont Code § 76-3-509, and Wyoming, Wyo. Stat. § 18-5-402(a)(ii), explicitly allow cluster development.

water conserving landscaping and interior facilities. The use of bonus density incentives (discussed in more detail in Section 7(e), *Bonus Density Zoning*, of Chapter 7, *The Zoning Code*) can both encourage developers to use clustering (where it is not required), and to adopt highly effective water conservation measures both on the land and inside the buildings.

EXAMPLE OF OPEN SPACE INCENTIVE IN CLUSTER SUBDIVISION ORDINANCE

Milton, New York

The Town of Milton's cluster subdivision ordinance offers an "open space incentive option" that authorizes the planning board to increase the maximum density in the Town's R-2 zoning district. The planning board may increase the number of permitted residences by 50% on properties greater than 10 acres if 50% of the land becomes permanently protected open space.[427]

c. Require a Pre-Application Conference to Discuss Water Issues

For all but the smallest subdivision applications, it is good practice to require a pre-application conference between the applicant and the local government planners, including those from the planning department and water providers. In cases where the water provider is a separate governmental entity from the land use authority, an effort should be made to bring them into a pre-application meeting. This informal meeting can be used to identify issues that may arise in the review process and to ensure that the property owners know the types of information and documents that need to be submitted before the subdivision can be approved. Requiring a pre-application conference and ensuring that the list of topics to be covered includes the need to document adequate water supply can help ensure that developers who cannot document adequate supply do not begin the subdivision process.

EXAMPLES OF PRE-APPLICATION REQUIREMENTS

Douglas County, Colorado[428]

As a prerequisite to the submittal of a preliminary plan for a subdivision, applicants in Douglas County are required to contact the Planning Office for a presubmittal meeting, which includes staff from other departments and referral agencies. At the meeting, staff explain the subdivision process and provide comments on the proposed subdivision's design, conformance with the County's Master Plan, and applicable regulations. Once this prerequisite is complete, the applicant may submit a preliminary plan, which is intended to be an in-depth analysis of the proposed subdivision, including the ability to obtain water.

427 Town of Milton, N.Y., Zoning Code §§ 180-30, Open Space Incentive Option, https://ecode360.com/9165132.

428 Douglass County, CO, Subdivision Resolution § 402, Preliminary Plan (2015), http://www.douglas.co.us/documents/sd-article-4.pdf.

Tombstone, Arizona

Under its Tentative Plat Regulations, the City of Tombstone requires an informal preliminary (or "pre-tentative") plat meeting with the planning and zoning commission. The Regulations include a list of topics that the meeting participants should be prepared to discuss, including provisions for water and water conservation measures to minimize increased water use.[429]

Broomfield, Colorado[430]

Broomfield is its own water provider. The City's Planning Division offers and highly recommends a pre-concept plan review meeting with planning staff for any Planned Unit Development plans and Site Review plans in a PUD zoning district.[431] Almost all applicants take advantage of this meeting. The Water Division is invited to be a part of these meetings and, although the main focus of their discussion is on the utility system infrastructure component, water conservation is tied in through the City's landscaping standards, which require soil amendments and limit the amount of turf grass for residential developments.

Parker, Arizona

Parker has a subdivision pre-application stage that allows the planning and zoning department to advise the proposed subdivider prior to preparation of a preliminary subdivision plat. This can save the applicant and the town both time and money and can reduce friction and conflict that occur when applicants begin a subdivision process that they are not able to complete. The prospective subdivider is required to include a general outline of the proposal, sketches of plans and ideas, and tentative proposals regarding water supply, sewage disposal, surface drainage, and street improvements.[432]

d. Require Documentation of Water Supply Adequacy in Preliminary Plat Applications

Subdivision approval is one of the two most important steps in aligning development potential with available water supplies. Although much depends on whether the community is rural, suburban, or urban, approximately two-thirds of the land area in most communities is occupied by residential uses. It is critical to ensure that these residential lots are not platted to accommodate growth beyond the ability of the community to provide water for that growth. Once a final subdivision plat is approved, it is highly likely that owners of the resulting lots will apply to construct homes on those lots, and it will be difficult to deny those permits. Land development law assumes that lots have not been created for which water service is not available, and that water service can and will be provided to lots that have achieved final subdivision approval, so local governments are often constrained to allow construction of some type on almost all platted lots. Therefore, lots should not be created through the subdivision process if adequate water supply for those lots is not available. Achieving that result often requires that subdivision

429 Tombstone, AZ § 13-1-6: Subdivision Regulations, Tentative Plat Regulations (2005), http://sterlingcodifiers.com/codebook/index.php?book_id=541&section_id=308751.

430 Broomfield Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015); Email interviews with Dave Shinneman, Community Development Director, City of Broomfield (Jan. 24, 2017) and David Allen, Director of Public Works, City of Broomfield (Jan. 25, 2017).

431 City of Broomfield, CO, Planning Division, Concept Plan Checklist (For Planned Unit Development Plans & Site Development Plans in a PUD Zone District) (2012).

432 Town of Parker, AZ Municipal Code, § 11-2-2, Platting Procedures and Requirements: Preapplication Stage (A), http://sterlingcodifiers.com/codebook/index.php?book_id=810&section_id=516630.

regulations reference the need to document adequate water supply at several different stages of the process.

The document that finally creates new lots (or reconfigured lots) that can be sold for development is a "final plat," which is recorded in the real property records of the community where the property is located. The approval of a final plat is almost never done before the applicant has filed a "preliminary plat" and that document has been reviewed by staff and by a higher review body, generally the planning commission. (The exception is in very simple cases — such as the division of land into no more than three lots that already front on a public street — where local governments sometimes allow a preliminary and final plat document to be reviewed and approved at the same time.) In a typical, two-step preliminary-then-final subdivision plat process, it is generally the first step that is the most important for ensuring adequacy of water supply, utilities, and overall design. Final plat approval is often focused on confirming that the changes requested during preliminary plat review have been reflected on the plat itself. It is therefore very important that adequate water supply and lot and street designs that will reduce water waste must be demonstrated during preliminary plat review.

A few communities also permit or require an even earlier step — the creation of a "concept plan" for the subdivision before any plat document is prepared. Concept plans, however, are very general, and it would not be appropriate to require documentation of water supply at that stage — although it is wise to inform the applicant that documentation will be required when the preliminary plat is submitted.

While some states have rigorous requirements that the local and county governments verify that adequate water supply to serve a new subdivision is available before that subdivision is approved, other states have only weak requirements, or none. The requirements of various states and the degree to which any state allowances or requirements to document water supply are enforced (or not enforced) at the local level varies greatly across the country.[433]

In the western U.S., this is often an area of mismatch between the levels of detail required in land use planning and water planning. While most of the work of generating a subdivision plat is done at the preliminary plat stage (early in the process), much of the hard work of providing water for new development often occurs when conditional or preliminary water rights are finalized (late in the process). While it is not too difficult or expensive to obtain an early-stage document confirming that the applicant owns certain water rights, those initial documents often contain conditions or limitations that make it unlikely that they can be perfected (i.e., turned into water that is actually present for the occupants of the land to use). This is because preliminary water rights documents often reflect low-priority rights on streams or rivers where the total amount of water allocated to more senior water rights holders exceeds the amount of water that can be removed from the stream. Approval of a preliminary subdivision based on junior, conditional, or limited rights to water can result in a situation where the local government assumes that finalization of the water rights is a minor or technical issue (like most of the corrections required between a preliminary and final plat document), when finalizing those rights will in fact be difficult, expensive, or impossible. This mismatch also occurs when water will be supplied by a water-supply district rather than the local government, because a "willing to serve" letter from the water district sometimes has conditions or limitations stating that the district will serve the project if and when it has adequate water to do so, or if and when the property owner acquires and donates to the water district the water rights needed to serve the development.

433 *See*, Lincoln Davies. *Just a Big, "Hot Fuss"? Assessing the Value of Connecting Suburban Sprawl, Land Use, and Water Rights through Assured Supply Laws* 34 Ecology L. Q. 1217 (2007), http://ssrn.com/abstract=1132512. *See also*, Bobbie Klein & Douglas Kenney, The Land Use Planning, Water Resources and Climate Change Adaptation Connection: Challenges and Opportunities (2009), http://sciencepolicy.colorado.edu/admin/publication_files/resource-2729-2009.15.pdf.

As a result of this mismatch, counties are often faced with a request to approve a final subdivision plat (that is completely finalized except in regard to water rights) that includes a plat note warning purchasers that building permits will not be issued until the water rights are finalized. [While this can technically happen to towns and cities as well, it usually does not.[434]] If the government agrees, the plat can be filed, and lots can be sold even though the water needed to support that construction is not (and in some cases will not be) available. Despite the plat note, lot buyers sometimes do not realize that they will not be able to use the lot as they intended. But since the U.S. and most state constitutions require that all local land use laws leave the property owner with a "reasonable economic use" of the property, local governments can be left in a bind. In theory, the subdivision process should have ensured that adequate water would be available (in which case homes or buildings could be constructed and there would be a "reasonable economic use" of each lot), but in fact, new lots have been created without an adequate water supply.

To avoid this situation, it is very important that subdivision regulations clearly require demonstration of adequate water supply at the preliminary plat stage. While an initial or conditional water right may be acceptable at that stage, the local government should carefully review the water rights documents in light of the available water in the designated stream, river, or other water source to ensure that it is likely the owner will be able to perfect the water right before the final plat is approved (discussed more in Section 8(e) of this Chapter). Equally important, the final plat should not be approved until the water rights have been finalized (discussed more in Section 8(f) of this Chapter). Once the plat is approved, it is very hard to prevent the sale of lots to unsuspecting buyers. Plat approval creates a new legal lot, and government attempts to limit or prevent the sale of legal property are often disfavored by the courts.

EXAMPLES OF ASSURED WATER-SUPPLY REQUIREMENTS

Tombstone, Arizona

In Tombstone, the tentative plat submittal must include the water conservation measures to be employed in the subdivision. In addition, the regulations clarify that a tentative plat will only be approved if it demonstrates that there is a sufficient supply of potable water that does not cause an unreasonable depreciation of an existing water supply.[435]

Pitkin County, Colorado

Pitkin County has adopted a very high level of proof of adequate water supply at the preliminary plat stage, effectively refusing to process preliminary plats where it appears that the applicant will not be able to finalize the water rights because of "over-allocation" of the streams from which that water is to be taken.[436]

434 This typically does not happen to towns and cities because, when land is annexed into a town or city, the local government almost always requires that the property owner deed to the municipality all the water rights related to the property as a condition of annexation (and future water service from the municipal system). *See e.g.*, Town of Eloy, AZ Municipal Code, §15-77(C), Water Service Requirements, http://sterlingcodifiers.com/codebook/index.php?book_id=674&section_id=453955.

435 City of Tombstone, AZ Municipal Code, § 13-1-6(C)(1)(h), Subdivision Regulations, Tentative Plat Regulations (2005), http://sterlingcodifiers.com/codebook/index.php?book_id=541&section_id=308751.

436 Pitkin County, CO, Land Use Code, § 7-50-020 Development Standards (2006), http://pitkincounty.com/DocumentCenter/View/3470.

Parker, Arizona

Parker's Preliminary Plat Procedures[437] require a statement concerning the sufficiency of the water supply for the development. Further, as a prerequisite to preliminary plat review by the Community Development Department, the subdivider must inform the County Health Department of tentative plans and learn the general requirements for water supply, among other things. Once the preliminary plat is submitted, the Community Development Department submits the application to the director of Public Works, the county health department, interested utilities, and others for review and information. Similarly, the Town's Water Allocation Management Program requires a water service letter prior to the issuance of a building permit, a lot split, or a final subdivision approval for certain categories of residential development. Otherwise, an additional water supply must be acquired and a water delivery contract must be executed with either the Town and/or Bureau of Reclamation to provide for the delivery of an adequate 100-year water supply on the subject property. If the Town, the Arizona Department of Water Resources, and the U.S. Bureau of Reclamation determine that the water that will be provided for residential development is derived from ground water sources and not from the Colorado River, the request for the water service letter must specify that ground water will be used. Further, the applicant must document the adequacy of a 100-year water supply before the town will issue a water service letter.[438]

Star Valley, Arizona

Star Valley requires certain reports and statements to accompany the tentative map, including a statement from the county health officer that either a water company is under permit to serve all lots in the subdivision or the subdivider has an acceptable well and water delivery system.[439]

Douglas County, Colorado

In Douglas County, disputes over the types of water-supply documentation required at different stages of the subdivision process led the county to adopt many pages of detailed application requirement lists that apply in different situations.[440] Among these, the County's Water Supply Overlay District requires applicants to demonstrate the adequacy of a proposed subdivision's water supply in the preliminary plan.441 To do so, the applicant must submit the following:

- Either a letter from a qualified attorney verifying the applicant's ownership of adjudicated water rights or an executed contract granting the applicant adjudicated renewable water rights.
- A copy of the court decree adjudicating the water rights.
- A Water Plan, which must detail the following requirements:
  - The source of water to be supplied to meet development demand.
  - The water-supply delivery system, conveyance system, and storage facilities to be used.
  - Demonstration of the water-supply's reliability (physically and legally), including losses associated with the delivery and storage system.

437 Town of Parker, AZ Municipal Code, § 11-2-3 Preliminary Plat Stage, http://sterlingcodifiers.com/codebook/index.php?book_id=810&section_id=516631.

438 Town of Parker, AZ., Town Code § 8-3A-1 (1997), http://sterlingcodifiers.com/codebook/index.php?book_id=810&chapter_id=55548#s516422.

439 Town of Star Valley, AZ Municipal Code, § 11-3-7(B)(1-2) SUBDIVISION Preliminary Step, http://sterlingcodifiers.com/codebook/index.php?book_id=451&section_id=168343.

440 Douglass County, CO, Zoning Resolution § 18A, Water Supply – Overlay District (2015), http://www.douglas.co.us/documents/section-18a.pdf.

441 Douglass County, CO, Zoning Resolution § 1802A.02, Water Supply Overlay District, Applicability (2015), http://www.douglas.co.us/documents/section-18a.pdf.

- Proof that the water supply is owned and can be used by the applicant for the intended purposes.
- Proof that all necessary decrees, permits, and other legal requirements are in place that allow legal use of the water supply.
- The timing of the development demands through project build out
- The estimated demand of the development.

- For nonrenewable water, the applicant must also submit proof that the water rights in all Denver Basin aquifers have been reserved in perpetuity for the benefit of future landowners within the proposed development, pursuant to a declaration of restrictive covenants in a form prescribed by the County.[442]

Snowflake, Arizona

Snowflake requires that certain reports and statements accompany the tentative map, including the source of the water supply and the size and location of water lines. Additionally, the town requires a statement from the county health officer that either a water company is under permit to serve all lots in the subdivision or the subdivider has an acceptable well and water delivery system.[443]

Doña Ana County, New Mexico

Doña Ana County requires a statement from the State Engineer concerning whether the subdivider can provide an adequate water supply to fulfill the maximum annual water requirements of the subdivision (including water for indoor and outdoor domestic uses) and whether the subdivider will be able to fulfill the proposal in the disclosure statement concerning water (except water quality).[444]

Eloy, Arizona

Eloy requires a statement assuring the provision of water supply for the development on the preliminary plat.[445]

For the reasons stated in this Section, it is very important that preliminary plat application documents clearly identify not only the need to document adequate water supply, but also the types of documentation that will be accepted; and those requirements should ensure that the water rights involved, or the water supply district commitment involved, can be finalized so as to represent actual water by the time a final plat is approved.

442 Douglass County, CO, Zoning Resolution § 1806A, Water Supply Overlay District (2015), http://www.douglas.co.us/documents/section-18a.pdf.

443 Town of Snowflake, AZ, Municipal Code, § 11-6-3(A)-(Z): Preliminary Steps (1986), http://sterlingcodifiers.com/codebook/index.php?book_id=676&section_id=454875.

444 Doña Ana County, NM, Unified Development Code, § 350-212 Subdivision Procedures, http://ecode360.com/32277377.

445 Town of Eloy, AZ Municipal Code, §15-37(D)(7), Preliminary Plat, http://sterlingcodifiers.com/codebook/index.php?book_id=674&section_id=453924.

e. Refer Application to Water Agencies

Once a complete application for a preliminary plat review has been received, it is referred to other local government agencies for comment as to whether it meets their requirements for service. The list of "referral agencies" often includes the following requirements for individual departments:

- The public works or streets department, to ensure that street designs meet their engineering standards for grades, curves, intersections, and widths
- The fire department or district, to ensure that street designs, grades, and layouts are adequate to allow good access by fire fighting and emergency medical equipment
- The public health department, to ensure that sewer or septic system designs meet their engineering standards

Communities could consider amending subdivision regulations to also require a referral to the Public Works department, water department, or water district to review the adequacy of the documentation of water supply. It is also important that the referral agency have the expertise to evaluate whether the proposed source of water supply in fact has the water rights (or the ability to acquire water rights) necessary to serve the development. Adding another level, if the local government has also adopted water conservation requirements that can be confirmed at this stage (such as requirements to incorporate Low-Impact Development features to manage stormwater that will, in turn, reduce the need for irrigation) then a referral to the agency or department that will review those features also should be included.

EXAMPLE OF AGENCY REFERRAL PROVISIONS

Tombstone, Arizona

The City of Tombstone allows the planning director to transmit proposals to a number of groups, including the Arizona Department of Water Resources, the University of Arizona Cooperative Extension Water Wise Program, and other agencies to review water conservation provisions.[446]

Douglas County, Colorado

Douglas County requires subdivision applicants to attend a presubmittal meeting with the Planning Office and staff from other departments and referral agencies, after which the applicant may submit a preliminary plan.[447] For subdivisions within the County's Water Supply Overlay District, the code provides stringent approval standards to ensure that the Planning Commission and the Board of County Commissioners carefully reviews the preliminary plan and supporting documentation to ensure water-supply adequacy.[448] Under these standards, the Board of County Commissioners is charged with determining whether applicants have completed the following requirements:

- The water rights can be used for the uses proposed.
- The reliability of the water right has been analyzed and is sufficient based on its priority date within the Colorado System of Water Rights Administration.

446 City of Tombstone, AZ Municipal Code, § 13-1-6(E)(1)-(2), Subdivision Regulations, Tentative Plat Regulations (2005), http://sterlingcodifiers.com/codebook/index.php?book_id=541&section_id=308751.

447 Douglass County, CO, Subdivision Resolution § 402, Preliminary Plan (2015), http://www.douglas.co.us/documents/sd-article-4.pdf.

448 Douglass County, CO, Zoning Resolution §§ 1803A, 1806A, Water Supply Overlay District (2015), http://www.douglas.co.us/documents/section-18a.pdf.

- The project's water plan is adequate and feasible to ensure that water-supply shortages will not occur due to variations in the hydrologic cycle.
- The water plan is sufficient to meet the demand applicable to the project based on the County's established minimum water demand standards.

f. Withhold Final Plat Approval Until Confirmation of Adequate Water

As noted in Section 8(d) of this Chapter, once the preliminary plat has been reviewed for confirmation that initial or conditional water rights will be adequate to serve the development, it is important that the final plat approval requirements include the finalization of those initial or conditional water rights. Ideally, final plats should not be approved and recorded unless any conditional water rights have been finalized so that lot buyers will be certain of their ability to obtain water for their lots and homes. If that is not possible, then it is important that the plat clearly state that building permits are "subject to" finalization of conditional water rights. If this is stated clearly and prominently, title insurance companies and title abstract companies can disclose the limitations on usability of lots and avoid misunderstandings with potential lot buyers.

EXAMPLES OF FINAL PLAT APPROVAL CRITERIA

Tombstone, Arizona

In Tombstone, a final plat will be approved only if it meets a number of factors, including a demonstration that there is a sufficient supply of potable water that does not cause an unreasonable depreciation of an existing water supply.[449] As part of the final plat review process, the applicant must submit a copy of the report prepared by the Arizona Department of Water Resources stating that an adequate supply of water exists for the projected needs of the subdivision, as well as a copy of the final hydrology report approved by the building inspector.[450]

Doña Ana County, New Mexico

Before final plat approval in Doña Ana County, the applicant must submit an opinion from the State Engineer confirming the subdivider's ability to both furnish a sufficient quantity of water to fulfill the maximum annual water requirements and conform with the proposals in the disclosure statement with regard to water. If the State Engineer has not issued a positive determination concerning water use, the DOCC (approving agency) may elect not to approve the final plat.[451]

449 City of Tombstone, AZ Municipal Code § 13-1-3(F) Planning and Zoning Commission and City County Review, http://sterlingcodifiers.com/codebook/index.php?book_id=541&section_id=308748.

450 City of Tombstone, AZ Municipal Code § 13-7-7(E)(3) Final Plat; General Submittals and Review Process, http://sterlingcodifiers.com/codebook/index.php?book_id=541&section_id=308748.

451 Doña Ana County, NM, Unified Development Code, § 350-212 Subdivision Procedures, http://ecode360.com/32277377.

Douglas County, Colorado[452]

Under Douglas County's Subdivision Regulations and Water Supply Overlay District requirements, the Board of County Commissioners must determine the adequacy of the water supply of a subdivision in the preliminary plan. Before approving a final plat application, the Board must then ensure that the water rights to serve the subdivision have been conveyed to the District and are available for the intended uses and that the water credits to serve the subdivision have been purchased from the District (as necessary), and/or the water supply is the subject of a fully executed contract or IGA with another water provider in which all terms have been fully satisfied, as confirmed by a signed will-serve letter from the provider.[453]

Once again, it is important that the subdivision regulations clarify in some detail exactly what documentation must be submitted to ensure that each of the lots to be created will in fact have an adequate water supply for both household and fire safety purposes. It is often not enough to state that documentation must be submitted; the better practice is to state what types of documentation must be submitted and what types of conditions or limitations will not be permitted in those documents. The goal is to ensure that buyers of the lots can actually develop those lots without having to pay for the acquisition or finalization of additional water rights.

g. Require Improvements Necessary to Deliver Water

At the time a final subdivision is approved, most cities and counties require that a note on the final plat, or a separate "subdivision improvements agreement" or "development agreement," be approved alongside the final plat document, requiring the property owner to build the pipes and other infrastructure needed to deliver water to individual lots in the subdivision. Communities should consider amending subdivision regulations to clarify that this will be required.

In addition, to protect the local government against the possibility that the property owner will not have adequate funds to complete the required water infrastructure, many counties and cities require that the applicant post financial security (i.e., a performance bond or letter of credit) to ensure that, if the owner cannot fulfill its obligations, the local government will have access to adequate funds to complete those improvements on its own.

However, since performance bonds and letters of credit are expensive and difficult to obtain — and often difficult for the local government to administer — an increasing number of local government have in recent years instead required "subdivision phasing agreements" or other agreements providing that the final plat will be approved in installments, and that the water infrastructure for each installment must be fully completed before the final plat for the next installment of lots will be approved. While not ensuring that the local government has funds available to complete the improvements, these types of agreements limit the government's risk, because any developer default in building pipes and infrastructure will affect only a few lots (those remaining in that "phase") rather than all of the lots in a subdivision.

452 Douglas County, CO, Zoning Resolution §§ 1802A.02, 1806.A.02.3(2), Water Supply Overlay District (2015), http://www.douglas.co.us/documents/section-18a.pdf.

453 Douglas County, CO, Zoning Resolution § 1806.A.02.3(2), Water Supply Overlay District (2015), http://www.douglas.co.us/documents/section-18a.pdf.

EXAMPLE OF WATER INFRASTRUCTURE REQUIREMENTS

Eloy, Arizona

In Eloy, Arizona, the subdivider is responsible for "all costs, including review fees, for the installation of the improvements as a stipulation of zoning and/or preliminary plat" including public/private water-supply systems.454 The improvements for approved subdivisions may be constructed in increments according to a Council-approved phasing plan.[455] In addition, the subdivider must provide adequate financial assurance (cash, a performance bond from a corporate surety, an irrevocable letter of credit, or funds in escrow) at the time of application for final subdivision approval in the amount sufficient to secure satisfactory construction of the required improvements.[456]

Many counties and cities now have similar provisions in their subdivision regulations.

454 City of Eloy, AZ Municipal Code, § 15-76(A) Subdivisions: Improvement Requirements, (2004), http://sterlingcodifiers.com/codebook/index.php?book_id=674&section_id=453955.

455 City of Eloy, AZ Municipal Code, § 15-79(A) Agreement by Subdivider (2004), http://sterlingcodifiers.com/codebook/index.php?book_id=674&section_id=453955.

456 City of Eloy, AZ Municipal Code, § 15-79(B) Financial Assurance of Construction (2004), http://sterlingcodifiers.com/codebook/index.php?book_id=674&section_id=453955.

9. Site-Plan Regulations

Site-Plan approval is commonly required of multifamily, commercial, mixed-use, industrial, and institutional projects. This approval process is often required when land has already been zoned (i.e., placed in a zoning district where specific types of land uses and buildings are allowed) and subdivided (i.e., divided into lots and parcels with streets and utilities serving each lot), and the remaining question is how to organize buildings, open spaces, parking spaces, landscaping, and lighting on individual lots so that they achieve additional planning goals and minimize impacts on surrounding properties and roads. Site-plan approval is seldom required for single-family detached, duplex, or single-family attached (townhouse) developments because each lot will contain one structure (a house or duplex or townhouse building) and the maximum building heights and minimum building setbacks in the zoning regulations are enough to prevent adverse environmental, traffic, or other impacts on surrounding properties.

a. Consider Water-Supply Adequacy for Approval

By the time lots have been platted and zoned and utilities have been installed, the opportunities to ensure adequate water supply to the property are somewhat limited. In theory, the local government should not have approved subdivision lots or applied zoning to those lots that allow development beyond their capacity to provide water service. (See Chapter 8, *Subdivision Regulations*, for more on this.) In practice, however, this sometimes happens, either because the planning and zoning process was not thoughtful or because the community's water shortages became evident after the land was subdivided and zoned. In those situations, water-consumption controls can sometimes (depending on state law) be applied at the site-plan stage.

More specifically, during site-plan review, the city or county engineer may consider and advise the reviewer (generally staff or the planning commission) as to the adequacy of the community's water supply. The availability of this tool should be confirmed with the county or municipal attorney, however, since some states may not allow consideration of water-supply factors at this late point in the development review process.

EXAMPLE OF ENGINEER-CONFIRMED ADEQUACY REQUIREMENT FOR SITE-PLAN APPROVAL

Star Valley, Arizona

In Star Valley, Arizona, the town engineer considers adequacy of supply prior to approval or denial of a site-plan application by the town council.[457]

Even if adequacy of water supply cannot be reviewed at the site-plan stage, however, many other water-related aspects of development can and usually are reviewed at this stage. For example, site-plan review is where compliance with site landscaping standards will be reviewed and confirmed. There are many development standards that communities can adopt for purposes of water conservation that can only be

457 Town of Star Valley Municipal Code Ch. 1 Site Plan Requirements, sec. 12-1-2 Definitions, http://sterlingcodifiers.com/codebook/index.php?book_id=451&section_id=168388.

implemented and enforced at the site-plan review stage. For example, this site-plan review is where the community planners (or the planning commission) confirm that requirements will be met:

1. The required amount of landscaping has been installed in proper locations.
2. Any soil quality/remediation/augmentation requirements have been met.
3. Plants to be installed are from an approved plant list designed to reduce irrigation needs.
4. Trees and shrubs meet the minimum size requirements.
5. The amount of irrigated turfgrass and the quality of the installed turfgrass does not exceed limits designed to reduce irrigation needs.
6. Any installed irrigation system meets water efficiency requirements (for example, drip rather than spray irrigation is used, or spray irrigation nozzles are designed to avoid overspray and have automatic rain sensors and shutoffs).
7. Any required water-harvesting features — such as cisterns or green roofs — have been included in the design.

In short, site-plan review is often the last time prior to construction that the community can review whether the proposed site and building construction plans comply with any water-related design requirements included in the building, zoning, and subdivision regulations.

b. Include a Good Purpose Statement

The statement of purpose and intent for site-plan requirements should include a general statement that the intent is to confirm compliance with all applicable development regulations and may include a specific statement of the need to confirm compliance with landscaping and water conservation regulations.

EXAMPLE OF SITE-PLAN REGULATION PURPOSE STATEMENT INCLUDING INSURING ADEQUATE WATER

Carlisle, New York

Carlisle's Site-Plan Regulations set forth the following purpose statement: "The purposes of these regulations are to maintain the rural, natural, and scenic qualities of the Town of Carlisle by preserving farmland and significant open lands while allowing landowners a reasonable return on their holdings. Through site-plan review, it is the intent of these regulations to promote the health, safety and general welfare of the town. A clean wholesome, attractive environment is declared to be of importance to the health and safety of the inhabitants of the town and, in addition, such an environment is deemed essential to the maintenance and continued development of the economy of the town and the general welfare of its inhabitants. It is further the intent of these regulations to ensure the optimum overall conservation protection, preservation, development and use of the natural and man-related resources of the town through review and approval of

site plans. Toward this end, these regulations establish standards for preserving water quality, controlling air quality and traffic congestion, ensuring site access for emergency services (e.g., fire/police protection and ambulance services), providing adequate water supply and safe and proper means for sewage and solid waste disposal, and guarding neighboring properties against intrusive development impacts."[458]

c. Include Specific Criteria to Demonstrate Compliance

As discussed in Chapter 11, *Supplemental Regulations*, communities may adopt — through the zoning ordinance, subdivision regulations, or a stand-alone landscaping ordinance — objective criteria about landscaping materials (to require drought-resistant and water conserving species), including the minimum sizes and qualities of those plants. They may also include objective standards requiring open spaces to be designed to help manage stormwater without the need for "hard infrastructure" where the use of pipes, culverts, and other hard infrastructure can be avoided.

The site-plan review regulations, in turn, can then include specific criteria requiring site plans to demonstrate compliance with those requirements. In order for site-plan review to produce predictable results, the review needs to be tied to objective standards in the landscaping ordinance (not just vague intent statements), and decisions need to be based on clear criteria requiring compliance with the zoning standards related to water supply and conservation.

SAMPLE[459] CRITERIA TO DEMONSTRATE COMPLIANCE WITH WATER-FOCUSED SITE-PLAN REQUIREMENTS

Compliance with Low-Impact Development Requirements

The site plan shall demonstrate that all areas required to be landscaped pursuant to Chapter XX (Landscaping) comply with the requirements of that chapter and are designed as an integrated system to meet onsite stormwater-quality requirements for the lot through incorporation of Low-Impact Development design principles and incorporation of Best Management Practices for onsite stormwater management.

Compliance with Water Quality Requirements

The site plan shall demonstrate that each residential area is designed so that open spaces and landscaped areas on individual residential lots, on individual lots for permitted nonresidential uses, in common areas, and along street frontages shall provide permanent onsite treatment of stormwater from impervious surfaces on the lot.

Similarly, site-plan review regulations can include specific criteria requiring site plans to demonstrate compliance with other objective water conservation requirements contained within the local code, such as those related to green, water efficient buildings.

458 Section A.2 of the Site Plan Regulations of the Town of Carlisle, New York, http://www4.schohariecounty-ny.gov/PdfFiles/TCAR/CarlisleSitePlan.pdf.

459 Where community examples of important techniques could not be found, this Guidebook offers sample language for consideration.

EXAMPLES OF SITE-PLAN DOCUMENTATION REQUIREMENTS DEMONSTRATING COMPLIANCE

Greenburgh, New York[460]

Under Greenburgh's Green Building Initiative and Energy Construction Standards, an applicant seeking site-plan review must submit a Green Building Project Checklist (a.k.a., LEED Scorecard),[461] completed by a LEED Accredited Professional, and a Green Building Worksheet (which specifies submittals required for site-plan review), and any other documents that may be necessary to demonstrate compliance with the Town's green building requirements. In addition, after submittal but prior to a public hearing on the site plan, the local Green Building Compliance Official (GBCO) will arrange a meeting with the applicant to discuss the proposed measures. The applicant may not obtain a site-plan approval or building permit until the GBCO has approved the documentation.

Under the LEED for New Construction rating system version 2009 (v3), cited by Greenburgh's local law, projects are required to employ strategies that, in the aggregate, reduce water use by a minimum of 20% from a building's calculated baseline, not including irrigation. Optional water conservation credits in the rating system include the use of water efficient landscaping, installation of innovative wastewater technologies, and an additional reduction in building water use by 30%, 35%, or 40% from a building's calculated baseline, not including irrigation.

Under Greenburgh's local law, the applicant, owner, or tenant is also required to submit documentation that the following has been completed:

- Prior to the issuance of a certificate of occupancy, verifying that the green building measures approved in the pre-permitting documentation were implemented
- After one year of occupancy of the building, showing that the building is being operated according to the previously approved efficiency and conservation standards
- Again after five years of occupancy of the building, showing that the building is being operated according to the previously approved efficiency and conservation standards

Annapolis Maryland

In Annapolis, all applicants for applicable projects that require site design review must provide design plans that show how the building's surrounding landscape will comply with the applicable green development standard (which varies by building type and size), a LEED scorecard showing the LEED points that a building will obtain, and a written explanation of how the building and surrounding landscape will obtain those points.[462]

460 Town of Greenburgh, NY, Municipal Code, Submission of Site Plan Application Review Documentation, §233-5 and §233-7 (2009), http://ecode360.com/13704945.

461 U.S. Green Building Council, Checklist: LEED v2009 for New Construction (Apr. 2009), https://www.usgbc.org/resources/new-construction-v2009-checklist-xls.

462 City of Annapolis, MD, municipal Code, tit. 17, Ch. 17.14, § 17.14.050(A)(1) (2008), https://www.municode.com/library/md/annapolis/codes/code_of_ordinances?nodeId=TIT17BUCO_CH17.14GRBUENEFENDE_17.14.050SIPL.

Under Version 4 of the LEED for Building Design + Construction rating system — automatically incorporated by the Annapolis code — projects, at a minimum, must meet these requirements:

- Reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period or by reducing the project's landscape water requirement by at least 30% from the baseline for the site's peak watering month (calculated with the EPA's WaterSense Water Budget Tool)
- Use indoor plumbing fixtures that are WaterSense–labeled (where eligible) and that, in the aggregate, reduce water use by a minimum of 20% from a building's calculated baseline
- Install permanent water meters that measure the total potable water use for the building and associated grounds (and compile data summaries monthly and annually for five years)

Optional water conservation credits in the rating system include further reductions in outdoor water use, further reductions in indoor plumbing fixture and fitting water use (can be met by using alternative water sources), permanent water metering for two or more water subsystems (such as irrigation, indoor fixtures, reclaimed water), and conducting a potable water analysis for cooling towers and evaporative condensers.[463]

Under Version 4 of the LEED for Homes Design + Construction rating system, automatically incorporated by the Annapolis code, single-family homes connected to a municipal water system are required, at a minimum, to install a whole-house water meter (single-family attached homes may share a whole-building water meter if landscaping is commonly managed). Optional water conservation credits in the rating system include reducing total indoor and outdoor water consumption by at least 10% over standard practices, landscaping with native plants or plants adapted to the region, and labeling bathroom fixtures with WaterSense and limiting overall volume flow.[464]

d. Ensure That the Approved Design Is Constructed

After the site plan has been approved, communities should then ensure that open spaces are laid out as shown on the approval and that landscaping is installed in the locations, amounts, and with the species shown on the site plan. Actual installation of these features will need to be verified through onsite inspection, which is often part of the building construction inspection process.

Unfortunately, this is an area of weakness for many communities. Historically, after development has been approved, site inspections are performed by building inspectors who are trained to identify compliance with technical standards for building engineering and safety. Over time, that role has expanded (in most communities) to include verification that the building is located where it is supposed to be on the lot (i.e., no closer to any street or lot line than the required setbacks) and that the parcel includes at least the minimum parking spaces required in the proper location. As landscaping requirements have become more widespread and common, some building inspectors' roles have also expanded to confirm that the required number of trees and shrubs have been installed in the locations

463 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction 51-63 (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

464 U.S. Green Bldg. Council, LEED v4 for Homes Design and Construction 26-31 (Oct. 2, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

where they are required. However, building inspectors are generally not trained as landscape architects, hydrologists, or soil experts. If the community's regulations require that specific species of trees or shrubs be installed, or that soil be remediated to minimize runoff and reduce irrigation needs, or that bioswales or other water management measures be installed, the building inspectors may not have the training (or may be unwilling) to perform those tasks. Communities should keep this in mind as they update landscaping and site-plan standards and ensure that inspectors receive necessary training.

As water conservation and green building regulations become more prevalent, detailed, and complex, it may be necessary for the community to arrange for planning staff, environmental review staff, water utility staff, or outside professionals to perform periodic site inspections. While this is primarily true during construction, it may also be true in the years following occupancy. Just as fire departments perform periodic inspections to confirm that a building that was constructed safely remains safe for its occupants, the local government may want to arrange for periodic inspections to confirm that pervious pavement and bioswales (for example) are still functioning as they were designed to function, or that water conserving landscaping has not been replaced by thirstier varieties of trees, shrubs, or ground cover. (For more on this, see Chapter 15, *Post-Occupancy Enforcement*.)

EXAMPLES OF POST-CONSTRUCTION ENFORCEMENT OF SITE-PLAN REQUIREMENTS

Westminster, Colorado

A majority of the City of Westminster is zoned as Planned Unit Development (PUD),[465] under which all proposed uses must conform to the City's highly detailed Comprehensive Plan.[466] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[467] Through the PUD approval process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. As part of the PUD requirements, all land uses and negotiated standards, which must comply with the Comprehensive Plan and design guidelines — both of which promote strong water efficiency — must be reflected in the project's ODP, which acts as a site plan, making them the legal requirements for that project.[468] A project's ODP will include specifications relative to landscape compliance in terms of the water usage standards (referring to the municipal code and landscape code) and planting specification, including hydro-zone analysis and plant types,

465 City of Westminster, CO, City Zoning Map (2010), http://westminstereconomicdevelopment.org/Westminster/media/Westminster/Maps/ZoningMap_July2014.pdf?ext=.pdf.

466 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 94, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/LongRangePlanningandUrbanDesign/ComprehensivePlan.

467 *Development Review*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview (scroll down to "Development Project Types" header; then click "Design Guidelines" to expand the menu). Because the State of Colorado recently (as of the writing of this Module) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

468 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

which correspond to the City's planting palette.[469] The City then has a robust inspection process to ensure continued compliance with these ODPs.

In addition to pre-occupancy inspections, which include a check to ensure the correct installation of water efficient landscaping, Westminster also has a post-occupancy inspection program under which the City periodically inspects landscapes to be sure that what was listed in the ODP and originally installed still exists. The City's code requires property owners to maintain the landscaping indicated on any approved ODP or site plan accompanying an ODP waiver.[470] The City has a special ODP Inspector who manages this process, which commonly results in missing trees or other landscape areas needing replacement. The inspections do not occur on a regular, planned schedule; rather, they are based upon observed violations or warranty inspections. Because continued compliance with the ODP is legally required by virtue of it being part of the zoning, alterations to water efficient landscaping are treated as code violations, as are any other violations of the ODP — the same way that another community might enforce a zoning violation where a single-family home was converted to a two-family home. The City can enforce these violations in the same way as any other code violation (as a misdemeanor, punishable by $2,000/day and/or 1 year in jail), although these punishments are rarely levied as the City's main concern is remedying the violation.

Sarasota County, Florida

Under Sarasota County's Land Development Regulations, site and development plans must include landscape plans and specifications indicating types, sizes, locations, and quality of vegetation as well as provisions for irrigation and maintenance.[471] Sarasota County's Water-Efficient Landscaping Regulation requires resourceful landscape planning, installation of water efficient irrigation, and appropriate maintenance measures to promote conservation of water resources. To enforce maintenance, the Landscaping Regulation requires builders to provide property owners with a landscape maintenance checklist in a format prepared by the County that includes information such as cleaning and calibrating the irrigation system, resetting the automatic controller, replenishing mulch, pruning plants, and cutting grass around sprinkler heads.[472] The builder must also inform the owner of the current irrigation restrictions adopted by the County and the Water Management District. In addition, inspections are required by the Code Enforcement Officer or designated inspectors to "make inspections at reasonable hours of all land uses or activities regulated by Water-Efficient Landscaping Regulations in order to insure compliance with the provisions" included in the Water-Efficient Landscaping Ordinance.[473] The code enforcement officer is responsible for initiating enforcement proceedings, and the Board of County Commissioners is authorized to select Special Magistrate candidates who can issue citations, assess fines against violators, and hold hearings as provided in the Sarasota County, Florida Code of Ordinances.

469 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

470 City of Westminster, CO, City Code, § 11-7-5, Site Development Standards, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH7SIDEST_11-7-5PRRELA.

471 City of Sarasota, FL, Land Development Regulations, § 74-62 (2015), https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH74LADERE_ARTIIISIDEPLRE_S74-62STRESIDEPLAP.

472 Landscape Compliance Certification & Checklist Chapter XXII, Article VI of Sarasota County Code Ordinance Number 2001-081, http://sarasota.ifas.ufl.edu/Hort/WEL/ord/docs/ordchecklist.htm; *See also,* Sarasota, FL, Water efficient Landscaping Regulations, § 22-154(2005), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-154GEPRDEST.

473 City of Sarasota, FL, Water efficient Landscaping Regulations, § 22-155 (2001), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-155EN.

Aurora, Colorado

The City of Aurora requires a landscaping site plan to be submitted as part of the site-plan application process.[474] The plan must conform with the City's landscaping code, which includes requirements for drought-tolerant or drought-resistant landscaping and plant species, turf limitations, automatic irrigation shutoff sensors, buffer reductions for xeriscape design, and maintenance requirements. The landscape plan must include a table summarizing landscaped areas that are water conserving (non-turf) and non-water conserving (turf), to be used for assessing irrigation tap fees.[475] Similarly, projects qualifying for buffer reductions by using xeriscape design must include notes on the landscape plan describing the type of irrigation for each area.[476]

The City requires that all landscaping indicated on the site plans for single- and two-family homes must be installed prior to inspection and issuance of a Certificate of Occupancy. Temporary certificates of occupancy may be issued when the required landscaping is not completed due to weather or seasonal conditions.[477] Post occupancy, homeowners are then required to maintain this landscaping, including a requirement that any replacement plants conform to the City's current landscaping standards.[478] Inspections are based on observed violations and may result in citations.

The City also prohibits single- and two-family homeowners from installing a lawn, turf, or sodded area without a valid lawn permit.[479] Applications for a lawn permit must include a site plan or drawing of the lot. The Water Department then inspects soil amendment and soil preparation to determine whether the application satisfies the City's water conservation requirements. If there is a potential violation of this requirement, the City may enter private property to inspect. Violations are treated as a violation of the City's Waste of Water code provision.

474 City of Aurora, CO, Building and Zoning Code, § 146-1401, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV1INGE_S146-1401AP.

475 City of Aurora, CO, Building and Zoning Code, § 146-1430, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1430IR.

476 City of Aurora, CO, Building and Zoning Code, § 146-1437, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1437XEDE.

477 City of Aurora, CO, Building and Zoning Code, § 146-1450(E)(1), Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV4DIST_S146-1450ADREREDE.

478 City of Aurora, CO, Building and Zoning Code, § 146-1438, Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1438LAMA.

479 City of Aurora, CO, Municipal Code, § 138-187, Utilities, https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-187WACOREEX.

PART III: ADDITIONAL STRATEGIES

10. Building and Plumbing Codes

In most communities, almost every building constructed must comply with a building code adopted by the local government (or adopted by the state and made applicable to its local governments). There is not just one building code, however. The general term "building code" includes many other codes such as electrical codes, mechanical codes, and plumbing codes, and there are often different versions of those codes applicable to new construction, renovations, and historic buildings. Building codes establish minimum quality, design, installation, and construction standards for almost all building systems, and they often also include minimum efficiency standards for building equipment and fixtures.

While zoning, subdivision, and site-planning regulations and criteria are still usually custom-drafted for each city and county, the same is not true of building construction standards. Very few local governments create a building code based on their own knowledge and judgments about building safety. States often adopt model codes to regulate building systems and parts. In many states, local governments are responsible for enforcing these state codes and must obtain state approval to adopt stricter provisions. While a few states preempt local adoption of stricter code standards altogether, none are in the Interior West. Most Interior West states have adopted statewide building, energy, and plumbing codes and authorize municipalities to adopt more restrictive provisions and enforcement measures for one or more of these codes.[480] Because the field is so technical, almost all communities work from an accepted model and then choose among "pre-approved" options that have been declared safe by the authoring agency to meet their local needs. As a result, the decision process in this area is not as much about how to draft new and efficient regulations, but mostly about what features to choose from the field of pre-approved alternatives. Local governments do, however, often make additions and edits to established codes.

Over the past two decades, increases in the water efficiency standards for toilets, dishwashers, clothes washers, water heaters, and other types of appliances and fixtures have contributed to very significant water savings throughout the country, reducing burdens on water supplies and wastewater systems. In addition to water efficiency improvements, potable water use has increasingly been reduced through the use of onsite nonpotable water for irrigation as well as flushing of toilets and urinals. Water reuse can be made possible through rainwater and stormwater collection systems (where permitted under state water rights doctrine) or through the installation of greywater systems, which recycle water from baths, showers, sinks, dishwashers, and washing machines, and treat the water onsite to a requisite level of quality (which may be determined by the state or local government). Building codes can include requirements for fixture efficiency, water reuse, smart meters, submetering, and other such technologies. Likewise, plumbing and landscaping codes can include requirements for these same features, as well as rain sensors and automatic shutoffs for rain and periods of high moisture content, requirements for programmable irrigation timers, drip irrigation, water harvesting, water loss limits, positive shutoff, and restrictions on outdoor plumbing connections, which would be used for watering, car washing, and other outdoor uses. Used in combination with limits on the amount of irrigated landscaping, requirements

480 In the Interior West, Colorado, Idaho, Montana, Nevada, New Mexico, and Utah have adopted statewide building, energy, and plumbing codes, but they do authorize municipalities to exceed one or more of these codes. Arizona and Wyoming have not adopted one or more of the statewide building and related codes. At least five states—none of them in the Interior West—have adopted statewide building, energy, and plumbing codes but do not allow municipalities to amend any of these codes.

that the installed irrigation be as efficient as possible can result in dramatic reductions in residential water use.

Communities should compare these strategies to their current building codes to ensure that existing standards foster water efficient development or, at the very least, do not inhibit such development, given that developers are free to exceed but not contradict code requirements. (For example, local codes requiring that downspouts connect to drains will inhibit rainwater collection and could be amended.) Similarly, as part of updating zoning, site plan, and subdivision regulations to focus on water efficiency and conservation, communities should compare any new incentives or requirements with existing building codes to ensure consistency.

a. Focus on Process and Potential Pitfalls

When amending building and plumbing codes to reduce potable water use, communities should be careful to consider options carefully and think through implementation early and often to avoid conflicting standards.

i. Follow Good Procedure and Remove Barriers to Water Conservation

The discussion in this Chapter should make clear that there are several different alternative codes that could be adopted — and would almost always be tailored — to achieve significant water savings. The challenge for local governments is to (1) choose which alternative code to start from, (2) tailor that code for local conditions (for example, cold or warm climates that may lead to unusual risks of pipes freezing in the cold or expanding in the heat), and (3) organize political support to adopt the code as the city or county's mandatory construction code. (4) In most communities, a fourth step — training the local building and plumbing contractors on the new requirements — may be required, but in practice those professions are generally involved in both the choice of which code to adopt and in tailoring the code to local conditions.

During this process of selecting a code and tailoring it for local conditions, communities concerned with water conservation will want to carefully consider how their newly selected building code might prevent desired water efficiency and conservation. The community's Water and Land Use Planning and Integration Team (discussed in Chapter 4, *Getting Started*) could meet to discuss potential barriers and necessary amendments (within any limitations applied by the state to select and amend building codes). Discussion points may include, for example: Does the code allow for rainwater collection? Greywater reuse? What surfacing materials are required in the code and are those materials preferable from a water systems standpoint?

EXAMPLE OF REMOVING BUILDING CODE BARRIERS TO WATER CONSERVATION

Cleveland, Ohio

To facilitate the construction of resource-efficient, sustainable development projects, especially those seeking LEED for Neighborhood Development (LEED-ND) certification, which has multiple water conservation elements, the City of Cleveland created a Green Team. The Mayor's executive

staff assembled the team from LEED-ND experts and municipal infrastructure staff, as well as staff from the Cleveland City Planning Commission, Division of Engineering, Department of Building and Housing, Public Works Department, Department of Law, and local utilities. The team met monthly, held topical workshops to identify and reconcile roadblocks for the City's several LEED-ND projects (especially to identify conflicts between specific LEED-ND criteria and local regulations and policies and to eliminate these barriers), educated City officials from different departments, and facilitated communication between project teams and City staff.

One of the barriers identified during this process was that the LEED-ND criteria included a credit for water efficient landscaping that required projects to reduce water consumption for outdoor landscape irrigation by 50% from the baseline. The City's building code, however, required downspouts to connect to drains only, which inhibited rainwater collection — a major tool for conserving potable water resources. To facilitate water conserving development projects, Cleveland altered its building code (which was more restrictive than the State-adopted code) to allow connections directly to rain barrels through the City's downspout disconnection program.[481] The City's zoning code also permits rain barrels as accessory structures in residential districts.[482] Similarly, to allow pervious paving materials, which reduce stormwater runoff and increase water recharge, the City authorized its building director to approve paving materials other than asphalt or concrete during the project review process.[483]

ii. Avoid Overlapping Standards or Incentives

When using building and plumbing codes to promote water efficiency, communities should ensure that the codes are not inconsistent with water conservation measures included, required, or incentivized in zoning, subdivision, site plan, and landscaping regulations. It is not uncommon, for example, to find landscaping regulations that offer incentives for (or require) irrigation features that do not align with the requirements of the plumbing code governing irrigation systems. Not only do those types of inconsistencies cause frustrations for builders, but they often also require additional administrative effort to review something twice when it only needs to be reviewed once.

481 Interview with representatives from the Cleveland City Planning Commission and Green Team members / LEED-ND experts: Robert Brown, FAICP, James Danek, Michelle Bandy-Zalatoris, AICP, LEED AP, and Justin Glanville, Cleveland City Hall (Oct. 15, 2010).

482 Cleveland, Ohio, Zoning Code § 336.04 (2007) (Urban Garden Districts); Cleveland, Ohio, Zoning Code § 337.25 (2010) (Agricultural Uses in Residential Districts), http://library.amlegal.com/nxt/gateway.dll/Ohio/cleveland_oh/partthreelandusecode/partiiiblandusecode-zoningcode/titleviizoningcode?f=templates$fn=default.htm$3.0$vid=amlegal:cleveland_oh.

483 Interview with representatives from the Cleveland City Planning Commission and Green Team members / LEED-ND experts: Robert Brown, FAICP, James Danek, Michelle Bandy-Zalatoris, AICP, LEED AP, and Justin Glanville, Cleveland City Hall (Oct. 15, 2010); City of Cleveland, OH, Zoning Code, § 349.07 Off-Street Parking and Loading (2008) (Requiring the maintenance of off-street parking spaces and driveways surfaced with concrete, asphalt, "or other surfacing materials approved by the Director of Building and Housing"), http://library.amlegal.com/nxt/gateway.dll/Ohio/cleveland_oh/partthreelandusecode/partiiiblandusecode-zoningcode/titleviizoningcode/chapter349-off-streetparkingandloading?f=templates$fn=default.htm$3.0$vid=amlegal:cleveland_oh$anc=JD_349.07.

EXAMPLE OF RESOLVING CONFUSION

Boulder, Colorado

As an environmentally conscious community, Boulder has included requirements or incentives for energy efficiency in its zoning ordinance, subdivision regulations, building construction code, and energy efficiency codes.[484] This approach sometimes led to confusion as to whether the planning or building department was responsible for verifying compliance with the standards. It also led to frustration among builders who felt that the various requirements were sometimes inconsistent and that the need to document compliance with the standards occurred throughout the process. To resolve these conflicts, Boulder retained a consulting firm to identify potentially conflicting requirements and incentives and recommend an allocation of responsibilities that would avoid future conflicts and overlapping regulations.[485]

b. Use Base Codes with Local Amendments for Water

Some of the standard building and plumbing codes currently being used in the U.S. include the following:

- International Building Code (IBC), published by the International Codes Council (ICC)
- International Residential Code (IRC), published by the ICC
- International Existing Building Code (IEBC), published by the ICC
- International Plumbing Code (IPC), published by the ICC
- Uniform Plumbing Code (UPC), published by the International Association of Plumbing and Mechanical Officials (IAPMO)
- National Standard Plumbing Code (NSPC), formerly published by the Plumbing, Heating, Cooling Contractors Association (PHCC), now by IAPMO

Although many more code options used to exist, this field of regulation is becoming more standardized as codes converge, eliminating regional limitations. Even many of the remaining standard codes, however, contain opportunities for cities and counties to choose among optional provisions to best meet their needs.

At the same time as the general range of building construction regulation is converging toward the established national and international building codes, there is also a growing trend toward local customization of details and options. When adopting these established, standard codes, most communities choose to exclude or amend particular requirements because they are incompatible with local needs. As this relates to water conservation, communities may consider amending code provisions to further enhance efficiency and address local concerns regarding water adequacy.

484 Examples include: City of Boulder, CO Energy Conservation Code, § 10-7.5-1 Green Building and Green Points Program (2007), https://bouldercolorado.gov/plan-develop/green-building-and-green-points-program; City of Boulder, CO Charter, § 182 Utility Standards (2013), https://www.municode.com/library/co/boulder/codes/municipal_code?nodeId=THCHBOCO_ARTXIIILIPOUT_S182UTSEST ; City of Boulder, CO, Land Use Code, § 9-9-12, Landscaping and Screening Standards (2014) https://www.municode.com/library/co/boulder/codes/municipal_code?nodeId=TIT9LAUSCO_CH9DEST_9-9-12LASCST; City of Boulder, CO Subdivision Regulations, § 5-302 Standards and Conditions for Final Plat Approval http://www.bouldercounty.org/doc/landuse/lucodearticle05.pdf.

485 Interview with Don Elliott, FAICP, Clarion Associates (Nov. 21, 2015).

EXAMPLES OF STANDARD CODE ADOPTION WITH LOCAL MODIFICATIONS FOR WATER

Aurora, Colorado

In 2015, the City of Aurora adopted the 2015 International Building Code (IBC)[486] and International Plumbing Code (IPC)[487] with local modifications. The stated intent of the plumbing code adoption was to meet or exceed the requirements of the State of Colorado Plumbing Code. According to the code, when technical requirements, specifications, or standards in the State code conflict with the IPC as adopted by Aurora, the more restrictive applies. Among other modifications, the City included a provision on water conservation that amends the IPC to add a requirement that faucets and lavatories located in public restrooms be "of the metering type or self-closing." Special purpose showerheads and faucets necessary for health and safety purposes are exempt from this requirement when approved by the building official.[488]

Scottsdale, Arizona

In late 2016, the City of Scottsdale, Arizona, adopted the 2015 edition of the International Existing Building Code (IEBC)[489] by reference into the City's Building Code. The IEBC was adopted in its entirety, as published by the ICC, without local modification. At the same time, the City adopted the 2015 editions of the International Building Code (IBC),[490] the International Residential Code for One- and Two-Family Dwellings (IRC),[491] and the International Plumbing Code (IPC).[492] As adopted, the City amended the IBC's chapter on Plumbing to modify the minimum number of required plumbing fixtures and to remove a requirement for businesses and mercantile occupancies 3500 square feet or smaller to have service sinks. As adopted, the City amended the IRC's chapter on Water Supply and Distribution to modify the maximum flow rates and consumption for plumbing fixtures and fixture fittings. As adopted, the City amended the IPC chapter on Fixtures, Faucets, and Fixture Fittings to require any shower compartment built without a threshold to have a trough drain installed at the threshold to stop water from leaving the shower compartment and to connect the trench drain to the drainage system at the shower tailpiece between the drain inlet and the trap. The City also amended the IPC chapter on Water Supply and Distribution to modify the required size of water service pipe and the maximum flow rates and consumption for plumbing fixtures and fixture fittings.

486 City of Aurora, CO, Building and Zoning Code § 22-131, International Building Code, Code Adopted, (2015), https://www.municode.com/library/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH22BUBURE_ARTIVINBUCO_S22-131COAD.

487 City of Aurora, CO, Building and Zoning Code § 22-316, International Plumbing Code, Code Adopted, (2015), https://www.municode.com/library/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH22BUBURE_ARTXINPLCO_S22-316COAD.

488 City of Aurora, CO, Building and Zoning Code § 22-326, International Plumbing Code, Water Conservation, (2015), https://www.municode.com/library/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH22BUBURE_ARTXINPLCO_S22-326WACO.

489 City of Scottsdale, AZ, Scottsdale Revised Code § 31-120, International Existing Building Code, Adopted Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTVIIIINEXBUCO_S31-120ADINEXBUCO.

490 City of Scottsdale, AZ, Scottsdale Revised Code § 31-1, International Building Code, Adopted Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTIINBUCOSCAM_DIV1AD_S31-1INBUCOADAM.

491 City of Scottsdale, AZ, Scottsdale Revised Code § 31-50, International Residential Code For One- and Two-Family Dwellings, Adopted Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTIIINRECOOMIDW_DIV1ADCO.

492 City of Scottsdale, AZ, Scottsdale Revised Code § 31-50, International Plumbing Code, Adoption of International Plumbing Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTIVINPLCO_S31-80ADINPLCO.

Austin, Texas

When Austin, Texas, adopted the 2015 edition of the Uniform Plumbing Code (UPC), the City made deletions and detailed amendments.[493] Local amendments and additions to the code include the following requirements:

- Licensing Requirements: Landscape irrigation may only be installed by a licensed installer registered with the City.
- Max Flow Rates: The amendments set maximums on the water consumption levels for water closets and urinals.
- Meter Sizing Specifications: Requirements for specific water meter sizing for residential, single-family homes, duplexes, and townhomes.
- Hydrozoning, Isolation, and Automatic Shutoff Valves: Requirements that commercial and residential landscape irrigation installations be designed and installed to include zone valves and circuits separated based on hydrozoning (i.e., when plants are clustered based on similar watering needs), isolation valves between the water meter and backflow prevention device, and automatic rain shutoff devices (for commercial and multifamily) or moisture sensors or automatic rain shutoff devices (for one- and two-family dwellings).
- Inspection Details: Requirements for final plumbing inspections include specifications on water budget details, water utility compliance reports, and proof that a laminated copy of the water budget is permanently installed inside the irrigation controller door.
- Once-Through Cooling Limitations: Prohibitions on potable water use for once-through cooling of commercial equipment unless 100% of the potable water used is returned for nonpotable uses (such as cooling towers).
- Water Reuse Allowances: While referencing minimum water-quality requirements for alternate water source systems, the City provides exceptions for rainwater catchment systems used for aboveground, subsurface, or drip irrigation, greywater used for surface irrigation, and alternate or auxiliary water originating from a well, river, or lake and used for outdoor irrigation. The City also permits laundry-to-landscape systems to discharge to subsurface irrigation systems, subsoil irrigation systems, or mulch basins, and to be used to irrigate the exterior of the structure, but not root crops or food crops intended for human consumption.
- Conflict of Laws: The code amendments address potential conflicts between the Plumbing Code and the requirements of the International Energy Conservation Code, applying the most restrictive requirement when such conflict arises.

c. Adopt Supplemental Code Provisions

Furthering the trend toward local customization of details and options, new codes and certifications have emerged — from local, state, national, and international quarters — that require higher standards for resource efficiency, material sustainability and quality, construction methods, and similar issues. Local governments may use these alternatives to add more stringent code requirements that reduce water use.

493 City of Austin, TX, Plumbing Code §§ 25-12-151–153 (2017), https://library.municode.com/tx/austin/codes/land_development_code?nodeId=TIT25LADE_CH25-12TECO_ART6PLCO.

i. Use Established Code Overlays and Additions

The following list presents some of the established codes and referenced standards that go beyond the requirements of the base codes discussed in Section 10(a) of this Chapter in the field of water conservation and efficiency:

- The Uniform Plumbing Code green plumbing supplement by the International Association of Plumbing and Mechanical Officials (IAPMO)
- The ICC's International Green Construction Code (IgCC)
- ICC 700 (National Green Building Standard) — intended to take over where the IgCC leaves off — developed by the ICC and the National Association of Home Builders
- ASHRAE/USGBC/IES Standard 189.1, Standard for the Design of High-Performance Green Buildings
- ASHRAE Standard 191, Standard for the Efficient Use of Water in Building, Site, and Mechanical Systems (*proposed standard*)

These codes and sets of standards — sometimes referred to as stretch codes or reach codes — are created and reviewed in the same manner as the widely adopted, standardized building codes and are designed to operate in the same way. These more rigorous codes are intended to function as either a mandatory overlay — increasing (or stretching) the requirements of the base code — or as an alternate, optional compliance path that is more stringent than the base code and sometimes paired with incentives (encouraging developers to reach farther than they otherwise would). The codes are sometimes adopted directly by local governments or by state governments to be made available to their local governments as an approved set of standards for local adoption. For example, the IgCC — which is broadly supported and is the first regulatory framework to recognize an entire set of risks not addressed in other codes — is designed as an overlay stretch code for the existing set of ICC codes and it also incorporates ASHRAE's Standard 189.1 as an alternative (reach code) compliance path. Further, the IgCC also allows jurisdictions to require compliance with the ICC/ASHRAE 700 National Green Building Standard (for residential structures, including single-family and townhouses three stories and under) in order to increase the IgCC's scope to include various residential structures, their accessory structures, and the site or lot on which they are located. Communities may consider adopting the IgCC or other green codes as an overlay to encourage high-performance building design and construction with water efficiency and other sustainability elements in mind. The IgCC has been adopted by at least five states and almost 20 individual local governments beyond those states, most of which are in the Interior West. It was intended to be mandatory but can be voluntary.

Not surprisingly, some of the features required by reach codes are also available as optional provisions under the more widely used international codes. Some of the features contained in these alternative water codes include the following:

- Minimum standards for indoor plumbing fixture efficiency — including but not limited to U.S. EPA's "WaterSense," "WaterSense at Work," and "WaterSense" Hotel Challenge standards (WaterSense products are certified to use 20% less water than the prevailing industry average).
- Minimum standards for irrigation system efficiency (which can include rain sensors to stop irrigation during rainstorms, high-efficiency spray nozzles, or even requirements for installation of drip rather than spray irrigation for trees)
- Systems to reuse indoor water from sinks and showers for nonpotable uses such as toilets or irrigation (commonly referred to as greywater irrigation) — including but not limited to the National Sanitation Foundation's NSF/ANSI Standard 350 and 350-1, which establish material, design, construction, and performance requirements for onsite residential and commercial water reuse treatment systems and set water-quality requirements for the reduction of chemical and

microbiological contaminants for nonpotable water use
- Requirements for water harvesting (capture and reuse of rainwater from rooftops and impervious surfaces in tanks or cisterns for use in irrigation and other nonpotable purposes)
- Features to reuse air conditioning condensate and basement drain water
- Maximum pipe length and pipe volume for hot water distribution (limiting how much water and energy are wasted while waiting for hot water to reach the fixture)
- Requirements that individual apartments in apartment buildings each have a separate water meter (which is very effective in reducing water use, but surprisingly seldom required because of the additional cost of initial metering)
- Requirements that portions of the plumbing system automatically shut off if a leak is detected[494]

Local governments may choose to adopt these established stretch or reach codes in their entirety or comb them for additional, more rigorous standards related to water. Some of these codes, such as the IgCC, are also designed to be jurisdictionally customizable with additional, regionally appropriate, environmental criteria.

EXAMPLES OF SUPPLEMENTAL CODE ADOPTION

Santa Fe County, New Mexico

In December 2015, Santa Fe County adopted its Sustainable Land Development Code (SLDC). The SLDC's Fire and Building Codes section explains that, in addition to the requirements of the SLDC, all development shall comply with the most current applicable codes adopted by the State of New Mexico and Santa Fe County, including but not limited to the State's Commercial Building Code (which adopts the IBC by reference), the State's Residential Building Code (which adopts the IRC by reference), and the State's Plumbing Code (which adopts the UPC by reference).[495] The SLDC serves as an additional locally adopted standard containing requirements more stringent than the State of New Mexico's building code.[496] Under the SLDC's Water Harvesting section,[497] the County requires rainwater catchment systems for all new construction and all remodeling of existing structures whose roof area is 2,500 square feet or greater and accessory structures whose roof surface is 500 square feet or greater. These systems must be designed to capture rainwater from a minimum of 85% of the roofed area. Cisterns should be connected to pumps and a drip irrigation system to serve landscaped areas and shall be sized to hold 1.15 gallons per square foot of roof area that is captured.

Sioux Falls, South Dakota

In 2010, South Dakota adopted the 2009 Uniform Plumbing Code (UPC) and also adopted the 2010 IAPMO Green Plumbing and Mechanical Code Supplement. While explaining that the adoption of a new version of the UPC was needed and necessary to continue licensing reciprocity

494 H.W. Hoffman, *Water Codes and Standards Continue to Tighten Water Usage Limits,* Facilitiesnet, (Dec. 7, 2015), http://www.facilitiesnet.com/plumbingrestrooms/article/Water-Codes-And-Standards-Continue-To-Tighten-Water-Usage-Limits--14929.

495 County of Santa Fe, NM, Sustainable Land Development Code § 7.2, Fire and Building Codes (2016), https://www.santafecountynm.gov/media/files/SLDC%201.20.17.pdf.

496 County of Santa Fe, NM, *Santa Fe County's New Energy Efficient Building Code for New Home Construction* (2016), https://www.santafecountynm.gov/media/files/Green%20Building%20Code/HERS-Compliance-Guide-01-16.pdf.

497 County of Santa Fe, NM, Ordinance No. 2015-11, Sustainable Land Development Code § 7.13.11.7 Water Harvesting (2015), http://www.santafecountynm.gov/documents/ordinances/Ordinance_2015-11.pdf.

agreements with some surrounding states but that the UPC may not answer all questions regarding the use of newer technologies, the IAPMO Green Plumbing and Mechanical Code Supplement was adopted as a source of nonmandatory guidance for situations where newer technologies or applications are not covered by the UPC.[498] Subsequently, the City of Sioux Falls adopted the IAPMO Green Plumbing and Mechanical Code Supplement in 2017.[499] In doing so, the City stated that the Supplement is deemed to be a nonmandatory referenced standard and is applicable only when plumbing systems or installation methods are not referenced in the UPC.

Scottsdale, Arizona[500]

In late 2016, at the same time as Scottsdale adopted the 2015 IBC, IRC, IPC, and IEBC, the City adopted the 2015 edition of the International Green Construction Code (IgCC) as part of the City's Building code.[501] The IgCC's chapter on Water Conservation and Efficiency (Chapter 7) seeks water efficiency regardless of the water source; includes efficiency provisions for plumbing fixtures and fittings, appliances, equipment, carwashes, and cooling towers; provides standards for hot-water distribution systems (maximum pipe length and volume); contains standards for HVAC systems, onsite water-treatment systems, metering, and alternative water sources; and encourages the use of nonpotable water wherever possible and permissible (although specific provisions on nonpotable water use — such as rainwater collection systems, greywater reuse systems, and reclaimed water systems — have been moved from the IgCC to the IPC). The IgCC also contains a chapter on outdoor water use (Chapter 10), such as pools and spas, as well as a chapter on Site Development and Land Use (Chapter 4), which has requirements for stormwater management, landscape irrigation, and outdoor fountains and water features.[502]

In adopting the code, the City altered the standard provisions of the IgCC in the following ways related to water conservation:

- Adding that buildings registered for certification or designation under specified national and local green building programs (which contain water efficiency standards) would be deemed to comply with the code:
  - LEED and Green Globes for new construction and major/significant renovations
  - ICC 700, LEED for Homes, and Scottsdale Green Building Program for the following:
    - Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height
    - Group R-3 residential buildings
    - Group R-2 and R-4 residential buildings of not more than four stories in height
- Amending the Site Development and Land Use chapter of the IgCC to comply with the following requirements:

498 *South Dakota Adopts 2009 UPC, 2010 Green Plumbing and Mechanical Code Support,* IAPMO I-Connection October 2010 Newsletter, (Dec. 7, 2012), http://www.iapmo.org/IConnection%20Issues/2010-10%20October%20I-Connection.pdf.

499 Sioux Falls, SD, Code of Ordinances § 150.301(a) (2017), http://library.amlegal.com/nxt/gateway.dll/South%20Dakota/siouxfalls_sd/titlexvlandusage/chapter150building?f=templates$fn=default.htm$3.0$vid=amlegal:siouxfalls_sd$anc=JD_150.301.

500 *Building Code Information,* City of Scottsdale, AZ, http://www.scottsdaleaz.gov/codes/building-code (last visited January 27, 2017).

501 City of Scottsdale, AZ, Scottsdale Revised Code § 31-140, International Green Construction Code, Adoption of International Green Construction Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTXGRCOCO_S31-140ADINGRCOCO.

502 International Code Council, *The 2015 International Green Construction Code (IgCC) and Water Efficiency Provisions* (2016), http://media.iccsafe.org/Annual/2016/Overview-of-the-2015-IgCC-Plus-Water-Efficiency-Provisions.pdf.

- Require a predesign inventory and assessment of natural resources and baseline conditions submittal in accordance with City requirements for landscaping and native plants
- Require the provision and maintenance of stormwater management systems on the building site, including but not limited to, infiltration, evapotranspiration, and rainwater harvest and runoff reuse
- Remove an exemption from the IgCC that allowed outdoor ornamental fountains and water features to use potable water if the water is recirculated and there is not an automatic refill valve connection to a source of potable water
- Remove specifications regarding vegetation and soil protection and require compliance with existing City requirements for landscaping and native plants
- Subject native plant landscaping — when installed as part of a site plan or within the building site — to comply with City landscaping and native plant requirements

- Amending the Water Resource Conservation, Quality & Efficiency chapter of the IgCC to edit provisions related to condensate drainage recovery.

Washoe County, Nevada

In May 2013, Washoe County adopted chapters 2 through 12 of the International Green Construction Code (IgCC) to supplement its Building Code in order to provide voluntary guidelines and references for projects seeking to follow green construction practices.[503] The IgCC, however, is not enforced by the County, it does not serve as a stand-alone construction regulation document, and permits are not issued under the code.[504] The Water Resource Conservation, Quality, and Efficiency Chapter of the code provides specific requirements for a wide range of water conservation and efficiency measures, including requirements for maximum flow rates for various water fixtures, HVAC systems, water-treatment devices and equipment, water metering, nonpotable water, rainwater collection and distribution systems, greywater systems, and reclaimed water systems.[505]

Although many of the available alternative codes contain similar standards on similar fixtures and systems, there are differences. The following table summarizes some of those differences.[506]

503 Washoe Cty., Nev., § 100.101.2.5 (2013), https://www.washoecounty.us/building/Files/Files/Handouts/2017%20January%20-%20WCC%20Chapter%20100.pdf.

504 Washoe Cty., Nev., § 100.101.2.5.1, https://www.washoecounty.us/building/Files/Files/Handouts/2017%20January%20-%20WCC%20Chapter%20100.pdf.

505 Washoe Cty., Nev., §§ 701–709 (2013).

506 More information available at, *Green Building Guidelines & Standards,* Alliance for Water Efficiency, http://www.allianceforwaterefficiency.org/Background_on_Green_Building_Specifications.aspx.

Table 1. Differences in water efficiency standards between various codes

Codes:	US National Product Standard	ASHRAE S 189.1 (2014)	IgCC (2015)	ICC 700 National Green Building Standard (2015)	IAPMO Green Plumbing Supplement (2015)	ASHRAE S 191 (Proposed Standard)
Applies to:		Residential < 3 stories; all commercial	Residential > 3 stories; all commercial	Residential ≤ 3 stories	Residential < 3 stories; all commercial	Residential < 3 stories; all commercial
Equipment or Facility						
Toilets	1.6 gpf	1.28 gpf	1.28 gpf + WaterSense; 1.6 gpf for public	1.28 gpf	1.28 gpf residential; 1.6 gpf commercial	1.28 gpf
Private lavatory faucets	2.2 gpm	1.5 gpm	1.5 gpm	1.5 gpm	1.5 gpm	1.5 gpm
Nonmetered public lavatory faucets	0.5 gpm	0.5 gpm	0.5 gpm	N/A	0.5 gpm	0.5 gpm
Metered Public lavatory faucets	0.25 gallon per cycle (gpc)	0.25 gpc	0.25 gpc	N/A	0.25 gpc	0.2 gpc
Residential kitchen faucet	2.2 gpm	1.8 gpm	1.8 gpm	N/A	1.8 gpm	2.2 gpm
Residential showerhead	2.5 gpm	2.0 gpm	2.0 gpm + WaterSense	2.5 gpm	2.0 gpm	2.0 gpm
Residential dishwasher	5.0 gpc	3.8 gpc + Energy Star	Energy Star	Energy Star	Energy Star	5.0 gpc + Energy Star
Residential clothes washer	8.4 gpc Top; 4.7 gpc Front	WF of ≤5.4 gpc + Energy Star	WF of ≤5.4 gpc + Energy Star	Energy Star	Energy Star	4.5 gpc + Energy Star
Tenant Submetering (based on building water usage per day)		Buildings > 1000 gal		N/A	Buildings > 500 gal	Buildings > 1000 gal

The ICC also publishes a document entitled "Water Efficiency Provisions of the International Green Construction Code" (WEP or WEP — IgCC), which compiles all of the IgCC's provisions related to water efficiency, conservation, and management. Because the IgCC includes ASHRAE/USGBC/IES Standard 189.1 as an alternate compliance path, the WEP also includes 189.1's High-Performance Water-Use Provisions (HPWUP) and, because the IgCC's specific provisions on nonpotable water use were moved to the IPC, the WEP includes Chapter 13 of the IPC as well. The WEP is designed for ease of access to all of these water-related provisions and is ideal for communities interested in adopting an advanced water efficiency code. The WEP establishes comprehensive minimum water efficiency and conservation regulations for building systems and site considerations using prescriptive and performance-related provisions and is intended to be an overlay code to be used with all of the ICC's codes.

ii. Add Locally Developed Codes or Standards

Local and county governments may consider creating and adopting their own supplemental standards, based upon local needs and priorities. These supplemental code standards may be adopted instead of an established reach code or as an alternate compliance path to one.

EXAMPLE OF LOCALLY CREATED SUPPLEMENTAL STANDARDS

Scottsdale, Arizona

The City of Scottsdale, Arizona, created a set of voluntary green building standards called the Scottsdale Green Building Program to qualify projects for designation as a green building.[507] When Scottsdale adopted the 2015 IgCC as part of the City's Building Code[508] in late 2016, it elected to include the IgCC's addition of the ICC 700 as a standard for small to mid-size residential structures. The City amended this provision, however, by, among other things, adding that such projects registered for certification under the City's Green Building Program would be deemed to comply with the code in lieu of following IgCC/ICC 700 standards. In doing so, the City provides its own Green Building Program as an alternate compliance path for residential structures. The City's Green Building Program rates building projects in six environmental impact areas, including water. Water efficiency strategies in the program include:

- Low-flow plumbing fixtures (i.e., dual-flush toilets) and water efficient appliances (i.e., horizontal axis washing machines)
- An efficient hot-water delivery system (i.e., tankless, recirculating, centrally located water heater)
- Providing or converting to native, drought-tolerant landscaping (xeriscape)
- Greywater systems that take the waste water from such locations as bathroom sinks, showers, bathtubs, and laundry rooms, and use it for landscape irrigation
- Collecting and/or directing rainwater for irrigation

Boulder, Colorado[509]

Under Boulder's Green Building and Green Points Program, all new construction, remodels, or additions to residential structures must earn a minimum number of Green Points. Green Points fall under 11 categories, two of which relate to water conservation: Site Development and Water Efficiency. In particular, applicants can earn Green Points through applying the following measures:

- Hardscape shading by preserving existing mature trees onsite or planting shade trees (in order to reduce surface evaporation on irrigated landscapes)
- Xeriscaping methods that conserve water, such as reduced turf areas, wood chip mulching, xeric plants grouped by water needs, and zoned irrigation systems
- Installing high-efficiency automatic irrigation systems
- Installing water efficient fixtures, such as low-flow showerheads and toilets
- Managing surface water flow with permeable sites, allowing for passive infiltration

507 City of Scottsdale, AZ, Green Home Rating Checklist: New Construction for Remodels & Additions, V.4 (2015) https://icma.org/sites/default/files/7054_.pdf.

508 City of Scottsdale, AZ, Scottsdale Revised Code § 31-140, International Green Construction Code, Adoption of International Green Construction Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTXGRCOCO_S31-140ADINGRCOCO.

509 City of Boulder, CO, Municipal Code, § 10-7.5-1 *et seq.*, Green Building and Green Points Program (2013); Green Building and Green Points Guideline Booklet (2014), https://www-static.bouldercolorado.gov/docs/green-points-guideline-booklet-1-201306271201.pdf.

iii. Reference Noncode Rating Systems and Standards

While not structured to fit within the typical code framework, there are established third-party rating systems and standards — focused solely on water or on water in the context of a green building — that communities may consider adopting as a mandatory or voluntary addition to their codes. Approaches to adopting these third-party programs vary widely (for example, sometimes they are adopted through local zoning and paired with a density bonus) but their standards, no matter where adopted, may alter what is expected or acceptable under the building and plumbing code and can be valuable ways for cities and counties to encourage water conservation. Some communities have referenced these programs outright in their codes or used them as a menu to select elements that will specifically decrease water use. Communities should avoid automatically incorporating any updates to such standards, however, and should consult local government counsel in figuring out how to best incorporate standards into law while avoiding any legal pitfalls such as the nondelegation doctrine.

Communities can encourage water efficient growth by requiring or incentivizing the private sector to design and construct or retrofit projects to meet third-party standards (or use third-party certified products), and sometimes to obtain certification from a program that requires review by these third-party certifying bodies. Any such decision should come only after consultation with the municipal attorney to ensure that the planned code provision stays within the bounds of any state limitations and established legal doctrine.

Typical third-party standards with water conservation elements referenced in codes include, but are not limited to:

- WaterSense New Homes Certification System: In addition to its WaterSense labeling program, the U.S. EPA also sponsors a program called the WaterSense New Homes Certification System, under which homes are inspected and certified to meet EPA's indoor and outdoor water efficiency criteria. The criteria include indoor specifications regarding leaks, service pressure, hot-water delivery, plumbing fixtures, dishwashers, and clothes washers, as well as outdoor specifications for landscape design, irrigation systems, pools, and spas.[510]
- RESNET HERS H2O: The Residential Energy Services Network (RESNET) is developing (as of 2018) a water efficiency rating system for residential homes, analogous to the Home Energy Rating System (HERS). Certified raters evaluate the energy (and/or water) efficiency of a home and rank it according to the typical efficiency of a standard new home. The HERS rating system is widely known among home energy raters and energy efficiency experts.[511]
- LEED: The U.S. Green Building Council's (USGBC) suite of Leadership in Energy and Environmental Design (LEED) rating systems provide green building certifications for numerous development types. Although the standards vary by development type, all of the LEED rating systems contain prerequisites and credits that advance water conservation. Minimum requirements for LEED certification, depending upon the rating system, produce buildings that reduce outdoor water used for landscaping; install water meters; and use water efficient indoor plumbing fixtures. The rating systems also contain optional credits to build toward certification for going beyond the prerequisite level requirements and taking additional actions related to water efficiency as outlined in the rating system.[512]

510 *WaterSense Labeled Homes*, Environmental Protection Agency (2017), https://www.epa.gov/watersense/watersense-labeled-homes.

511 RESNET *Board of Directors Adopts RESNET Water Efficiency Rating Technical Guidelines*, Residential Energy Services Network (Mar. 15, 2018), http://www.resnet.us/blog/resnet-board-of-directors-adopts-resnet-water efficiency-rating-technical-guidelines/.

512 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version; U.S. GREEN BLDG. Council, LEED v4 for Neighborhood Development (July 8, 2017), https://www.usgbc.org/resources/leed-v4-neighborhood-development-current-version.

- Living Buildings Challenge: The International Living Future Institute's Living Building Challenge is a green building certification program and sustainable design framework. The program has seven performance categories, called "Petals," which are place, water, energy, health and happiness materials, and equity and beauty, which are then subdivided into 20 Imperatives. The Water Petal comprises one Imperative, which is for projects to be net positive water. This Imperative requires 100% of the project's water to be supplied by captured precipitation or other natural closed-loop water systems and/or by recycling used project water and purifying it as needed without the use of chemicals; it also requires all stormwater and water discharge, including grey and black water, to be treated onsite and managed either through reuse, a closed-loop system, or infiltration. To verify compliance with the program's Imperatives, a building must be operational for at least 12 consecutive months prior to evaluation.[513]
- Green Globes: Green Globes is a green building rating system and certification program applicable to new construction and existing buildings. Points are distributed across seven assessment areas: project management, site, energy, water, materials and resources, emissions, and indoor environment. Of the 1,000 total available points, 110 of them are offered in the water category, which covers consumption, cooling towers, boilers and water heaters, water-intensive applications, treatment, alternate sources, metering, and irrigation.[514]
- Enterprise Green Communities: The Green Communities program from Enterprise Community Partners focuses on providing the expertise and financial resources necessary to bring sustainable development to low-income families in affordable housing communities. The Green Communities Criteria are grouped into eight categories: integrative design; location and neighborhood fabric; site improvements; energy efficiency; materials; healthy living environment; operations, maintenance, and resident engagement; and water conservation. Water conservation includes mandatory water conserving fixture requirements and optional point-based criteria for advanced water conservation, leaks and water metering, efficient plumbing layout and design, water reuse, and access to potable water during emergencies.[515]

Communities might also consider incorporating product certification requirements, such as WaterSense for plumbing fixtures and NSF/ANSI Standard 350 for greywater systems, if not already a part of the adopted base code.

513 *Living Building Basics*, International Living Future Institute, https://living-future.org/lbc/basics/; International Living Future Institute, Living Building Challenge 3.1 30 (2016), https://living-future.org/product/lbc-3-1-standard/.

514 *Green Globes Certification*, Green Bldg. Initiative (2018), https://www.thegbi.org/green-globes-certification/.

515 *Green Communities*, Enterprise Green Communities (2015), https://www.enterprisecommunity.org/solutions-and-innovation/green-communities; 2015 Enterprise Green Communities Criteria, Enterprise Green Communities (2015), https://www.enterprisecommunity.org/sites/default/files/media-library/solutions-and-innovation/green/ecp-2015-criteria-manual-11-15.pdf.

EXAMPLES OF NONCODE PROGRAMS

Scottsdale, Arizona

When Scottsdale adopted the 2015 International Green Construction Code (IgCC) as part of the City's Building code,[516] the City amended the IgCC by, among other things, adding that buildings registered for certification or designation under the LEED or Green Globes rating systems would be deemed to comply with the code. In doing so, the City provides these national green building rating systems as an alternate compliance path.

New York, New York

The New York City plumbing code limits the maximum flow rate of private lavatories, showerheads, urinals, and water closets to a variety of specified maximums based on the type of water fixture and its use. The City also mandates that new water fixtures must meet WaterSense specifications and be labeled as such. New York City also prohibits potable water from being used for once-through cooling, with some limited exceptions.[517]

Millburn, New Jersey[518]

Millburn's Sustainability Checklist Form requires the developer to indicate several measures to be implemented in the proposed development that relate to the goal of reducing the rate of water consumption. Specifically, the checklist requires the following water conservation measures:

- A list of WaterSense appliances, fixtures, and construction techniques
- A list of native and well-adapted species to be used in landscaping to eliminate the need for fertilization and pesticides (and over-watering)
- Details regarding the use of water efficient landscaping

Austin, Texas[519]

The Austin Energy Green Building (AEGB) rating system requires both multifamily residential and commercial buildings to provide specific flow rates for plumbing fixtures and requires single-family homes to install Energy Star–qualified appliances/fixtures and toilets that are EPA WaterSense–approved models (see AEGB Commercial Rating Guidebook Water Requirement 2, Multifamily Rating Guidebook Water Requirement 2, Single-Family Rating Guidebook Basic Requirement 6, and Indoor Environmental Quality Requirement 5).

516 City of Scottsdale, AZ, Scottsdale Revised Code § 31-140, International Green Construction Code, Adoption of International Green Construction Code (2016), https://www.municode.com/library/az/scottsdale/codes/code_of_ordinances?nodeId=VOLII_CH31BUBURE_ARTXGRCOCO_S31-140ADINGRCOCO.

517 City of New York, Plumbing Code, § 428, Prohibited Water Uses, http://www.nyc.gov/html/gbee/downloads/pdf/ll54_2010.pdf.

518 Township of Millburn, NJ, Ordinance 2359 – 10, (2010) *available at* http://sustainablejersey.com/fileadmin/SJ_Documents/Action%20Documents/Green%20Design/Milburn.pdf.

519 Austin Green Energy Bldg., Commercial Rating Guidebook (2016), https://austinenergy.com/wcm/connect/271a252e-1bf3-40ff-934a-b1ddb496ce03/AEGB_2016+Commercial+Guidebook.pdf?MOD=AJPERES&CVID=lvEyT56;
Austin Green Energy Bldg., Multifamily Rating Guidebook (2016), https://austinenergy.com/wcm/connect/b7e92936-2182-4ba7-8efe-98b197f27e7c/AEGB+2016+MF+Rating+Guidebook.pdf?MOD=AJPERES&CVID=lvEy-MH;
Austin Green Energy Bldg., Single Family Rating Guidebook (2016), https://austinenergy.com/wcm/connect/5db04df0-f9c6-4bc5-a1bd-4540686fbbe3/SF+2016+GUIDEBOOK+FINAL.pdf?MOD=AJPERES&CVID=lvEyyQs.

Chicago, Illinois[520]

Chicago's Green Permit Process requires commercial developments to achieve LEED certification while smaller residential projects must earn certification under the Chicago Green Homes Program Checklist or LEED for Homes. Additionally, projects must earn Green Menu Items, which require certain green strategies or technologies, to receive the Green Permit. The Homes Rating System has seven categories containing a mix of requirements for all projects and options with different point values. The optional credits for which points are given seek to reduce water consumption and include, but are not limited to, these elements:

- Using an EnergyStar labeled clothes washer
- Using low-flow toilets (1.1 gpf) or dual-flush toilets (averaging 1.1 gpf)
- Using an aerator on bathroom faucets to restrict the flow to 1.8 gpm
- Using an aerator on kitchen faucets to restrict the flow to 2.0 gpm
- Using low-flow showerheads (averaging 2.5 gpm)
- Capturing and reusing greywater for toilet flushing
- Amending Soil (3 cubic yards per 1,000 landscaped area)
- Using irrigation systems with efficiency devices such as soil moisture or rain sensor
- Irrigation system designed for efficient water distribution
- 50% max cool-season turf grass (remainder as non-turf bedding)
- Installing native landscapes (at least 50% non-paved area)
- Organic mulch or compost
- Incorporating Water Wise landscaping[521]

Cleveland, Ohio

In 2012, the Cleveland City Planning Commission drafted Green Design Guidelines containing requirements for new construction and substantial renovations to facilitate conservation, sustainable design, and neighborhood development.[522] The draft Guidelines recommend that single-family, two-family, and townhouse projects achieve certification under LEED or Enterprise Green Communities criteria and require Energy Star home qualification, plumbing fixtures that meet EPA WaterSense standards, and 50% construction waste recycling for these structures. Further, the Guidelines require LEED certification for commercial and institutional projects and LEED or Enterprise Green Communities certification for multifamily buildings. Roofs on commercial, institutional, and multifamily structures must be Energy Star compliant or 50% vegetated, and these structures must achieve 50% construction waste recycling.

520 *Overview of the Green Permit Program,* City of Chicago (2018), https://www.cityofchicago.org/city/en/depts/bldgs/supp_info/overview_of_the_greenpermitprogram.html.

521 Chicago Green Homes, Green Homes Checklist - Enrollment Form (Oct. 24, 2012), https://www.landonbonebaker.com/wp-content/uploads/2010/01/Roseland-Place_Chicago-Green-Homes-Multi-Family-New-Construction-Checklist.pdf;
Chicago Green Homes, Program Guide 150-153 (Version 2.0 Apr. 2009), http://www.cityofchicago.org/dam/city/depts/doe/general/GreenHomesRoofsBldgs_pdfs/ChicagoGreenHomesGuidev20_.pdf.

522 City of Cleveland, OH, Draft Code § 341A.05, Green Design Overlay Districts (2012); Design Review Guidelines § 4 Landscaping 19 (2011), http://planning.city.cleveland.oh.us/designreview/drcagenda/2011/05062011/Clev_Design_guidelines_DRAFT_Feb%2021_lowres.pdf. *See also* City of Cleveland, OH, Land Use Code § 352 (2017), http://library.amlegal.com/nxt/gateway.dll/Ohio/cleveland_oh/cityofclevelandohiocodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:cleveland_oh.

11. Supplemental Regulations

This Chapter discusses regulations related to water conservation and efficiency that vary most frequently in methods for adoption. This includes provisions for the following conservation elements:

- Establishing a water-use benchmarking and disclosure program
- Requiring water efficiency audits and retro-commissioning
- Adopting a water-waste ordinance
- Adopting a water-demand offset policy for water-neutral growth
- Adopting landscaping codes and landscape design guidelines

Some communities may choose to adopt such standards directly into the zoning code, subdivision regulations, site-plan standards, utility codes, and the like, while others may adopt them as stand-alone regulations within the local code or use them as the basis for zoning incentives, environmental mitigation conditions, or development agreement stipulations. Because local treatment varies so significantly, this Guidebook addresses these standards separately in this chapter on Supplemental Regulations.

a. Establish a Water-Use Benchmarking and Disclosure Program

Communities can establish a water-use benchmarking program and implement it by passing legislation requiring benchmarking and disclosure for a specified group of private-sector properties, as well as committing to the benchmarking and disclosure requirements for government-owned buildings.

Communities may be most familiar with building energy-use benchmarking requirements, but tools such as EPA's Energy Star Portfolio Manager are able to track not only energy but also water use. Benchmarking involves tracking water and/or energy use (by entering it into a program like EPA Portfolio Manager), measuring performance over time, and then comparing performance against similar properties and against expected performance under the same climatic conditions. It helps property owners and managers identify opportunities to cut energy and water waste, make smarter decisions, drive continuous improvement, and quantify energy and water savings.

Through water-use benchmarking legislation, the local government may require owners of properties over a certain size to annually benchmark their water use. When coupled with a public disclosure requirement, property owners are typically required either to disclose the data directly (through, for example, building signage), or to report it to the local government, which may publicly disclose the data in some form (perhaps per building or as an aggregate number of certain building types or sizes).

When developing the legislation, communities might consider forming a task force of local government staff (members of the Water and Land Use Planning Integration Team, discussed in Chapter 4) and external experts, especially those representing the local real estate development and property owner communities. The legislation will need to define the size thresholds and building types covered and any necessary exemption categories and process for properties with characteristics that make water benchmarking impractical. It should also establish the system for tracking and annually disclosing the benchmarking information — although some of the implementation methods could be established after adoption of the legislation. As mentioned, it may require public disclosure of data, which could be annual summary statistics on water consumption (aggregating benchmarking information for certain types or sizes of buildings or for all properties covered by the legislation) or might be annual statistics for each individual property. Communities might also include other details such as the staff member

responsible for managing the benchmarking and reporting activities and a requirement for that staff member to report annually to the legislative body.

EXAMPLE OF WATER-USE BENCHMARKING LEGISLATION

Los Angeles, California[523]

In January 2017, Los Angeles adopted an ordinance establishing the City's Existing Buildings Energy and Water Efficiency (EBEWE) Program as an amendment to the City's Building Code.[524] Among other requirements, the ordinance furthers the City's Sustainable City pLAn goals of reducing water use by 25% per capita by 2035, energy use by 30% per square foot by 2035, and greenhouse gas emissions by 80% by 2050.[525] The EBEWE ordinance requires buildings, including existing buildings, to undergo energy and water efficiency audits, retro-commissioning, and annual benchmarking of energy and water consumption.

With some exemptions, the program applies to City-owned buildings of 7,500 square feet or more, privately owned buildings of 20,000 square feet or more, and buildings of 20,000 square feet or more that are owned by a local agency of the state that is required to comply with the City's building ordinances. For each property subject to the regulation, the owner must annually submit to the City's building department an energy and water benchmarking report based on an assessment in EnergyStar Portfolio Manager or the total energy and water consumed by the whole building for the calendar year. Among other assessments, the report must include: indoor water use, indoor water intensity, outdoor water use (when available), and total water use. The building department must then make the following information available to the public on the Internet:

- Summary statistics on overall compliance with the EBEWE code provision
- Summary statistics on overall energy and water consumption of buildings subject to the provision derived from aggregation of annual benchmarking reports
- For each individual building: (a) building address and property use type; (b) annual summary statistics for the whole building derived from the submitted benchmarking report; and (c) the status of compliance with this EBEWE requirement

The code provides exemptions for the following: one- and two-family dwellings and related accessory structures; residential hotels; broadcast antennas; vehicle charging stations; utility pumping stations; treatment facilities; sound stages; structures primarily used for the production and post-production of motion pictures and television, and similar uses; and other buildings not meeting the purpose of the ordinance, as determined by the building department. In addition, owners of buildings subject to this EBEWE provision are exempted from filing a benchmarking report in certain obvious situations outlined in the code, such as when demolition work has commenced on the building, the building did not have a Certificate of Occupancy, was unoccupied for the entire year due to renovation, or did not receive energy or water services for the entire calendar year required to be benchmarked.

523 Los Angeles, Cal., Building Code art 1, div. 97 (2017), http://library.amlegal.com/nxt/gateway.dll/California/lamc/municipalcode/chapterixbuildingregulations/article1buildingsbuildingcode?f=templates$fn=default.htm$3.0$vid=amlegal:losangeles_ca_mc$anc=JD_C9A1D97.

524 Los Angeles, Cal., Ordinance 184674 (Jan. 29, 2017), https://www.ladbs.org/docs/default-source/publications/ordinances/ord_184674.pdf?sfvrsn=6, as amended by Ordinance 185198 (Oct. 12, 2017), https://www.betterbuildingsla.com/_images/content/ordinances_185198.pdf; *see* LA Energy & Water Efficiency Resource Center, The Law (2018), https://www.betterbuildingsla.com/the-law.

525 Los Angeles, Cal., The City of Los Angeles Existing Buildings Energy and Water Efficiency Ordinance, https://www.betterbuildingsla.com/_images/content/EBEWE_Ordinance_Brochure.pdf.

b. Require Water Efficiency Audits and Retro-Commissioning

Water efficiency audits help identify potential modifications and improvements to a property's equipment and systems that utilize water in order to optimize overall water performance. Retro-commissioning is a process for correcting deficiencies in existing building systems to improve performance. As with a water-use benchmarking program, communities may pass legislation requiring auditing and retro-commissioning for a specified group of private-sector properties, as well as committing to the requirements for government-owned buildings. Such legislation can provide strong post-occupancy enforcement of water efficiency standards, as discussed further in Chapter 15, *Post-Occupancy Enforcement*.

EXAMPLE OF WATER AUDIT AND RETRO-COMMISSIONING LEGISLATION

Los Angeles, California[526]

The City of Los Angeles' Existing Buildings Energy and Water Efficiency (EBEWE) Program ordinance, adopted as an amendment to the City's Building Code,[527] requires buildings to undergo energy and water efficiency audits, retro-commissioning, and annual benchmarking of energy and water consumption.

With some exemptions, the program applies to City-owned buildings of 7,500 square feet or more, privately owned buildings of 20,000 square feet or more, and buildings of 20,000 square feet or more that are owned by a local agency of the state that is required to comply with the City's building ordinances. All properties subject to the regulation must undergo a water audit and retro-commissioning of the base building systems, which must be performed in accordance with industry standard practices, including ASHRAE Guideline 0.2 *Commissioning Process for Existing Systems and Assemblies,* and under the direct supervision of a California licensed engineer or architect. The water audit and retro-commissioning must include, at a minimum: potable water distribution systems, landscape irrigation systems, water reuse systems, and water features. Property owners must maintain a report of the water audit and retro-commissioning, completed and signed by a California licensed engineer or architect. The report must include the following documentation, at a minimum:

- The date(s) that the audit and retro-commissioning were performed
- Identifying information on the auditor and retro-commissioning provider
- Information on the base building systems and equipment
- A list of all retrofit measures that can reduce water use, and/or cost of operating the building, costs of each measure, and an estimate of the water savings associated with each measure
- All the retro-commissioning process activities undertaken and retro- commissioning measures completed
- Functional performance testing reports

526 Los Angeles, Cal., Building Code art 1, div. 97 (2017), http://library.amlegal.com/nxt/gateway.dll/California/lamc/municipalcode/chapterixbuildingregulations/article1buildingsbuildingcode?f=templates$fn=default.htm$3.0$vid=amlegal:losangeles_ca_mc$anc=JD_C9A1D97.

527 Los Angeles, Cal., Ordinance 184674 (Jan. 29, 2017), https://www.ladbs.org/docs/default-source/publications/ordinances/ord_184674.pdf?sfvrsn=6, as amended by Ordinance 185198 (Oct. 12, 2017), https://www.betterbuildingsla.com/_images/content/ordinances_185198.pdf; *see* LA Energy & Water Efficiency Resource Center, The Law (2018), https://www.betterbuildingsla.com/the-law.

- Operational training conducted

The code provides exemptions for the following: one- and two-family dwellings and related accessory structures; residential hotels; broadcast antennas; vehicle-charging stations; utility pumping stations; treatment facilities; sound stages; structures primarily used for the production and post-production of motion pictures and television, and similar uses; and other buildings not meeting the purpose of the ordinance, as determined by the building department. In addition, owners of buildings subject to this EBEWE provision are exempted from the water audit and retro-commissioning if the following water conservation elements have occurred:

- The building has reduced its water-use intensity by at least 20% when compared to the five years preceding the building's compliance due date (as certified by a state-licensed engineer or architect).
- The building's water use conforms to the requirements of the City and State building codes in effect at any time during the five-year compliance cycle being reported (as certified by a state-licensed engineer or architect).
- The building is new and has been occupied for less than five years.
- The building does not have a central cooling system and two of the three following measures have been installed within five years of the compliance due date and have been certified by a state-licensed engineer or architect in a report detailing the measures: (a) low-flow faucets and shower heads, (b) front-loading clothes washing machines in all common laundry facilities, or (c) water closets and urinals meeting the City and State building codes in effect at any time during the five-year compliance cycle being reported.

c. Adopt a Water Waste Ordinance

Local governments can discourage new and existing developments from engaging in a practice or using equipment that causes water waste from over-watering, leakages, water pooling, and the like. Local governments can adopt and enforce a water waste ordinance to supplement building and plumbing code requirements, landscape codes, and other regulations. Such an ordinance may set forth specific prohibitions on water use, such as restrictions on the purposes for which water may be used (such as washing sidewalks or filling decorative fountains); time-of-day watering restrictions; and bans on irrigation runoff, overspray, and other wasteful practices. To ensure that adequate water supplies are maintained and to provide a legal basis for drought management, such ordinances may also establish drought phases with progressively more restrictive standards. Where a community takes this approach, the ordinance should designate responsible staff and outline evaluation and monitoring procedures. A water conservation or water waste ordinance may include exemptions and enforcement provisions, which may include sanctions. It also may have public education and staff enforcement training components.

EXAMPLES OF WATER WASTE CODE PROVISIONS

Sierra Madre, California

In 2008, Governor Schwarzenegger declared his plan for the State to achieve a 20% reduction in per capita water use by 2020.[528] In 2009, the California legislature amended the State's Water Code to include a section on Sustainable Water Use and Demand Reduction, which incorporates into law this "20x2020" goal and declares, among other goals, the importance of protecting water against waste and unreasonable use; the importance of efficient water resource management due to a need to balance a growing population, climate change, economic growth, and habitat protection; and the benefits of reduced water use through conservation.[529]

In 2012, the City of Sierra Madre adopted a Mandatory Water Conservation Plan ordinance into its City Code[530] with the purpose of furthering this State goal, minimizing the effects of water shortages in the City, and significantly reducing the delivery and consumption of water. The ordinance established prohibited uses applicable to all water department customers, violations of which would subject customers to administrative citations:

- Wasting water (no lawn, landscape, or turf area shall be watered in a wasteful manner, nor shall any water be wasted if the existing conditions may be corrected or reasonably modified)
- Leaks (no customer shall permit water to leak from any facility on the premises).
- Cleaning, filling, or maintaining levels in decorative fountains unless such water is part of a water recycling system
- Washing sidewalks, walkways, patios, driveways, or parking areas by a water hose
- Using a hose to wash an automobile, unless the hose has an automatic shutoff valve
- Watering at certain times of day (no lawn, landscaping, or other turf area shall be watered or irrigated between the hours of 10 a.m. and 4 p.m.)
- Serving water in restaurants (unless expressly requested)

The code amendment created four water conservation phases, each of which, when declared by the City Council (based upon continued water department evaluations), brings with it differing conservation standards, prohibitions, penalties, and exceptions. As part of the water conservation phases, the City's Water Department will evaluate and monitor the projected availability, supply, and demand for water and will recommend to the City Manager the extent of the conservation phases required by customers so that the Department can plan for and deliver water to customers continuously. Notably, water customers using less than 1,200 cubic feet of water

528 20x2020 Agency Team on Water Conservation, California Environmental Protection Agency, State Water Resources Control Board, https://www.waterboards.ca.gov/water_issues/hot_topics/20x2020/ (last visited Oct. 22, 2017).

529 Cal. Water Code, § 10608 (2010), https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=WAT&division=6.&title=&part=2.55.&chapter=1.&article=.

530 City of Sierra Madre, CA, Municipal Code, § 13.24, Mandatory Water Conservation Plan, https://library.municode.com/ca/sierra_madre/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.24MAWACOPL.

per Notably, water customers using less than 1,200 cubic feet of water per billing cycle are exempted from the implementation of water conservation phases. Among other provisions, the code provides that the City Council may adopt a moratorium upon the declaration of a Phase III or Phase IV water conservation period.[531] Under the moratorium, no new potable water service or new temporary or permanent meters may be provided and no statements of immediate ability to serve or provide potable water service (such as "will-serve" letters) may be issued except when (1) a valid, unexpired building permit has already been issued for the project or (2) the project is necessary to protect the public's health, safety, and welfare. Annexation to the City's water service area will also be suspended and other water uses may be prohibited, as determined by the water superintendent.

Aurora, Colorado

Applicable during a declared water shortage, the City of Aurora's Utility Code defines waste of water as noncompliance with the City's water management plan.[532] The water management plan includes a recommended irrigation schedule for residents and small commercial operators. This schedule permits watering on assigned days during limited hours from May through September, with the exception of new sod seed installations with a permit.[533]

The City prohibits single- and two-family homeowners from installing a lawn, turf, or sodded area without a valid lawn permit.[534] Applications for a lawn permit must include a site plan or drawing of the lot. The Water Department then inspects soil amendment and soil preparation to determine whether the application satisfies the City's water conservation requirements. If there is a potential violation of this requirement, the City may enter private property to inspect. Violations are treated as a violation of the City's Waste of Water code provision, and violators are subject to fines.

The code authorizes the Director of Water to enforce the provision with written violations and penalties added to the water bill or, where there is an extreme waste of water, install a flow restrictor or turn off water service to the property.

d. Adopt a Water-Demand Offset Policy for Water-Neutral Growth

Where a local government is also the water provider, it may adopt a water-demand offset policy to achieve water-neutral growth. Water-demand offset policies (sometimes called net-zero water or water-neutral growth ordinances) can either require or incentivize residential and commercial developments to offset their projected additional water demand, which allows for future development without increasing overall water demand within a community. Such policies are most frequently seen where communities face a supply-demand gap, but they may be adopted sooner, before a community is hard pressed to

531 City Of Sierra Madre, Ca, Municipal Code, § 13-24-220, Moratorium- Phases Iii & Iv Conservation Periods, https://www.municode.com/library/ca/sierra_madre/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.24MAWACOPL_13.24.210IMREPH.

532 City of Aurora, CO, Municipal Code, § 138-190, Utilities, https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-190WAWA.

533 City of Aurora, CO, Water Management Plan (2013), § 3.030.020(A), https://auroragov.org/UserFiles/Servers/Server_1881137/File/Residents/Water/Water%20System/Aurora%20Water%20Facts/014885.pdf.

534 City of Aurora, CO, Municipal Code, § 138-187, Utilities, https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-187WACOREEX.

acquire new water supplies. In fact, offset policies implemented prior to a shortage can aid in drought resiliency by providing an opportunity to allocate water saved from efficiency measures to supply storage.[535] Offset requirements are also sometimes imposed when adopting a moratorium aimed at addressing a water shortage. In these cases, local governments may provide exemptions for projects with reduced impact on water supply, such as new development meeting a specified offset ratio.

The policy could require that a development's projected water demand first be reduced by onsite demand mitigation measures (such as efficient fixtures and recycled water use), and could then require that the remaining demand be offset by off-site water-use reductions within the same system or by paying a fee in lieu for the water utility to achieve the same effect. According to the Alliance for Water Efficiency, which has studied demand offset policies extensively, where fees in lieu of demand mitigation are accepted, fees should be disbursed in a reasonable and cost-effective manner and "the policy must be clear on whether or not building permit approvals hinge on the expenditure of those fees to implement efficiency measures."[536] Where the water provider is a special district or otherwise separate from the local government, the policy should provide similar clarity on whether they will issue a "Will-Serve" letter (upon which the local government typically relies in issuing a building permit). This is a critical point because it could have implications for project financing. Many communities have had difficulty expending these funds expediently, as they often rely on public interest and engagement (such as in the case of a fixture replacement rebate). Should building permits or certificates of occupancy hinge on actually expending the funds, lenders may be hesitant to back a project that ultimately might not receive approval or that could be subject to extensive delays. Selling offset credits for a particular efficiency program may help avoid this issue, so long as purchase of the credit is deemed to satisfy the requirement for the equivalent offset.

Water demand offset policies generally include these water conservation elements:[537]

- A condition that triggers the requirement for a water demand offset (e.g., new development and/or expanded use of an existing connection)
- Water-demand projection of new development or expansion
- Demand mitigation implementation options, such as:
    - Onsite conservation measures (such as xeriscaping or reductions in landscaped area)
    - Onsite efficiency measures (such as water efficient fixtures and appliances)
    - Onsite alternative supply measures (such as rainwater use, stormwater use, or greywater recycling)
- Water-demand offset ratio (e.g., a ratio of 2:1 would require 200% of the projected demand to be offset)
- Verification of water demand (after implementation of demand-mitigation measures) and implementation of offset measures
- Allowable off-site offset options, such as:
    - Purchasing senior water rights within the existing water system
    - Fee-in-lieu of developer-implemented efficiency measures to fund water provider projects and programs (e.g., fixture replacement programs)
- Methodology for estimating savings of efficiency measures
- Administrative fees and other costs

535 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A Literature Review & Case Study Compilation 3 (2015), http://www.allianceforwaterefficiency.org/net-blue.aspx.

536 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A Literature Review & Case Study Compilation 3 (2015), http://www.allianceforwaterefficiency.org/net-blue.aspx.

537 This list was adapted and expanded from Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A Literature Review & Case Study Compilation 2 (2015), http://www.allianceforwaterefficiency.org/net-blue.aspx.

- A rule that ensures that demand reductions are permanent

The feasibility of such offset policies may be affected by state water doctrine, which can limit the ability for property owners to capture and reuse water, the rights for which may belong to another user. (See Chapter 10, *Building and Plumbing Codes*, for more.) These difficulties, however, could be mitigated where land use planners and water planners collaborate on the methodology for determining a project's anticipated demand. Beyond factors such as anticipated water-fixture efficiency, landscaping demands, and onsite reuse, water providers could look to land use pattern to estimate reduced water loss from compact development. Dispersed development requires longer systems and incurs greater loss than compact development.538 The American Water Works Association's water audit methodology and a study by the EPA and the Water Research Foundation all reveal system length as the key factor affecting water loss. (See Chapter 2, *Water Issues in the Interior West*, for more details.) Water offset policies present an opportunity for water providers to consider a more complete picture of water-neutral growth by accounting for location as a demand-mitigation measure. This reduction in anticipated demand could be viewed as an incentive for more compact development versus sprawl. Similarly, water planners might consider other factors that affect their financial models, such as the idea of recovering costs for new water infrastructure based on how compact the new development is and how much infrastructure is required to service that new development.

EXAMPLES OF WATER-DEMAND OFFSET POLICIES

Morro Bay, California[539]

The City of Morro Bay has had a water-demand offset policy for new development in place since 1985. In the City's program, new development must perform retrofits on existing housing stock that achieves water-use savings that are two times the amount of new demand from the developer (i.e., a 2:1 offset ratio) — no fee-in-lieu options exist. The quantity of demand offsets is estimated by the planning director.

Santa Fe, New Mexico[540]

The City of Santa Fe has had a water-demand offset policy for new development in place since 2002. New developments must either purchase water service via credits from a previously established "bank" of efficiency savings at the cost of $16,600 per acre-foot, or transfer an equivalent amount of water rights to the city. The offset ratio is 1:1 + 9.8%.

Soquel Creek Water District, California[541]

The Soquel Creek Water District relies upon a groundwater basin that has been in a state of overdraft, leading to seawater intrusion that could result in groundwater well contamination if

538 Environmental Protection Agency, Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies 5 (2006), https://www.epa.gov/sites/production/files/2014-01/documents/growing_water_use_efficiency.pdf.

539 City Council of Morro Bay, CA, Resolution No. 32-14: A Resolution of the City Council of the City of Morro Bay, California, Modifying the Water Allocation Program for 2014, https://www.morro-bay.ca.us/ArchiveCenter/ViewFile/Item/2108.

540 City of Santa Fe, NM, Ordinance Number 2011-37 § 11 and Ordinance Number 2009-38, § 14, http://www.allianceforwaterefficiency.org/uploadedFiles/Resource_Center/Net_Blue/SantaFeNM.pdf.

541 *Water Demand Offset (WDO) Program,* Soquel Creek Water District, https://www.soquelcreekwater.org/conserving-water/water-demand-offset-program (last visited May 27, 2018); *Water Demand Offset Program History,* Soquel Creek Water District, https://www.soquelcreekwater.org/water-demand-offset-program/water-demand-offset-program-history (last visited May 27, 2018).

left unchecked. In 2003, the district implemented a water demand offset policy (Resolution No. 17-24), in order to allow for continued development without further impacts to the groundwater supply. The policy requires the following developments to offset 1.6 times the amount of their projected use:

- Development projects requiring new water service
- New ADUs, including those that are entirely contained within the existing square footage of an existing single-family home or accessory structure
- Development projects with an existing water service that are undergoing a change in use that is expected to increase water demand, as determined using District-established water-use factors
- Existing commercial customers that are adding new square footage

Existing developments undergoing a change in use where water use is expected to increase (due to an increase in size or change to a more water-intensive use) must calculate their fee the same way as for a new development but will receive credit for existing water use.

The offset policy includes green building components as an optional demand-mitigation measure. Projects may reduce their offset requirement by going beyond the minimum water efficiency requirements for toilets, showerheads, turf, washing machines, and other water-using appliances. Under the policy, projects are required to offset their projected water demand with the following water conservation elements:

- Funding long-term District conservation or supply projects: Projects may satisfy 50% of their total offset requirement by purchasing offset credits from the District's future conservation programs and projects (offsets are sold at $55,000 per acre-foot). Such projects have included requirements such as:
    - Purchase of a NO-DES hydrant flushing machine. (Traditional main flushing methods result in water being released to storm drains or the sanitary sewer, but the NO-DES machine recycles the water used to flush water mains, resulting in a water savings of approximately 2,443,883–6,000,000 gallons per year.)
    - Installation of water efficient plumbing fixtures at public schools.
    - Saving water by replacing residential toilets or waiting on a wait list: Projects may satisfy 50% of their total offset requirement through replacement of older 1.6 gpf or greater toilets in the District with 0.8 gpf ultra-high-efficiency toilets. Developers may directly install new toilets in homes or can purchase offset credits generated by the enhanced toilet rebate program, for which there is a wait list (offset credits are sold at $55,000 per acre-foot).
    - Identifying, proposing, and performing their own offset-generating project, which must be pre-approved by the Board.

The offset policy notes that offset requirements must be satisfied before the District will issue a "Will-Serve" letter stating that water is available for the project and will be provided. The County of Santa Cruz will require new or expanded developments to submit this letter before accepting a building permit application, and the City of Capitola will require this letter before granting a final building permit.

Model Ordinance, Alliance for Water Efficiency[542]

The Alliance for Water Efficiency (AWE) has studied demand offset policies extensively, producing a report on existing examples as well as creating a model ordinance that communities can tailor and customize to create a water-demand offset approach meeting local needs. The model ordinance is designed as a worksheet that highlights the decisions that need to be made by the user in order to craft an ordinance that meets the particular needs of a given community. In addition, AWE provides three sample ordinances that can result from the worksheet to highlight the diverse outputs that may result.

e. Adopt Landscape Codes or Landscape Design Guidelines

Landscaping provides economic and aesthetic value to areas by performing a number of useful functions such as regulating humidity, providing shade and improving cooling, enhancing visuals, improving smell, absorbing carbon dioxide, releasing oxygen, filtering dust and dirt, holding dust and dirt in place, providing noise and visual buffers, and providing wildlife habitat. According to the EPA, however, water used for exterior landscaping can account for over 30% of average annual per capita use and over 50% of water used for landscaping may be lost through evaporation due to improper system design, installation, and maintenance.543 Since the types of soils and plants in building landscapes and the methods of caring for such landscapes account for such a high percentage of per capita or per-household water use, incorporating landscape regulations into local codes is essential to communities establishing standards for water conservation and efficiency.

As discussed in Chapter 10, building and plumbing codes may include requirements for fixture efficiency, water reuse, smart meters, submetering, rain sensors, automatic shutoffs, programmable irrigation timers, drip irrigation, and other such technologies. Communities should implement such code provisions, however, in combination with limits on the amount of irrigated landscaping and with landscaping specifications such as approved plant lists, soil quality requirements, turfgrass limits, mulching to reduce evaporation, provisions for artificial turf, and quantity/use limitations. They may also include objective standards for proper planning and design such as hydrozoning (grouping plants with similar water needs together) and requiring open spaces to be designed to help manage stormwater without the need for hard (or "gray") infrastructure where the use of pipes, culverts, and other hard infrastructure can be avoided. Landscaping codes may also include some of the provisions discussed earlier in this chapter, such as water loss limits, bans on water waste, and limitations on the times and purposes for which water may be used.

Communities may find help in identifying these standards by consulting a variety of outside sources such as sustainable development rating systems, EPA standards, and relevant university departments. State land-grant colleges, for example, may have a list of appropriate plants and soils as well as best practices for installing and operating irrigation systems. Local governments can incorporate such lists by reference into local regulations (although avoid incorporating automatically any updates to such lists). Local government counsel could be consulted in figuring out how to incorporate standards into law and how to draft such standards. Landscaping standards that are not sufficiently specific, for example, can be hard to enforce, may be legally vulnerable, and can complicate project approvals. Landscaping requirements may be adopted through the zoning ordinance, subdivision regulations, design guidelines, or a stand-alone landscaping ordinance.

542 Alliance for Water Efficiency, Net Blue: Model Ordinance (2017), http://www.allianceforwaterefficiency.org/net-blue-ordinance.aspx.

543 Envtl. Prot. Agency, Water Efficiency Management Guide Landscaping and Irrigation 1 (Nov. 2017), https://www.epa.gov/sites/production/files/2017-12/documents/ws-commercialbuildings-waterscore-irrigation-landscape-guide.pdf.

i. Select Water Wise Landscaping Elements

Landscaping codes and design guidelines may include objective criteria about landscaping materials, including the minimum sizes and qualities of those plants. The code may include a specific list of approved or recommended plants or may contain a more general requirement that landscapes only use plant species suitable for the site conditions and climate/hardiness zone. Some codes specify that plants must be "native," "drought tolerant," "drought resistant," or that developers/owners must demonstrate that the landscape will not need an irrigation system after the landscape's establishment period. Most important is that the community clearly defines in the code what it means by these terms.

Likewise, landscaping codes and design guidelines may include soil improvement requirements (e.g., soil amendments, soil preparations), as the type and quality of soil used in new developments relates directly to the amount of water used to sustain the landscape. Landscaping codes can encourage and require new developments to use water conserving soil types and practices (such as clay, shredded bark, or vermiculite). Such codes may also include provisions for artificial turf, which, in appropriate locations, can reduce onsite water use significantly.

Such codes may also include allowances or requirements for onsite stormwater retention and treatment, such as impervious coverage limits, functional stormwater features/green infrastructure (such as bioswales and raingardens), and rainwater harvesting (although this varies by state law).

Some communities may choose to reference third-party standards or tools for landscaping codes or site design requirements. Approaches to adopting third-party programs vary widely but their standards can be valuable ways for cities and counties to encourage water conservation. Some communities have referenced these programs outright in their codes or used them as a menu to select elements that will decrease water use. Communities should, however, avoid automatically incorporating any updates to such rating systems. Local government counsel could be consulted regarding the process of incorporating third-party standards, particularly revisions of such standards, into local land use laws. The most popular of these third-party rating systems is the Sustainable Sites Initiative's SITES Rating System,[544] which certifies the design, construction, and maintenance of sustainable landscapes with or without buildings. Among other requirements, projects under SITES v2 must manage and retain or treat precipitation on-site from the 60th percentile precipitation event (as defined by the EPA) using strategies such as minimizing impervious surfaces and using rainwater harvesting systems; reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond the establishment period or by reducing the project's landscape water requirement by at least 50% from the baseline (calculated with the EPA's WaterSense Water Budget Tool for water-smart design[545]); and use only plant species suitable for site conditions, climate, and design intent. Related optional credits in the rating system include further onsite retention or treatment, further reductions in outdoor water use, using functional stormwater features as amenities (such as bioswales), and conserving and installing native plans and plant communities that receive a minimum score of 20 from the SITES native plants calculator.

544 Sustainable Sites Initiative, SITES v2 Rating System 26-47 (2014), http://go.usgbc.org/SITES-Rating-System-and-Scorecard-Registration.html.

545 Envtl. Prot. Agency, WaterSense Water Budget Tool (2018), https://www.epa.gov/watersense/water-budget-tool.

EXAMPLES OF WATER-WISE LANDSCAPING ELEMENTS IN LANDSCAPE CODES AND DESIGN GUIDELINES

Westminster, Colorado

A majority of the City of Westminster is zoned as a PUD,[546] under which all proposed uses must conform to the City's highly detailed Comprehensive Plan.[547] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[548] Through the PUD approval process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. As part of the PUD requirements, all land uses and negotiated standards, which must comply with the Comprehensive Plan and design guidelines — both of which promote strong water efficiency — must be reflected in the project's ODP, which acts as a site plan, making them the legal requirements for that project.[549] A project's ODP will include specifications relative to landscape compliance, in terms of the water usage standards (referring to the municipal code and landscape code) and planting specification, including hydro-zone analysis and plant types, which correspond to the City's planting palette.[550] The City then has a robust inspection process to ensure continued compliance with these ODPs.

Aurora, Colorado

The City of Aurora's landscaping code includes requirements for drought-tolerant or drought-resistant landscaping and plant species, turf limitations, automatic irrigation shutoff sensors, buffer reductions for xeriscape design, and maintenance requirements.[551] As part of the site-plan application process, applicants must submit a landscape plan that conforms to this code. The landscape plan must include a table summarizing landscaped areas that are water conserving (non-turf) and non-water conserving (turf), to be used for assessing irrigation tap fees.[552] Similarly, projects qualifying for buffer reductions by using xeriscape design must include notes on the landscape plan describing the type of irrigation for each area.[553]

546 City of Westminster, CO, City Zoning Map (2010), http://westminstereconomicdevelopment.org/Westminster/media/Westminster/Maps/ZoningMap_July2014.pdf?ext=.pdf.

547 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 94, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/LongRangePlanningandUrbanDesign/ComprehensivePlan.

548 *Development Review*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview (scroll down to "Development Project Types" header; then click "Design Guidelines" to expand the menu). Because the State of Colorado recently (as of the writing of this Module) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

549 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

550 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

551 City of Aurora, CO, Building and Zoning Code, § 146-1401, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV1INGE_S146-1401AP.

552 City of Aurora, CO, Building and Zoning Code, § 146-1430, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1430IR.

553 City of Aurora, CO, Building and Zoning Code, § 146-1437, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1437XEDE.

The City also prohibits single- and two-family homeowners from installing a lawn, turf, or sodded area without a valid lawn permit.[554] Applications for a lawn permit must include a site plan or drawing of the lot. The Water Department then inspects soil amendment and soil preparation to determine whether the application satisfies the City's water conservation requirements. If there is a potential violation of this requirement, the City may enter private property to inspect. Violations are treated as a violation of the City's Waste of Water code provision.

Parker, Colorado

The City of Parker's Master Plan Update 2035 set forth Landscape Plan requirements for xeriscaping.[555] The goals of the Update are to promote proactive environmental programs and water conservation practices. The City intends to reach this goal through implementing responsible creation of landscaping that uses the seven xeriscape principles: proper planning and design, efficient irrigation systems (such as drip- and micro-irrigation), use of mulches to reduce evaporation, use of soil amendments, grouping of plant materials of similar water needs together (e.g., hydrozoning), limiting of turf areas, and appropriate maintenance of the landscape.[556] The Parker Water and Sanitation District will continue to develop other programs and projects to reduce the City's impact on the aquifers, including actively pursuing additional renewable water rights, metering, xeriscape education, and reuse of wastewater for irrigation.[557]

The City has also adopted a highly detailed set of site plan regulations that require landscape design, installation, and maintenance to promote water conservation.[558] The regulations require the preservation of existing trees and shrubs and set forth xeriscape requirements, plant material specifications, and irrigation requirements. The xeriscape requirements limit large percentages of bluegrass or other traditional turf grasses, including a 15% cap for commercial and industrial use; prohibit turf grasses from being used on any interior parking lot landscaping; and identify Buffalo Grass and Blue Grama as preferred turf grasses. The plant material specifications require landscaping to use well-adapted, drought-tolerant vegetation to the maximum extent practical and encourage native grasses as replacement for traditional bluegrass, fescue, or ryegrass cultivars. The regulation also requires that all landscaped areas, except those on individual single-family residential lots, be served by a functioning automatic irrigation system. Landscaped areas over 5,000 square feet are required to have an irrigation system that provides coverage to all turf and plant materials from rotary/gear-driven sprinklers, pop-up and surface-spray sprinklers, bubblers, drip or trickle irrigation and allows residential landscaped areas of that size to be irrigated by hand if an adequate water source is available within 50 feet of the landscaped area. The irrigation requirements set forth rainfall or soil moisture sensors, check valves, pressure reducers, water efficient sprinkler heads, and flow sensor valves as desirable to reduce unnecessary water usage.

554 City of Aurora, CO, Municipal Code, § 138-187, Utilities, https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-187WACOREEX.

555 Parker 2035: Changes and Choices, Town of Parker, Colorado, 12.6, http://prod.parker.cciconstellation.net/Parker/media/Parker/Master%20Developer%20RFQ/Appendix-1-Town-of-Parker-Master-Plan.pdf.

556 Parker 2035: Changes and Choices, Town of Parker, Colorado, 12.7, http://www.parkeronline.org/DocumentCenter/View/21759.

557 Parker 2035: Changes and Choices, Town of Parker, Colorado, 11.6, http://www.parkeronline.org/DocumentCenter/View/21759.

558 City of Parker, CO, Land Development Code §13.06 Site Plan Standards and Procedures, (2000), https://www.municode.com/library/co/parker/codes/municipal_code?nodeId=TIT13LADEOR_CH13.06SIPLSTPR.

Cheyenne, Wyoming[559]

Cheyenne's Unified Development Code includes landscape standards in the site plan regulations based on a point system that favors trees, shrubs, and ground cover that require less than one inch of supplemental watering per week during hot, dry periods. The system also favors native grass. Further, the landscape standards specify that "tree species selection could reflect species historically found in the neighborhood." In addition, the city's landscape standards require species diversity, prohibit extensive monocultures, and compel developers to install automatic irrigation systems with automatic controllers. These systems must irrigate a landscaped area with similar site, slope, soil conditions, and plant watering needs.

Doña Ana County, New Mexico[560]

Doña Ana County requires that low-water-use trees and other plants be used in a minimum of 50% of provided live cover. The ordinance contains an extensive list of recommended plants and trees including plants that are suitable for the arid climate and temperature range. There is also a list of prohibited and not recommended plants that have water-seeking roots. The ordinance requires that a Landscape Plan be submitted with an application for building permits, site plans, and subdivisions. The Landscape Plan should include proposed irrigation, plantings, ground cover, and other landscape treatments including water harvesting and hardscape. Additionally, the County recommends water conservation measures for housing units in all subdivisions that encourage low-water-use landscaping techniques applying the principles of xeriscaping.[561]

Eloy, Arizona[562]

Eloy requires water conserving landscaping in certain circumstances.[563] These standards are included as Plant Specifications within Design Guidelines in the Zoning Code. The guidelines not only prohibit non-native species that require more water than native species, but also require low-water-use, drought-tolerant plant species (xeriscaping) for required landscaping elements.

Oro Valley, Arizona[564]

Oro Valley has an extensive landscaping conservation section in its zoning that integrates town requirements related to landscape improvements, native plant preservation, irrigation, and outdoor water conservation. These conservation landscaping techniques include preserve land values by preserving the existing desert landscape; preserve environmental quality by stabilizing desert soil and providing native drought-tolerant vegetation; protect water conservation by reducing the amount of water used for landscaping; raise awareness of water conservation objectives; restrict use of turf; and implement sustainable irrigation standards including rainwater

559 Cheyenne, WY, Unified Development Code, § 6.3 Landscaping Standards (2015), https://www.cheyennecity.org/DocumentCenter/View/24934.

560 Doña Ana County, NM, Unified Development Code, § 5.7 Landscaping and Buffering, and fencing (2016), https://donaanacounty.org/sites/default/files/pages/UDC.pdf.

561 Doña Ana County, NM, Unified Development Code, § 6.6 Water and Wastewater Systems (2016), https://donaanacounty.org/sites/default/files/pages/UDC.pdf.

562 City of Eloy, Az. City Code, § 21-200 Landscape Standards (2004), http://www.sterlingcodifiers.com/codebook/m_index.php?book_id=674.

563 City of Eloy, Az. City Code, §§ 21-200-04 Landscape Standards (2004), http://www.sterlingcodifiers.com/codebook/m_index.php?book_id=674.

564 Oro Valley, AZ, Zoning Code, § 27.6 Landscape Conservation (2009), http://www.codepublishing.com/AZ/OroValley/mobile/index.pl?pg=orovalley100/orovalley10027.html.

harvesting techniques. The code provides a list of allowable plants and vegetation and allows clustering development. The amount of plants allowed depends on the type of zone in which the property is located. Oro Valley also requires a Landscape Water Plan for any irrigated landscape. This plan includes calculation on the monthly and total annual water use required for all specified plants.

Parker, Arizona

Parker requires the submittal of a preliminary landscape plan for all on-site and off-site, open space, trails, and retention area landscaping.[565] Additionally, Parker requires a final landscape plan that includes a detailed list of plant species, plant sizes, specific quantities and specific plant locations. Parker additionally appends a list of low-water-use/drought-tolerant plants to its Code.[566]

Silver City, New Mexico[567]

Silver City offers a bonus to applicants for development permits as an incentive to use only trees and vegetation contained on a pre-approved Low-Water and Native Vegetation list within the ordinance. The bonus allows applicants to reduce the project's required landscaping area requirements by 10%. Silver City only allows for a maximum of 50% of landscaped areas to be covered by plants requiring irrigation. Subdivision approval is contingent upon having an adequate water supply, proper infrastructure, and water rights to provide units with normal operation and fire protection.

Evanston, Wyoming[568]

Evanston adopted a landscape ordinance "to provide information and details which will enable property to be landscaped in a reasonable manner." According to the ordinance, landscaping provides economic and aesthetic value to areas by performing a number of useful functions such as regulating humidity, providing shade, improving cooling, enhancing visuals, altering smell, absorbing carbon dioxide, releasing oxygen, filtering dust and dirt, providing noise and visual buffers, and increasing wildlife habitat. Evanston encourages the use of drought-tolerant plant materials and xeriscaping techniques to conserve water while requiring plant materials to be suitable to the climate.

Star Valley, Arizona[569]

Star Valley includes preservation of scarce water supplies as one of the purposes within the landscaping requirements and requires landscaping plans to be submitted with the site plan. The Town requires the preservation of existing vegetation and incorporation of native plants and low-water-need plants to preserve the natural resources and scarce water supplies.

565 Town of Parker, AZ, Town Code, § 10-10A-4 Submittal Requirements (2005), http://www.sterlingcodifiers.com/codebook/m_index.php?book_id=810.

566 Town of Parker, AZ, Town Code, § 10-12-2 Plant Specifications (2005), http://www.sterlingcodifiers.com/codebook/m_index.php?book_id=810.

567 Town of Silver City, NM, Land Use and Zoning Code, § 5.10 Landscaping and Buffering, (2010), https://library.municode.com/nm/silver_city/codes/code_of_ordinances?nodeId=PTIICOOR_APXCLAUSZOCO2010_ARTVDEST_5.10LABU.

568 Evanston, WY, Supplemental Zoning Regulations Ch. 24, § 24-36 Landscaping Requirements (2004), http://www.ecode360.com/9852372.

569 Star Valley, AZ, Town Code § 9-5-7 Landscaping and Screening Standards (2008), http://sterlingcodifiers.com/codebook/index.php?book_id=451&section_id=168302.

Winter Park, Colorado[570]

The Town of Winter Park has regulations to ensure adequate water supplies, in part because of the reduced flows in the Fraser River caused by transmountain diversions. The Town developed much of its land use code to protect the health of the Fraser River. The Town prohibits outdoor irrigation anywhere in Winter Park and limits the issuance of development permits to maintain 10 cubic feet per second in the Fraser River.

ii. Consider Various Procedural Features

From a procedural standpoint, landscape code elements and design guidelines may be mandatory, or the extent of compliance could be the basis for financial incentives (such as irrigation tap fee calculations) or zoning incentives (such as buffer reductions). Communities could vary the applicability of landscaping requirements or the stringency of those requirements in a number of ways, such as requiring design guideline compliance only for subdivisions or PUD projects. Adopting design guidelines by reference through land development codes gives the community additional flexibility to amend the design guidelines as new techniques for water conservation and efficiency evolve. Some communities may adopt landscape standards as recommendations and create educational programs to inform and urge homeowners and developers to follow them. Communities will want to consider where to adopt landscaping requirements based, among other things, on the desired extent of applicability and the desired extent of post-occupancy enforcement.

While landscaping requirements may be adopted through the zoning ordinance, subdivision regulations, or other measures, the site-plan review process should include a submittal requirement for landscaping plan documentation. Site-plan review regulations can then include specific criteria requiring site plans to demonstrate compliance with those landscaping requirements. In order for site-plan review to produce predictable results, the review needs to be tied to objective standards in the landscaping ordinance (not just vague intent statements), and decisions need to be based on clear criteria requiring compliance with the code provisions related to water supply and conservation. Requiring detailed landscape plans will lay the groundwork for post-occupancy enforcement. The more specific the requirements are and the more detailed the landscape plans are, the stronger a community's post-occupancy enforcement can be. See Chapter 9, *Site Plan Regulations*, for more.

Landscaping codes typically include installation and inspection requirements to verify compliance prior to issuance of a building's Certificate of Occupancy (C of O). Such requirements may include exceptions for landscaping installations that could not be completed due to weather or seasonal conditions, perhaps allowing for a temporary C of O instead.

Finally, such codes may require ongoing maintenance of landscaping, including requirements that any replacement plants conform to updated codes or design standards in effect at the time of installation. As water conservation regulations become more prevalent, detailed, and complex, it may be necessary for the community to arrange for planning staff, environmental review staff, water utility staff, or outside professionals to perform periodic site inspections. While this is primarily true during construction, it may also be true in the years following occupancy. Just as fire departments perform periodic inspections to confirm that a building that was constructed safely remains safe for its occupants, the local government

570 Northwest Colorado Council of Government Water Quality/Quantity Committee, *Summary of May, 7 2014 Land Use and Water Conservation Workshop* 2, http://nwccog.org/wp-content/uploads/2015/03/SUMMARY.NWCCOGQQ-LandUseWaterConsvnWorkshop-5-7-14.FINAL_.pdf.

may want to arrange for periodic inspections to confirm that pervious pavement and bioswales (for example) are still functioning as they were designed to function, or that water conserving landscaping has not been replaced by thirstier varieties of trees, shrubs, or ground cover. See Chapter 15, *Post-Occupancy Enforcement*, for more on how to enforce water-wise landscaping requirements.

EXAMPLES OF PROCEDURAL FEATURES OF LANDSCAPE CODES AND DESIGN GUIDELINES

Westminster, Colorado

A majority of the City of Westminster is zoned as a PUD,[571] under which all proposed uses must conform to the City's highly detailed Comprehensive Plan.[572] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[573] Through the PUD approval process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. As part of the PUD requirements, all land uses and negotiated standards, which must comply with the Comprehensive Plan and design guidelines — both of which promote strong water efficiency — must be reflected in the project's ODP, which acts as a site plan, making them the legal requirements for that project.[574] A project's ODP will include specifications relative to landscape compliance, in terms of the water usage standards (referring to the municipal code and landscape code) and planting specification, including hydro-zone analysis and plant types, which correspond to the City's planting palette.[575] The City then has a robust inspection process to ensure continued compliance with these ODPs.

In addition to pre-occupancy inspections, which include a check to ensure the correct installation of water efficient landscaping, Westminster also has a post-occupancy inspection program under which the City periodically inspects landscapes to be sure that what was listed in the ODP and originally installed still exists. The City's code requires property owners to maintain the landscaping indicated on any approved ODP or site plan accompanying an ODP waiver.[576] The City has a special ODP Inspector who manages this process, which commonly results in missing trees or other landscape areas needing replacement. The inspections do not occur on a regular, planned schedule; rather, they are based upon observed violations or warranty inspections.

571 City of Westminster, CO, City Zoning Map (2010), http://westminstereconomicdevelopment.org/Westminster/media/Westminster/Maps/ZoningMap_July2014.pdf?ext=.pdf.

572 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 94, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/LongRangePlanningandUrbanDesign/ComprehensivePlan.

573 *Development Review*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview (scroll down to "Development Project Types" header; then click "Design Guidelines" to expand the menu). Because the State of Colorado recently (as of the writing of this Module) began requiring water-sense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

574 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

575 Email Interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

576 City of Westminster, CO, City Code, § 11-7-5, Site Development Standards, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH7SIDEST_11-7-5PRRELA.

Because continued compliance with the ODP is legally required by virtue of its being part of the zoning, alterations to water efficient landscaping are treated as code violations, as are any other violations of the ODP — the same way that another community might enforce a zoning violation where a single-family home was converted to a two-family home. The City can enforce these violations in the same way as any other code violation (as a misdemeanor, punishable by $2,000/day and/or 1 year in jail), although these punishments are rarely levied as the City's main concern is remedying the violation.

Aurora, Colorado

In 2014, Aurora revised its Landscape Ordinance to require landscaping plans for new development applications, applications for large alteration on existing buildings, and lawn permits.[577] In order to conserve and protect water resources, the ordinance requires at least 75% of all annual plants and trees and 100% of shrubs, perennials, groundcovers, and ornamental grasses to be selected from the City's Recommended Xeriscape Plant List, the Colorado State University Cooperative Extension Facts Sheet on Xeriscaping, or other approved water-wise and xeriscaping plant material reference.[578] The addition of turf is subject to drought conditions. Developers of both commercial and residential developments must install automatic rain shutoff sensors to monitor rainfall and to override the controls to prevent unnecessary irrigation.[579] Those that incorporate approved xeriscaping techniques may deduct an additional foot from the width of the required landscaped buffer.[580] As part of the site-plan application process, applicants must submit a landscape plan that conforms to this code. The landscape plan must include a table summarizing landscaped areas that are water conserving (non-turf) and non-water conserving (turf), to be used for assessing irrigation tap fees.[581] Similarly, projects qualifying for buffer reductions by using xeriscape design must include notes on the landscape plan describing the type of irrigation for each area.[582]

The City's zoning code has incorporated several green infrastructure features over the years, including tree requirements for residential, commercial, and industrial development projects; development and water incentives for native plant material or xeriscape landscaping; and an extensive parks and open space trail and greenway system within the city limits.[583]

577 City of Aurora, CO, Municipal Code, § 138-187 Water Conservation Requirements; Exemptions (2015), https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-187WACOREEX.

578 City of Aurora, CO, Building and Zoning Code, § 146-1426, Landscaping, Plant Material Requirements (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1426PLMARE.

579 City of Aurora, CO, Building and Zoning Code, § 146-1430, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1430IR.

580 City of Aurora, CO, Building and Zoning Code, § 146-1437, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1437XEDE.

581 City of Aurora, CO, Building and Zoning Code, § 146-1430, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1430IR.

582 City of Aurora, CO, Building and Zoning Code, § 146-1437, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1437XEDE.

583 City of Aurora, CO, 2009 Comprehensive Plan, Chapter II, Sustainability Plan 19 (2009), https://www.auroragov.org/UserFiles/Servers/Server_1881137/Image/Departments/Development/Final%20Comp%20Plan.pdf. *See also* Aurora, CO, Building and Zoning Code, § 146 (2014) *available at*, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1426PLMARE.

The City requires that all landscaping indicated on the site plans for single- and two-family homes must be installed prior to inspection and issuance of a Certificate of Occupancy. Temporary certificates of occupancy may be issued when the required landscaping is not completed due to weather or seasonal conditions.[584] Post-occupancy, homeowners are then required to maintain this landscaping, including a requirement that any replacement plants conform to the City's current landscaping standards.[585] Inspections are based on observed violations and may result in citations.

The City also prohibits single- and two-family homeowners from installing a lawn, turf, or sodded area without a valid lawn permit.[586] Applications for a lawn permit must include a site plan or drawing of the lot. The Water Department then inspects soil amendment and soil preparation to determine whether the application satisfies the City's water conservation requirements. If there is a potential violation of this requirement, the City may enter private property to inspect. Violations are treated as a violation of the City's Waste of Water code provision.

The City is a large community with a multifaceted program designed to conserve water in new and existing developments. As such, it provides an excellent example of what communities in the Interior West are allowed and can do to address serious water shortages.

Sarasota County, Florida

Under Sarasota County's Land Development Regulations, site and development plans must include landscape plans and specifications indicating types, sizes, locations, and quality of vegetation as well as provisions for irrigation and maintenance.[587] Sarasota County's Water efficient Landscaping Regulation requires resourceful landscape planning and installation, water efficient irrigation, and appropriate maintenance measures to promote conservation of water resources. To enforce maintenance, the Landscaping Regulation requires that builders provide property owners with a landscape maintenance checklist in a format prepared by the County that includes information such as cleaning and calibrating the irrigation system, resetting the automatic controller, replenishing mulch, pruning plants, and cutting grass around sprinkler heads.[588] The builder must also inform the owner of the current irrigation restrictions adopted by the County and the Water Management District. In addition, inspections are required by the Code Enforcement Officer or designated inspectors to "make inspections at reasonable hours of all land uses or activities regulated by Water efficient Landscaping Regulations in order to insure compliance with the provisions" included in the Water efficient Landscaping Ordinance.[589] The

584 City of Aurora, CO, Building and Zoning Code, § 146-1450(E)(1), Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV4DIST_S146-1450ADREREDE.

585 City of Aurora, CO, Building and Zoning Code, § 146-1438, Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1438LAMA.

586 City of Aurora, CO, Municipal Code, § 138-187, Utilities, https://library.municode.com/co/aurora/codes/code_of_ordinances?nodeId=CICOAUCOVOII_CH138UT_ARTVWASE_DIV2WASH_S138-187WACOREEX.

587 City of Sarasota, FL, Land Development Regulations, § 74-62 (2015), https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH74LADERE_ARTIIISIDEPLRE_S74-62STRESIDEPLAP.

588 Landscape Compliance Certification & Checklist Chapter XXII, Article VI of Sarasota County Code Ordinance Number 2001-081, http://sarasota.ifas.ufl.edu/Hort/WEL/ord/docs/ordchecklist.htm; *See also,* Sarasota, FL, Water efficient Landscaping Regulations, § 22-154(2005), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-154GEPRDEST.

589 City of Sarasota, FL, Water efficient Landscaping Regulations, § 22-155 (2001), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-155EN.

code enforcement officer is responsible for initiating enforcement proceedings, and the Board of County Commissioners is authorized to select Special Magistrate candidates who can issue citations, assess fines against violators, and hold hearings as provided in the Sarasota County, Florida Code of Ordinances.

Española, New Mexico

Española's development code includes provisions for Design Guidelines, Landscape Performance Standards, and Landscape Plans.[590] Under the code, applicants for new construction of individual commercial buildings or additions, subdivisions of three or more lots, and certain expansions or changes in use on existing sites must receive planning commission approval of a site development plan prior to issuance of a building permit. Among other things, the site plan must substantially conform to the City's Comprehensive Plan and must include a landscape plan that conforms to the Landscaping Performance Standards and Landscape Plan requirements found in the code. The project must also make necessary provisions for controlling stormwater drainage onsite and off-site consistent with the City of Española Design Guidelines and, to the extent practical, must preserve outstanding topographical features and natural amenities on the site.[591]

The site development plan must include, among other things, the following: locations of existing and new structures; lot coverage, height and gross floor area of structure; lot area; the placement and arrangement of buildings; topography, onsite drainage, retention and detention areas, drainage flow; location of off-street parking and loading facilities; any significant natural features, including drainage and vegetation; location and type of landscaping; and the type of visual screening such as walls, fences, and landscaping. The landscape plan (submitted with the development plan) must conform with the City's Landscaping Performance Standards, which include, among other things, that landscape design should emphasize native plants and water conservation practices and should give due consideration to the City's recommended plant materials list. All landscaping must be completed prior to issuance of a final certificate of occupancy and no later than three months after completion of construction of all structures unless otherwise approved by the City's Planning Director.

West Windsor, New Jersey[592]

To comply with West Windsor's preliminary Environmental Impact Statement requirement, developers must submit, among other things, a completed Green Development Practices Checklist, which asks the developer if they will be implementing certain sustainable development features focused primarily on site improvements. Among these features, several relate to the goal of reduced water consumption, including:

- The use of indigenous plant species and avoidance of exotic invasive plants
- Construction of drip landscape irrigation in lieu of spray systems or installation of soil water sensors to conserve irrigation water use

590 City of Espanola, N.M., Development Standards 350 § 1303 (Design Guidelines for Improvements), § 1304 (Landscaping Performance Standards), § 1305 (Landscape Plans), https://ecode360.com/15578274.

591 City of Espanola, N.M., Code, Chapter 350 § 403, https://ecode360.com/14542579#14542579.

592 West Windsor Township, NJ Town Code § 200-23(C)(1) Environmental Considerations (2010), http://ecode360.com/8062991.

Belmar, New Jersey[593]

Belmar's goals in creating its Sustainability Program Checklist for the Belmar Seaport Village redevelopment area are to encourage developers to design and build to higher levels of performance than the minimums set within the redevelopment area, helping Belmar achieve its mission of a more livable, affordable, and inclusive community.[594] The checklist presents a prioritized version of the issues that are most important to the Town and to the success of the district's master plan. Terms sufficient to carry out the purpose and intent of the sustainability elements (i.e., the Checklist) of the Redevelopment Plan must be incorporated in the redevelopment agreement with each developer in the Seaport Village Redevelopment Area.

The Sustainability Program Checklist[595] has eight categories containing a mix of required and optional features, of which several relate to reducing the rate of water consumption within the district. Among these, Belmar *requires* the following of developers:

- Building equipment and fixtures must meet or exceed minimum water efficiency standards
- Irrigation systems must reduce the demand for potable water by 50% over standard regional practices
- Landscape designs must incorporate drought-tolerant vegetation

San Francisco, California

The purpose of San Francisco's Water Efficient Irrigation Ordinance is to regulate landscape irrigation practices and plant use.[596] Property owners and developers are expected to design and build drainage facilities including, but not limited to, culverts, retention and detention basins, and drainage swales. The ordinance also requires irrigation audits for a landscaped area by a Certified Landscape Irrigation Auditor, the project applicant, or a Public Utilities Commission Water Service Inspector.[597] An irrigation audit includes inspections, system tests, precipitation rates, and runoff reports. If a site violates the wastewater provision of the ordinance, property owners can be fined.[598]

Also in San Francisco, the Public Utilities Commission has a water budget report pilot program that provides a report to property owners with dedicated irrigation meters.[599] These reports include information on how property owners can meet their calculated water budget. The installation of a dedicated irrigation water service and meter helps property owners and tenants track irrigation water use, reduce wastewater fees associated with indoor uses, and use a separate shutoff for the irrigation system if needed. The General Manager of the Public Utilities

593 Borough of Belmar, Seaport Development Program, Redevelopment Plan Update (2009), http://www.belmar.com/forms/municipal/Seaport%20Redevelopment%20Plan%20-%20Amended%203-7-12%20per%20ORD%202012-02.pdf.

594 Belmar Seaport Village, Sustainability Program Checklist, http://sj-site-legacy-editor-doc.s3.amazonaws.com/p5!495.pdf.

595 Belmar Seaport Village, Sustainability Program Checklist, http://sj-site-legacy-editor-doc.s3.amazonaws.com/p5!495.pdf.

596 S.F. Pub. Util. Comm'n Water Conservation Sec., Complying with San Francisco's Water Efficient Irrigation Requirements 1 (2011), http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=731.

597 S.F. Pub. Util. Comm'n Water Conservation Sec., Complying with San Francisco's Water Efficient Irrigation Requirements 7 (2011), http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=731.

598 S.F., Cal., Water Efficient Irrigation Ordinance No. 301-10 (Aug 3, 2010), http://www.sfwater.org/modules/showdocument.aspx?documentid=384. *See also Water Efficient Landscape*, S.F. Water Power Sewer (2017), http://www.sfwater.org/index.aspx?page=689.

599 S. F. Water Power Sewer, Pilot Community Garden Irrigation Meter Grant Program Overview, https://www.tucsonaz.gov/files/water/docs/SF_grant_funding_for_UA_water.pdf.

Commission may issue a written warning entered on the user's water service record and delivered to the property owner by any reasonable means. The written warning may include information regarding the violation, educate the violator on restrictions, provide resources to assist with compliance, and set a deadline for corrective action. If violations are not corrected to the General Manager's satisfaction, administrative penalties and other available legal remedies can be taken pursuant to San Francisco's Administrative Code.

Similarly, San Francisco's Green Landscaping Ordinance seeks to achieve increased permeability through front yard and parking lot controls and encourages responsible water use through increasing "climate-appropriate" plantings.[600] According to the San Francisco Planning Department, 20% of a front yard must be plant material, and 50% must be permeable. Examples of approved permeable surfaces include porous asphalt, in-ground planters, and loosely set paving. There is a full guide to help property owners maintain landscapes to comply with the ordinance and understand the benefits of such landscapes.[601]

In addition, the Planning Department's Code Enforcement team helps maintain and improve the quality of San Francisco's neighborhoods by operating programs that ensure compliance with the City's Planning Code. Code enforcement officials will respond to any complaints regarding code violations. The complaint is logged and assigned to an Enforcement Planner in charge of the area. Each complaint is investigated in order of priority. If a violation occurs, the Enforcement Planner sends a notice to the property owner. The Enforcement Planner may conduct a site visit to further investigate the violation. One of their most typically reported Planning Code violations is the removal of required landscaping.[602]

600 S.F. Planning Dep't, Guide to the San Francisco Green Landscaping Ordinance Planning Code 2 (2010), http://www.sf-planning.org/ftp/files/publications_reports/Guide_to_SF_Green_Landscaping_Ordinance.pdf *See also* S.F., CA Planning Code § 84-10 (2010). http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances10/o0084-10.pdf.

601 *See generally* S.F. Planning Dep't, Guide to the San Francisco Green Landscaping Ordinance Planning Code (2010), http://www.sf-planning.org/ftp/files/publications_reports/Guide_to_SF_Green_Landscaping_Ordinance.pdf.

602 *Enforcement*, S. F. Planning Dep't, http://sf-planning.org/index.aspx?page=2202.

12. Development Moratoria

A moratorium on development is a local law or ordinance that preserves the status quo for a reasonable time while the community develops and adopts a land use strategy to respond to new or recently perceived problems not adequately dealt with by its current laws. The moratorium suspends the right of property owners to obtain development approvals, preventing development of land under current land use plans and regulations that the community is considering changing. It helps to accomplish the purpose of the new rules by giving them the broadest possible applicability and preventing development that is inconsistent with them. Moratoria on development have been upheld in all Interior West states.[603]

Local governments may use moratoria on development prior to the adoption of an overlay zone, a new subdivision law, the designation of a critical environmental area, or the adoption of an environmental constraints ordinance, just to name a few. Communities can use emergency development moratoria when it is necessary to address an immediate shortage of drinking water to prevent unsustainable development while allowing the appropriate regulatory regime to be established.[604]

EXAMPLE OF DEVELOPMENT MORATORIUM LINKED TO WATER SHORTAGE

Frederick, Maryland

The County of Frederick realized that its drinking-water demand was outpacing its drinking-water supply. As a result, on March 27, 2001, Frederick City's Mayor issued an Executive Order establishing a development moratorium to slow development until the appropriate steps could be taken to ensure an adequate future water supply. The moratorium was extended on August 15, 2001. Additionally, on February 8, 2002, the Mayor issued Executive Order 1-02, which prohibited the city from recording subdivision plats, annexing new areas, and issuing building

603 Arizona, Ariz. Rev. Stat., § 9-463.06 (specifying the limitations under which a city or town may adopt a moratorium on construction or land development); Colorado, *Deighton v. City Council of Colorado Springs,* 902 P.2d 426, 429 (Colo. App. 1994) (Colorado court approved the use of moratoria by city governments); Colo. Rev. Stat § 30-28-121 "The board of county commissioners of any county, after appointment of a county or district planning commission ... may promulgate, by resolution without a public hearing, regulations of a temporary nature, to be effective for a limited period only..."; *See also, Droste v. Bd. of Cnty. Comm'rs of the Cnty of Pitkin,* 159 P.3d 601 (Colo. 2007) (court held that county had authority to adopt ordinances, confirmed through public hearings, imposing a temporary moratorium on land use application reviews that lasted approximately 10 months, while it prepared its master plan); Idaho, Idaho Code § 67-6524 "If a governing board finds that a plan, a plan component, or an amendment to a plan is being prepared for its jurisdiction, it may adopt interim ordinances as required or authorized under this chapter..." An interim ordinance or moratorium may also be adopted after a finding of "imminent peril to the public health, safety, or welfare."; Montana, Mont Code § 76-2-306 " city or town council or other legislative body of the municipality, to protect the public safety, health, and welfare and without following the procedures otherwise required prior to the adoption of a zoning ordinance, may adopt as an urgency measure an interim zoning ordinance...", Montana, Mont Code § 76-2-206 "The board of county commissioners may establish an interim zoning district or interim regulation to address an emergency that involves the public health, safety, morals, or general welfare ..."; Nevada does not have an enabling statute *per se*, however, case law dictates that local moratoria are valid as long as the owner has constructive knowledge of the zoning plan. *Williams v. Griffin*, 542 P.2d 732 (Nev. 1975); New Mexico, N.M. Stat § 5-8-42 "A moratorium shall not be placed on new development for the sole purpose of awaiting the completion of all or any part of the process necessary to develop, adopt or update impact fees." *See also, Santa Fe Trail Ranch II, Inc. v. Bd. of Cnty. Comm'rs*, 961 P.2d 785 (N.M. Ct. App. 1998) (upholding one year moratorium on subdivisions); Utah, Utah Code § 10-9a-504 "municipal legislative body may, without prior consideration of or recommendation from the planning commission, enact an ordinance establishing a temporary land use regulation for any part or all of the area within the municipality..."; Wyoming does not have an enabling statute *per se*, however, case law dictates that moratoria are a proper exercise of police power. *Sun Ridge Dev. v. Cheyenne*, 787 P.2d 583 (Wyo. 1990) (holding that a building moratorium was valid when its purpose was to protect the general welfare of those affected by inadequate drainage for a new development). *See also, Schoeller v. Bd. of Cnty. Comm'rs*, 568 P.2d 869 (Wyo. 1977) (supporting a temporary land use freeze by the local zoning board, stating that the County was authorized under state law to regulate and restrict the use of buildings and land and this necessarily implies the authority to adopt regulations that would freeze such buildings and land uses).

604 Explicitly allowed by statute in several Interior West states, including Idaho, Idaho Code § 67-6524; Montana, Mont Code § 76-2-306; and Utah, Utah Code § 10-9a-504.

permits until the water-supply issue was resolved. In the fall of 2002, the city adopted a water allocation ordinance and in 2003 began to issue water allocations. Under the Water Allocation Ordinance, any project that required water and/or additional water from the City had to secure a water allocation and sign a Water Service Contract with the City before applying for a building permit. [605]

While most local governments enact moratoria as a reaction to an acute problem being faced, communities may also consider proactively planning and regulating for moratoria as a part of planning and regulating for future water shortages. Such an approach could include a code amendment detailing the circumstances under which a moratorium will be implemented and the specifics of what the moratorium would entail.

Developing these local procedures and standards for moratoria would allow a local government to quickly respond when a water crisis arises and to do so in a way that is predictable for the development community, reducing the risk of significant pushback and increasing the legitimacy of the action if challenged. Similarly, putting the moratorium standards in the context of other proactive solutions to a water quantity issue (such as restrictions on wasting water, when lawns can be watered, serving water in restaurants, and other water conservation measures) and tying the imposition of any moratorium to constant monitoring and evaluation of water availability will further bolster the legal rationale behind permitting moratoria. This will show that the local government has thought carefully about how to address the water problem before and while enacting a moratorium.

Through such a proactive approach, both land use planners and water planners can be engaged in the process to determine what is feasible from a monitoring and reporting standpoint and to create an open system of communication so the building and planning departments can predict more accurately how water levels will affect development.

EXAMPLE OF WATER-SPECIFIC MORATORIUM STANDARDS

Sierra Madre, California

In 2008, Governor Schwarzenegger declared his plan for the State to achieve a 20% reduction in per capita water use by 2020.[606] In 2009, the California legislature amended the State's Water Code to include a section on Sustainable Water Use and Demand Reduction, which incorporates into law this "20x2020" goal and declares, among other things, the importance of protecting water against waste and unreasonable use; the importance of efficient water-resource management due to a need to balance a growing population, climate change, economic growth, and habitat protection; and the benefits of reduced water use through conservation.[607]

605 *Water and Sewer Allocation and Impact Fee,* City of Frederick, MD, https://www.cityoffrederick.com/652/Water-and-Sewer-Allocation-and-Impact-Fe (last visited Oct. 18, 2017). City of Frederick, MD, Code of ordinance §25-56–75, https://library.municode.com/md/frederick/codes/code_of_ordinances?nodeId=PTIITHCO_CH25WA_ARTIXWASEALIMFE.

606 20x2020 Agency Team on Water Conservation, California Environmental Protection Agency, State Water Resources Control Board, https://www.waterboards.ca.gov/water_issues/hot_topics/20x2020/ (last visited Oct. 22, 2017).

607 Cal. Water Code, § 10608 (2010), https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=WAT&division=6.&title=&part=2.55.&chapter=1.&article=.

In 2012, the City of Sierra Madre adopted a Mandatory Water Conservation Plan ordinance into its City Code[608] with the purpose of furthering this State goal, minimizing the effects of water shortages in the City, and significantly reducing the delivery and consumption of water. The code amendment created four water conservation phases, each of which, when declared by the City Council (based upon continued water department evaluations), brings with it differing conservation standards, prohibitions, penalties, and exceptions. Standards include restrictions on wasting water; the purpose for which water may be used (such as restrictions on decorative fountains, washing driveways or walkways); when lawns can be watered; serving of water in restaurants; and automatic shutoff valves for hoses. As part of the water conservation phases, the City's Water Department will evaluate and monitor the projected availability, supply, and demand for water and will recommend to the City Manager the extent of the conservation phases required. This allows the Water Department to plan for and deliver water to customers continuously. Notably, water customers using less than 1,200 cubic feet of water per billing cycle are exempted from the implementation of water conservation phases. Among other things, the code provides that the City Council may adopt a moratorium upon the declaration of a Phase III or Phase IV water conservation period.[609] Under the moratorium, no new potable water service or new temporary or permanent meters may be provided and no statements of immediate ability to serve or provide potable water service (such as "will-serve" letters) may be issued except when (1) a valid, unexpired building permit has already been issued for the project or (2) the project is necessary to protect the public's health, safety, and welfare. Annexation to the City's water service area will also be suspended and other water uses may be prohibited, as determined by the water superintendent.

In May 2013, the City implemented mandatory water conservation measures but found itself still forced to import water in October of that year. Seeing that additional action must be considered, the City Council unanimously decided to place Sierra Madre in a Phase III mandatory conservation period, which, among other things, prohibits the use of water delivered from the water department for any purpose in an amount in excess of 70% of the base period allocation.[610] As permitted under the City's Mandatory Water Conservation Plan ordinance, the City Council adopted an Interim Moratorium Ordinance on July 8, 2014,[611] imposing a moratorium on new water service connections to the City's water system. The moratorium prevented the issuance of all building permits and any discretionary approvals for construction of new development requiring new water service connections.

When adopting a moratorium aimed at addressing a water shortage, the water and land use nexus is an important consideration. Local governments may provide exemptions for projects with reduced impact on water supply. For example, a community might implement a moratorium that temporarily prohibits new development or expansion of existing connections while still allowing new construction that provides water demand offsets at a specified ratio. A ratio of 1:1 would require a project to offset

608 City of Sierra Madre, CA, Municipal Code, § 13.24, Mandatory Water Conservation Plan, https://library.municode.com/ca/sierra_madre/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.24MAWACOPL.

609 City Of Sierra Madre, CA, Municipal Code, § 13-24-220, Moratorium- Phases III & IV Conservation Periods, https://www.municode.com/library/ca/sierra_madre/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.24MAWACOPL_13.24.210IMREPH.

610 City of Sierra Madre, CA, Municipal Code, § 13.24.100, Mandatory Water Conservation Plan, https://library.municode.com/ca/sierra_madre/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.24MAWACOPL; City Of Sierra Madre, CA, Questions and Answers Regarding Sierra Madre's Moratorium on Water Service Connections (July 21, 2014), http://cityofsierramadre.hosted.civiclive.com/common/pages/DisplayFile.aspx?itemId=265049.

611 City Of Sierra Madre, CA, Ordinance No. 1357U, 16 (July 8, 2014), http://cityofsierramadre.hosted.civiclive.com/common/pages/DisplayFile.aspx?itemId=265049.

100% of its projected demand, while a 2:1 ratio would require a 200% demand offset. The local policy could require that a development's projected water consumption first be reduced by onsite efficiency requirements or the provision of new water supplies (including onsite recycled water use), and then require that the remaining demand be offset by off-site efficiency measures or other water-use reductions, such as allowing agricultural land to go fallow. Some communities also permit a fee-in-lieu option.[612]

EXAMPLE OF WATER EFFICIENT DEVELOPMENT PERMITTED WITHIN MORATORIUM

Santa Barbara, California

In 1982, Santa Barbara amended its City Charter to mandate resource balance in the City's development policies.[613] In 1988, motivated by several years of a significant drought emergency combined with continued population growth,[614] the City implemented a development moratorium. In 1991, the City amended this moratorium to permit new construction that provided water offsets at a ratio of 2:1 for residential development (requiring 200% of the projected demand to be offset) and 3:1 for commercial (requiring 300% of the projected demand to be offset).[615]

A moratorium can be seen as an extreme land use action because of its complete suspension of development rights, so it is important for the locality to precede the adoption of a moratorium by documenting findings that confirm the necessity of the action. Findings should address questions such as:

- What are the conditions that mandate the imposition of a moratorium?
- Are there no available alternatives less burdensome on property rights?
- Why are the existing land use plans and ordinances not adequate?
- What recent circumstances have occurred that justify the adoption of the moratorium?
- How serious and urgent are these circumstances?
- What hard evidence is there to document the necessity of the moratorium?

When adopting the moratorium, the local government may set forth how the water shortage that gave rise to the moratorium is to be dealt with. For example:

- What local bodies are responsible?
- What studies are to be done?
- What resources are being made available to complete those studies?
- Can deadlines be established for various steps in the process?

The more specific and legitimate a plan and timetable are, the more likely it is that the moratorium will be found reasonable if challenged. Local governments should adopt moratoria in conformance with all procedures required of any zoning or land use action, including notice, hearing, the formalities of adoption, and filing. Equally important is that the local government is moving forward reasonably to find

612 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A Literature Review & Case Study Compilation 2 (2015), http://www.allianceforwaterefficiency.org/net-blue.aspx.

613 Michael A. Pagano & Ann O'M. Bowman, Cityscapes and Capital: The Politics of Urban Development 61 (1995), https://books.google.com/books?id=liNknxMGRPgC&pg=PA61&lpg=PA61&dq=1988+santa+barbara+moratorium&source=bl&ots=gV01fi9gT-&sig=OURbwCyFpDxh0tfOvZ3WFY6LsXM&hl=en&sa=X&ved=0ahUKEwj6k6qEv_zWAhUB2iYKHYw8Bpo4ChDoAQgvMAI#v=onepage&q=1988%20santa%20barbara%20moratorium&f=false.

614 Robert Reinhold, *Water and Growth: Some Californians Want Less*, NY Times (May 25, 1991), http://www.nytimes.com/1991/05/25/us/water-and-growth-some-californians-want-less.html?pagewanted=all.

615 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A Literature Review & Case Study Compilation 14 (2015), http://www.allianceforwaterefficiency.org/net-blue.aspx.

a solution to the issue that gave rise to the moratorium. The absence of actions toward a solution suggests that the threat to public health, safety, or welfare was not serious, which undermines the legal rationale behind permitting moratoria. A city or county that enacts a moratorium and then does not move forward to find a solution to the problem may face a challenge that the moratorium was not really enacted to solve a pressing public issue and is merely a stalling tactic to delay unpopular types of development.

13. Development Agreements

In most states, developers do not enjoy vested rights to the uses, development intensities, and development quality standards in zoning and other land use regulations until their proposed development has been fully approved with some level of specificity and, in some cases, until the developers have substantially invested in the approved projects. Simply knowing that the rules can change during the planning process or even after approvals until construction is underway, particularly with larger projects, can be a serious disincentive to developers. Development agreements — contracts between local jurisdictions and developers of a particular property — can allow the developer and local government to establish the terms and conditions that will govern property development (or redevelopment, as the case may be) even where vested rights would not otherwise apply. When communities are authorized by state law to do so and when they are so inclined, a proposed development can become the subject of a development agreement under which the local government agrees not to change the rules and standards applicable at the time the agreement is entered into.

a. Require Water Efficiency Measures

Local governments may enter into development agreements in order to give more certainty to the development process and ensure that the public interest in matters such as water conservation, building and site design, and infrastructure is accommodated. Such agreements may require the developer to provide public amenities and may contain conditions mitigating the impact of the development on the community, such as water demand offset measures (e.g., on- and off-site efficiency measures and onsite water capture and reuse). The benefit to the developer is that, after a development agreement is signed, the risks surrounding investment in the project are substantially lowered.

In some states, the law permits localities to enter into development agreements that may not be abridged by subsequent changes in land use rules. In other states, that power does not exist, but the development agreement may provide that the developer is to be compensated by the local government for costs incurred in reliance on the agreement if the city or county does change the standards in the future. In Colorado, for example, the validity of a development agreement limiting the local government's power to rezone a property for over 20 years was upheld,[616] although this time period is much longer than those upheld in many other jurisdictions.

To aid in protecting water supply, localities can create development agreements that incorporate provisions guaranteeing maximum water conservation including, for example, water efficient interior facilities, water conserving landscaping, and onsite recycled water use. (For a discussion and examples of development agreements negotiated in the context of a rezoning, see Section 7(d) of Chapter 7, *The Zoning Code*.)

616 Geralnes B.V. v. City of Greenwood Village, 583 F. Supp. 830 (D. Colo. 1984).

EXAMPLES OF DEVELOPMENT AGREEMENTS WITH WATER CONSERVATION ELEMENTS

Belmar, New Jersey[617]

Belmar's goals in creating its Sustainability Program Checklist for the Belmar Seaport Village redevelopment area are to encourage developers to design and build to higher levels of performance than the minimums set within the redevelopment area, helping Belmar achieve its mission of a more livable, affordable, and inclusive community.[618] The checklist presents a prioritized version of the issues that are most important to the Town and to the success of the district's master plan. Terms sufficient to carry out the purpose and intent of the sustainability elements (i.e., the Checklist) of the Redevelopment Plan must be incorporated in the redevelopment agreement with each developer in the Seaport Village Redevelopment Area.

The Sustainability Program Checklist[619] has eight categories containing a mix of required and optional features, several of which relate to reducing water consumption within the district. Among these, Belmar *requires* that building equipment and fixtures must meet or exceed minimum water efficiency standards, exclusive of irrigation; irrigation systems must reduce the demand for potable water by 50% over standard regional practices; and landscape designs must incorporate drought-tolerant vegetation.

Similarly, the *optional* credits for which points are given include, but are not limited to, the following:

- Employ strategies that use less water than the water-use baseline calculated for the building after meeting the requirements of the Energy Policy Act of 1992
- Use only captured rainwater, recycled wastewater, or recycled greywater for irrigation or install landscaping that does not require permanent irrigation systems
- For common and public areas, design and construct greywater and/or stormwater systems to capture and reuse at least 50% of greywater and stormwater

Danville, California

Alamo Creek, a development project in Danville, California, was located in an unincorporated part of Contra Costa County near the East Bay Municipal Utility District (EBMUD). Because of its location, no entity was required to supply water for the development project. EBMUD was the closest water provider but would only agree to provide water to the development if the developer agreed to stringent water conservation requirements. The Alamo Creek development was designed to include 1,060 single-family homes, 340 townhomes, senior rental homes, a community center and pool, nine neighborhood parks, an elementary school, a 10-acre soccer complex, a fire station, and over 300 additional acres of open space. In the development agreement, EBMUD required zero-net impact with a 2:1 offset (two gallons saved for each gallon used).

617 Borough of Belmar, Seaport Development Program, Redevelopment Plan Update, http://www.belmar.com/forms/municipal/Seaport%20Redevelopment%20Plan%20-%20Amended%203-7-12%20per%20ORD%202012-02.pdf.

618 Belmar Seaport Village, Sustainability Program Checklist, http://sj-site-legacy-editor-doc.s3.amazonaws.com/p5!495.pdf.

619 Belmar Seaport Village, Sustainability Program Checklist, http://sj-site-legacy-editor-doc.s3.amazonaws.com/p5!495.pdf.

Alamo Creek complied with the offset requirements in a number of interesting ways, including the following adaptations:

- The planned onsite conservation for both residential and nonresidential applications included high-efficiency appliances (including toilets, urinals, showerheads, kitchen faucets, washing machines, and dishwashers), low-water using landscapes, artificial turf soccer field, and irrigation controllers.[620]
- The developer was required to pay $6,000 per new home (totaling $8 million), which was used to sponsor conservation projects within the existing EBMUD service area.
- The developer also prepared a set of covenants, conditions, and restrictions (CCRs) to ensure that the onsite conservation would be permanent. The CCRs indicate that each water meter has a water budget based on the type of connection, building size, and lot size.[621] If the water budget for the entire development exceeds 0.45 million gallons a day (mgd) by 20% in a given year, the HOA will receive a penalty water bill and will be given access to readings of all individual meters. The HOA can then pay the penalty collectively or allocate it to the over-budget accounts. As homes in Alamo Creek have sold, the new owners have continued to follow the water-saving requirements. [622]

As part of the project's Conceptual Mitigation and Monitoring Plan (which was created to mitigate permanent infill of .9 acres of seasonal wetlands, seeps, and creeks), Alamo Creek agreed to the following actions, among other things:

- Create a total of 1.3 acres of freshwater seasonal wetlands and seeps and 0.19 acres of new seasonal tributary creek and engage in enhancement and restoration work over 0.59 acres of a seasonal creek.[623]
- Restoration and enhancement activities, including three freshwater ponds and dedication of 269 acres to open space.[624]

Although this example reflects an agreement between a developer and a water provider, the same type of requirements could be contained in a development agreement with a local or county government.

620 EBMUD Water Conservation Master Plan, § 31, 31A-B (2011), https://www.ebmud.com/index.php/download_file/force/1465/1225/?EBMUD_WCMP202011.pdf. Specific requirements included: total turf area must be less than 25% of irrigated areas; non-turf areas must be 80% native or low-water use plants; toilets must use no more than 1.28 gallons per flush; urinals must be used no more than 0.5 gallons per flush; showerheads must have a flow rate of 2.5 gallons per minute (gpm) or less; and kitchen faucets must have a flow rate of 2.2 gpm or less.

621 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A literature Review & Case Study Compilation, 21 (Jan. 2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

622 Margaret Buranen, *Contract for Conservation*, Water Efficiency (April 30 2009), http://www.waterefficiency.net/WE/Articles/Contract_for_Conservation_6912.aspx.

623 State of California, Regional Water Quality Control Board, Report Shapell Industries of Northern California & Ponderosa Homes, Alamo Creek Project, Unincorporated Contra Costa County – Issuance of Waste Discharge Requirements and Water Quality Certification (May 19, 2004), http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2004/may/5L_ssr.pdf. (*These actions were done in accordance with the Conceptual Mitigation and Monitoring Plan, Alamo Creek Project, Danville, California, Corps File No. 24832S 4/3/03. This Plan was created to mitigate the permanent fill of .9 acres of seasonal wetlands, seeps, and creeks.*).

624 State of California, Regional Water Quality Control Board, Report Shapell Industries of Northern California & Ponderosa Homes, Alamo Creek Project, Unincorporated Contra Costa County – Issuance of Waste Discharge Requirements and Water Quality Certification (May 19, 2004), http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2004/may/5L_ssr.pdf.

b. Offer Fees-In-Lieu

In lieu of or in addition to developer-implemented efficiency measures, development agreements can contain provisions for fees or other contributions to be used by the community to achieve water conservation goals and mitigate the development's impact. Such fees could be included as contributions of a specified amount of money, or the fee provisions could be triggered when the development exceeds a specified water-use threshold. Where such fees exist, the local government assumes responsibility for ensuring that water conservation measures are implemented, for example, using those fees to fund rebates or other programs that incentivize water efficiency retrofits in existing development.[625] Many states have legislation requiring that fees-in-lieu of any local government regulation be spent to achieve the same goal as the regulation (and prohibiting their contribution to the local general fund).

EXAMPLES OF DEVELOPMENT AGREEMENTS WITH FEES TO SUPPORT MUNICIPAL WATER EFFORTS

Santa Monica, California

As of October 2015, Santa Monica's City Council adopted a development agreement for a new 6-story, 52,545 square foot mixed-use project consisting of 64 residential units and 6,345 square feet of ground floor commercial space.[626] The development agreement — required for the project because it exceeds 32 feet in height and is located in the downtown area[627] — included several water conservation measures, including that the development must ensure that any irrigation system installed is as efficient as drip irrigation. The development agreement recommends that the building achieve LEED (version 2009) certification at the Platinum level. In order to accomplish this certification, the developer committed to design the building to, among other things, achieve 50% below the CALGreen (Title 24) baseline for exterior water use and landscaping and 30% below CALGreen baseline for interior building water use supplemented, with specific performance standards for fixtures such as clothes washers, faucets, and toilets. The agreement also included a $300,000 contribution from the developer (paid prior to the issuance of the project's building permit) to be used for water conservation programs throughout the City. The amount was negotiated after an extensive discussion regarding the possibility of using greywater for toilet flushing in the project. Such use was newly authorized by the county health department but, because Santa Monica had not yet developed a regulatory framework that would allow for appropriate oversight for greywater system testing, City staff ultimately decided that a contribution commensurate with the cost of installing a greywater system would be more effective in facilitating the use of greywater in the City, such as by using it to fund the study of greywater system feasibility or for potential grants aimed at partners interested in pilot projects for greywater systems.

625 For a deeper discussion on water offset policies, including fees-in-lieu, see the Alliance for Water Efficiency's (AWE) report cited here, which discusses, among other things, appropriate offset ratios, legal considerations, and the like. It should be noted that the examples contained in the AWE report are specific to locally adopted policies, not development agreements. Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A literature Review & Case Study Compilation (Jan. 2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

626 *City Council Minutes* 10/13/2015, City of Santa Monica, C.A., http://santamonicacityca.iqm2.com/Citizens/FileOpen.aspx?Type=15&ID=1033.

627 *City Council Report* 10/13/2015, City of Santa Monica, C.A., http://santamonicacityca.iqm2.com/Citizens/FileOpen.aspx?Type=30&ID=3749.

Castle Rock, Colorado

The Lanterns development in Castle Rock is an approved development project including single-family and multifamily residential units and some commercial space. In 2002, an initial development agreement was entered into that included the creation of a Water Bank — an account administratively maintained by the Town to be periodically credited or debited — starting with 979 single-family equivalent (SFE) credits (i.e., the average annual wholesale water production that must be developed to meet the imputed demand from a single-family residence under the Town Regulations). If the Water Bank is exhausted prior to full development of the property, the owner is required, under the development agreement, to provide additional water resources or pay a "cash-in-lieu of water rights" fee to the Town. If the owner fails to provide these additional water resources, the Town is not obligated to provide any further development approvals for the project. The development agreement was amended in 2014, but the Water Bank and the requirement to provide additional water rights or cash-in-lieu were carried forward to the amended version.[628] Under Castle Rock's municipal code, the Town has established, within its water fund, a separate account for the funds received in lieu of groundwater rights dedication, which the Town may use "to lease, purchase, or otherwise obtain the beneficial use of groundwater rights, or to invest in water development projects that are intended to extend the useful life of Town groundwater resources."[629]

c. Include Continuation, Expansion, and Enforcement Provisions

Local and county governments can bolster the water conservation requirements within development agreements in a number of ways. One is to stipulate that the agreement's water conservation measures must be incorporated into any conveyance documents, private covenants, and restrictions. Similarly, development agreements can give the community the option to strengthen water standards by specifying that, in the event that more restrictive water conservation measures than those contained within the agreement are adopted into local regulations, the more restrictive provisions will govern. Finally, development agreements can contain compliance verification and enforcement requirements, such as affirmations made by builders, landscape specialists, and water specialists, or additional compliance inspections performed by trained local staff.

EXAMPLE OF A DEVELOPMENT AGREEMENT BOLSTERED BY CONTINUATION, EXPANSION, AND ENFORCEMENT PROVISIONS

Castle Rock, Colorado

The Lanterns development in Castle Rock, Colorado, is an approved development project of residential units, both single-family and multifamily, as well as some commercial space. In 2002, an initial development agreement was created, which was then amended in 2014.

628 The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

629 Town of Castle Rock, CO, Municipal Code § 4.04.090, *Cash in Lieu of Groundwater Fund* (2006), https://www.municode.com/library/co/castle_rock/codes/municipal_code?nodeId=TIT4WARE_CH4.04WADECO_4.04.090CALIGRFU.

The 2014 amended development agreement requires the implementation of a Water Efficiency Plan with the intent to manage water demand and extend the Town's water supplies through aggressive water conservation design guidelines for the development.[630] The Water Efficiency Plan includes a comprehensive set of mandatory indoor and outdoor standards (which comply with minimum standards established by the Town) intended to ensure that residential units are constructed to achieve lower water demands.[631] Through the use of high-efficiency indoor fixtures and compliance with landscape and irrigation design requirements, this Plan is expected to significantly reduce water demands relative to the Town's standards for single-family residences. The development agreement states that, in the event that more restrictive water-use conservation measures (than those contained in the Plan) are subsequently adopted by Town regulations, the more restrictive provisions will govern. The development agreement also requires that the Plan be incorporated into all conveyance documents for the property and private covenants and restrictions and contains compliance checklists and verification requirements for the Water Efficiency Plan. Each homebuilder, landscape architect, and irrigation consultant must certify that the homes are being constructed in compliance with the standards of the Plan.

Prior to the issuance of a Certificate of Occupancy, all homes must be inspected and certified by a third-party contractor for compliance with the plan, with costs paid by the developer. The Plan contains minimum standards for the inspection, requires that the inspection and certification process be developed in cooperation with Town staff, and states that inspectors will be specifically trained to assess compliance with The Lanterns' Water Efficiency Plan.

To assist with implementation of the Plan, all residential customers in The Lanterns development must have customized water budgets that provide for a sufficient water supply, coupled with a tiered billing rate structure.[632] This structure sets different billing rates by use: indoor use (Tier 1), outdoor use (Tier 2) — customized according to lot size and specific landscape and irrigation plan — and excessive use (Tier 3) — a higher rate for when residents exceed their indoor/outdoor water budgets. The custom water budget and rate structure is a tool for monitoring compliance with the Plan's efficiency standard and reduced water demands. This tiered billing approach will financially incentivize customers to manage water use within the unit's water budget. Under the development agreement, the Town reserves the right to adjust this water budget rate structure and its allocations based on changes to the municipal code and new technology and scientific data. The Town's surcharge tier may also be adjusted consistent with the intent of this reduced water usage development.

An ongoing component of the Water Efficiency Plan is creation and distribution of educational materials and training for residents. Information will address the water budget rate structure, water conservation measures, soil preparation, plant materials, smart irrigation controllers, and high-efficiency sprinkler heads, among other things.

630 The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

631 Town of Castle Rock, CO, Municipal Code § 4.04.030, *Definitions, Water Efficiency Plan* (2006), https://www.municode.com/library/co/castle_rock/codes/municipal_code?nodeId=TIT4WARE_CH4.04WADECO_4.04.030DE.

632 Town of Castle Rock, CO, Discussion: the Lanterns Amended & Restated Development Agreement (May 20, 2014), http://www.crgov.com/DocumentCenter/View/8440.

d. Use Water Conservation as a Threshold for Incentives

Local and county governments can also use development agreements to condition financial incentives (such as reduced taxes) on water conservation measures. Water-related standards may be used as a threshold qualifier for landowners to enter into a development agreement with the community.

EXAMPLE OF A DEVELOPMENT AGREEMENT OFFERING FINANCIAL INCENTIVES CONDITIONED UPON WATER-RELATED STANDARDS

Eloy, Arizona

Through its Retail Development and Economic Development Tax Incentive program, the City of Eloy is authorized to enter into development agreements with private developers of projects meeting certain conditions. Once those conditions are met, the developer can enter into a development agreement with the City in exchange for a reduced tax rate on certain privilege taxes.[633] One of the conditions that must be met for the developer to qualify for the development agreement is that the proposed project must not require the use of City water or sewer infrastructure to serve the development.[634]

This example is offered because, similarly, communities might establish a water- conservation threshold for entering into development agreements. For example, a threshold condition for a developer to qualify for a development agreement could be a showing that the projected water demand for the proposed project will be half of the amount projected under a local water provider's water conservation plan for per household use. It is important to note that the legality of any such financial incentive program that, like Eloy's, relates to taxes will be dependent upon the local government's authority under state tax law.

e. Offer Additional Incentives

Further, local government can offer other incentives, such as additional density, within development agreements. They might also consider using third-party water conservation standards (reducing the burden of local verification and enforcement), coupled with these additional incentives.

633 Such as engaging in business as a "construction contractor" or "speculative builder". City of Eloy, AZ., Tax Code §§ 16-415 and 16-416 (2011), http://eloyaz.gov/DocumentCenter/Home/View/618*. A privilege tax is a tax levied in exchange for a privilege or license granted to the taxpayer. For example, the State of Alabama levies an annual Business Privilege Tax on corporations and limited liability entities for the privilege of conducting business in the State. See Alabama Dep't of Rev., Business Privilege Tax Incentives* http://revenue.alabama.gov/taxincentives/buspriv.cfm *(last visited Feb 4, 2016).*

634 City of Eloy, AZ., City Code § 16B-1 (2006), http://sterlingcodifiers.com/codebook/index.php?book_id=674&chapter_id=49515#s454418.

EXAMPLE OF A DEVELOPMENT AGREEMENT OFFERING INCENTIVES FOR COMPLIANCE WITH THIRD-PARTY STANDARDS

Cranford, New Jersey[635]

Cranford's sustainable building standards ordinance applies green building measures to encourage the conservation of water and other resources. To accomplish this and other goals, the ordinance adopts the use of LEED for municipally funded facilities — whether they are existing buildings, new buildings, or major renovations, and it encourages potential developers seeking redeveloper status through a Redevelopment Agreement to also use the LEED rating systems. To encourage formal LEED certification, the ordinance does the following:

- Establishes a Green Building Density Incentive Program that allows redevelopers to request the density incentive if the project is located in a statutorily created redevelopment area and anticipates LEED Certification at any level (Certified, Silver, Gold, or Platinum). The scale of the incentive varies based upon the project and the level of LEED certification sought.
- Requires that this program be incorporated in the Redevelopment Agreement, and that the redeveloper include a LEED Accredited Professional (LEED AP) on the project team.

Water conservation elements contained in Version 3 of the LEED rating system include the use of water efficient landscaping, installation of innovative wastewater technologies, and employing strategies that, in the aggregate, reduce water use by a minimum of 20% from a building's calculated baseline (not including irrigation).

f. Consider Related Issues

Some attorneys, planners, and policy-makers object to the type of intense negotiation regarding each affected parcel of land involved in a development agreement, preferring instead the predictability and transparency of zoning based on objective standards and incentives without the need for individualized negotiation. Increasingly, local governments are finding that traditional zoning with its fixed uses is not flexible enough to meet the rapidly changing environment in which land use planning and zoning operates. To accommodate changing markets, demographics, and environmental influences, more flexibility is needed, particularly in rapidly developing communities. One solution is development agreements that provide for ample participation of affected individuals and interest groups in negotiations — an approach that can provide the desired transparency while serving the interests of all affected groups. The process of negotiating a development agreement offers an opportunity for citizen involvement, particularly for nearby stakeholders. Knowing that zoning and other land use provisions will not be changed can be extraordinarily valuable for the developer. This value can be captured in a negotiated development agreement to accommodate the needs of the community, neighbors, and other affected stakeholders by providing water conserving features, amenities, and services that meet their interests. Where a negotiated process would be overly time-consuming and difficult to measure, monitor, amend, and enforce over time, an alternate solution is to replace the rigidity of traditional Euclidian zoning with flexible, mixed-use, menu-based zoning

635 Township of Cranford, NJ, Code § 106 (2005), https://www.ecode360.com/11248541.

that incorporates both objective requirements and incentives.

In requiring developers to comply with water conserving standards, local governments and their planners must be careful to comply with the standards set in a number of U.S. Supreme Court cases, notably *Nollan*[636], *Dolan*[637], and *Koontz*.[638] The takeaway lesson from these cases is that it is essential that conditions imposed on new developments be fair and proportionate to the adverse impact a development will have on the community, such as using excessive amounts of water on a per-unit basis. The requirements discussed in this Guidebook, such as water conserving interior fixtures and landscaping practices, are fair and bear a close relationship to the impact of new developments on limited water supplies. This is a sufficient defense to a lawsuit brought under these cases that challenges a permit denial, a monetary exaction, or an onsite development requirement aimed at water conservation.[639] All three of these cases illustrate, however, that negotiated, uniquely tailored requirements and exactions from developers will be scrutinized more closely than objective, formula-based, or menu-based systems applicable to a broad class of developers.

636 Nollan v. California Coastal Commission, 483 U.S. 825 (1987).

637 Dolan v. City of Tigard, 512 U.S. 374 (1994).

638 Koontz v. St. Johns River Water Management District, 133 S.Ct. 2586 (2013).

639 For more information, see Sean F. Nolon *Bargaining for Development Post-Koontz: How the Supreme Court Invaded Local Government*, 67 Fla. L. Rev. 171 (2015).

14. Non-Zoning Incentives

Local and county governments can develop programs that encourage property owners to construct new development to water conserving standards or to undergo substantial property changes to reduce water use. Although bonus density zoning, discussed in Chapter 7, *The Zoning Code*, is the most popular incentive, communities have a broad range of strategies for incentivizing and championing water conservation through the built environment. This Chapter lays out some of the most successful non-zoning incentive options. These options generally fall into three categories, and are grouped accordingly in the Chapter:

1. Financial incentives (such as fee rebates, reductions, or waivers; grants; loans; and tax credits, abatements, or exemptions)
2. Process incentives (such as an expedited review/streamlined permitting process, guaranteed timelines, and priority inspections)
3. Assistance, education, and marketing incentives (such as workshops, educational programs, and communication networks; monitoring and direct assistance; information dissemination; award programs; and marketing assistance)

When creating an incentive program, communities can take advantage of synergies. The most successful incentive programs are those that combine options to achieve maximum impact.

Many communities focused on water conservation turn to offering incentives for projects that meet third-party green development certifications that contain water efficiency requirements as well as locational and other requirements that increase water conservation by calling for compact and/or infill development, which generally requires less water per household and experiences less water loss. (For a discussion of how such development decreases water demand, see Chapter 2, Water Issues in the Interior West: A Call to Action). These green development programs can be referenced outright, or selected elements can be adopted as local standards. Frequently cited third-party programs include, but are not limited to, the following programs:

- The Leadership in Energy and Environmental Design (LEED) green building rating systems
- The Living Building Challenge
- The Sustainable Sites Initiative (SITES)
- The STAR Communities rating system
- WaterSense New Homes Certification
- Better Buildings Challenge
- Green Globes
- Build It Green/Green Point Rated
- Enterprise Green Communities

These rating systems include credits for an array of project elements that increase water conservation, including elements such as:

- Development density and community connectivity
- Infill development/use of a previously developed site
- Compact development
- Use of existing infrastructure
- High-efficiency indoor plumbing fixtures and fittings
- Reduction of water use by a minimum of 20% below baseline water consumption profile for interior non-process water uses

- Increased efficiency in hot-water distribution
- WaterSense volume limit for hot-water distribution
- Resource-efficient landscapes (including drought-tolerant species)
- Minimized turf
- Hydrozoning
- Minimized building footprints and other impervious areas/increased onsite infiltration
- Green infrastructure stormwater control measures (such as permeable paving material and bio-retention features)
- Preservation and/or restoration of natural drainage systems
- Directing impermeable surfaces to infiltration features
- Rainwater harvesting
- Greywater reuse systems
- Recycled wastewater irrigation system
- Use of municipal recycled water system
- Submeter or dedicated meter for landscape irrigation
- A landscape that meets the water budget
- Use of high-efficiency irrigation system (such as that designed by a WaterSense certified professional that includes submetering, drip irrigation, automatic timers/shutoff, moisture sensor)
- A reduction in overall estimated irrigation demand by 20%–45%

a. Offer Financial Incentives for Water Conserving Development

Local and county governments can offer many different types of financial incentives to encourage the private development of water conserving, environmentally friendly projects such as rebates, reductions, or waivers of government fees or of those charged by a third-party verifier; grants and loans; and tax abatements, property or sales tax exemptions, and property tax credits.

i. Create Fee Rebates, Reductions, and Waivers

Where incentive programs are concerned, communities may have the most flexibility in controlling development and water conservation through fee rebates, fee reductions, and waivers, in addition to grants and loans, discussed later in this Chapter.

Local and county governments may charge fees for permit review or other permitting processes and offer reductions or waivers of these fees for developers or owners who implement water conservation and efficiency measures. Communities can also pair these monetary incentives with procedural incentives, such as expedited permitting, to build a more robust incentive program.

Government fees for which communities might consider a rebate or waiver program include the following conservation measures:

- Building permit fees
- Plan review or expedited review fees
- Plumbing permit fees
- Impact fees
- Stormwater management fees

Fee rebates and waivers are typically offered, whether in new construction or retrofits to existing

development, for the following measures :

- General measures related to water conservation
- WaterSense-labeled, high-efficiency fixtures such as toilets, clothes washers, showerheads, and faucets
- Installation of greywater systems
- Low- or no-water-use landscaping
- Green roofs with drought-tolerant plants
- High-efficiency irrigation (slow-flow nozzles and conversion of automatic irrigation spray heads to drip irrigation) or capping-off a zone completely
- Installation of rain sensors, soil moisture sensors, and smart controllers (i.e., weather-based irrigation controllers, which use local weather and landscape conditions to tell a sprinkler system when to turn off, tailoring watering schedules to actual site conditions/plant water needs)

Communities may also consider offering rebates for fees charged by third-party certification organizations (such as the U.S. Green Building Council) or outside auditors (such as an irrigation professional certified under a WaterSense labeled program, a Certified Landscape Irrigation Auditor, or a Watershed Wise Landscape Professional), in order to incentivize projects to take advantage of those programs. When offering rebates for certification fees, local and county governments could include in their eligibility requirements that applicants achieve specific water efficiency standards (sometimes called credits or points) from those programs, as well as standards related to compact development — in order to emphasize not just landscaping and appliance water efficiency, but also a water conserving growth pattern. Going further, communities might limit their fee rebates and waivers to development within a specified zoning district in order to encourage a water conserving development pattern. (See Chapter 2, *Water Issues in the Interior West: A Call to Action*, for more on the water conservation benefits that can be achieved through land use pattern.)

When offering fee rebates for the installation of high-efficiency products, communities should carefully consider which products[640] and what level of performance qualify. If a community establishes a specific level of product performance (such as x gallons per flush) that they wish to incentivize, they should also establish a process for periodically reevaluating that standard, as performance levels can become obsolete, leaving incentives to reward customers for actions that they would have taken anyway. Referencing a third-party standard, such as WaterSense-labeled high-efficiency products, can help to keep incentive programs functioning as intended. Communities should also consider the amount of the fee they are reimbursing/waiving as compared to the homeowner's or developer's cost of taking the incentivized action and establish incentive amounts that are enough to encourage action. Similarly, when determining the products to incentivize, communities should consider the difficulty in calculating the water-savings benefit. For example, as a 2015 Alliance for Water Efficiency report states, "efficiency incentives for faucets are uncommon throughout the U.S. due to the potentially limited and difficult to calculate water efficiency benefit."[641]

Local and county governments may offer a full or partial rebate/refund or a full or partial waiver. Partial rebates and waivers are often a percentage of fees that is scaled based upon project type or level of performance achieved. For example, a growing number of communities in Colorado charge lower water impact fees (also called water system development charges or tap fees) in proportion to reduced water demands (see Western Resource Advocates' report: *A Guide to Designing Conservation-Oriented Water*

640 For example, according to the Alliance for Water Efficiency, rain sensors have been shown to be less effective than soil moisture sensors and weather-based irrigation controllers for outdoor water savings. Bill Christiansen, Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth 20 (2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

641 Bill Christiansen, Alliance for Water Efficiency Water Offset Policies for Water-Neutral Community Growth 20 (2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

System Development Charges).[642] Communities can also condition rebates upon availability of funding, given on a first-come, first-served basis or as part of a competitive process. Such rebate and waiver programs are typically funded through annual budget allocations, or they can be tied into a related fee. For example, communities could collect fees from new developments to offset estimated water use[643] and then use those fees to fund demand-reduction programs including rebates and waivers. (See Chapter 11, *Supplemental Regulations*, for more on demand offset policies. Also see the Alliance for Water Efficiency's report: *Water Offset Policies for Water-Neutral Community Growth*).[644]

Communities might consider including the following options in a fee rebate and waiver incentive program:

- Conditioning the refund or waiver upon inspection
- Setting a maximum lifetime dollar amount that can be received, with different amounts for small and large property applicants
- Limiting eligibility to projects that are highly visible to the public

EXAMPLES OF FEE REBATES, REDUCTIONS, AND WAIVERS TO INCENTIVIZE WATER CONSERVATION

Southern Nevada Water Authority[645]

The Southern Nevada Water Authority (SNWA) offers the most popular, most well-funded, and most-successful (in terms of turf grass removal) program of its kind in the nation. Its Water Smart Landscapes Rebate (or "cash for grass") program, in operation for over 15 years, has replaced more than 173 million square feet of turf grass (more than 3,000 football fields) with landscaping more appropriate for Nevada's arid climate. SNWA offers its customers a rebate of $3 per square foot of grass removed and replaced with desert landscaping up to the first 10,000 square feet converted per property, per year, and $1.50 per square foot beyond the first 10,000 feet, up to a maximum of $300,000 for any property in a single fiscal year. (These amounts were recently increased from $2 per square foot for the first 5,000 square feet, and $1 thereafter.) According to the program, every square foot of grass replaced with water-smart landscaping saves an average of 55 gallons of water per year. The rebates and tools offered by SNWA give property owners the opportunity to convert to water-friendly landscapes more quickly, efficiently, and cheaply than they would be able to achieve otherwise. The rebate program has helped the community to save billions of gallons of water by converting more than 185 million square feet of lawn.

642 Western Resource Advocates & Raftelis Financial Consultants, A Guide to Designing Conservation-Oriented Water System Development Charges (2018), https://westernresourceadvocates.org/wp-content/uploads/2018/07/WRA_Guide-to-Conservation-Oriented-SDCs_web.pdf.

643 Communities should note that where they accept fees in lieu of demand mitigation measures, the municipal policy should "be clear on whether or not building permit approvals hinge on the expenditure of those fees to implement efficiency measures." Bill Christiansen, Alliance for Water Efficiency Water Offset Policies for Water-Neutral Community Growth 3 (2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

644 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth (Jan. 2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

645 *Water Smart Landscapes Rebate*, Southern Nev. Water Authority., https://www.snwa.com/rebates/wsl/index.html (last visited Jul. 7, 2018).

San Diego County, California[646]

The County of San Diego's Green Building program includes incentives, policies, regulations, and guidelines to promote green building design and construction. Incentives include a 7.5% reduction in plan check and building permit fees and an expedited review process ("reduced plan check turnaround time"). The County offers these incentives to projects implementing building measures related to water conservation, energy conservation, or other natural resource conservation. Qualifying water conservation measures include the installation of greywater systems (using wastewater produced from bathtubs, showers, and washing machines) in new or renovated buildings. In order to conserve water, greywater can be used for landscape irrigation via a subsurface distribution system. The program notes that greywater systems require a permit from the California Department of Environmental Health.

Aurora, Colorado

Aurora offers a tap fee waiver and several rebate programs for expenses related to water efficiency improvements: an ultra-high-efficiency toilet rebate, low-income fixture replacement program, a water-wise landscape rebate, and an irrigation efficiency rebate.[647]

Under the City's ultra-high-efficiency Toilet Rebate program, residential customers can receive from $50 to $150 for replacing a low-efficiency toilet with a WaterSense-labeled toilet that uses 1.1 gallons per flush or less. (The amount received depends upon the efficiency of the toilet being replaced.) Residential rebates are issued on a first-come, first-served basis and are limited to two toilets per household every 10 years. Commercial properties are also eligible for up to $10,000 in rebates but must receive pre-approval from the water department.

Under its Low-Income Program, the City has partnered with an organization to replace old fixtures for free in income-qualified homes and nonprofit buildings. The program offers replacement of up to two toilets, two showerheads, and three faucet aerators with water-saving versions, which will also save money on water utility bills.

Aurora's Water-wise Landscape Rebate program has two tiers: (1) The City offers up to $3,000 in rebates for property owners to convert a turf grass lawn, which needs about 28 inches of supplemental water each year, to low-water-use landscaping, which typically thrives with a third as much water. (2) The City also offers up to $4,500 in rebates for property owners for installation or conversion to "Z-Zone" landscaping, the City's new category of landscaping that is designed to require no supplemental irrigation after the three-year establishment period. The City does not associate a tap fee with these Z-zones since no permanent water source will be needed.[648] The Water-wise Landscape Rebates are based on the actual material costs and are given only for projects in residential front or side yards and for commercial or large property areas that are highly visible to the public. Owners must apply prior to beginning a project in order

646 *Green Building Incentives Program*, County of San Diego Plan. & Dev. Serv., http://www.sandiegocounty.gov/pds/greenbuildings.html (last visited Jul. 17, 2018).

647 *Water Rebates,* City of Aurora, Colo., https://www.auroragov.org/cms/one.aspx?pageId=2036891 (last visited Jul. 7, 2018).

648 *Water Resources Review Committee for the City of Aurora, Colo., Hearing Concerning Measures to Conserve Municipal Water Used for Outdoor Purposes* (Colo. 2014) (statement of Greg Baker, Manager for Public Relations at Aurora Water), https://www.colorado.gov/pacific/sites/default/files/Aurora%20Water%20SB%2014-017%20Testimony.pdf.

to determine eligibility and receive approval. The City also requires all Water-wise Landscape Rebate participants to enroll in its Know Your Flow (KYF) program,[649] under which enrolled water customers receive a detailed monthly email that includes a graph summarizing indoor water use, outdoor water use, and their property's customized recommended water use (RWU). (The RWU is the annual outdoor water needs, as determined by the water department's mapping of a property's landscape and analysis of monthly weather data.) From April to October, customers also receive weekly emails with recommended sprinkler system watering times.

Under its Irrigation Efficiency Assessments/Rebates, the City offers free outdoor water assessments to check irrigation efficiency and rebate qualifications. Rebates are for the installation of rain sensors (up to $50 rebate), residential smart controllers (up to $300), and commercial/multifamily smart controllers (up to $15,000). Smart controller rebates for both residential and commercial projects are broken into three payments: after initial installation, after one full growing season (pending irrigation efficiency of 110% or less of RWU). and after two full growing seasons (pending irrigation efficiency of 110% or less of RWU). All smart controller rebate participants must enroll in the City's KYF program. Irrigation rebates are also available on a first-come, first-served basis for upgrading current irrigation systems to include soil-moisture sensors that must be able to connect to the controller and make scheduled adjustments ($100 each, limit of two per residence); pop-up sprinklers with pressure-regulating systems, check valves, and minimum 4" height ($9 each, limit of 50 per residence); high-efficiency nozzles ($6 each, limit of 50 per residence); spray-to-drip conversions ($75 per zone, limit of three zones per residence); and gear-driven rotor sprinklers with check valves ($12 each, limit of 50 per residence). Properties must receive pre-approval for these irrigation rebates based on an outdoor water assessment and must undergo a post-installation irrigation system inspection. The irrigation rebate program is designed to incentivize owners of existing systems to undertake upgrades meeting the City's Irrigation Ordinance to which any newly installed irrigation system must adhere. Applicants can receive up to $850 in one year with a lifetime limit of $1,000. Large property applicants may receive up to $100 per zone, for up to 50 zones, for a maximum $15,000 rebate.

Aurora holds pre-application meetings with developers, which they use in part to discuss available incentives. The City has and continues to re-tool its incentives based upon feedback from developers during these pre-application meetings.[650]

Austin, Texas

Through its WaterWise Landscape Rebate Program, Austin Water pays residents to swap out grass for more drought-resistant native plants.[651] Under the program, participants convert automatic irrigation spray heads to drip irrigation or they cap-off the zone completely. Participants receive rebate checks within four to six weeks of project completion. The program limits rebates to up to 5,000 square feet per applicant (a maximum rebate of $1,750), but allows for participants

649 *Know Your Flow*, City of Aurora, Colo., https://www.auroragov.org/residents/water/water_conservation/know_your_flow/ (last visited Jul. 7, 2018).

650 Telephone interview with Lyle Whitney, Water Conservation Supervisor, City of Aurora, Colo., and Karen Hancock, Long-Range Planner & Environmental Program Supervisor, City of Aurora, Colo. (Aug. 5, 2016).

651 Telephone interview with Christopher Charles, Conservation Program Associate, Austin Water (October 8, 2013). *See also:* Austin Water, *Rebates, Tools, and Programs*, City of Austin, Tex., http://www.austintexas.gov/department/rebates-tools-and-programs (last visited September 12, 2018).

to enter in multiple acceptance periods if another eligible area of turf grass is converted to a Water Wise landscape.[652] Education has been an important element in maintaining the program. Residents are aware of the frequent droughts and realize that grass requires a lot of water that could be used for other important functions. In Austin, it is common to see water efficient landscapes more frequently than manicured lawns. As a result, the program does not need to provide a large amount of rebate money to create a major incentive, and new residents are likely to follow community norms and maintain these efficient landscapes.[653]

Additionally, Austin has created the S.M.A.R.T. (Safe, Mixed-Income, Accessible, Reasonably-priced, Transit-oriented) Housing Policy Initiative, which is designed to stimulate the production of housing for low- and moderate-income residents of Austin by providing standards for development projects that use existing City infrastructure and services. Austin provides an expedited review process and waivers of permit fees and water/wastewater capital recovery fees for certified S.M.A.R.T. housing development projects that are completed on schedule for both large developments and infill construction. Certified developments are also eligible for fee waivers for water meters, sewer taps, and right-of-way closure and licensing. The S.M.A.R.T. Housing program also requires that all units meet Austin Energy Green Building Program (GBP) minimum standards and obtain GBP approval prior to submission of plans for permits. Before submitting an application, developers must also ensure that the property is adequately served by water and wastewater utilities.[654]

Danvers, Massachusetts[655]

Under the Danvers Water Use Mitigation Program, all new construction and other projects that will cause increased water demand must install water and energy-efficient faucets, showerheads, clothes washers, dishwashers, and toilets — all meeting EPA water efficiency standards — and irrigation systems installed in these projects must have a rain and soil moisture sensor. As part of the program, the Town also collects fees (scaled by proposed project size) to offset twice the estimated water use of such projects. These fees are put into a fund and used for demand-reduction programs such as rebates for the replacement of inefficient fixtures, including toilets, clothes washers, showerheads, faucets, and new wireless rain sensors for existing irrigation systems. The rebates range from $25 to $200 and are scaled by a combination of the new fixture's level of efficiency and the age of the old fixture being replaced, while others are a set amount:

- Toilet rebates — $25 to $200 depending upon the efficiency (gallons per flush) and the manufacture year of the toilet being replaced
- Clothes washers — $200 for replacement of machines manufactured after a specified year
- Showerheads and faucets — $50 for fixtures meeting a specified level of efficiency
- Wireless rain sensors — $100 for installing sensors on systems installed before 2008

652 Austin Water, WaterWise Landscape Frequently Asked Questions 4 (2015), https://www.austintexas.gov/sites/default/files/files/FAQwaterwiselandscape2015.pdf.

653 Austin Water, *Rebates, Tools, and Programs*, City of Austin, Tex., http://www.austintexas.gov/department/rebates-tools-and-programs (last visited September 12, 2018). *See also* Austin Water, *Waterwise Landscape Rebate*, http://www.austintexas.gov/sites/default/files/files/Water/Conservation/Rebates_and_Programs/WaterWise_Landscape_Residential_Rebate_Application.pdf.

654 Neighborhood Hous. and Cmty. Dev. for the City of Austin, Tex., S.M.A.R.T. Housing Policy Resource Guide (2008), https://www.austintexas.gov/sites/default/files/files/Housing/Application_Center/SMART_Housing/smart_guide_0708.pdf.

655 *Water Use Mitigation Program*, Town of Danvers, Mass, https://www.danversma.gov/water-use-mitigation-program-wump/ (last visited July 25, 2018).

Catawba County, North Carolina

In Catawba County, qualifying projects that receive verification by a third-party inspection agency of meeting specified green building standards (which include water efficiency requirements) for new and existing buildings are eligible to receive partial refunds of certain county fees, including plumbing permit fees, as follows:

- A newly constructed single-family residence, two-family residence, or commercial building is eligible to receive a 25% refund of the "blanket permit fee" paid (not to exceed $500). Blanket permit fees are calculated by multiplying the gross area of the project by a square foot multiplier and must be paid in full upon receiving a building permit.
- Commercial applicants are also entitled to a 50% reimbursement of fees paid for building plan review or express building plan review.[656]
- Existing buildings are eligible for a 50% refund of the following applicable mechanical, electrical, or plumbing permit fees:
  - Geothermal heat pumps receive mechanical and electrical fee rebates.
  - Photovoltaic energy systems receive an electrical fee rebate.
  - Solar hot water heating systems receive electrical and plumbing fee rebates.
  - Grey/rain water collection systems for flushing fixtures receive a plumbing fee rebate.

Wilmington, Ohio[657]

The City of Wilmington's Green Enterprise Zone program includes grants and fee reductions, among other benefits, for new or existing building projects that will enhance the green character of a building, property, public space, or infrastructure. Typical projects include the installation of greywater systems, stormwater gardens, and other green installations or innovations. Under the program, existing residential and commercial properties may be eligible for a 50% reduction of building and other permit fees associated with "green" projects, as determined by the Green Enterprise Zone Development Council. In addition, residential or commercial projects registered with the USGBC for LEED certification are eligible for a 75% reduction in building permit fees contingent upon the project achieving certification upon completion.

Chandler, Arizona[658]

Under Chandler's Green Building Program, eligible projects must achieve LEED certification, including several points related to water efficiency, to earn the incentives offered, which include scaled reimbursement of certification fees paid to the U.S. Green Building Council (USGBC). To be eligible, certified projects must also earn specific LEED credits:

- LEED New Construction, Core and Shell, and Existing Buildings projects must earn at least two of the five "Water Efficiency" points and at least one of the two "Heat Island Reduction" points.
- LEED Commercial Interior projects must earn at least one of the two "Water Efficiency" points and at least three points from the "Optimize Energy Performance" credit.

656 County of Catawba, N.C., FY 2017-2018 Building Services Fee Schedule – Green Building Incentives http://www.catawbacountync.gov/site/assets/files/2210/fees.pdf.

657 City of Wilmington, Ohio, Green Enterprise Zone Ordinance, https://www.egovlink.com/public_documents300/wilmington/published_documents/News%20Items/ORDINANCE%20Creating%20a%20Green%20Enterprise%20Zone%20-%20as%20Amended.pdf. *See also* City of Wilmington, Ohio, Green Enterprise Zone Frequently Asked Questions, http://www.egovlink.com/public_documents300/wilmington/published_documents/Economic%20Development/GEZ%20Frequently%20Asked%20Questions.pdf (last visited February 12, 2016).

658 Long Range Planning, City of Chandler Green Building Program (2008), https://www.chandleraz.gov/sites/default/files/DEV-green-bldg-program-doc.pdf.

Once projects meet these requirements, the City will reimburse a percentage of certification fees based on the level of certification achieved:

- 50% of fees for Certified level
- 75% of fees for Silver level
- 100% of fees for Gold level

For Platinum-level certification, USGBC does not charge certification fees; however, the City will "reimburse" such projects 100% of the fee that USGBC would have required for a project of the same size to achieve certification at the Certified level (therefore effectively offering a grant for Platinum-level certification).

Reimbursements are issued on a first-come, first-served basis and are subject to annual budget approvals. Reimbursements are based upon certification fees at the USGBC member rate, regardless of a project's membership status. The Green Building Program fee reimbursements (along with the Program's awards and recognition costs, educational events, costs to pursue and form partnerships, and green building promotion efforts, discussed elsewhere in this Chapter) are funded from money allocated by the City to the Green Building Program each fiscal year.

Bernalillo County, New Mexico[659]

In 2009, Bernalillo County initiated a temporary reduction of the following Impact Fees for certain construction projects that qualify based on building type and upon proof of certification that the construction meets the New Mexico sustainable tax credits:

- 50% reduction in impact fees for standard residential construction
- 75% reduction in impact fees for sustainable residential construction certified by LEED or Build Green NM*
- 75% reduction in impact fees for nonresidential construction, other than that qualifying for a full impact fee waiver as an economic base development project

*New Mexico's Build Green NM Program[660] is tailored to emphasize water efficiency and energy and includes an Indoor Water Efficiency Rating (WEiR) Index, designed specifically by and for the Build Green NM program. A project's WEiR Index shows the efficiency of indoor water use and compares industry-standard water-use rates with installed fixtures and appliances. The maximum-allowed WEiR Index score is based on using all WaterSense fixtures, hot-water waste of .75 gallons, and an Energy Star dishwasher. There are four levels of certification that all require satisfying certain mandatory practices and a minimum number of points for optional practices, which include water efficiency and conservation requirements.

659 *Planning & Development Services, Impact Fee Reduction,* County of Bernalillo, N.M., http://www.bernco.gov/planning/impact-fee-applications.aspx (last visited July 18, 2018).

660 *Building Better Homes For A Better New Mexico*, Build Green N.M., http://buildgreennm.com/index.php?page=certification-process (last visited Feb. 9, 2015).

Northeast Ohio Regional Sewage District[661]

The Northeast Ohio Regional Sewage District has an individual residential property credit. Customers receive a reduction in stormwater management fees if they take measures to reduce stormwater runoff from their property. Credits are obtained through the installation and continued use, operation, and maintenance of an approved stormwater control measure, such as rain gardens, onsite stormwater storage, pervious pavement, and vegetated filter strips — all green infrastructure measures that aid in groundwater recharge. Maintenance guidelines are provided, which include some simple measures to maintain efficiency such as cleaning gutters, checking hoses, and winterizing structures. After three years, recertification is required to receive credits. If ownership of the property changes, a new application must be submitted in order to receive the credit.

Asheville, North Carolina[662]

The City of Asheville offers a $50 rebate on fees associated with the installation of a stormwater/greywater collection device. Rebates are issued upon verification once all regular fees are paid and the project has been completed.

Anchorage, Alaska

Under Anchorage's green building program, developers of green building projects are given the opportunity to pay a fee to expedite their permitting process. 100% of the expedited portion of the building permit fee is then refunded to projects meeting the required level of certification under LEED or the ICC 700 National Green Building Standard (NGBS) (both of which have water efficiency requirements). In addition, a percentage of the regular portion of building permitting fees is also refunded to these projects, from 10%–35%, based upon the final level of certification achieved.[663]

San Antonio, Texas[664]

The City of San Antonio and the San Antonio Water System (SAWS) work together to promote development and growth in targeted areas throughout the City, as identified on the City's Target Investment Area (TIA) Map. The TIA Map reflects areas that are served by public infrastructure and transit but underserved by residential and commercial real estate markets. The program uses City and SAWS incentives within the TIA to stimulate investment and create a walkable, urban community. In 2013 alone, the program waived approximately $4 million in impact fees. The stated goals of the fee waiver incentive program are to increase new housing and commercial development on vacant infill lots; increase redevelopment of existing buildings; increase rehabilitation, upgrade, and adaptive reuse of existing buildings; and increase business recruitment and expansion in the City's targeted industries. Residential/mixed-use projects and commercial/industrial projects within the TIA are eligible. Retail projects are also eligible but

661 Northeast Ohio Reg'l Sewer Dist., Regional Stormwater Management Program: Individual Residential Property Credit (2016), http://www.neorsd.org/I_Library.php?SOURCE=library/Individual_Residential_Property_Credit_manual_121112.pdf&a=download_file&LIBRARY_RECORD_ID=5692.

662 City of Asheville, N.C., July 1, 2018-June 30, 2019 Development Services Department, Fee Schedule (2018-2019), http://www.ashevillenc.gov/civicax/filebank/blobdload.aspx?BlobID=30664.

663 City of Anchorage, Alaska, Municipal Code § 23.05.050(F) (2009), http://www.muni.org/Departments/OCPD/development/BSD/Building%20codes/codeadoption.pdf.

664 City of San Antonio, Tex. Eco. Dev. Dep't., Business & Incentive Guide FY 2018 10 (2018), https://www.sanantonio.gov/Portals/0/Files/EDD/IncentiveProgramGuide.pdf. *See also*, City of San Antonio, Tex. SAWS Impact Fee Waiver Guidelines (Draft) (last amended 2010), https://www.sanantonio.gov/portals/0/files/ccdo/saws%20fee%20waiver%20guidelines.pdf.

are evaluated on a case-by-case basis to ensure that they align with the program's goals. The incentives may be used outside the TIA for affordable housing and community service projects or for projects that meet certain job creation and/or capital investment thresholds.

This program evolved from an earlier incentive with water efficiency benefits.[665] The City had passed an ordinance in 2006 creating an incentive scorecard system under which projects would be eligible to have certain permitting fees reduced or waived (including SAWS Water and Sewer Impact Fees), depending on project type and score. Points are awarded for projects achieving certification under the LEED for New Construction or LEED for Homes rating systems, both of which have water efficiency requirements.

Tucson, Arizona

Tucson was the first city in the country to require rainwater harvesting for landscaping use.[666] The City's Commercial Rainwater Harvesting Ordinance,[667] effective as of June 1, 2010, applies to all new commercial construction. Facilities subject to the ordinance must meet 50% of their landscape demand using harvested rainwater, prepare a site water harvesting plan and water budget, and use irrigation controls that respond to soil moisture.[668] Additionally, the City has a Rainwater Harvesting Rebate Program that is available to single-family residential and small commercial (property with a single meter that is 5/8" or 3/4") Tucson Water customers.[669] Applicants must complete a three-hour class that helps determine their plan and then can choose between two rebate levels, up to $300 for smaller projects such as rocks for basins or $2,000 for larger projects such as installing a cistern.

Thornton, Colorado[670]

The City of Thornton created an effective water conservation program that includes rebates for water efficient toilets, irrigation controllers, rain barrels, and water-wise landscapes. The City also had a washing machine rebate program, which was discontinued in 2017.

Under these programs, residential customers in the Thornton water service area can receive a $75 rebate for replacing an older toilet with a new EPA WaterSense-labeled toilets. Commercial and multifamily buildings constructed before 1994 are also eligible for toilet and urinal rebates of $75, applied to the building's water account, for each EPA WaterSense-labeled fixture that replaces a high-volume flush fixture. The program is offered on a first-come, first-served basis and is limited to 100 fixtures per property per year. Pre-approval is required for properties planning to replace more than 10 toilets. Thornton also has a program called "Thornton Cares Water-Assistance Toilet Upgrades," which was designed for water customers in need of a toilet upgrade

665 City of San Antonio, Tex., Ordinance 2006-06-15-0722 (2006).

666 Christopher Kloss, Low Impact Dev. Ctr., EPA, Managing Wet Weather with Green Infrastructure Municipal Handbook, Rainwater Harvesting Policies 3 (2008), http://www.epa.gov/sites/production/files/2015-10/documents/gi_munichandbook_harvesting.pdf.

667 City of Tucson, Ariz., Ord. No. 10597 (2008), https://www.tucsonaz.gov/files/water/docs/rainwaterord.pdf.

668 Planning and Dev. Serv. Dep't. for the City of Tucson, Ariz., Commercial Plan Review for Rainwater Harvesting Ordinance (2008), https://www.tucsonaz.gov/files/water/docs/rwhordsum.pdf.

669 *Rainwater Harvesting Rebate Program*, City of Tuscon, Ariz., https://www.tucsonaz.gov/water/rwh-rebate (last visited July 19, 2018).

670 Rebates, City of Thornton, https://www.thorntonwater.com/rebates.html (last visited July 30, 2018).

who do not have the resources to purchase a toilet and have it installed according to the rebate program. To qualify, a resident must be a Thornton CARES water-assistance participant receiving assistance on their water bill. Upon qualifying, a Center for ReSource Conservation technician will visit the home to conduct a Home Water Use Consultation and will then install up to two water efficient toilets. Customers must also sign a liability waiver prior to the installation.

Residential customers can also receive a rebate of up to $200 toward the cost of a new, qualifying, WaterSense-certified irrigation controller (excluding taxes and installation costs), or up to $200 for the installation of a new, qualifying WaterSense-certified irrigation controller. The rebate for commercial and multifamily buildings is $50 per active irrigation station. Rebates are subject to availability of funds.

Residents can receive a $50 rebate for purchasing and installing a rain barrel, and the City will rebate a maximum of two 55-gallon rain barrels per account. Additionally, Thornton offers a $25 rebate for rain sensor devices purchased and installed into automatic sprinkler systems for residential and commercial water customers.

In 2018, Thornton also created a rebate to reward water customers that replace their turf with water-wise landscaping. Under the program, residents can receive $1 per square foot for approved and installed low-water landscape up to 1000 sq. ft.

ii. Offer Grants and Loans

An additional option to promote water conserving development is through grant and loan programs that encourage property owners to implement water conserving measures (for example, to adhere to xeriscape design principles in new development projects). Grant programs require financial investment by the local government and can be funded by taxes, fees, federal grants, and state grants. Communities can award grants to developers or homeowners upon their application for funding, helping to offset expenses in advance of water conservation measures. Grants can be used to subsidize certain specified expenses or can be given as a lump sum applied to the total cost of a project. Grant programs should be designed with enough flexibility for all parties to benefit.

Communities can also consider establishing a revolving loan fund to encourage home owners and developers to take action by lowering the up-front costs associated with some water conservation practices. Under such a program, the local government would establish a large fund and use it to make low-interest loans to applicants seeking to build or renovate to specified water conservation standards. Recipients then repay the loans to the fund at a rate lower than the operational cost savings from the improvements. The fund is continuously replenished by the repayments so that it can be used for additional loans.[671]

671 U.S. Green Building Council, *Good to Know: Green Building Incentive Strategies,* LEED (May 2, 2014), http://www.usgbc.org/articles/good-know-green-building-incentive-strategies-0 (last visited Feb 9, 2016).

EXAMPLES OF GRANT AND LOAN PROGRAMS FOR WATER CONSERVING MEASURES

El Paso, Texas[672]

El Paso's Green Building Grant Program encourages private developers to build sustainable buildings by providing incentives for LEED-designed buildings that include a minimum level of water efficiency. Subject to the availability of funds, the Grant is awarded to applicants intending to construct, renovate, or remodel commercial or mixed-use properties. New or existing building grants range from $50,000 if the property meets the LEED-Certified level to $200,000 if it meets the LEED Platinum level. For existing multistory buildings, the building grants range from $100,000 if the building meets the LEED-Certified level to $400,000 if it meets the LEED Platinum level. The City requires applicants to provide verification of LEED registration and receive a Certificate of Occupancy before any grant funds are released. Projects must include the construction, renovation, or remodeling of a minimum of 15,000 square feet (unless the total project investing is at minimum $5 million).

Wilmington, Ohio[673]

The City of Wilmington provides Green Enterprise Grants for new or existing commercial or industrial business entities that will enhance the green character of a building, property, public space, or infrastructure. Typical projects include the installation of greywater systems, stormwater gardens, and other green installations or innovations. Applicants with projects to be completed in buildings built in 1950 or before or that have been vacant for six months are required to provide 25% matching funds. All others must provide 50% matching funds.

King County, Washington

King County's Environmental Sustainability Program is intended to ensure high performance in energy, water, and waste reduction. As part of this program, which involves sustainability requirements for public sector development, the County's Department of Natural Resources and Parks administers a grant program to incentivize the private sector, nonprofit organizations, and cities within the county to adopt green buildings and sustainable development practices.[674] The County's code provides that grant funding must be supported by the solid waste division, water and land resources division, and the wastewater treatment division. Grant funding is to be identified annually, consistent with approved funding of each division's annual budget. Grant funds are managed by the GreenTools program in cooperation with the wastewater treatment and water and land resources divisions. Grant funding may go to residential or commercial projects that meet a discrete set of eligibility requirements, are in the service area of the division providing the grant funding, and are selected in a competitive award process. Approved projects must provide educational opportunities to the public to increase awareness and benefits of green building and sustainable development within the County.

672 RTEL, City of El Paso Green Building Grant Program Guidelines (2007), http://legacy.elpasotexas.gov/muni_clerk/meetings/lrcm0121100900/01211004.pdf.

673 City of Wilmington, Ohio, Green Enterprise Zone Ordinance, https://www.egovlink.com/public_documents300/wilmington/published_documents/News%20Items/ORDINANCE%20Creating%20a%20Green%20Enterprise%20Zone%20-%20as%20Amended.pdf. *See also* City of Wilmington, Ohio, Green Enterprise Zone Frequently Asked Questions, http://www.egovlink.com/public_documents300/wilmington/published_documents/Economic%20Development/GEZ%20Frequently%20Asked%20Questions.pdf (last visited February 12, 2016).

674 King County, Wash., Municipal Code § 18.17.030 (2018) (citing King County., Wash., Ordinance 16147 § 4 (2008)), https://www.kingcounty.gov/council/legislation/kc_code/21_Title_18.aspx.

In past years, for example, the program has offered $15,000 to $25,000 in grant funding to commercial, institutional, and multifamily projects seeking green building certification. Award amounts are based upon the level of performance achieved. Among other minimum performance requirements, eligible projects must reduce landscape irrigation by 50% and building water use by 20% beyond code requirements. Funding for these grants is issued at 50% upon signed completion of the Green Building Grant Agreement and 50% at project completion. Projects that fail to achieve minimum performance requirements and appropriate certification level will be responsible for refunding the grant award.[675]

As part of the Environmental Sustainability Program, the Department of Public Health, Water, and Land Resources Division of the Department of Natural Resources and Parks, and the department of permitting and environmental review staff who review and approve permits related to development, will receive training in green building and high- performance rating systems such as Build Green Emerald Star and the Living Building Challenge. These departments/divisions, along with the Green Building Team, will form an interagency review committee to facilitate review of projects that involve multiple green building systems and approval of buildings using high-performance features.[676]

Portland, Oregon[677]

Under its Ecoroof Incentive Program, offered from 2008 to 2012, Portland made financial incentives available to building owners to increase the number of ecoroofs in the City. An ecoroof, which is essentially a green roof with thin, lightweight soils and drought-tolerant plants requiring minimal irrigation and maintenance, can range in installation costs from $5–$20 per square foot depending upon project size, design, and complexity. The program provided up to $5 for each square foot of ecoroof installed on approved projects. Evaluation criteria for approval under the incentive program included cost of the ecoroof; total square footage; sustainability of the roof; innovation; and ecoroof components (including soil specifications, membrane, plants, and structural integrity of the building). To be eligible for the incentives, projects must be within municipal limits, manage stormwater, have a designated project manager, begin construction within two years of incentive approval, secure funding within two years, be feasible and buildable, and agree with and satisfy the municipality's contract agreement requirements to receive funding. Projects that receive a FAR bonus are eligible for ecoroof incentives. From 2008–2012, the City granted almost $2 million in incentives that helped fund over 130 projects that created more than eight acres of ecoroofs.

Sonoma County, California[678]

Sonoma County's Energy Independence Program (SCEIP) provides Property Assessed Clean Energy (PACE) financing to property owners within the county. PACE financing allows commercial, residential, and some nonprofit property owners to borrow funding to increase their property's energy efficiency, renewable energy, and water conservation. Such projects can include, among

675 King County, Wash., 2007 LEED Grants Application and Guidelines (2007).

676 King County., Wash., Municipal Code § 18.17.020 (updated July, 20 2018), https://www.kingcounty.gov/council/legislation/kc_code/21_Title_18.aspx.

677 *2008-2012 Portland EcoRoof Incentive*, Envtl. Serv., https://www.portlandoregon.gov/bes/article/547491 (last visited July 23, 2018).

678 Sonoma County Energy Independence Program, http://sonomacountyenergy.org (last visited Jul. 7, 2018).

other things, the installation of waterless urinals. The money is paid back as an assessment on the property's regular tax bill, due at the same time as property taxes. Repayment can be spread across a maximum of 20 years, and repayments remain with the property when ownership changes. SCEIP is the longest-running PACE program in the country.

iii. Consider Tax Abatements, Exemptions, and Credits

Other financial incentive strategies available to local governments to encourage water conserving development — whether new buildings or modifications to existing properties — include tax abatements, property tax exemptions, sales tax exemptions, and tax credits. Although tax incentives are perhaps the strongest non-zoning incentive, this chapter does not address them at the outset because local authority to use tax-based incentives is so dependent upon state law (given that most property tax systems are heavily, if not completely, regulated by the state). For example, Colorado local governments can almost never abate taxes because they are required to assess and collect taxes per the state system (although they may then rebate them to achieve city purposes).

When developing a tax incentive program, communities may consider tying the amount of the benefit offered to the actual cost of the work done. They may also consider tying the amount of the tax benefit to some level of achievement or certification obtained. For example, a percentage of property taxes reduced could correspond to a level of LEED certification achieved. Alternatively, tax incentives can be used to freeze a property's assessed value for tax purposes so the owner does not have to pay property tax on any increase in assessed value resulting from the improvements.[679] Communities should consider that this latter method makes the incentive more difficult to obtain because the action being incentivized must increase the appreciable value of the property in order for an owner to benefit. Communities looking to incentivize the conversion of grass lawns to xeriscapes, for example, should not establish their incentive in this way because such a landscape conversion is not an assessable improvement that will alter a property's appreciable value (at least not yet), therefore freezing a property's assessment at the pre-improvement value would have no effect. Some actions may have no appreciable financial value but they may be of value for the local government to incentivize nonetheless. Communities should therefore carefully consider the structure of the tax benefit they establish to ensure that it will effectively incent action.

Property tax incentives can be full or partial and can be based on a number of factors, such as those previously mentioned: the cost of improvements, pre- and post-improvement assessment values, or scaled by some specified level of achievement. They can be created as temporary, short-term incentives or as ongoing programs with yearly renewals incorporating maintenance and recertification/verification requirements. As part of a robust incentive program, abatements, exemptions, and credits may also be combined. Finally, tax credit programs could allow for credit transfer, which would enable building owners that do not pay property taxes (such as not-for-profits) to participate. Transferable tax credit programs can guarantee income to third-party investors that provide financing for water efficiency improvements.

679 N.Y.C., Indep. Budget Office, J-51 Property Tax Exemptions and Abatements (2003), http://www.ibo.nyc.ny.us/iboreports/J51overview.pdf.

EXAMPLES OF TAX ABATEMENTS, EXEMPTIONS, AND CREDITS FOR WATER CONSERVING DEVELOPMENT

Harris County, Texas[680]

Harris County established a property tax abatement program focused on the creation and retention of job opportunities in the County's Reinvestment Zone; it also includes a green building component, which contains water efficiency prerequisites. Harris County allows for a tax abatement if an applicant's proposed new project: (1) increases the tax roll value of new real property by at least $1,000,000; (2) creates a list of 25 new full-time permanent positions at the project site; and (3) is competitively sited. It also offers a "LEED Tax Abatement," which developers may seek as an add-on to the standard abatement or as a stand-alone abatement.

For the stand-alone LEED* abatement, the job creation targets and competitive siting requirements are waived. Under the County's LEED Tax Abatement, developers of new commercial construction projects who have registered with the USGBC seeking LEED certification may qualify for a partial tax abatement for the incremental investment associated with obtaining such certification. The abatement is available for a maximum of 10 years at a percentage of the appraised value after certification is obtained. The value of the tax abatement is scaled from 1%–10% based upon the level of certification actually obtained after construction, with a bonus that the abatement may be increased at the County's discretion by up to $1,000 in the final year.

*Water conservation elements contained in Version 4 of the LEED for Building Design + Construction rating system[681] include the following requirements:

- Reduce outdoor water use either by showing that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period or by reducing the project's landscape water requirement by at least 30% from the baseline for the site's peak watering month (calculated with the EPA's WaterSense Water Budget Tool)
- Use indoor plumbing fixtures that are WaterSense labeled (where eligible) and that, in the aggregate, reduce water use by a minimum of 20% from a building's calculated baseline
- Install permanent water meters that measure the total potable water use for the building and associated grounds (and compile data summaries monthly and annually for five years)

Optional water conservation credits in the rating system include further reductions in outdoor water use, further reductions in indoor plumbing fixture and fitting water use (can be met by using alternative water sources); permanent water metering for two or more water subsystems (such as irrigation, indoor fixtures, reclaimed water); and conducting a potable water analysis for cooling towers and evaporative condensers. The rating system also contains credits that further a water conserving land use pattern, including credits for locating development on previously developed land, in infill locations, in areas with existing infrastructure, on sites with a minimum level of density prescribed by the rating system, and within walking distance from diverse uses.

680 Harris County, Tex., Guidelines & Criteria for Granting Tax Abatements (2014), https://budget.harriscountytx.gov/doc/ED/Tax_Abatement/HC_Tax_Abatement_Guidelines.pdf; *see also, Harris County Property Tax Abatement for Green Commercial Buildings,* U.S. Dep't. of Energy, https://www.energy.gov/savings/harris-county-property-tax-abatement-green-commercial-buildings (last visited September 24, 2018).

681 U.S. Green Bldg. Council, LEED v4 for Building Design and Construction 51-63 (July 8, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

Cincinnati, Ohio

The City of Cincinnati offers a Residential Property Tax Abatement[682] program that allows owners to pay taxes just on the pre-improvement value of their property for 10–15 years. The abatement is available for any increased valuation that results from improvements to the property for new construction and renovation. The benefits stay with the property for the entire length of the abatement, transferring to any new property owner within that time. The City offers longer abatements terms and higher abatement amounts for newly constructed or remodeled properties that meet LEED* or Living Building Challenge** standards — both of which include water efficiency requirements. Owners must submit their documentation of LEED or LBC certification at the time of application for the abatement.

The City also offers a Community Reinvestment Area (CRA) Tax Exemption[683] for companies and developers building or renovating a multifamily residential (three or more units), commercial, industrial, or mixed-use facility in cases where the new or renovated facility will result in job creation. CRA Tax Exemptions are authorized by the state code and issued by municipalities that have established special CRA districts. The entire City of Cincinnati is a CRA district and its program provides a property tax exemption of up to 75% for a maximum period of 15 years. The City offers more favorable tax exemptions for LEED* and Living Building Challenge** developments. Whether the exemption is awarded and what amount is awarded depends upon a number of factors evaluated by the City Council when considering the exemption application, such as the project's intention to meet these green building standards (which include water efficiency) and intention to enter into a Voluntary Tax Incentive Contribution Agreement (VTICA). [A VTICA is an agreement with a third-party nonprofit designated by the City in which the applicant would contribute a portion of the abated taxes to support neighborhood-based projects and services or citywide affordable housing initiatives. A 15% VTICA contribution would result in a 60% net exemption rate, which represents the maximum 75% exemption.] Among other things, applicants must also take the following actions:

- Agree to pay the municipality's Board of Education 25% of the full amount of real property taxes that would have been paid to the County if the exemption agreement were not in effect
- Agree to pay the City an annual fee of 1% of the annual tax exemption, but not less than $500 or more than $2,500
- Pay the City the State-established application fee for an exemption agreement[684]

*Water conservation elements in the LEED for Building Design + Construction rating system, applicable to commercial properties, may be found in the Harris County, Texas example above. Water conservation elements applicable to homes can be found in the LEED for Homes rating system.[685] Under LEED for Homes version 4, projects are required to earn at least three points

682 *Cincinnati Residential Tax Abatement,* City of Cincinnati, Ohio Community & Econ. Dev., http://choosecincy.com/Community-Development/Homebuyers/Residential-Tax-Abatements.aspx (last visited September 23, 2018); *see also* City of Cincinnati, Ohio, Ordinance No. 182 – 2007 (May 17, 2007), http://city-egov.cincinnati-oh.gov/Webtop/ws/council/public/child/Blob/20406.pdf?rpp=-10&m=2&w=doc_no%3D%27200700567%27.

683 *Community Reinvestment Area (CRA) Commercial Abatement,* City of Cincinnati, Ohio Community & Econ. Dev., http://choosecincy.com/Community-Development/Developers/Multifamily-Commercial-Tax-Abatements.aspx (last visited September 23, 2018).

684 City of Cincinnati, Ohio, Application for Commercial Tax Abatement (Revised Oct. 2017), http://choosecincy.com/getattachment/Community-Development/Developers/Multifamily-Commercial-Tax-Abatements/Commercial-Tax-Abatement-Application/Commercial-CRA-Application-11_6.pdf.aspx;;?ext=.pdf.

685 U.S. Green Bldg. Council, LEED v4 for Homes Design and Construction 26-31 (Oct. 2, 2017), https://www.usgbc.org/resources/leed-v4-building-design-and-construction-current-version.

in the Water Efficiency Category. Projects are required to support water efficiency efforts in different ways, depending on whether they are single-family or multifamily homes. Single-family homes must install a whole-house water meter (single-family attached homes may share a whole-building water meter if landscaping is commonly managed and any units that will not achieve LEED certification are separately metered). Homes that use only well water and are not connected to a municipal water system are exempt from this prerequisite. Multifamily homes must install a water meter or submeter for each unit or the entire building. Optional water conservation credits in the rating system include reducing total indoor and outdoor water consumption by at least 10% over standard practices, landscaping with native plants or plants adapted to the region, and labeling bathroom fixtures with WaterSense and limiting overall volume flow.

**Water conservation elements contained in the Living Building Challenge include an imperative for projects to be net positive water, which requires 100% of the project's water to be supplied by captured precipitation or other natural closed-loop water systems and/or by recycling used project water and purifying it as needed without the use of chemicals, and requires all stormwater and water discharge, including grey and black water, to be treated onsite and managed either through reuse, a closed-loop system, or infiltration.[686]

Hays County, Texas[687]

The State of Texas authorizes taxing units of government to exempt from taxation all or part of the assessed value of a property on which water conservation modifications have been made and leaves it to the taxing entity to designate the list of eligible water conservation initiatives. Pursuant to this state law, Hays County offers Rainwater Harvesting Exemptions, which are property tax exemptions for the value of rainwater harvesting systems where the system serves as the sole source of water for a residence.

Baltimore County, Maryland

Under Baltimore County's Code of Ordinances, high-performance buildings and homes that include water efficiency elements are eligible to receive a tax credit for either three or five consecutive years (depending on the project type), based on a percentage (ranging from 10%–100%) of the total municipal property tax assessed on the property. The duration and amount of the tax credit depend on the project type and level of performance achieved. The total tax credits for the program may not exceed an aggregate amount in any fiscal year of $5,000,000 for commercial buildings (which include income-producing multifamily residential buildings of at least 50 units) and $1,000,000 for single-family and low-rise multifamily residences, subject to the County Council's annual review of the program amount.[688] Such a tax credit is authorized under the Tax-Property Article of Maryland's state code.

686 *Living Building Basics*, International Living Future Institute, https://living-future.org/lbc/basics/; International Living Future Institute, Living Building Challenge 3.1 30 (2016) *available at* https://living-future.org/product/lbc-3-1-standard/.

687 Texas Water Development Board, The Texas Manual on Rainwater Harvesting, 3rd Ed. 53–54 (2005), http://www.twdb.texas.gov/publications/brochures/conservation/doc/RainwaterHarvestingManual_3rdedition.pdf; *see also*, Commissioners Court, Hays County, Tx Res. (March 24, 2015), http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=310&fileid=5116&mid=355; *see also*, Hays County Application for Rainwater Harvesting Incentive Program, http://www.hayscad.com/wp-content/uploads/2017/05/2018-Rainwater-Collection-Exemption-Packet.pdf.

688 County of Baltimore, Md., Code of Ordinances §§ 11-2-203.1 - 11-2-203.2 (amended Oct. 16, 2011), https://library.municode.com/md/baltimore_county/codes/code_of_ordinances?nodeId=ART11TA_TIT2ADVATA_SUBTITLE_2PRTACRIM.

New York, New York

New York City offers a "J-51" property tax exemption and abatement for renovating residential apartment buildings.[689] While the abatement is offered for an amount directly tied to the improvements done and can last for up to 20 years, the exemption freezes the building's assessment for tax purposes at the pre-project value and can last for up to 34 years, depending on the project type. The program allows exemptions and abatements to be combined, with the result that a qualifying owner would pay taxes on the pre-improvement value, minus any abatement received. The amount of the benefit depends on the building's location and the type of improvements made. Qualifying improvements include the following:

- The as-of-right conversions of a nonresidential property to a multiple dwelling
- Building alterations designed to conserve energy

In this same way, a local government (subject to state law authorization) could offer exemptions for building alterations designed to conserve water. Similarly, exemptions could be offered for infill development that increases the density or mixed-use nature of a neighborhood (such as converting nonresidential property to a multiple dwelling).

New York City also created a Green Roof Property Tax Abatement Program, offering one-year abatements to owners that install green roofs on their buildings. The abatement was available at $5.23 per square foot, for up to $200,000 or the building's tax liability, whichever is less. The program included an overall cap on the amount that can be spent in any one year on abatements and charged the City's Department of Finance with allocating this amount among eligible applicants on a pro rata basis. The program also required a maintenance plan that included semi-annual inspections, plans for plant replacement, monthly inspections of drains, and maintenance of green roofs for a minimum of four years.[690]

Although this example does not relate directly to water conservation, it is offered because of the transferability of this concept. Subject to state law, a community might offer a water conservation tax abatement requiring an annual inspection to ensure that the water conservation features for which the abatement was originally received are being maintained and properly utilized.

b. Use Process Incentives to Encourage Water Conservation

Communities can encourage water efficient development through process incentives, such as a streamlined permitting process, guaranteed timelines, priority inspections, or any combination of these techniques that result in an expedited project review and approval process. These process incentives enable local and county governments to increase tax revenue while saving developers time and money — time and money that they can then invest in water conserving projects.

Measures for which a community might offer process incentives, whether in new construction or retrofits to existing development, include but are not limited to, the following:

689 *J-51 Exemption and Abatement*, N.Y.C. Dep't of Fin., http://www1.nyc.gov/site/finance/benefits/benefits-j51.page (last visited February 10, 2016). *See also* N.Y.C., Indep. Budget Office, J-51 Prop. Tax Exemptions and Abatements (2003), http://www.ibo.nyc.ny.us/iboreports/J51overview.pdf.

690 N.Y. Legis. Assemb. A-7058. Reg. Sess. 2013-2014 (2013), https://www.nysenate.gov/legislation/bills/2013/A7058.

- Installation of green roofs with drought-tolerant plants
- Installation of greywater systems (or, generally, projects that use nonpotable water for permanent irrigation)
- Infill development at a specified density that conserves water
- New construction or renovations to existing buildings meeting government-specified water conservation standards
- Certified green buildings completing specified water efficiency credits

Communities can do many things to streamline their permitting process. Among them are the following:

- Remove barriers: Identify building code, zoning code, and process conflicts that could inhibit water conserving development and technologies and remove or reduce those barriers.
- Offer priority review (fast-track permitting): Prioritize water conserving projects for review by automatically placing those applications on the top of the pile for processing.
- Offer reduced plan check–turnaround time: Reduce the amount of compliance review that water conserving projects need to undergo.
- Charge a fee for Expedited Review: Communities could consider charging a fee for an expedited review of water conserving projects and then refund that fee upon verification that the project was built to the program's water conservation standards.
- Train staff: Create a training program for development review and inspection staff and establish a required number of training hours. Having staff well-trained on the process and standards associated with a program is an important part of any streamlining effort. Staff training should include an explanation of the community's water conservation goals, the tools and resources available to staff and applicants, information on the approval process and how to move it forward expeditiously, case studies of successful programs and projects, presentations from experts on water efficient development patterns and technologies, presentations on water efficiency standards and programs such as WaterSense, and the water conservation aspects of various green building rating systems including strategies and resources for these programs.
- Offer citizen/developer education: Conduct training and outreach programs to educate potential or current developers on the local government's streamlined permitting process for water conserving development. Create a program to educate citizens about this initiative, the importance of water conservation, and what they can do on their own properties.

Communities can place additional requirements upon applicants receiving expedited review, such as submitting evidence that the project has allocated money for water efficient fixtures and appliances or that the project has hired a water efficiency auditor.

EXAMPLES OF STREAMLINED PERMITTING PROCESSES TO INCENTIVIZE WATER CONSERVING DEVELOPMENT

San Diego County, California[691]

The County of San Diego's Green Building program includes incentive programs, policies, ordinances, and guidelines to promote green building design and construction. Incentives include an expedited review process ("reduced plan check–turnaround time") as well as a 7.5% reduction in plan check and building permit fees. The County offers these incentives to projects

691 *Green Building Incentives Program*, County of San Diego Plan. & Dev. Serv., http://www.sandiegocounty.gov/pds/greenbuildings.html (last visited Jul. 17, 2018).

implementing green building measures related to water conservation, energy conservation, or natural resource conservation. Qualifying water conservation measures include the installation of greywater systems (which use wastewater produced from bathtubs, showers, and washing machines) in new or renovated buildings to irrigate landscapes through a subsurface distribution system. Such a greywater system requires a permit from the California Department of Environmental Health.

Portland, Oregon

The City of Portland began its green building program[692] in 2000 to work with residents, businesses, and community partners to advance sustainable building practices. Over the years, the program has included various initiatives to optimize the building development review and inspection process to encourage green building practices (including water efficiency) through a number of actions, including, but not limited to, the following actions:

- Providing Process Management by the Bureau of Development Services for qualified public and private-sector LEED-registered building projects
- Identifying building and zoning code and process conflicts that inhibit green building practices and technologies
- Creating an inter-bureau training program for relevant City development review and inspection staff [693]

Staff training conducted under this initiative has included, among other events:

- Multiple half-day City Project Manager trainings that explained the requirements of the City's green building policy, the tools and resources available to City project managers, and case studies of former and current green building projects
- In-house meetings between City staff and visiting sustainable design and construction experts (already in Portland for separate City events), which offered lessons learned from leading experts and an outside perspective on the compatibility of the City's development process and LEED implementation
- A variety of City-sponsored training opportunities for City project managers, including sessions on LEED rating system, the G/Rated Tenant Improvement guidelines, and value engineering green buildings, among others
- Multiple Interior Tenant Improvement (T/I) Guide trainings for City project managers, which provided an overview of strategies and relevant resources[694]

Charlotte County, Florida

Under the Charlotte County Code, its Green Building Program — whose goals include the development of green buildings and water conserving landscapes, as well as the protection of water — promotes a number of incentives such as fast-track permitting for any voluntary

692 *Green Building*, City of Portland, https://www.portlandoregon.gov/bps/41481 (last visited Sept. 21, 2018).

693 City of Portland, Or., BCP-ENB-9.02 (2005), https://www.portlandoregon.gov/shared/cfm/image.cfm?id=112682 (superseded by City Council, Portland, Or. Res. No. 37122 (Or. 2015), https://www.portlandoregon.gov/bps/article/529212).

694 Terry Miller & Rob Bennett, OSD, City of Portland, Or. Office of Sustainable Dev., Portland's Green Building Policy: A Status Report and Recommendations (2005), http://www.portlandonline.com/shared/cfm/image.cfm?id=112689.

applicant seeking certification.[695] The Code also encourages County staff to attend at least two hours of green building/design training per year and includes an initiative to conduct training and outreach programs to educate potential or current participants about the program,[696] all of which will result in a smoother, more informed approval process.

Anchorage, Alaska

Anchorage offers an expedited permitting process for green building projects but charges a fee to take advantage of this incentive. 100% of the expedited portion of building permitting fees is then refunded to projects meeting the required level of certification under LEED or the National Green Building Standard. In addition, a percentage of the regular portion of building permitting fees is also refunded to these projects, from 10%–35%, based upon the final level of certification achieved.[697]

As part of creating a streamlined review and approval process, communities can go a step further and offer priority inspections or set guaranteed timelines for qualifying water conserving projects. This type of incentive enables projects to obtain permits and begin construction sooner, saving the developer time and money. Such a policy, if established, should focus on expediting the discretionary permit/approval process at the staff level and could include multiple departments (planning, building, engineering, and others).

A policy of this sort can set one overall time frame for staff review. For example, "Comments will be provided from all departments within X days of submittal," or "The department will process site and development plan permits and building permit applications in X working days." Such an approach typically includes a provision that any subsequent submittals for a project granted expedited review will be reviewed within a certain number of business days. Alternatively, the policy could break the process down into smaller pieces, each with their own time frame. This latter option is preferable as doing so provides a secondary benefit of clearly mapping out the approval process for an applicant. The following list outlines the process clearly:

- Pre-application Review
- A Completeness Check (5 business days)
- First Review Cycle (20 business days)
- Project Review Meeting (scheduled within 10 business days after the First Review Cycle) to further clarify outstanding issues and resolve project conflicts
- Subsequent Review Cycles, if needed (10 business days)
- Public Hearing

The policy should charge a specific department or staff member with approving projects for the expedited review process. In addition, when making guarantees for processing times, it is important that such a policy create a pressure-release valve for instances where staff may receive more applications than anticipated when the timelines were established. As a result, the policy can set forth guidelines for how approved entry to the program may be affected by carrying capacity. For example, the policy could establish a priority list, ranking the types of water conserving projects most eligible for expedited review, and explain that during times when workload exceeds the program's carrying capacity, the staff member

695 County of Charlotte, Fla., Code § 3-2-85(a) (amended June 11, 2013), https://www.municode.com/library/fl/charlotte_county/codes/code_of_ordinances?nodeId=PTIIILADEGRMA_CH3-2BUBURE_ARTVGRBUPR_S3-2-85INPRAP.

696 County of Charlotte, Fla., Code § 3-2-87 (amended June 11, 2013), https://www.municode.com/library/fl/charlotte_county/codes/code_of_ordinances?nodeId=PTIIILADEGRMA_CH3-2BUBURE_ARTVGRBUPR_S3-2-87OBGOED.

697 City of Anchorage, Alaska, Municipal Code § 23.05.050(F) (2009), http://www.muni.org/Departments/OCPD/development/BSD/Building%20codes/codeadoption.pdf.

or department charged with approving projects for the program will do so based upon the priority list.

Similarly, to guard against a backlog in the process, guaranteed timelines and priority inspection policies often include a requirement for pre-application review meetings. Such meetings will help the local government and the applicant to identify any potential roadblocks, allow for early feedback regarding project proposals, and provide opportunity to begin identifying important stakeholders in the community review process.

Guaranteed timeline policies may also include enforcement measures to ensure that applicants do not take advantage of expedited review, only to later change some aspect of the project to make it less water conserving. For example, the policy could state that after initial approval for the expedited review process, if subsequent plan submittals indicate that the project will be less water efficient than originally indicated, to the point that it would no longer qualify for expedited review, then the applicant must resubmit the application, going back through the standard review and approval process from the beginning. Applicants also could be required to sign an agreement stating that projects will be built as indicated on approved documents.

EXAMPLES OF GUARANTEED TIMELINES AND PRIORITY INSPECTIONS TO INCENTIVIZE WATER CONSERVING DEVELOPMENT

San Diego, California[698]

In 2003, the City of San Diego established a policy to expedite the discretionary permit process, ministerial building permits, and engineering approvals for affordable housing as well as new residential, commercial, or industrial projects meeting the definition of "sustainable buildings" established in the City's policy for its own projects. This definition includes the following water-related elements:

- Projects that use 20% less water than the baseline water consumption profile for interior non-process water uses
- Projects that use nonpotable water for permanent irrigation to the extent possible
- Projects that comply with all stormwater development requirements in the Storm Water Management and Discharge Control Ordinance and the San Diego Municipal Code Land Development Manual Storm Water Standards

"Sustainable buildings" are also encouraged to limit disruption of natural water flows and minimize stormwater runoff by making the following adaptations:

- Minimizing building footprints and other impervious areas
- Increasing onsite infiltration
- Preserving and/or restoring natural drainage systems
- Reducing contaminants introduced into the City's rivers, bays, beaches, and the ocean

The City's expedited process includes the following guaranteed timelines, resulting in a permit review process that takes 75% of the standard time:

698 City Council of San Diego, Cal., Affordable/In-Fill Housing and Sustainable Buildings Expedite Program Policy No. 600-27 (2017), http://docs.sandiego.gov/councilpolicies/cpd_600-27.pdf.

- Mandatory Preliminary Review Meetings to allow for early feedback regarding project proposals, provide opportunities to identify important stakeholders in the community review process, and enable staff to identify issues for the project applicant prior to formal design and submittal
- A Completeness Check (5 business days)
- First Review Cycle (20 business days)
- Project Review Meeting (scheduled within 10 business days after the First Review Cycle) to further clarify outstanding issues and resolve project conflicts
- Subsequent Review Cycles, if needed (10 business days)
- Public Hearing

San Diego's policy acknowledges that a key component in the success of an expedited approval process is identifying the carrying capacity of the program in order to maintain efficiency and effectiveness within established timelines. Although a program may be staffed appropriately in order to meet these timetables, workload is unpredictable. As such, the City's policy sets forth a priority list, ranking the types of projects most eligible for expedited review during periods when workload exceeds the program's carrying capacity. In such situations, the program manager will begin deferring projects through the normal development preview process and provide expedited permit processing (both discretionary and ministerial) based on the priority list. Residential development projects that qualify as both "sustainable building" and "affordable housing" projects, as defined by the City, are at the top of that list.

San Mateo, California[699]

Under the County of San Mateo's green building program, applicants must submit a checklist prior to the issuance of a building permit. The program offers expedited building permit processing for applicants for new construction or 50% or greater remodel of a single-family, two-family, or low-rise multifamily residential project based upon information indicated in the checklist:

- For projects Green Point Rated at 75 points or higher under the Build It Green* program or LEED for Homes** certified, comments on the first round of building permit applications will be provided from all County departments within 30 days of submittal.
- For projects Green Point Rated at 100 points or higher under the Build It Green program or LEED for Homes certified, an additional benefit of guaranteed building inspections will be provided within two working days of a request for inspection.

The County program also offers this 30-day guarantee for comments and two-day guarantee for building inspections to commercial or industrial projects with checklists showing they will receive LEED certification at the Silver level, which includes the use of water efficient landscaping, installation of innovative wastewater technologies, and strategies that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline (not including irrigation).

699 County of San Mateo, Cal., Ordinance Code §§ 1404, 1406 (amended Oct. 7, 2008), http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/51/53/1338972748GreenBuildingOrdinance.pdf.

*Water conservation elements contained in the Build It Green[700] program include the use of green infrastructure stormwater control measures (such as permeable paving material and bio-retention features), hydrozoning, resource-efficient landscapes (including drought-tolerant species), minimizing turf, rainwater harvesting, recycled wastewater irrigation system, submeter or dedicated meter for landscape irrigation, a landscape that meets the water budget, third-party landscape program certification, increased efficiency in hot water distribution, WaterSense volume limit for hot water distribution, water efficient plumbing fixtures, greywater system, as well as several standards related to compact, mixed-use, walkable, and bikeable development.

**Water conservation elements contained in the LEED for Homes rating system include provisions for a water conserving development pattern, such as infill development, use of a previously developed site, compact development, and use of existing infrastructure. LEED for Homes also includes points for high-efficiency indoor fixtures and fittings, as well as water conserving landscape features and systems, such as the use of drought-tolerant turf (if any turf), drought-tolerant plants, permeable paving, impermeable surfaces directed to infiltration features, rainwater harvesting, greywater reuse systems, use of municipal recycled water system, use of high-efficiency irrigation system (such as that designed by a WaterSense-certified professional, submetering, drip irrigation, automatic timers/shutoff, moisture sensor), and a reduction in overall irrigation demand by 20%–45%.

Chandler, Arizona[701]

Chandler's Green Building Program offers an expedited plan review incentive (as well as financial incentives and an array of assistance, education, and marketing incentives, discussed in other sections of this Chapter) under which the City will cut the standard plan review time of 20 days in half to 10 days for eligible projects that pursue LEED* Silver or higher. [702] This guaranteed timetable enables projects to obtain building permits and begin construction sooner.

Under the program, the City's Planning and Development Director and Green Building Coordinator have to approve any expedited plan review application before review begins and the Green Building Coordinator is charged with working with developers before plans are submitted to ensure that the Department has ample time to verify eligibility. Once a project has been granted this expedited review, each additional submittal will also be reviewed within 10 business days and the project may not be removed from the expedited process except under specific circumstances where the applicant fails to meet established requirements.

Among other eligibility requirements, applicants must sign an agreement stating that projects will be built as indicated on approved site-plan and construction documents. Additionally the agreement will state that the development will be carried out as indicated by any supporting documentation that was submitted to show conformance with certain LEED prerequisites and points. If subsequent plan submittals indicate that the project will not be able to earn the minimum required level of certification, the applicant must resubmit building permit applications and go back to the plan review process from the beginning at the standard 20-day period.

700 *Documents and Checklists*, Build It Green, https://www.builditgreen.org/greenpoint-rated/documents-checklists (last visited Feb. 9, 2016).

701 Long Range Planning, City of Chandler Green Building Program (2008), https://www.chandleraz.gov/sites/default/files/DEV-green-bldg-program-doc.pdf.

702 City Council, Chandler, Ariz. Res. No. 4199 Exhibit A. Reg. Meeting (June 26, 2008), https://www.chandleraz.gov/sites/default/files/documents/imported/GB_4199.pdf.

The Planning and Development Department is responsible for carrying out the 10-day review. The Long-Range Planning, Current Planning (including Site Development), and Building Plan Review divisions coordinate to review applications and verify that site plans, building plans, and other submitted documents include green building strategies that will be able to meet the requirements of all prerequisites and points being pursued. These Divisions also assure that each additional submittal maintains the previously shown green building strategies.

*Water conservation elements contained in the LEED rating system include the use of water efficient landscaping, installation of innovative wastewater technologies, and employing strategies that, in the aggregate, reduce water use by a minimum of 20% over a building's calculated baseline (not including irrigation).

Charlotte County, Florida

Under Charlotte County's Green Building Ordinance, developers of eligible projects voluntarily seeking certification under an applicable green building program (all options include water efficiency requirements) can have their permitting process fast-tracked. Under the ordinance, the County will process site and development plan permits and building permit applications in 15 working days.[703]

c. Provide Assistance, Education, and Marketing Incentives

Many local and county governments provide incentives related to assistance, education, and marketing for developments that achieve notable benchmarks in water conservation or sustainable design. Such programs are important to celebrate successes and change public attitude toward the importance of such measures and the ease with which they can be achieved. Communities can tailor such programs to their own budget restrictions and needs.

Assistance that communities can provide as an incentive includes monitoring and direct assistance, whether technical or nontechnical. Technical assistance could include consultation with experts, design assistance, free site-plan review, access to special government resources, the creation of handbooks or website tutorials, and possibly even offering the option of live assistance.

EXAMPLES OF GOVERNMENT ASSISTANCE PROGRAMS TO ENCOURAGE WATER CONSERVING DEVELOPMENT

Aurora, Colorado

The City of Aurora offers free outdoor water assessments to check irrigation system efficiency. These assessments can help water customers to pinpoint problem areas and increase water efficiency; they can also confirm qualifications for some of the City's water efficiency rebate

703 Charlotte County, Fla., Code § 3-2-85(a) (amended June 11, 2013), https://www.municode.com/library/fl/charlotte_county/codes/code_of_ordinances?nodeId=PTIIILADEGRMA_CH3-2BUBURE_ARTVGRBUPR.

programs.[704] Aurora also provides direct assistance to income-qualified homes and nonprofit buildings through its Low-Income Program, which offers free replacement and installation of up to two toilets, two showerheads, and three faucet aerators with water-saving versions, which will also save money on water utility bills.[705]

Chandler, Arizona[706]

Chandler's Green Building Program offers an array of assistance incentives, all of which could be used in a water efficient development program. As part of Chandler's program, the Planning and Development Department provides nontechnical assistance for those interested in pursuing a green building project. Specifically, City staff will provide the following services:

- Assist developers with questions regarding green building techniques and strategies, the LEED certification process, and general requirements to obtain points
- Assist individual homeowners who may be interested in remodeling their homes to meet green standards
- Provide broad information about LEED and green buildings (not provide specific construction or design recommendations)
- Direct developers or homeowners to more appropriate sources that can provide specific green building advice

Portland, Oregon

As part of its green building program,[707] Portland offers free customized water conservation kits from the City's Water Bureau.[708] The customized kits are available for residential, commercial, and multifamily customers. Interested customers simply contact the Water Bureau to discuss what they might need for their home and the Bureau mails a kit containing the necessary items at no charge. The kits include simple-to-install, water-saving devices for fixtures, such as water efficient showerheads, kitchen and bathroom faucet aerators, shower timers, toilet fill cycle diverters, and toilet leak detector tablets.[709] The commercial and multifamily customer kits can also include rain sensors and high-efficiency pre-rinse sprayers, as well as samples (one of each per kit) of a dual-flush handle, water-saving toilet diaphragm kit for flushometer style toilets, and water-saving urinal diaphragm kit.[710]

Education is vital in allowing for sustainable development focused on water conservation and efficiency. Education not only works with developers and building owners, but also helps spread the word to communities and helps future owners make informed decisions to further water conserving efforts.

Education incentives can include training workshops, educational programs, communication networks, and information dissemination (i.e., indirect assistance such as free resource lists or water efficiency

704 *Irrigation*, City of Aurora, Colo., https://www.auroragov.org/residents/water/rebates/irrigation/ (last visited July 7, 2018).

705 *Low-Income Programs*, City of Aurora, Colo., https://www.auroragov.org/cms/one.aspx?portalId=1881221&pageId=2036905 (last visited July 7, 2018).

706 Long Range Planning, City of Chandler Green Building Program (2008), https://www.chandleraz.gov/sites/default/files/DEV-green-bldg-program-doc.pdf.

707 *Green Building*, City of Portland, https://www.portlandoregon.gov/bps/41481 (last visited Sept. 21, 2018).

708 *Free Water Efficiency Devices*, City of Portland, https://www.portlandoregon.gov/water/article/358406 (last visited Sept. 21, 2018).

709 *Save Water! Save Money! Water Conservation Kit,* City of Portland, https://www.portlandoregon.gov/water/article/402953 (last visited Sept. 21, 2018).

710 *Free Water Efficiency Devices*, City of Portland, https://www.portlandoregon.gov/water/article/358406 (last visited Sept. 21, 2018).

product information made available on the government website). Communities may offer free planning or certification training with access to water efficiency experts. This type of educational assistance may empower developers who are unfamiliar with water conservation practices to build with these techniques in mind.

EXAMPLES OF EDUCATION-BASED INCENTIVES TO ENCOURAGE WATER CONSERVING DEVELOPMENT

Castle Rock, Colorado

As part of Castle Rock's Water Wiser program, created in 2004, the Town offers outdoor landscape efficiency classes for local residents taught by the Town's Water Conservation Specialist.[711] The interactive Water Wiser workshops introduce residents to the seven xeriscape principles and focuses on irrigation efficiency and water management, providing attendees with easy techniques to implement. Under the Town's 2006 Water Efficiency Master Plan (updated in 2016), people who graduate from the class are exempt from the Town's "every third day" watering schedule restrictions, which are in place during the peak summer months, giving residents discretion to decide for themselves when they actually need to water.[712] This flexibility serves as an incentive for participation in the program, which has been completed by thousands of residents.[713] Castle Rock's water waste ordinance still guards against waste of water, subjecting residents to code violations whether they are a Water Wiser or not. The Town is evaluating the program's success and considering whether the Water Wiser designation should have to be renewed periodically and whether a fee should be charged for the workshops to prevent no-shows and ensure attendance only by those truly interested in water conservation.[714]

The Lanterns development in Castle Rock, Colorado, is an approved mixed-use development project. In 2002, an initial development agreement was created, which was then amended in 2014. The 2014 amended development agreement requires the implementation of a Water Efficiency Plan with the intent to manage water demand and extend the Town's water supplies through aggressive water conservation design guidelines for the development.[715] The Water Efficiency Plan includes a comprehensive set of mandatory indoor and outdoor standards intended to ensure that residential units are constructed to achieve lower water demands. Through the use of high-efficiency indoor fixtures and compliance with landscape and irrigation design requirements, this Water Efficiency Plan is expected to significantly reduce water demands relative to the Town's standards for single-family residences. To assist with implementation of the Water Efficiency Plan, all residential customers in the development must have customized water

711 *Learn to Conserve*, Castle Rock, Colo., Water Wiser, https://crconserve.com/101/Learn-to-Conserve (Last visited Jul. 8, 2018).

712 Castle Rock, Colo. Water Resources Division & Water Conservation Division, Water Conservation Master Plan 37 (2016), http://www.crgov.com/DocumentCenter/View/592/Water efficiency-Master-Plan.

713 As of March of 2016, 3,318 residents were Water Wiser designated, not including former residents who were certified but have moved out of Town. Telephone interview with Rick Schultz, Water Conservation Specialist, Town of Castle Rock, Colo. (Mar. 3, 2016).

714 Castle Rock, Colo. Water Resources Division & Water Conservation Division, Water Conservation Master Plan 37 (2016), http://www.crgov.com/DocumentCenter/View/592/Water-Efficiency-Master-Plan. Telephone interview with Rick Schultz, Water Conservation Specialist, Town of Castle Rock, Colo. (Mar. 3, 2016).

715 Agenda of the Meeting, Castle Rock, Colo. Town Council, Discussion 6: The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

budgets that provide for a sufficient water supply, coupled with a tiered billing rate structure.[716] The custom water budget and rate structure is a tool for monitoring compliance with the Plan's efficiency standard and reduced water demands. An ongoing component of the Water Efficiency Plan is creation and distribution of educational materials and training for residents. Information will address the water budget rate structure, water conservation measures, soil preparation, plant materials, smart irrigation controllers, and high-efficiency sprinkler heads, among other things.

Algonquin, Illinois[717]

As part of its water conservation program, the Village of Algonquin created an educational outreach program. The outreach program is specifically laid out in its Water Conservation Plan and was created and refined each year by the Village's Water Conservation Committee made up of staff from each department. The outreach program elements include the following:

- Educational door hangers
- Elementary school presentations about where water comes from, water plant operations, conservation tips, and other topics
- Stickers distributed to students during the school presentations and handed out to students visiting Village Hall or attending community events
- T-Shirts worn by staff while giving school presentations and enforcing water regulations; also given as prizes for contests throughout summer
- Water Division vehicle magnets that tell the current water restriction status
- Refrigerator magnets outlining the water conservation program
- Brochures that include the water restrictions and helpful tips for conserving water
- Notices on water bills, website, and newsletters
- Automated reverse E-911 messages if water system status changes to red
- Village voicemail messages reminding callers about water conservation practices
- Direct outreach to HOAs
- Educational letters sent to businesses that have irrigation systems explaining the benefits of limited water and the cost savings, an explanation of the watering status system, regulations, and incentive programs
- Promotion of water conservation at various community events including the Earth Day celebration, Conservation Community Day, and Founder's Day Festival
- Press outreach share efforts with local press and encourage them to draft articles and promote the Water Conservation Plan and contests

The Plan lays out cost, responsibility, and timing for each of these items, as well as samples for components such as the door hangers and mailers.

716 Agenda of the Meeting, Castle Rock, Colo. Town Council, Discussion 6: The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

717 Village of Algonquin, IL, Water Conservation Plan 2–19 (2006), https://www.algonquin.org/egov/docs/1183993810_455841.pdf.

Chandler, Arizona[718]

Chandler's Green Building Program offers an array of educational incentives, all of which could be used in a water efficient development program. Development professionals and residents who are interested in participating in the Green Building Program can take advantage of the City's educational offerings, which include the following:

- Green building publications
- A green building lecture series
- A green building website

The educational material and events focus, at least in part, on providing homeowners with the information that they will need in order to "green" their homes. The educational programs provide residents with the knowledge and resources that they will need in order to improve their home's energy and water efficiency in a cost-effective manner. Additionally, the City will provide a document that provides a list of suggested green site design strategies. This list of strategies is available to homeowners and developers.[719] The program's website is intended to act as an information center for the following matters:

- A Green Building Program Participant List
- Educational material
- Basic green building strategies and suggested green site design strategies
- Information about some of the best products and materials to achieve green building goals
- Information on tax incentives or rebates available through the federal and state governments, utilities, and any other agencies
- Links to additional resources
- Applications for LEED certification fee reimbursements

The Green Building Program awards and recognition costs, educational events, costs to pursue and form partnerships, green building promotion efforts, and fee reimbursements (discussed under financial incentives), are funded from money allocated by the City to the Green Building Program each fiscal year.

Aurora, Colorado

Aurora offers a free, three-level Water Conservation course for residents, both online and in person: A series of Water Conservation 101 classes, series of 201 classes, and series of 301 classes. Topics include water-wise landscape basics, DIY sprinkler systems, DIY water-wise landscape design, seasonal garden maintenance, turf grass alternatives, growing food/saving water, landscaping with native plants, and rainwater diversion, among others.[720] Attendees can leave the course with what is essentially a free landscaping/xeriscaping plan for their property.[721]

718 Long Range Planning, City of Chandler Green Building Program (2008), https://www.chandleraz.gov/sites/default/files/DEV-green-bldg-program-doc.pdf.

719 City Council, Chandler, Ariz. Res. No. 4199 Exhibit A. Reg. Meeting (June 26, 2008), https://www.chandleraz.gov/sites/default/files/documents/imported/GB_4199.pdf.

720 *Water Conservation Classes*, City of Aurora, Colo., https://www.auroragov.org/cms/one.aspx?pageId=3616138 (last visited Jul. 8, 2018).

721 City of Aurora, CO, Representatives, Land Use Leadership Alliance Training Program (LULA), Denver, CO (April 30, 2015).

Beginning in February 2018, Aurora residents could enroll in the City's Know Your Flow (KYF) program.[722] Under the program, enrolled customers receive a detailed monthly email that includes a graph summarizing indoor water use, outdoor water use, and their property's customized RWU. The RWU is the annual outdoor water needs as determined by the water department's mapping of a property's landscape and analysis of monthly weather data. From April to October, customers also receive weekly emails with recommended sprinkler system watering times. The information in these weekly and monthly emails is intended to help customers evaluate actual usage against recommended usage and to make household changes to conserve water. The City requires all participants in its all Water-wise Landscape Rebate program and its Smart Controller Rebate program to enroll in the KYF program.

In addition, Aurora offers several rebate programs for water efficiency improvement expenses. As part of the standard development application process, the City holds pre-application meetings with developers, which they use in part to discuss the available programs. The City has and continues to re-tool its incentives based upon feedback from developers during these pre-application meetings, which have turned out to be an important opportunity for information dissemination and gathering.[723]

Charlotte County, Florida

Charlotte County has four different ways to educate citizens and staff and disseminate information regarding its green building program (whose goals include the development of green buildings and water-thrifty landscapes and the protection of water):

1. Develop educational programs to promote economic and environmental health in the County (such as a training workshop or expo)
2. Conduct training and outreach programs to educate potential or current participants about the program
3. Provide meeting space at a County facility, if possible, so that organizations can offer green building seminars (of a general nature, not product-specific)
4. Encourage County staff to attend at least two hours of green building/design training per year[724]

Santa Monica, California[725]

Santa Monica has created an in-depth Residential Green Building Guide for homeowners and developers. The guide is meant to help residents make better-informed decisions when updating and upgrading their home; identifying health and environmental measures for new construction or remodeling projects; collaborating with their architect and contractors during the design and construction process; and finding additional green building resources. The guide specifies that water conservation and efficiency should be considered when analyzing green building attributes and includes the following details on water conservation: job sites should protect native soil to

722 *Know Your Flow*, City of Aurora, Colo., https://www.auroragov.org/residents/water/water_conservation/know_your_flow/ (last visited Jul. 7, 2018).

723 Telephone interview with Lyle Whitney, Water Conservation Supervisor, City of Aurora, Colo., and Karen Hancock, Long-Range Planner & Environmental Program Supervisor, City of Aurora, Colo. (Aug. 5, 2016).

724 County of Charlotte, Fla., Code § 3-2-87 (amended June 11, 2013), https://www.municode.com/library/fl/charlotte_county/codes/code_of_ordinances?nodeId=PTIIILADEGRMA_CH3-2BUBURE_ARTVGRBUPR_S3-2-87OBGOED.

725 City of Santa Monica Energy & Green Building Programs, Santa Monica Residential Green Building Guide 4, http://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Green_Building/Residential_GB_Guidelines.pdf.

conserve irrigation water; developers should design resource-efficient landscapes and gardens and reuse materials or use recycled content materials for landscape areas; and plumbing fixtures should specify low-flow conservation devices for kitchen faucets, bathroom faucets, and showerheads.

Portland, Oregon

As part of Portland's Ecoroof Program,[726] offered from 2008 to 2012, under which the City made financial incentives available to building owners to increase the number of ecoroofs, the City also made available an "Ecoroof Resource List" on its website, containing information on companies that provide ecoroof services and materials.[727] An ecoroof is essentially a green roof with thin, lightweight soils and drought-tolerant plants requiring minimal irrigation and maintenance. Similarly, as part of the City's green building program, initiated in 2001 and updated many times since, it offers a range of publications, fact sheets, guides, and other resources on its website. Among them is the "G/Rated Tenant Improvement Guide," created by the local government to support and promote healthy, productive, durable, resource-efficient, and energy-efficient workspaces. This Guide provides information on executing green tenant improvement projects.[728]

Thornton, Colorado[729]

Thornton offers several opportunities for community educational outreach through its H2Overhaul program, which is a water-wise initiative that provides programs and resources to transform lawns into water-saving landscapes. The City provided a free H2Overhaul Workshop on March 7, 2018, which taught people the Seven Principles of Water-Wise Landscaping. Thornton also provides steps to follow for citizens to receive 200 sq. ft. of perennial garden plants and a spray-to-drip irrigation converter, which include: 1) attending the H2Overhaul Workshop, 2) selecting and taking a photo of a 200 sq. ft. area of maintained turf to submit with an application, 3) upon pre-approval, removing turf and submitting a "during" photo for final approval, 4) collecting a free conversion package, and 5) scheduling a final review and consultation with Resource Central.

The City also provides resources, such as step-by-step guides to help citizens customize their water-saving landscape conversion, and Water-Wise Plant Suggestions and Layout Maps, including: 1) Margaret W. Carpenter Recreation Center Water-Wise Garden Layout, 2) Fire Station 5 Water-Wise Garden Layout, 3) Average Size Residential Lot Layout, 4) Large Residential Lot Layout, 5) Plant Select Downloadable Designs.

The Water Efficiency Plan for the City of Thornton is a comprehensive resource that provides background information on water efficiency, information on the Thornton water-supply system, the water demand management, the water efficiency goals and activities in Thornton, and the implementation and monitoring plan.[730]

726 *2008-2012 Portland EcoRoof Incentive*, Envtl. Serv., https://www.portlandoregon.gov/bes/article/547491 (last visited July 23, 2018).

727 *See* City of Portland, Or., Ecoroof Resource List (2016), https://www.portlandoregon.gov/bes/article/258211.

728 *Creating a High Performance Work Space: Portland's Green Tenant Improvement Guide*, The City of Portland Or. Plan. and Sustainability, https://www.portlandoregon.gov/bps/article/296430 (last visited June 2018). *See also* City of Portland, Or., Green Building Policy, Res. No. 37122 (2015), https://www.portlandoregon.gov/bps/article/529212.

729 H2Overhaul Programs & Resources, City of Thornton, https://www.thorntonwater.com/h2overhaul.html (last visited July 30, 2018).

730 City of Thornton, Water Efficiency Plan (2018), http://www.thorntonwater.com/PDFs/COT_Conservation_Plan.pdf.

Government marketing assistance can incentivize private-sector water conservation in a number of ways. By creating programs that increase the visibility and community recognition of water conserving developments, the local government creates an incentive for the development community, while also increasing education and awareness of the importance of water conserving development. Some local and county governments have begun to offer free marketing assistance as an incentive for developers to build more sustainably through the following programs:

- Recognition programs (such as plaques or annual awards programs)
- Marketing assistance (free signage, website/directory listing, press releases, and other tactics)

EXAMPLES OF MARKETING AND RECOGNITION INCENTIVES TO ENCOURAGE WATER CONSERVING DEVELOPMENT

Southern Nevada Water Authority[731]

The Southern Nevada Water Authority (SNWA) has partnered with the Southern Nevada Home Builders Association (SNHBA) to develop a Water Smart Home program that certifies new homes and neighborhoods as water smart. The program promotes water efficiency by requiring homes to meet efficiency standards related to plumbing, landscaping, irrigation, and pools. Participating builders meet stringent water-use requirements for their homes, and SNWA markets for them on their website, has signage at the homes, and more. Builders can also use the program logo and materials in advertising. The program also educates homebuyers about the benefits of buying a water efficient home. Builders are required to meet the standards for water efficiency, participate in a mandatory program briefing, and allow inspections of randomly selected Water Smart Homes prior to occupancy.

Chandler, Arizona[732]

Chandler's Green Building Program offers an array of marketing incentives, all of which could be used in a water efficient development program. Under the program, developments that obtain LEED certification are then eligible for the following awards and recognitions:

- Preferential consideration for an Architectural Excellence Award
- Inclusion on the Chandler Green Building Program Participant List (posted on the City website and made available at the front counter of the Planning & Development building)
- A City of Chandler Green Building Seal of Approval, which can be displayed on a sign that is posted during and prior to the site's construction
- A City of Chandler Green Building Recognition Sign, provided by the City, which can be posted on a window or glass door[733]

The Green Building Program awards and recognition costs, educational events, costs to pursue and form partnerships, green building promotion efforts, and fee reimbursements (discussed under financial incentives), are funded from money allocated by the City to the Green Building Program each fiscal year.

731 *Water Smart Home Program*, Southern Nev. Water Authority, https://www.snwa.com/business/water-conservation-programs/water-smart-home.html (last visited July 21, 2016).

732 Long Range Planning, City of Chandler Green Building Program (2008), https://www.chandleraz.gov/sites/default/files/DEV-green-bldg-program-doc.pdf.

733 City Council, Chandler, Ariz. Res. No. 4199 Exhibit A. Reg. Meeting (June 26, 2008), https://www.chandleraz.gov/sites/default/files/documents/imported/GB_4199.pdf.

Scottsdale, Arizona[734]

Scottsdale's Green Building Program provides technical and marketing assistance to incorporate Green Building Program elements into the project, which includes, among other marketing materials, marketing plans to help reach the home-buying public, promotional/educational brochures, media coverage through press releases, educational programs targeted specifically to realtors, and a green building job site sign and green building brochures.

San Diego, California

San Diego's Sustainable Building Policy includes, among other incentives a City-sponsored recognition program for innovative green building projects (both public and private).[735]

Charlotte County, Florida

Charlotte County's Green Building Program — whose goals include the development of green buildings and water-thrifty landscapes and the protection of water quality — offers a number of incentives, including a marketing program created by the community development department in conjunction with the public information office and economic development office to promote green development.[736] The marketing program may provide, but is not limited to, the following items:

- Free outdoor signage that a builder may use to promote a project under construction that is seeking certification under this program
- Inclusion of program participants (including developers, builders, material suppliers, and others) on a website, which includes hyperlinks to local sustainable businesses and green materials suppliers
- Creation, for the project's owners, of promotional packages (such as a program logo for developers' advertisements or brochures and educational information for owners to distribute on the benefits of green building)
- Press releases
- Special recognition awards designed to recognize the efforts of businesses, professionals, and individuals in green building. The County will promote award recipients by methods deemed to be cost-effective and beneficial for promoting green building. Suggested award categories include residential green builder, commercial green builder, architect/engineer, subcontractor, material supplier, and a suggested annual award to a building material supplier who donates substantial amounts of reusable materials to not-for-profit building organizations

734 *Green Building Program: Invitation to Participate*, City of Scottsdale, Ariz., http://www.scottsdaleaz.gov/green-building-program/invitation (last visited July 25, 2018).

735 City of San Diego, Cal., Council Policy CP-900-14 – Outreach/Education (effective May 20, 2003), https://www.sandiego.gov/sites/default/files/legacy/environmental-services/energy/pdf/900-14.pdf.

736 County of Charlotte, Fla., Code § 3-2-85(b) (amended June 11, 2013), https://www.municode.com/library/fl/charlotte_county/codes/code_of_ordinances?nodeId=PTIIILADEGRMA_CH3-2BUBURE_ARTVGRBUPR_S3-2-85INPRAP.

15. Post-Occupancy Enforcement

In spite of their best efforts to ensure water efficient development, local governments may still need to prevent residents from converting to more water-intensive behavior (such as replacing low-flow showerheads with conventional ones or planting grass where xeriscaping used to be). This Chapter addresses how a local government can enforce the continuation and maintenance of water efficient landscaping and other water conservation techniques, "post-occupancy" (i.e., after the users of the new development or redevelopment have moved in). The best practices presented here can be applied post-occupancy to new developments to existing developments with retrofitted landscapes, or they can be used to encourage the conversion of landscapes to more water efficient designs.

a. Authorize Enforceable Administrative Restrictions on Use

Communities can pass ordinances authorizing appropriate municipal staff to implement by administrative rules any restrictions on water use, such as restrictions on hours of operation, length of time of irrigation, types of outdoor uses permitted, car washing, hand watering, uses permitted on impervious surfaces, and any other activity using water from the municipal water system. Similarly, communities can pass ordinances authorizing staff to determine when water efficiency provisions of the local code are being violated, to impose penalties on users of the municipal water system, to collect those penalties, and/or to turn off water service to a property when excessive waste occurs.

EXAMPLE OF ADMINISTRATIVE RESTRICTIONS ON WATER USE

Arvada, Colorado[737]

Under Arvada's Water Conservation Ordinance, the Utilities chapter of the City Code requires conservation of the City's potable water supply through the use of certain residential plumbing and fixtures. Maximum capacity limits are established for plumbing fixtures and fittings, and residential units are required to be equipped with an approved pressure regulator valve to monitor water usage. A licensed contractor or owner/occupant is responsible for the installation of plumbing fittings and must provide this information to the building inspector certifying that the fittings are in conformance with these standards. The code also authorizes the Director of the Utilities Department to determine whether restrictions on uses are necessary and, if so, what restrictions should be placed upon users of water supplied by the City water system. Such use restrictions may include but are not limited to, the following:

- Hours of irrigation
- Permissible schedules for outdoor use
- Length of time of irrigation
- Types of outdoor uses
- Car or fleet washing
- Uses on impervious surfaces

737 City of Arvada, CO, City Code, §§ 102-101-111 Water Conservation (1988), https://www.municode.com/library/co/arvada/codes/code_of_ordinances?nodeId=PTIICOOR_CH102UT_ARTIIWASE_DIV4WACO.

- Irrigation of common areas and parks
- Irrigation of golf courses
- Hand watering
- Exemptions and exceptions, or any other related matter or activity dependent upon or using water from the City water delivery system.

Where the City Council has by resolution declared a drought, the Director is also authorized and directed to promulgate such administrative rules without using the standard procedures set forth in the code.

Furthermore, the code explicitly prohibits "waste of water" such as the following:

- The continuous application of water to any lawn, turf, or sodded area resulting in pooling or the flowing of water into the drainage or storm drainage facilities, including sidewalks, gutters, or streets
- Failure to repair any irrigation system that is leaking
- Application of water intended for lawn irrigation to an impervious surface such as building exteriors, a street, sidewalk, or driveway

The Director of the Utilities Department is authorized to enforce these requirements and the person billed for water service to a property is responsible for compliance. Users found in violation of the use restrictions or the waste-of-water prohibition are subject to tiered penalties including the following :

- A first violation results in a warning notice.
- A second violation within a 12-month period results in a $100 fine, which is added to the water bill.
- A third violation within 12 months results in a $250 fine, added to the water bill.
- Subsequent violations within 12 months result in a $500 fine added to the water bill. In addition, the Director is authorized to order the installation of flow-restriction devices and/or a suspension of water service to the property. If water service is restricted or suspended, the violator must make a $500.00 deposit to the utilities department of the City before full water service will be restored. The deposit will be retained by the City for 12 months and is forfeited if there are any further violations within that time.

If the Director of the Utilities Department finds that an "extreme waste of water" is occurring on a property, he or she is authorized under the code to shut off water service to the property.

b. Adopt a Landscaping Ordinance with Maintenance Standards and Inspections

Local governments considering drafting or updating an ordinance that requires or encourages water efficient landscaping (such as those discussed in Chapter 11) may include standards for maintenance of

the installed landscaping and irrigation. In addition to enforceable standards, the local government may want to supply a maintenance checklist to help residents preserve their water efficient landscapes. The checklist may also state how compliance with the ordinance will be enforced through inspections/audits, coupled with citations and fines for noncompliance.

EXAMPLES OF LANDSCAPING ORDINANCES WITH MAINTENANCE STANDARDS AND INSPECTIONS

Sarasota County, Florida

Under Sarasota County's Land Development Regulations, site and development plans must include landscape plans and specifications indicating types, sizes, locations, and quality of vegetation as well as provisions for irrigation and maintenance.[738] Sarasota County's Water-Efficient Landscaping Regulation requires resourceful landscape planning, installation, and irrigation and encourages appropriate maintenance measures to promote conservation of water resources. To enforce maintenance, the Landscaping Regulation requires builders provide property owners with a landscape maintenance checklist in a format prepared by the County that includes information such as cleaning and calibrating the irrigation system, resetting the automatic controller, replenishing mulch, pruning plants, and cutting grass around sprinkler heads.[739] The builder must also inform the owner of the current irrigation restrictions adopted by the County and the Water Management District. In addition, inspections are required by the Code Enforcement Officer or designated inspectors to "make inspections at reasonable hours of all land uses or activities regulated by Landscaping Regulations in order to insure compliance with the provisions" included in the Water-Efficient Landscaping Ordinance.[740] The code enforcement officer is responsible for initiating enforcement proceedings, and the Board of County Commissioners is authorized to select Special Magistrate candidates who can issue citations, assess fines against violators, and hold hearings as provided in the Sarasota County, Florida Code of Ordinances.

San Francisco, California

The purpose of San Francisco's Water Efficient Irrigation Ordinance is to regulate landscape irrigation practices and plant use.[741] Property owners and developers are expected to design and build drainage facilities including, but not limited to, culverts, retention and detention basins, and drainage swales. The ordinance also requires irrigation audits for a landscaped area by a Certified Landscape Irrigation Auditor, the project applicant, or a Public Utilities Commission Water Service

738 County of Sarasota, FL, Land Development Regulations, § 74-62 (2015), http://sarasotacounty.elaws.us/code/coor_ptii_ch74_artiii_sec74-62.

739 Landscape Compliance Certification & Checklist Chapter XXII, Article VI of Sarasota County Code Ordinance Number 2001-081, http://sarasota.ifas.ufl.edu/Hort/WEL/ord/docs/ordchecklist.htm; *See also,* County of Sarasota, FL, Water efficient Landscaping Regulations, § 22-154 (2005), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-154GEPRDEST.

740 County of Sarasota, FL, Water efficient Landscaping Regulations, § 22-155 (2001), https://www.municode.com/library/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH22BUBURE_ARTVIWAFILARE_S22-155EN.

741 In accordance with California's State Water Conservation in Landscaping Act.

Inspector.[742] An irrigation audit includes inspections, system tests, precipitation rates, and runoff reports. If a site violates the wastewater provision of the ordinance, property owners can be fined.[743]

Also in San Francisco, the Public Utilities Commission has a water budget report pilot program that provides a report to property owners with dedicated irrigation meters.[744] These reports include information on how property owners can meet their calculated water budget. Installation of a dedicated irrigation water service and meter helps property owners and tenants track irrigation water use and reduce wastewater fees associated with indoor uses and allows for a separate shutoff for the irrigation system if needed. The General Manager of the Public Utilities Commission may issue a written warning entered on the user's water service record, which may include information regarding the violation, educate the violator on restrictions, provide resources to assist with compliance, and set a deadline for corrective action. If violations are not corrected to the General Manager's satisfaction, administrative penalties and other available legal remedies can be taken pursuant to San Francisco's Administrative Code.

Similarly, San Francisco's Green Landscaping Ordinance seeks to achieve increased permeability through front yard and parking lot controls and to encourage responsible water use through increasing climate-appropriate plantings.[745] Twenty percent of a front yard must be plant material, and 50% must be permeable.[746] Examples of approved permeable surfaces include porous asphalt, in-ground planters, and loosely set paving. There is a full guide to help property owners maintain landscapes to comply with the ordinance and understand the benefits of such landscapes.[747]

In addition, the Planning Department's Code Enforcement team helps maintain and improve the quality of San Francisco's neighborhoods by operating programs that ensure compliance with the City's Planning Code. Code enforcement officials will respond to any complaints regarding code violations, the complaint is logged and assigned to an Enforcement Planner in charge of the area, and each complaint is investigated in order of priority. If a violation occurs, the Enforcement Planner sends a notice to the property owner and may also conduct a site visit to further investigate the violation. One of their most typically reported Planning Code violations is the removal of required landscaping.[748]

742 City of San Francisco, CA Water Efficient Irrigation Ordinance No. 301-10 (2011), *http://www.sfwater.org/modules/showdocument.aspx?documentid=384*.

743 Telephone interview with Julie Ortiz, Water Conservation Manager, San Francisco Public Utilities Commission (September 20, 2013). *See also,* San Francisco, CA Water Efficient Irrigation Ordinance No. 301-10 (2011), http://www.sfwater.org/modules/showdocument.aspx?documentid=384. *See also, Water Efficient Irrigation Ordinance*, San Francisco Water Power Sewer, http://www.sfwater.org/index.aspx?page=689 (last visited Feb 2, 2016).

744 *Pilot Community Garden Irrigation Meter Grant Program Overview,* San Francisco Water Power Sewer, https://sfwater.org/Modules/ShowDocument.aspx?documentid=10317 (last visited January 28, 2016).

745 City of San Francisco, CA, Green Landscaping Ordinance No. 84-10 (2010), http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances10/o0084-10.pdf.

746 City of San Francisco, CA, Planning Code §§ 132(G), (H), Landscaping and Permeable Surfaces (2015), http://library.amlegal.com/nxt/gateway.dll/California/planning/article12dimensionsareasandopenspaces?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$anc=JD_132.

747 *Guide to the San Francisco Green Landscaping Ordinance*, San Francisco Planning Dep't (2010), http://www.sf-planning.org/ftp/files/publications_reports/Guide_to_SF_Green_Landscaping_Ordinance.pdf.

748 *Enforcement,* San Francisco Planning Department, http://sf-planning.org/index.aspx?page=2202 (last visited Jan. 28, 2016).

Westminster, Colorado

A majority of the City of Westminster is zoned as PUD,[749] under which all proposed uses must conform to the City's highly detailed Comprehensive Plan.[750] Under the Plan, development must conform to adopted design guidelines, many of which include water efficiency requirements, including water conserving landscape specifications (such as turf limitations), permeable pavement, and water conserving fixtures.[751] Through the PUD approval process, the City has the opportunity to negotiate all standards for each proposed project in the same way that another community might through a development agreement. As part of the PUD requirements, all land uses and negotiated standards, which must comply with the Comprehensive Plan and design guidelines — both of which promote strong water efficiency — must be reflected in the project's ODP, which acts as a site plan, making them the legal requirements for thatproject.[752] A project's ODP will include specifications relative to landscape compliance, in terms of the water usage standards (referring to the municipal code and landscape code) and planting specifications, including hydro-zone analysis and plant types (which correspond to the City's planting palette.[753] The City then has a robust inspection process to ensure continued compliance with these ODPs.

In addition to pre-occupancy inspections, which include a check to ensure the correct installation of water efficient landscaping, Westminster also has a post-occupancy inspection program under which the City periodically inspects landscapes to be sure what was listed in the ODP and originally installed still exists. The City's code requires property owners to maintain the landscaping indicated on any approved ODP or site plan accompanying an ODP waiver.[754] The City has a special ODP Inspector who manages this process, which commonly results in missing trees or other landscape areas needing replacement. The inspections do not occur on a regular, planned schedule; rather, they are based upon observed violations or warranty inspections. Because continued compliance with the ODP is legally required by virtue of its being part of the zoning, alterations to water efficient landscaping are treated as code violations, as are any other violations of the ODP — the same way that another community might enforce a zoning violation where a single-family home was converted to a two-family home. The City can enforce these violations in the same way as any other code violation (as a misdemeanor, punishable by $2,000/day and/or 1 year in jail), although these punishments are rarely levied as the City's main concern is remedying the violation.

749 City of Westminster, CO, City Zoning Map (2010), http://westminstereconomicdevelopment.org/Westminster/media/Westminster/Maps/ZoningMap_July2014.pdf?ext=.pdf.

750 City of Westminster, CO, Ordinance No. 2475 (1997). *See also,* City of Westminster, CO, Comprehensive Plan 94, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/LongRangePlanningandUrbanDesign/ComprehensivePlan.

751 *Regulations and Design Guidelines*, City of Westminster, CO, Planning Division, https://www.cityofwestminster.us/Government/Departments/CommunityDevelopment/Planning/developmentreview. Because the State of Colorado recently (as of the writing of this Module) began requiring WaterSense fixtures, the water-based points in Westminster's system are not as robust as they once were. The City plans to update the criteria in the near future to once again award points for going beyond code requirements. Telephone interview with Mac Cummins, Planning Manager, and Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Sept. 1, 2016).

752 City of Westminster, CO, City Code, § 11-4-7, Zoning, Planned Unit Development, Westminster, CO, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH4ZO_11-4-7PLAUNDEDI.

753 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

754 City of Westminster, CO, City Code, § 11-7-5, Site Development Standards, https://library.municode.com/co/westminster/codes/code_of_ordinances?nodeId=CD_ORD_TITXILADEGRPR_CH7SIDEST_11-7-5PRRELA.

Westminster offers other post-occupancy inspections, which include inspections of the water system. The City's reclaimed irrigation customers (which currently include about 110 large properties) also receive an annual inspection that includes water use.[755] Similarly, the City tries to interest high-water-use irrigation customers in walk-through inspections. The cost associated with such high use is usually motivation enough for customers to limit their use, especially in commercial and HOA customers. Often, HOAs will have little idea how to run their common area maintenance. The City attempts periodically to address this issue by working with the HOAs to encourage repairs and maintenance.[756] The City also tracks water use and sends out leak notices when accounts do not show any period of zero use within a day. Overall, the City has seen a tremendous reduction in its water use thanks to these and other initiatives.

Aurora, Colorado

The City of Aurora requires a landscaping site plan to be submitted as part of the site plan application process.[757] The plan must conform with the City's landscaping code, which includes requirements for drought-tolerant or drought-resistant landscaping and plant species, turf limitations, automatic irrigation shutoff sensors, buffer reductions for xeriscape design, and maintenance requirements. The landscape plan must include a table summarizing landscaped areas that are water conserving (non-turf) and non-water conserving (turf), to be used for assessing irrigation tap fees.[758] Similarly, projects qualifying for buffer reductions by using xeriscape design must include notes on the landscape plan describing the type of irrigation for each area.[759]

The City requires that all landscaping indicated on the site plans for single- and two-family homes must be installed prior to inspection and issuance of a Certificate of Occupancy. Temporary certificates of occupancy may be issued when the required landscaping is not completed due to weather or seasonal conditions.760 Post occupancy, homeowners are then required to maintain this landscaping, including a requirement that any replacement plants conform to the City's current landscaping standards.761 Inspections are based on observed violations and may result in citations.

c. Use Development Agreements to Impose Water Conservation and Verification Requirements

As discussed in Chapter 13, Development Agreements, local governments can use development agreements that incorporate provisions guaranteeing maximum water conservation (e.g., by requiring

755 Email interview with Stu Feinglas, Senior Water Resource Analyst, City of Westminster (Jan. 24, 2017).

756 Email interview with Mac Cummins, Planning Manager, City of Westminster (Jan. 24, 2017).

757 City of Aurora, CO, Building and Zoning Code, § 146-1401, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV1INGE_S146-1401AP.

758 City of Aurora, CO, Building and Zoning Code, § 146-1430, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1430IR.

759 City of Aurora, CO, Building and Zoning Code, § 146-1437, Landscaping (2014), https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1437XEDE.

760 City of Aurora, CO, Building and Zoning Code, § 146-1450(E)(1), Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV4DIST_S146-1450ADREREDE.

761 City of Aurora, CO, Building and Zoning Code, § 146-1438, Landscaping, https://library.municode.com/co/aurora/codes/building_and_zoning?nodeId=BUZOCO_CH146ZO_ART14LA_DIV3GEST_S146-1438LAMA.

water efficient interior facilities and water conserving landscaping). Local governments can then bolster these water conservation requirements within development agreements in a number of ways such as the following:

- Conditioning further development approvals upon the developer obtaining adequate water rights or meeting other water-related requirements
- Including compliance verification and enforcement requirements — such as certifications made by builders, landscape specialists, and water specialists, or additional compliance inspections performed by trained municipal staff — to ensure that water conservation requirements have been met
- Stipulating that the agreement's water conservation measures be incorporated into any land conveyance documents, private covenants, and restrictions

EXAMPLE OF USING DEVELOPMENT AGREEMENTS TO IMPOSE WATER CONSERVATION AND VERIFICATION REQUIREMENTS

Castle Rock, Colorado

The Lanterns development in Castle Rock, Colorado, is an approved development project including single-family and multifamily residential units and commercial space. In 2002, an initial development agreement was created that included the creation of a Water Bank—an account administratively maintained by the Town to be periodically credited or debited—starting with 979 SFE credits (i.e., the average annual wholesale water production that must be developed to meet the imputed demand from a single-family residence under the Town Regulations). If the Water Bank is exhausted prior to full development of the property, the owner is required, under the development agreement, to provide additional water resources or pay a "cash-in-lieu of water rights" fee to the Town. If the owner fails to provide these additional water resources, the Town is not obligated to provide any further development approvals for the project. The development agreement was amended in 2014, but the Water Bank and the requirement to provide additional water rights or cash-in-lieu were carried forward to the amended version.[762]

The 2014 amended development agreement also requires the implementation of a Water Efficiency Plan with the intent to manage water demand and extend the Town's water supplies through aggressive water conservation design guidelines for the development.[763] The Plan includes a comprehensive set of mandatory indoor and outdoor standards intended to ensure that residential units are constructed to achieve lower water demands. Through the use of high-efficiency indoor fixtures and compliance with landscape and irrigation design requirements, this Plan is expected to significantly reduce water demands relative to the Town's standards for single-family residences. The development agreement states that, in the event that more restrictive water-use conservation measures (than those contained in the Plan) are subsequently adopted by Town regulations, the more restrictive provisions will govern. The development agreement also requires that the Plan be incorporated into all conveyance documents for the property and private covenants and restrictions and contains compliance checklists and verification requirements for the Water Efficiency Plan. Each homebuilder, landscape architect, and irrigation consultant must certify that the homes are being constructed in compliance with the standards of the Plan.

762 The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

763 The Lanterns Amended and Restated Development Agreement (May 9, 2015), http://castlerock-co.granicus.com/MediaPlayer.php?view_id=2&clip_id=217.

Prior to the issuance of a Certificate of Occupancy, all homes must be inspected and certified by a third-party contractor for compliance with the plan, with costs paid by the developer. The Plan contains minimum standards for the inspection, requires that the inspection and certification process be developed in cooperation with Town staff, and states that inspectors will be specifically trained to assess compliance with The Lanterns' Water Efficiency Plan.

To assist with implementation of the Plan, all residential customers in The Lanterns development must have customized water budgets that provide for a sufficient water supply, coupled with a tiered billing rate structure.[764] This structure sets different billing rates by use: indoor use (Tier 1); outdoor use (Tier 2) — customized according to lot size and specific landscape and irrigation plan — and excessive use; and (Tier 3) — a higher rate for when residents exceed their indoor/outdoor water budgets. The custom water budget and rate structure is a tool for monitoring compliance with the Plan's efficiency standard and reduced water demands. This tiered billing approach will financially incentivize customers to manage water use within the unit's water budget. Under the development agreement, the Town reserves the right to adjust this water budget rate structure and its allocations based on changes to the municipal code and new technology and scientific data. The Town's surcharge tier may also be adjusted consistent with the intent of this reduced water usage development.

An ongoing component of the Water Efficiency Plan is creation and distribution of educational materials and training for residents. Information will address the water budget rate structure, water conservation measures, soil preparation, plant materials, smart irrigation controllers, and high-efficiency sprinkler heads, among other things.

d. Create a Commercial Audit Program

Local and county governments may implement an irrigation inspection program by adopting ordinances that require mandatory audits and inspections of new irrigation systems for commercial entities. Through such programs, commercial water users can be required to submit to an audit periodically — not just after construction — and to therefore continue to follow audit requirements, even when those requirements are updated.

EXAMPLE OF AN AUDIT PROGRAM

Allen, Texas[765]

The City of Allen implemented an Irrigation Inspection Program through an ordinance requiring mandatory audits and inspections of new irrigation systems for all commercial entities. Under this ordinance, all irrigation systems installed are required to comply with the Texas Commission of Environmental Quality's Landscape Irrigation Standards and the City's irrigation standards.

764 Town of Castle Rock, CO, *Discussion: the Lanterns Amended & Restated Development Agreement* (May 20, 2014), http://www.crgov.com/DocumentCenter/View/8440.

765 City of Allen, TX, Land Development Code § 7.05.6 Irrigation Plan Requirements (2010), https://library.municode.com/tx/allen/codes/land_development_code?nodeId=LADECO_ARTVIIZODEST_S7.05LARE.

Immediately following installation, an irrigation system audit and inspection is required for all new irrigation systems. For new developments, documentation of the audit and inspection must be submitted to the City prior to issuing a certificate of occupancy. The commercial account holder must hire a certified auditor and submit an audit every three years; existing development is not grandfathered from the audit requirements. In addition, all audits must be performed according to the latest edition of the Recommended Audit Guidelines published by the Irrigation Association. Any person, firm, or corporation who violates any provision of the Code is guilty of a misdemeanor and upon conviction is subject to a fine of up to $2,000, and each day that a violation exists or continues constitutes a separate and distinct offense. Overall, the Commercial Audit Program has contributed to a decrease in annual water consumption and repairs to irrigation systems.

e. Require Post-Occupancy Documentation

Local and county governments may require an applicant performing new construction to submit documentation at several phases of construction and at various post-occupancy intervals to show that the project is operating as planned (not just constructed as planned). The specific intervals are for the government to decide, but some communities require post-occupancy documentation one year and five years after completion, while others require documentation at 18 months and 24 months after completion, as recommended by the International Green Construction Code (IgCC).[766]

EXAMPLE OF POST-OCCUPANCY DOCUMENTATION

Greenburgh, New York[767]

Under Greenburgh, New York's Green Building Initiative and Energy Construction Standards, applicants of relevant projects must submit documentation showing compliance with standards at several phases in the development process. Pre-permitting responsibilities include submitting checklists, worksheets, and other documentation that may be necessary to show compliance with the green building requirements (which include water efficiency standards). After submitting this documentation, they must meet with the Town's Green Building Compliance Official (GBCO) to discuss proposed green building measures prior to any public hearing regarding the site-plan application and may not obtain a building permit until the GBCO has approved the documentation. The applicant, owner, or tenant is also required to submit the following documentation:

- Prior to the issuance of a certificate of occupancy, verifying that the green building measures approved in the pre-permitting documentation were implemented
- After one year of occupancy of the building, showing that the building is being operated according to the previously approved efficiency and conservation standards
- After five years of occupancy of the building, showing that the building is being operated according to the previously approved efficiency and conservation standards

766 International Code Council, *2012 International Green Construction Code* § 611.3.4-5 (2012).

767 Town of Greenburgh, NY, Building Regulations, § 233-7 Compliance (2012), https://ecode360.com/13704934?highlight=green#13704934.

f. Offer Financial Incentives and Disincentives

As discussed in Chapter 14, *Non-Zoning Incentives*, communities can develop incentive programs that encourage property owners to complete substantial property changes to meet stringent water efficiency standards (e.g., to convert conventional landscapes to xeriscapes). Local and county governments can design incentive programs so they discourage the same or subsequent property owners from converting back to old landscapes. Because it is more cost effective to maintain water efficient changes than to convert back to conventional landscaping, this deterrent acts as a relatively effective enforcement mechanism of sorts, as does pairing the incentive with a requirement for removal of water inefficient systems and fixtures.

EXAMPLES OF SELF-ENFORCING FINANCIAL INCENTIVES

Austin, Texas

Through its WaterWise Landscape Rebate Program, Austin Water pays residents to swap out grass for more drought-resistant native plants. According to Austin Water, the program maintains and enforces itself.[768] The program requires participants who have removed grass to convert automatic irrigation spray heads to drip irrigation or to cap-off the zone completely. In order to revert to grass. the homeowner would have to put added work and money into re-installing automatic irrigation systems; therefore, the program embodies a natural financial incentive to maintain these new landscaping features rather than converting them back at some point in the future. Education has been an important element in maintaining the program. Residents are aware of frequent droughts and realize that grass requires a lot of water that could be used for other important functions. The state legislature also supports water efficient landscapes and their growing popularity. In Austin it is common to see water efficient landscapes more frequently than manicured lawns. As a result, the program does not need to provide a large amount of rebate money to create a major incentive, and new residents are likely to follow community norms and maintain these efficient landscapes.[769]

Aurora, Colorado

Aurora offers two rebates for landscape water efficiency: a xeriscaping rebate[770] and an irrigation rebate.[771] Customers who are interested in converting a grass lawn to xeriscape may be eligible for a rebate for the actual material costs. Eligible projects may only include properties that are highly visible to the public. In contrast, irrigation rebates are available on a first-come/first-served basis for the installation of rain sensors, soil moisture sensors, weather- and non-weather–based controls, pop-up sprinklers, slow-flow nozzles, and spray-drip conversions. Applicants can receive up to $850 in one year with a lifetime limit of $1,000. Large property applicants may receive up to $100 per zone for up to 50 zones, up to a maximum $15,000 rebate. These irrigation rebates

768 Telephone interview with Christopher Charles, Conservation Program Associate, Austin Water, (October 8, 2013). *See also*, Austin Water, Waterwise Landscape Rebate, http://www.austintexas.gov/sites/default/files/files/Water/Conservation/Rebates_and_Programs/WaterWise_Landscape_Residential_Rebate_Application.pdf (last visited January 28, 2016).

769 Austin Water, WaterWise Landscape Rebate http://www.austintexas.gov/sites/default/files/files/Water/Conservation/Rebates_and_Programs/WaterWise_Landscape_Residential_Rebate_Application.pdf (last visited January 28, 2016).

770 City of Aurora, CO, Xeriscape Rebate, https://www.auroragov.org/UserFiles/Servers/Server_1881137/File/Residents/Water/Rebates/Xeriscape/2016%20XR%20Program%20Manual.pdf (last visited Jan. 8, 2016).

771 City of Aurora, CO, Irrigation Rebate, https://www.auroragov.org/residents/water/rebates/irrigation/ (last visited Jan. 21, 2016).

are subject to an audit by Aurora's Water Conservation Division. The changes made under these rebate programs would cost property owners money and time to remove or convert back, so this incentive program is largely self-enforcing and serves as a disincentive for re-installing water-intensive landscaping.

Southern Nevada Water Authority[772]

The Southern Nevada Water Authority (SNWA) offers the most popular, most well-funded, and most successful (in terms of turf removal) program of its kind in the nation. Its Water Smart Landscapes Rebate (or "cash for grass") program has operated for about 15 years and has replaced more than 173 million square feet of turf grass (more than 3,000 football fields) with landscaping more appropriate for Nevada's arid climate. SNWA offers its customers a rebate of $2 per square foot of grass removed and replaced with desert landscaping up to the first 5,000 square feet converted per property per year and $1 per square foot beyond the first 5,000 feet, up to a maximum of $300,000 for any property in a single fiscal year. According to the program, every square foot of grass replaced with water-smart landscaping saves an average of 55 gallons of water per year. The rebates and tools offered by SNWA give property owners the opportunity to convert to water-friendly landscapes more quickly, efficiently, and cheaply than they would be able to achieve otherwise. The rebate program has helped the community save billions of gallons of water by converting more than 179 million square feet of lawn.

g. Offer Stormwater Management Fee Reductions

While traditionally thought of as a water-quality mitigation technique, stormwater management via green infrastructure and low-impact development can play a role in reducing water demand. This is achieved when stormwater runoff is directed to vegetation that would otherwise require supplemental irrigation or help recharge aquifers that provide for the community's water supply. Local governments can create stormwater management programs that control runoff from residential properties through a fee and fee-reduction approach. Under such programs, customers are charged a stormwater utility cost based on a property's total impervious surface. A reduction in costs is then offered to those who employ stormwater control measures such as green infrastructure techniques like rain gardens and bioswales.

EXAMPLE OF STORMWATER MANAGEMENT FEE REDUCTION

Northeast Ohio Regional Sewage District[773]

The Northeast Ohio Regional Sewage District has an individual residential property credit. Customers receive a reduction in stormwater management fees if they take measures to reduce stormwater runoff from their property. Credits are obtained through the installation and continued use, operation, and maintenance of an approved stormwater control measure such as rain gardens, onsite stormwater storage, pervious pavement, and vegetated filter strips — all green

772 Water Smart Landscapes Rebate, Southern Nev. Water Auth https://www.snwa.com/rebates/wsl/index.html. (last visited July, 21, 2016).

773 Northeast Ohio Regional Sewer District, Stormwater Management Program: Individual Residential Property Credit (2012), http://www.neorsd.org/I_Library.php?SOURCE=library/Individual_Residential_Property_Credit_manual_121112.pdf&a=download_file&LIBRARY_RECORD_ID=5692.

infrastructure measures that aid in groundwater recharge. Maintenance guidelines are provided, which include some simple maintenance measures to maintain efficiency such as cleaning gutters, checking hoses, and winterizing structures. After three years, recertification is required to receive credits. If ownership of the property changes, a new application must be submitted in order to receive the credit.

h. Provide Property Tax Abatements

In some states, local governments can provide a property tax abatement to incentivize the maintenance of water efficient landscapes (also discussed in Chapter 14, *Non-Zoning Incentives*). Through such programs, residents who build or alter their property to increase water efficiency (such as by building or renovating to meet established green building standards) and thereby increase their property value can be eligible for a yearly tax abatement program that requires maintenance and inspections.

EXAMPLES OF PROPERTY TAX ABATEMENTS

New York, New York

The New York City Green Roof Property Tax Abatement Program offers property tax abatements to owners who install green roofs (covering at least 80% of the roof) on their buildings. The program also requires a maintenance plan that includes semi-annual inspections, plans for plant replacement, monthly inspections of drains, and maintenance of green roofs for a minimum of four years.[774]

Although this example does not relate directly to water conservation, it is offered because of the transferability of this concept. Local governments could put similar constraints on a tax abatement program for water conservation — offering a tax abatement but requiring an annual inspection to ensure that the water conservation features for which the abatement was originally received are being maintained and properly utilized.

i. Use Water Conservation Districts

Local governments may use water conservation districts to impose affirmative obligations to maintain existing landscapes and enforce local laws and regulations through inspections. Board members for the water conservation district, enforcement officials, or inspection agencies can perform inspections to check that residents are complying with the conservation districts' regulations and guidelines.

774 N.Y.C. Dep't of Bldg.'s, New York City Green Roof Property Tax Abatement Program, http://www.nyc.gov/html/gbee/html/incentives/roof.shtml; *See also*, N.Y. State Assembly, *An Act to Amend the Real Property Tax Law, in Relations to a Green Roof Tax Abatement for Certain Properties in a City of One Million or More Persons*, A6709 (2016), http://assembly.state.ny.us/leg/?bn=A06709&term=&Summary=Y&Actions=Y&Votes=Y&Memo=Y&Text=Y.

EXAMPLE OF USING CONSERVATION DISTRICTS TO IMPOSE LANDSCAPE OBLIGATIONS

Pennsylvania Conservation District

Under the Pennsylvania Conservation District Law, the Pennsylvania Association of Conservation Districts and the Board of Directors for each conservation district within Pennsylvania can enter public or private property to make inspections to ensure compliance with Clean Streams Law and Dam Safety and Encroachment Act.[775]

j. Engage Homeowners Associations

Local and county governments can work with HOAs to enforce landscape requirements. HOAs, which manage a large amount of residential property all over the U.S., can regulate a property owner's construction and operation activities, require maintenance of specific landscapes, impose fines, and bind future property owners to rules established to uphold water efficiency.

Communities may work directly with HOAs, encouraging them to impose restrictions and conditions that will promote native plant growth, water efficient landscapes, ongoing maintenance of water efficient irrigation systems, payment of service fees related to such systems, as well as other measures to offset water demand. For example, this could be done through the Conditions, Covenants, and Restrictions (CC&Rs) of the HOA to be formed before a certificate of occupancy is issued. CC&Rs run with the title to the land, binding future homeowners, and they can be enforced by the HOA or by individual owners. CC&Rs are used to regulate the use, appearance, and maintenance of the property and often include lawn maintenance standards. CC&Rs may even be used to require the maintenance of an inventory of replacement parts for water efficient fixtures and fittings and periodic notices to homeowners of the availability of these parts in order to avoid the purchase of incorrect after-market replacement parts by homeowners, which can significantly decrease efficiency.[776]

Where a local or county government has approved a common interest development that will include water conservation measures, the CC&Rs become critical to ensuring ongoing maintenance of those measures. Not only can communities work with builders and HOAs for new development to include water efficiency within CC&Rs but, because CC&Rs can be changed by a vote from the community of homeowners, local and county governments may also work with HOAs for existing developments to encourage the adoption of such measures. Because implementation and enforcement of CC&Rs is in the hands of the HOA and individual homeowners, obtaining true buy-in is critical. Where communities use development agreements to require HOAs to include specific provisions, there is a potential risk of lax enforcement, in which case, enforcement would fall to the local or county government. Where the local government has the political will and the bandwidth to enforce such measures, a local ordinance would be a more straightforward approach than relying on HOA CC&Rs.

Alternatively, communities could form public-private partnerships with HOAs for the purpose of

775 Pa. Ass'n of Conservation Dist.'s, § 9(17) Powers of Districts and Directors, https://pacd.org/wp-content/uploads/2009/06/217.pdf.

776 John Olaf Nelson, *Zero Footprint Design for Urban Development Project*, 12, https://www.scribd.com/document/19003252/Zero-Footprint-Design-for-Urban-Development.

increasing public and private attention to and investment in open space located in HOA boundaries. Public investment could be made in such spaces in a way that improves water conservation.

EXAMPLES OF HOW TO ENGAGE HOMEOWNERS ASSOCIATIONS

Phoenix, Arizona

The Mountain Park Ranch Homeowners Association in Phoenix, Arizona imposes specific landscaping rules. Properties must be maintained in a neat and attractive condition. Each homeowner is responsible for maintaining their property and keeping it free from weeds, trash, dead plants, and unsightly materials. The association requires all homeowners to blend their landscape design with the natural desert environment and requires that finished landscaping be either "turf" or "desert," as defined by the Association's rules. Homeowners are urged to use plant materials, irrigation systems, and maintenance practices to conserve water. The Board of Directors is responsible for rule enforcement and must take appropriate actions for all violations.[777] Such actions include lawsuits and fines if the property owner fails to comply with the HOA's Landscaping Rules by the designated date established by the Board of Directors.

Although this example does not include a government role (and although it allows for turf in a desert landscape), it is offered because of the transferability of this concept. Communities could — through a development agreement or other mechanism — require the developer of such a project to include water conservation measures in the Covenants, Rules, and Restrictions of the HOA to be formed before a certificate of occupancy is issued. These water conservation measures could include the types of provisions contained in the examples here or any other best practices.

Greenbelt, Maryland

The City of Greenbelt, Maryland, through a joint-use agreement with its most established HOAs, formed a public-private partnership to increase the quality, accessibility, and equipment safety of playgrounds.[778] The agreement addresses liability, insurance, and cost-sharing concerns and promotes public investment in privately owned playgrounds. This partnership has resulted in increased public and private attention to and investment in playgrounds. Public investment in playgrounds located in the HOAs has resulted in improved facilities and increased local property values.

Although this example does not relate directly to water conservation, it is offered because of the transferability of this concept. Local and county governments could form a similar public-private partnership to increase water conserving landscapes.

State of Colorado

The Colorado Common Interest Ownership Act works to create effective and efficient operation of HOAs. Under the Act, HOAs are not allowed to prohibit the use of xeriscaping or drought-tolerant, vegetative landscapes that provide ground covering. HOAs may adopt and enforce design or aesthetic guidelines or rules that require drought-tolerant vegetative landscapes or regulate the

777 Mountain Park Ranch Homeowners Association, http://mtparkranch.org/wp-content/uploads/2015/08/Rules-for-Community-Living.pdf (last visited Jan. 26, 2016).

778 Joint-Use Agreements with Home Owner Associations, https://media.kaboom.org/docs/documents/pdf/playmatters/Play_Matters_Greenbelt.pdf.

type, number, and placement of drought-tolerant plantings and hardscapes that may be installed on a unit owner's property.[779]

Although this is an example of state authorization, local and county governments could achieve similar results through development agreements. During the development approval process, communities could enter into a development agreement with the developer of an HOA that includes water conservation requirements such as the installation of drought-tolerant landscaping. Similarly, the development agreement could require that the HOA include within its Covenants, Rules, and Restrictions a covenant requiring unit owners to install or maintain water conservation features. Where the HOA or unit owners fail to comply, the government could bring an enforcement action. See Chapter 13, *Development Agreements*, for more on development agreements.

Danville, California

Alamo Creek, a development project in Danville California, was located in an unincorporated part of Contra Costa County near the East Bay Municipal Utility District (EBMUD). Because of its location, no entity was required to supply water for the development project. EBMUD was the closest water provider but would only agree to provide water to the development if the developer agreed to stringent water conservation requirements. In the development agreement, EBMUD required zero-net impact with a 2:1 offset (two gallons saved for each gallon used). Alamo Creek complied with the offset requirements in a number of interesting ways, including that planned onsite conservation for both residential and nonresidential applications included high-efficiency appliances (including toilets, urinals, showerheads, kitchen faucets, washing machines, and dishwashers), low-water-using landscapes, artificial turf soccer field, and irrigation controllers.[780] The developer also prepared a set of CCRs to ensure that the onsite conservation would be permanent.[781] The CCRs indicate that each water meter has a water budget based on the type of connection, building size, and lot size.[782] If the water budget for the entire development exceeds 0.45 mgd by 20% in a given year, the HOA will receive a penalty water bill and will be given access to readings of all individual meters. The HOA can then pay the penalty collectively or allocate it to the over-budget accounts. As homes in Alamo Creek have sold, the new owners have continued to follow the water-saving requirements.[783]

Although this example reflects an agreement between a water provider and a developer, the same type of requirements could be contained in a development agreement with a local or county government.

779 Colo. Rev. Stat. § 38-33.3-106.5(1)(i)(I) (2013) (amending the Colorado Common Interest Ownership Act of 1992), https://www.cohoalaw.com/wp-content/uploads/sites/532/CCIOA%20-%202006%20annotated.pdf *See also, Colorado Common Interest Ownership Act*, Kirch & Rounds, PC., https://dwkpc.net/client-forms-resources.

780 EBMUD Water Conservation Master Plan, § 31, 31A-B (2011), https://www.ebmud.com/index.php/download_file/force/1465/1225/?EBMUD_WCMP202011.pdf. Specific requirements included: total turf area must be less than 25% of irrigated areas; non-turf areas must be 80% native or low-water use plants; toilets must use no more than 1.28 gpf; urinals must be used no more than 0.5 gallons per flush; showerheads must have a flow rate of 2.5 gpm or less; and kitchen faucets must have a flow rate of 2.2 gpm or less.

781 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A literature Review & Case Study Compilation, 21 (Jan. 2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

782 Alliance for Water Efficiency, Water Offset Policies for Water-Neutral Community Growth: A literature Review & Case Study Compilation, 21 (Jan. 2015), http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9167.

783 Margaret Buranen, *Contract for Conservation*, Water Efficiency (May 1 2009), http://www.waterefficiency.net/WE/Articles/Contract_for_Conservation_6912.aspx.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