STUDY SESSION MEMORANDUM

TO: Mayor and Members of City Council

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DATE: December 12, 2024

SUBJECT: Introduction to Waterwise Landscaping Policy and Code Update Project and Scope Discussion

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EXECUTIVE SUMMARY

The purpose of this item is to present best practices research and seek feedback on the scope for the Waterwise Landscaping Policy and Code Update.

City Council identified Wildfire Hardening & Waterwise Landscaping Policies & Regulation as one of its 2024-2025 work program priorities. At its retreat, Council agreed to establish a priority that encompasses a review of policies and regulations focused on wildfire hardening strategies (building and properties) and waterwise landscaping (such as native plant use). While combined into one council priority, these are being managed as two discrete projects: wildfire hardening and waterwise landscaping. This memo and agenda item focuses on the waterwise landscaping project.

The project kicked off this fall and is a multi-departmental collaborative effort. A thorough review of best practices, an audit of Boulder's current requirements, and recommendations to support waterwise landscaping in Boulder have been developed and are available in **Attachment B**.

The city has a long history of efforts to support water conservation as evidenced by the community's voluntary achievement of 30 percent savings over the past 20 years. However, the landscaping standards in the land use code have not been significantly updated since 2003. Additionally, the Colorado legislature passed SB24-005 this year, which prohibits certain landscaping practices in support of water conservation goals. This project will focus on the policy and regulatory changes that could further support waterwise landscaping throughout the city, ensure that Boulder's codes align with the new state bill, and align with updates related to wildfire hardening.

QUESTIONS FOR CITY COUNCIL

Staff is seeking input and direction from City Council to guide the development of a draft ordinance.

1. Does City Council have feedback on staff's recommended considerations for the scope of work?
2. Does City Council support exploring expanding the applicability of the state bill prohibition on nonfunctional turf, artificial turf, and invasive plants to apply to all new multifamily residential development, in addition to the commercial, institutional, common interest communities, and industrial uses as required by the bill?

BACKGROUND

City Council identified Wildfire Hardening & Waterwise Landscaping Policies & Regulation as one of its 2024-2025 work program priorities. At its retreat, Council agreed to establish a priority that encompasses a review of policies and regulations focused on wildfire hardening strategies (building and properties) and waterwise landscaping (such as native plant use).

In the 2024-2025 Council Retreat Summary, staff recommended approaching this council priority in the following ways:

1. Review existing best practices for resilient landscape policies, incentives, education and regulation - *Q4 2024*
2. Work across departments to identify potential operational enhancements, education and incentive programs, and resources, including leveraging grants in support of the two focus areas - *Q4 2024*
3. Review code revision options as part of the scheduled updates to the International Building Codes (including the Fire Code and International Wildland Urban Interface Code) - *Q1 2025*
4. Review other code updates as they relate to resilient landscapes and wildfire hardening and bring forth potential tweaks that would make progress while limiting enforcement need - *Q4 2025*

Staff described at the council retreat some limitations in combining two areas of policy and code review and potential revisions on a reasonable timeline. Staff also noted the significant enforcement aspect to any regulatory schemes that relate to waterwise landscaping amongst single family homes that will be important to explore. Staff noted at

the retreat that focusing efforts on education and incentives to allow individuals to take action in the short-term may be the most effective tools, versus regulation.

Project Issue and Purpose

Issue

The city's landscaping regulations in the land use code have not been significantly updated since 2003. That update was accelerated in response to drought conditions to focus on xeriscape standards and was intended to promote water conservation and protect mature trees. After over 20 years, it is due time to review these existing policies and regulations and identify potential improvements that could further promote water conservation while also supporting the city's ecosystem services.

Purpose

Evaluate Boulder's existing landscaping regulations, policies, and programs in meeting the goal of enhanced water conservation to support Boulder's long-term water supply strategy. Explore updates that further support water conservation through landscaping practices, by adopting landscape regulations that promote climate adapted and water efficient landscapes, and by identifying educational programs and incentives for community members.

Plan and Policy Framework

Water Efficiency Plan

The Water Conservation Act of 2004 requires certain entities like Boulder to have a state approved water efficiency plan containing required minimum plan elements. All plans must be updated every seven years. The city recently updated its Water Efficiency Plan in early 2024. The plan proposes new water conservation programs aimed at reducing water loss in the city's distribution system as well as improving incentives and educational community programs to support conserving water. The city will implement the updated plan over the next seven years.

The Water Efficiency Plan identified the following programs for further evaluation and potential implementation and included promoting municipal code updates:

- Integrate water conservation into other planning efforts
- Investigate non-revenue water and strengthen water loss program
- Evaluate customer water budgets
- Perform feasibility study for Advanced Metering Infrastructure (AMI)
- Assist customers with fixture/appliance upgrades
- Improve water efficiency of municipal irrigation
- **Evaluate municipal code for water efficiency improvements**
- Enhance water efficiency communication
- Expand demonstration garden program
- Set up landscaper water efficiency training program

- Enhance customer support
- Build water conservation partnerships with existing community groups

The Water Efficiency Plan further describes the municipal code evaluation:

> *Boulder staff will evaluate its current Municipal Code, rules, regulations, and ordinances to identify sections that could be modified to better integrate and support efficient water use. Staff will work with other stakeholders and departments to develop recommended updates for consideration. Ordinances and regulations prepared by other local water providers may be reviewed for applicability within Boulder and can serve as examples for consideration. Staff will generate an internal report on recommendations.*

Sustainability, Equity, and Resilience Framework

While many of the policies in the Sustainability, Equity, and Resilience (SER) Framework are related to waterwise landscaping, the following policies align specifically with the intent of this project:

Safe

A welcoming and inclusive community that fosters positive neighborhood and community relations and ensures that all residents are secure and cared for during emergencies and natural disasters. Public infrastructure is well-maintained and reliable, and natural resources like water, air, and land are protected.

- Builds and maintains resilient infrastructure, landscapes and neighborhoods to mitigate existing and future hazards and risks.

Livable

High-performing, safe, and well-maintained buildings and infrastructure that accommodate a diverse set of community needs for working, learning, playing, and living.

- Encourages sustainable and well-regulated development of buildings supported by reliable and affordable city services and public infrastructure.

Environmentally Sustainable

A sustainable, thriving, and equitable community that benefits from and supports clean energy; preserves and responsibly uses the earth's resources; and cares for ecosystems.

- Accelerates progress towards the community's ambitious climate and energy goals through a culture of shared environmental stewardship across Boulder.
- Ensures the efficient use of natural resources in a manner that does not deplete them over time while reducing the proliferation of non-reusable materials, toxins, and hazardous products.

Boulder Valley Comprehensive Plan

The Boulder Valley Comprehensive Plan (BVCP) is the overarching policy document for the city. Several relevant policies are adopted within the BVCP, with the following most directly applicable to this project:

Natural Environment Policy 3.11 Urban Environmental Quality

To the extent possible, the city and county will seek to protect the environmental quality of areas under significant human and urban influence and will balance human needs and public safety with environmental protection. The city will develop and apply community-wide programs and standards for new development and redevelopment so that negative environmental impacts will be mitigated and overall environmental quality of the urban environment will be maintained and improved.

Natural Environment Policy 3.12: Urban Forests

The city will support, promote and, in some cases, regulate the protection of healthy existing trees and the long-term health and vitality of the urban forest in the planning and design of public improvements and private development. Urban canopy plays an important role in ameliorating the effects of climate change; therefore, the city will guide short- and long-term urban forest management that encourages overall species diversity and low water demand tree species.

Natural Environment Policy 3.13: Water Conservation

The city and county will promote the conservation of water resources through water quality protection, public education, monitoring and policies that promote efficient water usage such as water-conserving landscaping. The city will endeavor to minimize water waste and reduce water use during peak demand periods. New development and redevelopment designs to conserve water will be encouraged.

Natural Environment Policy 3.26 : Protection of Water Quality

Water quality is a critical health, economic and aesthetic concern. The city and county have been protecting, maintaining and improving water quality and overall health within the Boulder Valley watersheds as a necessary component of existing ecosystems and as a critical resource for the human community. The city and county will continue to reduce point and nonpoint sources of pollutants, protect and restore natural water systems and conserve water resources. Special emphasis will be placed on regional efforts, such as watershed planning, and priority will be placed on pollution prevention over treatment.

Natural Environment Policy 3.27 Water Resource Planning & Acquisition

Water resource planning efforts will be regional in nature, consider climate change and incorporate the goals of water quality protection as well as surface and groundwater conservation. The city will use a variety of strategies, such as water conservation, demand management, reuse and acquisition of additional water supplies to meet the adopted municipal water supply reliability goals while balancing in-stream flow maintenance and preservation of sustainable agriculture. The city will seek to

minimize or mitigate the environmental, agricultural and economic impacts to other jurisdictions and seek to prevent the permanent removal of land from agricultural production elsewhere in the state in its acquisition of additional municipal water rights. The city and county may continue to acquire water rights for Open Space purposes.

Economy Policy 5.12: Sustainable Business Practices

The city and county will support sustainable and energy-efficient business practices and establish and maintain programs to assist businesses in exploring solutions to sustainable practices. Potential solutions for exploration include reducing waste and GHG emissions, increasing building energy efficiency (in existing or renovated structures), conserving water, reducing transportation impacts, and procuring local, recycled and compostable materials, products and services

Local Governance and Community Engagement Policy 10.01: High-Performing Government

The city and county strive for continuous improvement in stewardship and sustainability of financial, human, information and physical assets. In all business, the city and county seek to enhance and facilitate transparency, accuracy, efficiency, effectiveness and quality customer service. The city and county support strategic decision-making with timely, reliable and accurate data and analysis.

Boulder's Current Water Conservation Efforts

The Water Efficiency Plan described above also comprehensively lists all of the city's current water conservation efforts:

Category	Program
Foundational	Meter of all water taps
	Track monthly meter reads and water billing
	Track water use by customer type
	Maintain customer water budgets
	Track system loss with annual AWWA M36 Water Loss Audits
	Maintain and repair distribution system
	Plan for water infrastructure improvements and implement Boulder's existing Drought Plan, Water Utilities Master Plan, and Source Water Master Plan
	Maintain membership with EPA WaterSense
Technical Assistance and Incentives	Provide matching funding for City projects that focus on water savings ($50,000 Annual Fund)
	Work with PACE to offer commercial/institutional water customers commercial water use audits, free faucet aerators and pre-rinse spray valves, and rebates for commercial dishwashers and ice machines

Category	Program
	Work with Resource Central to offer Garden-In-A-Box Program, Lawn Replacement Program, and Slow-the-Flow outdoor irrigation audits
	Use of raw water for irrigation – Parks and Recreation
Rules and Ordinances	Boulder Municipal Code 11-1-25.5 – Duty to Avoid Waste of Water and to Maintain Service Lines and Fixtures
	Turf restrictions in multiple Boulder code provisions – minimum width, maximum percent of lot, maximum slope allowed for turf
	Perform as-built inspections of landscapes associated with a building permit
Education and Outreach	Work with Resource Central to offer water customers Waterwise Yard Seminars
	Communicate water efficiency topics to customers via social media and bill stuffers
	Attend water fairs and support K-12 classroom education on water efficiency, primarily supported by Boulder's partnership with Eco-Cycle
	Maintain Boulder's Water Conservation Website
	Maintain xeriscape demonstration gardens

In addition to these items and programs identified for further evaluation and potential implementation in the Water Efficiency Plan, staff from Climate Initiatives and Parks and Recreation - Forestry are working to develop landscaping guidelines for fire-prone areas, as well as working on pollinator, water retention, and tree retention projects. As part of this council priority project, a goal is to ensure that all city plant lists and recommendations are aligned and complementary.

Landscape Plan Review

Landscape plans are required to be submitted for most building permits, as well as most reviews required by the land use code (Use Review, Site Review, etc.). There are different thresholds for which requirements apply depending on the scope of the project:

Scope	Threshold	Landscape Plan Requirements
New Construction	Always Reqiured	All Requirements
Addition	Permit Value >25% of Assessor's Actual Structure Value	Street Trees Only
Addition	Permit Value >50% of Assessor's Actual Structure Value	Street Trees & Front Yard Setback
Addition	Permit Value >75% of Assessor's Actual Structure Value	All Requirements
Remodel (no addition of floor area)	Permit Value >100% of Assessor's Actual Structure Value	All Requirements

The city currently has one full-time employee who reviews all landscape plans for compliance with the standards in the land use code and conducts all inspections to confirm compliance post-installation. In 2023, the city's landscape architect reviewed 545 building permits, 132 planning cases with landscape review, and completed 268 inspections.

Water Efficiency Fund Program

The city's Water Conservation Program within the city's Utilities department strives to promote wise uses of water to ensure this finite resource is sustainable for generations of Boulder community members. The Water Efficiency Fund Program is administered by the Utilities department and was developed to incentivize city departments to invest in water saving efforts.

P&DS staff successfully obtained funding through the city's Water Efficiency Fund Program to secure consulting assistance to review existing best practices for landscape code updates and assist with implementation of SB24-005. Recently, the Water Efficiency Fund has also supported the Parks & Recreation and Transportation & Mobility departments in irrigation system efficiency upgrades, replacement of infrastructure to support non-potable irrigation, and conversion of a large annual flower bed to a native perennial water-wise garden that supports pollinators.

State Legislation

The state has recently passed bills that impact water conservation and specifically relate to turf. In 2022, HB22-1151 created the Turf Replacement Program. The program provides financial incentives for voluntary replacement of irrigated turf with "water-wise landscaping," the practice of using plants with lower water needs. The Colorado Water Conservation Board has launched funding to support new and existing community programs aimed at helping eligible entities (local governments, districts, nonprofits, and tribes) replace nonfunctional turf to reduce outdoor watering. The program does not apply to individuals or Homeowners Associations. The City of Boulder has received funding from the Colorado Water Conservation Board through HB22-1151 to support residential lawn replacement rebates and a non-chemical native turf conversion project.

Additionally, this year the state passed SB24-005, "Prohibit Landscaping Practices for Water Conservation." The bill states that beginning January 1, 2026, "a local entity shall not install, plant, or place, *or allow* any person to install, plant, or place, any nonfunctional turf, artificial turf, or invasive plant species, as part of a new development project or redevelopment project, on any portion of applicable property within the local entity's jurisdiction." This only applies to commercial, institutional, or industrial property, Common Interest Community property (common areas owned by an HOA or similar), or a street right-of-way, parking lot, median, or transportation corridor. The state bill does not apply to residential uses.

In the bill, nonfunctional turf is defined as turf that is **not** located in a recreational use area or other space that is regularly used for civic, community, or recreational purposes. In contrast, examples of *functional* turf include: playgrounds; sports fields; picnic grounds; amphitheaters; portions of parks; and the playing areas of golf courses.

ANALYSIS

The following section will provide background information on the focus areas of the updates as well as the key questions for City Council input.

Current Code Audit

The city's consultant, Martin & Wood Water Consultants, thoroughly audited Boulder's existing landscaping standards and relevant water regulations. Acknowledging that Boulder's landscaping standards were relatively progressive when adopted in 2003, there are several positive features in the current code that support water efficiency:

- Limit high water use turf to 25% of landscaped area for most new projects
- Do not allow turf on steep slopes or narrow strips
- References xeriscaping landscaping principles

However, the consulting team identified several initial opportunities for improvement:

- Compliance with SB24-005
- Requirements are not as prescriptive as other municipalities
- No approved drought-tolerant or native plant list to accompany the landscape code
- No formal program for temporary establishment irrigation
- No standards for irrigating frequency or maintenance
- No certification requirements for landscapers
- No requirements related to firewise landscaping

More details on the code audit can be found in **Attachment B.**

Best Practices

After auditing Boulder's current code, the consulting team completed a literature review including model ordinances and guidance documents to develop a general list of best practices for water efficient landscaping codes. A list of typical best practices is included in **Attachment B**.

Next, the consulting team reviewed water regulations of eight cities: Aspen, Aurora, Broomfield, Castle Rock, Colorado Springs, Fort Collins, Bozeman, Montana, and Moab, Utah. The referenced codes and standards were selected because they were comprehensive, reflected communities with similar hydrological conditions or similar demographics, or have been commonly referenced by or recently updated in partnership with organizations at the forefront of outdoor water efficient codes.

The codes of each city were reviewed and summarized based on the following key topic areas:

- Applicability of Landscape Requirements

- Landscape Standard and Code Structure
- Establishment Irrigation Program
- Pre-Construction Landscape Plan and Enforcement
- Soil and Mulch Standards
- Plant Materials
- Turf Standards
- Irrigation System Design
- Irrigating Frequency/ Maintenance Standards
- Landscaping Professional Certification
- Firewise Landscaping Standards

SCOPE CONSIDERATIONS

The following summarizes the consultant's best practice recommendations for council's consideration in guiding the future direction of this project. Staff's initial assessment of potential city resource impacts has been included for each as well.

Code Structure

- Boulder should consider developing a separate standards reference document for adoption in conjunction with planned code updates, to allow for ease of future updates and future adaptability. This standards document would be referenced in the land use code.
- *Potential city resource impacts: This recommendation is not expected to involve more staff time than incorporating all standards in the land use code. It is anticipated that future updates in a separate standards document would be more efficient than if all standards are located in the land use code and require ordinance adoption to modify.*

Nonfunctional Turf Bill Implementation

- Boulder should adopt regulations in line with SB24-005 to prohibit nonfunctional turf on commercial, industrial, institutional, transportation (parking lots, medians, street rights-of-way, transportation corridors) properties or areas, and "common interest properties" (HOA common space) by 2026.
- Boulder should consider adopting a more detailed definition of nonfunctional turf than is provided in the state bill and determining definitions of invasive species.
- Boulder should consider expanding the applicability of the prohibition to include all multi-family residential properties, rather than just common interest properties, commercial, industrial, and institutional uses in the state bill. Defining multi-

family residential would be required. Typically, 2 units or above or 4 units or above are used.

- Boulder should also consider restricting the installation of any artificial turf to replace existing living landscapes beyond the locations identified in the bill.
- *Potential city resource impacts: This recommendation is expected to have a medium level of effort for implementation and would be implemented through a land use code change. It will impact staff time reviewing land use submittals.*

Landscape Water Efficiency Standard

- Consider adopting a landscape efficiency standard (called a "landscape water budget" in **Attachment B** and "water budgets" in some other communities) for some or all landscape plan submittals to ensure that projects meet water efficiency requirements. This allows property owners and landscape professionals to better understand specific water needs for different plants and landscaping features, manage irrigation, and manage water use while maintaining a healthy landscape.
- The work to develop a landscape water efficiency standard includes developing a plant list that classifies plants by water use, developing a standard application template or downloadable worksheet for use in the permit review process, and establishing a maximum water efficiency standard for landscapes (based in gallons of water per square foot of land per season). Additional application elements may include irrigation efficiencies based upon irrigation method for each hydrozone, local reference evapotranspiration, and water features.
- Staff could also explore a simplified version of this concept to reduce administrative and staff burden, which would entail requirements around minimum percentage of land that is planted with low water use plants.
- *Potential city resource impacts: This recommendation is expected to have a high level of effort to implement, including increased staff development review time and the need for additional staffing resources. There may potentially be barriers to implementation due to existing complexity with, and possible confusion of, the city's existing water budget policy.*

Soil Amendment Standards and Testing

- Boulder should consider strengthening its current soil standards to require that soil testing be completed and submitted along with soil amendment recommendations and plans for new and redeveloped landscapes.
- Appropriate soil amendments are difficult to implement after landscape has been installed and are critical to supporting a healthy landscape, increasing irrigation efficiency and plant health, and supporting appropriate drainage.
- *Potential city resource impacts: Enhanced soil testing and amendment requirements would increase staff review time, requiring additional staffing to*

support. Additional staff would also be needed to implement an inspection function, without which there would be no assurances of compliance.

Mulch Standards

- Boulder should consider more prescribed mulch standards to further encourage the use of organic mulches and to allow for limited rock mulch in only limited non-planting areas or in the Wildland Urban Interface (WUI) as needed for fire safety.
- Organic mulch is valuable for water efficiency and ecosystem services because it can support plant health by retaining moisture and cooling soils and it mimics the natural ecosystem.
- *Potential city resource impacts: While initial staff time will be required to develop more detailed mulch standards and integrate them into a code update, the subsequent additional anticipated review is not expected to increase significantly. However, inspection and enforcement staffing resources needed to ensure initial and sustained compliance could be significant.*

  Additionally, citywide policy and familiarization efforts would be required to ensure compliance by city construction and capital improvement projects, and potential new operational practices may need to be developed for departments such as Transportation and Mobility, Facilities and Fleet, and Parks and Recreation, with potential resource and budgeting implications.

Temporary Irrigation Zone Allowance

- Boulder should consider allowing for a portion of the landscape to have temporary irrigation over a maximum three-year establishment period for native plantings which require no supplemental water use. This can be implemented either through administrative approval via the landscape plan and landscape water budget or through a signed agreement or contract between Boulder and the applicant. There are several methods to achieve this that would need to be further analyzed by staff to determine the appropriate route.
- Temporary irrigation supports the healthy establishment of very low or no supplemental water use plant species, reducing long-term water use and supporting native ecosystems.
- This strategy would also need to be evaluated in terms of impact on trees, most of which need permanent irrigation systems to establish and thrive in Boulder.
- *Potential city resource impacts: Staff time requirements will depend on the needed level of review, which will be influenced by application requirements, process, and whether a signed agreement is required to approve temporary irrigation. Internal tracking of approved temporary irrigation will require additional staff time. Additional staff time should be weighed against potential water conservation benefits.*

Firewise Standards

- Boulder should incorporate firewise standards and plant requirements into the Municipal Code, such as requiring low-flammability plants in certain areas.
- *Potential city resource impacts: Some initial staff time to develop the standards and plant list as part of a land use code update, and additional review time for plans to ensure compliance.*

Professional Training and Certification Requirements

- Boulder should consider offering a no-cost, bilingual training program focusing on water efficient landscape and irrigation design and installation to landscape and irrigation professionals who work in Boulder. This training may focus on local hydrologic conditions and water supplies, plant selection and proper installation, irrigation system design and installation best practices, and provide an overview of Boulder's landscape and irrigation standards.
- As a more advanced best practice, this training could be offered and required or highly encouraged for all landscape and irrigation professionals completing work in Boulder. Boulder should consider any certification or registration requirements for landscaping professionals and/or irrigation professionals 1) preparing designs submitted through landscape and irrigation plans and 2) installing landscaping and irrigation systems approved under the submitted plans.
- Note that this was also a recommended implementation step of the city's Water Efficiency Plan.
- Staff is currently reaching out to other cities who have implemented training and certification programs to learn more about their experiences.
- *Potential city resource impacts: This is anticipated to have a high level of city effort to implement. The development of and hosting of a professional landscape and irrigation training program will require additional staff time and may also require external contracting support. If professionals completing this training will be registered with Boulder to satisfy any training requirements, staff time to manage this registration is required. Beyond the local training, any external certification requirements will also require additional staff time to verify and potentially manage a professional registration list.*

Watering Schedules

- Boulder should consider designating a maximum number of days per week that each customer can water and restrict watering during certain hours of the day. Maximum number of days per week reduces water use, and if implemented along with assigned days of the week (for example, odd addresses water Tuesday, Thursday, Saturday) can help with water treatment plant peaking concerns.
- Limiting watering to only late evening through early mornings when temperatures are lower increases irrigation efficiency, improving plant health and reducing

water use. This could potentially only apply seasonally to allow for winter watering.

- Boulder should consider whether these maintenance guidelines are required through code, or if they are unenforced efficiency recommendations.
- *Potential city resource impacts: Staff time will be required to develop these recommendations and for all communication and outreach to inform water users of these recommended or required schedules. Enforcement of a day of the week and time of day watering schedule is difficult and, if proactively, would require an enforcement staff.*

Flexibility for Small Landscaping Projects

- Boulder should avoid adopting code language which applies to small "do it yourself" landscaping or irrigation projects. Boulder should consider explicitly exempting some existing property landscape modifications from certain requirements and standards to avoid inconsistent enforcement across properties. If small installations occur on an existing property, enforcement of any standards or permit requirements may be difficult or impossible.
- *Potential city resource impacts: Developing these exceptions would require staff time during the code update. Ongoing support for allowing small do-it-yourself landscape projects likely will not require additional staff time to support.*

Additional Recommendations and Considerations

- Maintain and expand on existing turf restrictions: Boulder has had successful turf restrictions for over 20 years. These could be further expanded by setting a limit on a maximum total landscaped area with turf, rather than just relying on a percentage limit. This would not be expected to impact city resources.
- Waste of water penalties: Boulder should consider whether stronger waste of water enforcement is consistent with City values and goals. Waste of water requirements and penalties can serve as an enforcement mechanism for some landscaping and irrigation requirements and is an important water efficiency measure.
- *Potential city resource impacts: Developing stronger penalties and an enforcement mechanism would require additional enforcement staff, along with finance, court, and administrative resources.*

Request for Council Input

Staff is seeking City Council’s input on which of the above best practice recommendations are of most interest in further exploring.

COMMUNITY ENGAGEMENT

As described above, the city's Water Efficiency Plan was completed earlier this year and a summary of community engagement is included in the plan. The planning process included community engagement activities such as online questionnaires, stakeholder meetings, and staff workshops. As there is significant subject matter overlap, the feedback received through the Water Efficiency Plan process will inform next steps, but will also be supplemented by further engagement efforts specific to the landscape code update.

The project charter in **Attachment A** outlines some of the engagement strategies being explored. Initial ideas for engagement include participation in the state's Water Conservation Board-funded technical advisory committee, and incorporating both in-person and virtual engagement efforts on project options. Staff will further develop an engagement plan based on the scope of work determined by council. The city's racial equity instrument has also been initiated to guide efforts in this project, limit any disproportionate burdens, and advance racial equity.

NEXT STEPS

Staff is also scheduled to attend the December 17 Planning Board meeting and January Water Resources Advisory Board meeting to introduce the project and receive initial guidance. Staff is planning to return to City Council in mid-2025 to discuss potential land use code changes along with the wildfire hardening project. The goal is to complete this project by the end of 2025.

ATTACHMENTS

Attachment A: Project Charter

Attachment B: Water Efficient Landscaping and Irrigation Standards Review and Recommendations for Boulder Code Revisions

Waterwise Landscaping

City Council 2024-2025 Work Plan Priority
Project Charter – *Working Draft*

Project Purpose & Goals

Background

COUNCIL RETREAT DIRECTION

City Council identified *Wildfire Hardening & Waterwise Landscaping Policies & Regulation* as one of their 2024-2025 work program priorities. At their retreat, Council agreed to establish a priority that encompasses a review of policies and regulations focused on wildfire hardening strategies (building and properties) and waterwise landscaping (e.g., native plant use, etc.).

Staff described at the council retreat some limitations in combining two areas of policy and code review and potential revisions on a reasonable timeline.

There is also a significant enforcement aspect to any regulatory schemes that relate to both wildfire hardening and waterwise landscaping strategies amongst single family homes that will be important to explore. Staff believes that the most impactful manner in which to achieve both wildfire resilience and lowering water usage in landscapes across the city is to focus efforts on education and incentives to allow individuals to take action in the short-term.

Staff recommends approaching this council priority in the following ways:

1. Review existing best practices for resilient landscape policies, incentives, education and regulation (Q4 2024).
2. Work across departments to identify potential operational enhancements, education and incentive programs, and resources, including leveraging grants in support of the two focus areas (Q4 2024).
3. Review code revision options as part of the scheduled updates to the International Building Codes [IBC] (including the Fire Code and Wildland Urban Interface Code [WUIC]) (Q1 2025).
4. Review other code updates as they relate to resilient landscapes and wildfire hardening and bring forth potential tweaks that would make progress while limiting enforcement need (Q4 2025).

Potential outcomes include increased protection against wildfire events and decreased use of water for landscaping.

While combined into one council priority, these are two discrete projects: wildfire hardening and waterwise landscaping. The remainder of this project charter focuses on the waterwise landscaping project. A separate project charter has been created for the wildfire hardening project. For efficiency, some of the code changes that are identified in the wildfire hardening project will be incorporated into the final ordinance adopted within the waterwise landscaping ordinance. Tasks for each are outlined below:

WATERWISE LANDSCAPING	WILDFIRE HARDENING
Land Use Code changes Design & Construction Standards	Building code updates Potential Land Use Code changes
Educational programs Incentives Enforcement	

WATER EFFICIENCY PLAN

The city updated its Water Efficiency Plan in early 2024. The Water Efficiency Plan identified the following programs for further evaluation and potential implementation and aligns specifically with the item in bold.

- Integrate water conservation into other planning efforts
- Investigate non-revenue water and strengthen water loss program
- Evaluate customer water budgets
- Perform feasibility study for Advanced Metering Infrastructure (AMI)
- Assist customers with fixture/appliance upgrades
- Improve water efficiency of municipal irrigation
- **Evaluate municipal code for water efficiency improvements**
- Enhance water efficiency communication
- Expand demonstration garden program
- Set up landscaper water efficiency training program
- Enhance customer support
- Build water conservation partnerships with existing community groups

This evaluation is further described:

> *Boulder staff will evaluate its current Municipal Code, rules, regulations, and ordinances to identify sections that could be modified to better integrate and support efficient water use. Staff will work with other stakeholders and departments to develop recommended updates for consideration. Ordinances and regulations prepared by other local water providers may be reviewed for applicability within Boulder and can serve as examples for consideration. Staff will generate an internal report on recommendations.*

CURRENT WATER CONSERVATION EFFORTS

The Water Efficiency Plan also lists all of the city's current water conservation programs:

Table 4.1: Comprehensive List of Boulder's Current Water Conservation Programs Active in 2022.

Category	Program
Foundational	Meter of all water taps
	Track monthly meter reads and water billing
	Track water use by customer type
	Maintain customer water budgets
	Track system loss with annual AWWA M36 Water Loss Audits
	Maintain and repair distribution system
	Plan for water infrastructure improvements and implement Boulder's existing Drought Plan, Water Utilities Master Plan, and Source Water Master Plan.
	Maintain membership with EPA WaterSense
Technical Assistance and Incentives	Provide matching funding for City projects that focus on water savings ($50,000 Annual Fund).
	Work with PACE to offer commercial/institutional water customers commercial water use audits, free faucet aerators and pre-rinse spray valves, and rebates for commercial dishwashers and ice machines.
	Work with Resource Central to offer Garden-In-A-Box Program, Lawn Replacement Program, and Slow-the-Flow outdoor irrigation audits.
	Use of raw water for irrigation – Parks and Recreation
Rules and Ordinances	Boulder Municipal Code 11-1-25.5 – Duty to Avoid Waste of Water and to Maintain Service Lines and Fixtures
	Turf restrictions in Boulder code – minimum width, maximum percent of lot, maximum slope allowed for turf
	Perform as-built inspections of landscapes associated with a building permit
Education and Outreach	Work with Resource Central to offer water customers Waterwise Yard Seminars.
	Communicate water efficiency topics to customers via social media and bill stuffers
	Attend water fairs and support K-12 classroom education on water efficiency, primarily supported by Boulder's partnership with Eco-Cycle.
	Maintain Boulder's Water Conservation Website
	Maintain xeriscape demonstration gardens

STATE LEGISLATION

In addition, the state has recently passed bills that impact water conservation and specifically relate to turf. In 2022, HB22-1151 passed which created the Turf Replacement Program. The program provides financial incentives for voluntary replacement of irrigated turf with "water-wise landscaping," the practice of using plants with lower water needs. The Colorado Water Conservation Board has launched funding to support new and existing community programs aimed at helping eligible entities (local governments, districts, nonprofits, and tribes) replace nonessential turf to reduce outdoor watering. The program does not apply to individuals or Homeowners Associations. The City of Boulder has received funding from the Colorado Water Conservation Board through HB22-1151 to support residential lawn replacement rebates and a non-chemical native turf conversion project.

Additionally, this year the state passed SB24-005, "Concerning the conservation of water in the state through the prohibition of certain landscaping practices." The bill states that "On and after January 1, 2026, a local entity shall not install, plant, or place, or allow any person to install, plant, or place, any nonfunctional turf, artificial turf, or invasive plant species, as part of a new development project or redevelopment project, on any portion of applicable property within the local entity's jurisdiction." This only applies to commercial, institutional, or industrial property, Common Interest Community property (common areas owned by an HOA or similar), or a street right-of-way, parking lot, median, or transportation corridor. Implementation of this state bill could occur simultaneously with a larger landscaping update.

STATE RESOURCES: BEST PRACTICES

There are a number of resources that identify best practices for water conservation already:

Water Resources Advocates: The State of Water-Wise Landscaping Standards in Colorado

Colorado Water Conservation Board: Best Practices for Implementing Water Conservation and Demand Management Through Land Use Planning

Growing Water Smart: The Water-Land Use Guidebook

Colorado Department of Natural Resources: Compendium of Best Practices Across Colorado

Colorado Water Conservation Board Land Use Planning and Water Resource Page

Colorado Water Conservation Board Urban Water Efficiency Page

Colorado WaterWise Best Practices Guidebook

Colorado Native Grass Guide

Issue Statement

The city's landscaping regulations in the land use code have not been significantly updated since 2003. That update was accelerated in response to drought conditions to focus on xeriscape standards and was intended to promote water conservation and protect mature trees. After over 20 years, it is due time to review these existing policies and regulations and identify potential improvements that could further promote water conservation.

Project Purpose Statement

Evaluate Boulder's existing landscaping regulations, policies, and programs in meeting the goal of water conservation. Explore updates that further support water conservation through landscaping practices, by adopting landscape regulations that promote climate adapted and water efficient landscapes, and identifying educational programs and incentives for community members.

Guiding BVCP Policies

The project is guided by several key BVCP policies:

Natural Environment Policy 3.11 Urban Environmental Quality

To the extent possible, the city and county will seek to protect the environmental quality of areas under significant human and urban influence and will balance human needs and public safety with environmental protection. The city will develop and apply community-wide programs and standards for new development and redevelopment so that negative environmental impacts will be mitigated and overall environmental quality of the urban environment will be maintained and improved.

Natural Environment Policy 3.12: Urban Forests

The city will support, promote and, in some cases, regulate the protection of healthy existing trees and the long-term health and vitality of the urban forest in the planning and design of public improvements and private development. Urban canopy plays an important role in ameliorating the effects of climate change; therefore, the city will guide short- and long-term urban forest management that encourages overall species diversity and low water demand tree species.

Natural Environment Policy 3.13: Water Conservation

The city and county will promote the conservation of water resources through water quality protection, public education, monitoring and policies that promote efficient water usage such as water-conserving landscaping. The city will endeavor to minimize water waste and reduce water use during peak demand periods. New development and redevelopment designs to conserve water will be encouraged.

Natural Environment Policy 3.26 : Protection of Water Quality

Water quality is a critical health, economic and aesthetic concern. The city and county have been protecting, maintaining and improving water quality and overall health within the Boulder Valley watersheds as a necessary component of existing ecosystems and as a critical resource for the human community. The city and county will continue to reduce point and nonpoint sources of pollutants, protect and restore natural water systems and conserve water resources. Special emphasis will be placed on regional efforts, such as watershed planning, and priority will be placed on pollution prevention over treatment.

Natural Environment Policy 3.27 Water Resource Planning & Acquisition

Water resource planning efforts will be regional in nature, consider climate change and incorporate the goals of water quality protection as well as surface and groundwater conservation. The city will use a variety of strategies, such as water conservation, demand management, reuse and acquisition of additional water supplies to meet the adopted municipal water supply reliability goals while balancing in-stream flow maintenance and preservation of sustainable agriculture. The city will seek to minimize or mitigate the environmental, agricultural and economic impacts to other jurisdictions and seek to prevent the permanent removal of land from agricultural production elsewhere in the state in its acquisition of additional municipal water rights. The city and county may continue to acquire water rights for Open Space purposes.

Economy Policy 5.12: Sustainable Business Practices

The city and county will support sustainable and energy-efficient business practices and establish and maintain programs to assist businesses in exploring solutions to sustainable practices. Potential solutions for exploration include reducing waste and GHG emissions, increasing building energy efficiency (in existing or renovated structures), conserving water, reducing transportation impacts, and procuring local, recycled and compostable materials, products and services

Local Governance and Community Engagement Policy 10.01: High-Performing Government

The city and county strive for continuous improvement in stewardship and sustainability of financial, human, information and physical assets. In all business, the city and county seek to enhance and facilitate transparency, accuracy, efficiency, effectiveness and quality customer service. The city and county support strategic decision-making with timely, reliable and accurate data and analysis.

Project Timeline

	2024						2025											
	Q3			Q4			Q1			Q2			Q3			Q4		
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
PROJECT SCOPING & RESEARCH																		
Internal scoping																		
Internal coordination																		
Consultant contracting																		
Best practices research																		
Audit existing programs																		
COMMUNITY ENGAGEMENT																		
State TAC?																		
Public review draft																		
Office hours																		
DRAFTING																		
Code audit summary																		
Options development																		
Program development																		
Initial draft																		
CAO review																		
PLANNING BOARD AND WRAB REVIEW																		
PB matters						12/17												
WRAB matters							1/13											
WRAB final review																		
PB public hearing																		
CITY COUNCIL REVIEW																		
Study session						12/12												
1st reading																		
2nd reading																		
IMPLEMENTATION																		
Code updates																		

**Note: SB24-005 requires compliance by January 1, 2026.*

Project Scoping and Research | Q3 2024 | Planning

- Develop initial scope of work based on council retreat discussion
- Regular internal city collaboration check-ins with P&DS, Climate Initiatives, Utilities, and Forestry representatives (monthly)
- Secure consultant contract; seek grant funding to support if needed
- Develop Be Heard Boulder page, update city website
- Establish regional collaboration staff working group
- Begin best practices research (consultant)
- Meet with interested stakeholders as requested

Deliverables – P&DS

- *Project charter*
- *Internal meeting summaries*
- *Be Heard Boulder page*
- *Regional working group invite email*
- *Grant application (if needed)*

Best Practices and Evaluation | Q4 2024 | Shared Learning

- Finalize best practices research (consultant)

- Finalize evaluation of existing programs
- Continue regular internal city collaboration core team check-ins with multi-departmental representatives (change from monthly to quarterly)
- Regional coordination meeting (through CWCB technical advisory group- TBD?)
- Updates with City Council, Planning Board, Water Resources Advisory Board, and Environmental Advisory Board

Deliverables – P&DS

- *Planning Board Matters memo and attachments*
- *Water Resources Advisory Board memo and attachments*
- *Environmental Advisory Board memo and attachments*
- *City Council study session memo and attachments*

Deliverables – Consultant

- *Best practices research*
- *Code audit summary*

Develop Code Updates and Identify Programming Opportunities| Q4 2024 - Q2 2025 | Options

- Draft code language, integrate with previously identified changes for Wildfire Hardening project
- Continue regular internal city collaboration check-ins with core team representatives (quarterly)
- Identify recommendations for future programming and incentives (collaborate with Climate Initiatives, Utilities)
- Regional coordination meeting
- Begin CAO review meetings

Deliverables – P&DS

- *Draft ordinance*
- *Planning Board memo*
- *WRAB memo*
- *City Council memos*
- *Summary of non-code programmatic opportunities*

Adoption | Q3 2025 | Decision

- Continue regular internal city collaboration check-ins with core team representatives (quarterly)
- Finalize CAO review of ordinance
- Engagement – public review of draft ordinance
- Public hearings at Planning Board, WRAB and City Council – final adoption by Jan. 1, 2026

Deliverables – P&DS

- *Draft ordinance*
- *Planning Board memo*

- *WRAB memo*
- *City Council memos*

Engagement & Communication

Level of Engagement

The City of Boulder has committed to considering four possible levels when designing future community engagement opportunities (see chart in the appendix). For this project, the community will be ***Consulted*** on potential changes.

As noted previously, the Water Efficiency Plan was recently updated and included successful engagement on many relevant topics. This project directly implements one of the recommended strategies that came out of that plan based on community engagement. The feedback also included information about programs and incentives to explore. To be efficient with community members' time, we will utilize the results of that engagement to inform this project as much as possible and will focus engagement efforts and attention on the public review draft of potential changes.

Who Will be Impacted by Decision/Anticipated Interest Area

- **Residents and neighborhoods** who may be impacted in the neighborhoods where they live/work/play.
- **Historically excluded communities** that may be unfamiliar with the methods to offer input.
- **City staff, City boards, and City Council** who will administer water conservation or landscaping-related programs and regulations.
- **Development community**, specifically development review applicants.

Overall Engagement Objectives

- Model the engagement framework by using the city's decision-making wheel, levels of engagement and inclusive participation.
- Involve people who are affected by or interested in the outcomes of this project.
- Be clear about how the public's input influences outcomes to inform decision-makers.
- Provide engagement options.
- Remain open to new and innovative approaches to engaging the community.
- Provide necessary background information in advance to facilitate meaningful participation.
- Be efficient with the public's time.
- Show why ideas were or were not included in the staff recommendation.

Engagement Strategies

CWCB TECHNICAL ADVISORY GROUP

Purpose: The Colorado Water Conservation Board recently funded an effort to develop a Technical Advisory Group for the application of SB24-005. More details are forthcoming, but staff anticipates participating in this group.

BE HEARD BOULDER

Purpose: A home page for all project-related documents, announcements of engagement opportunities, and virtual engagement. This will be utilized to post the public review draft of the changes and a short questionnaire will be developed to help solicit comments on the draft.

Logistics: Be Heard Boulder was already used for the Water Efficiency Plan questionnaire. If possible, staff will contact respondents of that questionnaire or people who subscribed to that project to seek their input. 595 responses from Boulder community members, employees, and visitors were received in spring 2023 on the platform.

OFFICE HOURS

Purpose: Provide an informal forum for interested residents to chat with staff about the project and answer any questions.

Logistics: One will be held virtually and one will be held in person.

WEBSITE

Purpose: The P&DS code change website will be maintained and updated throughout the remainder of the project to inform the public of the project, provide updates, and link to any engagement opportunities.

Logistics: Work with communications staff to make updates as needed to the website.

NEWSLETTER AND EMAIL UPDATES

Purpose: Updates on the project will be provided to interested parties.

Logistics: Staff will work with communications staff to draft content for the planning newsletter during key engagement windows. Additional email updates will be provided on an as-needed basis.

Project Team & Roles

Team Goals

- Follow City Council, Planning Board, Water Resources Advisory Board, and Environmental Advisory Board direction regarding code changes.
- Seek community feedback on proposed changes and incorporate relevant ideas.
- Solution must be legal, directly address the purpose and issue statement, and must have application citywide.

- Regulatory solutions must be able to be practically enforced over time, to ensure accountability.

Critical Success Factors

- Conduct a successful public engagement process.
- Develop regulations and identify opportunities for programs that conserve water.

Expectations

Each member is an active participant by committing to attend meetings; communicate the team's activities to members of the departments not included on the team; and demonstrate candor, openness, and honesty. Members will respect the process and one another by considering all ideas expressed, being thoroughly prepared for each meeting, and respecting information requests and deadlines.

Potential Challenges/Risks

The primary challenge of this project is making sure that proposed code changes avoid land use impact, unintended consequences, and over-complication of the code. A secondary challenge is the practicality of administrating and sustainable enforcement of any regulations.

Administrative Procedures

The core team will meet regularly throughout the duration of the project. An agenda will be set prior to each meeting and will be distributed to all team members. Meeting notes will be taken and will be available upon request to all team members after each meeting.

CORE TEAM	
Executive Sponsor	Brad Mueller
Executive Team	Brad Mueller, Charles Ferro, Karl Guiler
Project Leads	
Project Manager	Lisa Houde
P&DS Assistance	
Landscape Architect	Chris Ricciardiello
Comprehensive Planning	Kathleen King
GIS	Sean Metrick
Community Engagement	Vivian Castro-Wooldridge
Code Compliance	Jenn Ross
Civil Engineering	Scott Kuhna, Kyle Gillitzer
Right of Way Inspections	Andrew Frost
Other Department Assistance	
CAO	Laurel Witt
Communications	Cate Stanek
Climate Initiatives	Rella Abernathy, Heather Bearnes-Loza
Utilities	Krystle Morey, Laurel Olsen, Kevin Koryto

Forestry	Kathleen Alexander
Parks	Mark Davison
Code Enforcement (PD)	Jen Riley
Fire Rescue	Dave Lowrey
Transportation & Mobility	Scott Schlecht

Executive Sponsor: The executive sponsor provides executive support and strategic direction. The executive sponsor and project manager coordinates and communicates with the executive team on the status of the project, and communicate and share with the core team feedback and direction from the executive team.

Project Manager: The project manager oversees the development of the project. The project manager will be responsible for preparing agendas and notes for meetings and coordinating with team members on the project. The project manager coordinates the preparation and editing of all council/board/public outreach materials for the project, including deadlines for materials.

Other Department Assistance: Staff from other departments coordinate with the project manager on the work efforts and products. Internal coordination meetings are expected to take place quarterly throughout the project after initial monthly meetings to kick off the project in Q2 2024. These staff members will assist in the preparation and editing of all council/board/public outreach materials including code updates as needed. This project is interdepartmental and will be implemented by several departments.

Project Costs/Budget

Consulting assistance to complete the best practices research and code audit. It is anticipated that P&DS will seek match funding from the city's Water Efficiency Fund Program to secure a consultant. Based on similar work products done for other communities, it is expected that the total consulting costs would be approximately $25,000. The consultant would also participate in internal coordination meetings to ensure that the city's water conservation policies and efforts are reviewed holistically.

Decision-Makers

- **City Council:** Decision-making body.
- **Planning Board:** Will provide input throughout the process, and make a recommendation to council that will be informed by other boards and commissions.
- **City Boards and Commissions:** Will provide input throughout process and ultimately, a recommendation to council around their area of focus.

Boards & Commissions

City Council – Will be kept informed about project progress and issues; periodic check-ins to receive policy guidance; invited to public events along with other boards and commissions. Will ultimately decide on the final code changes.

Planning Board and **Water Resources Advisory Board**– Provides key direction on the development of options periodically. Will make a recommendation to City Council on the final code changes.

Appendix: Engagement Framework

City of Boulder Engagement Strategic Framework

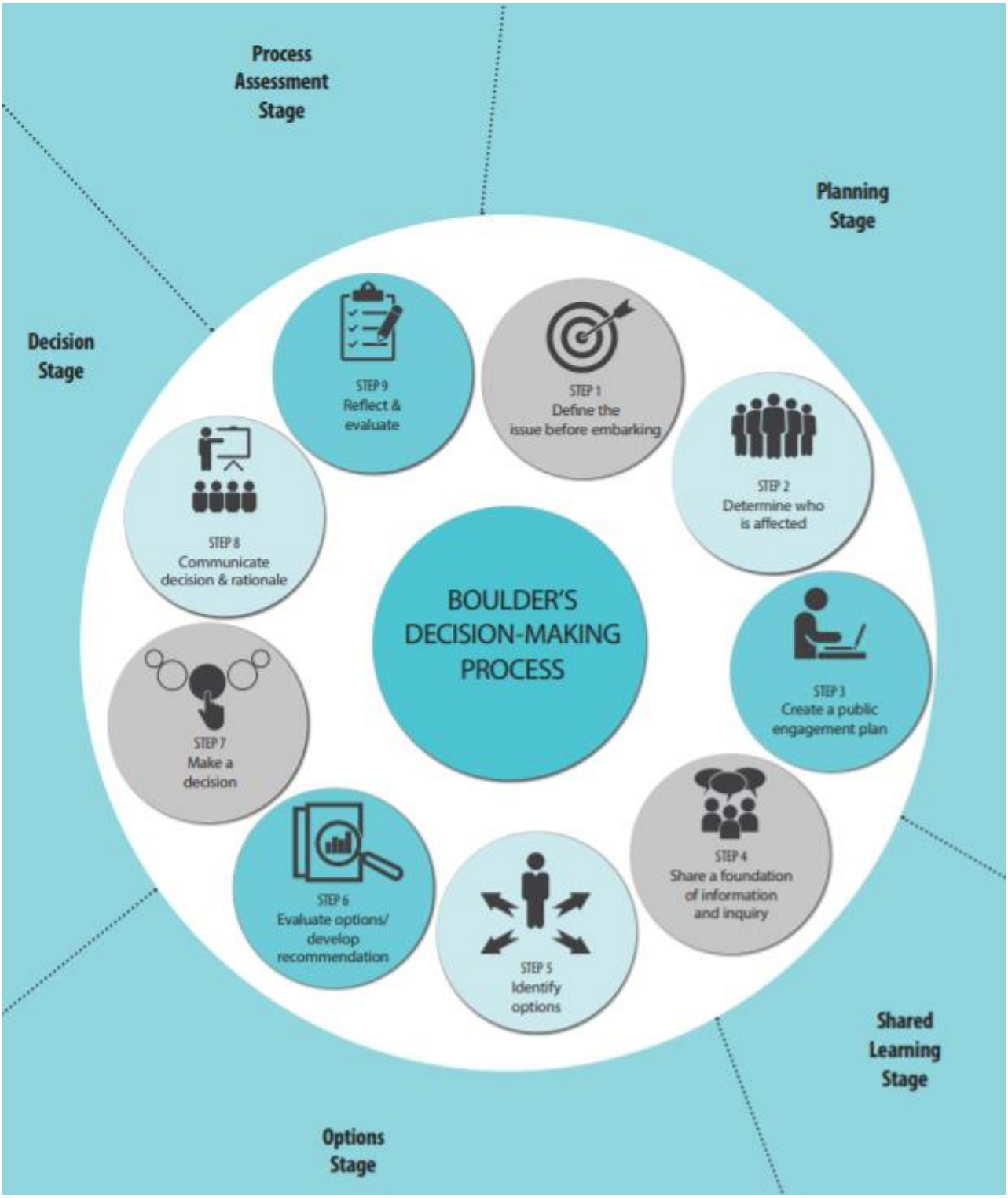
BOULDER'S ENGAGEMENT SPECTRUM

The city will follow a modified version of IAP2's engagement spectrum to help identify the role of the community in project planning and decision-making processes.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE
PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding a problem, alternatives, opportunities and/or solutions.	To obtain public feedback on public analysis, alternatives and/or decisions.	To work directly with the public throughout a process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and identification of a preferred solution.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge your concerns and aspirations, and share feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are reflected in any alternatives and share feedback on how the public input influenced the decision.	We will work together with you to formulate solutions and to incorporate your advice and recommendations into the decisions to the maximum extent possible.

Boulder's Decision Making Process



Martin and Wood Water Consultants, Inc.
538 Commons Drive, Golden, CO 80401
Phone: (303) 526-2600 Fax: (303) 526-2624
www.martinandwood.com

Memorandum

To: Lisa Houde, AICP, Christopher Ricciardiello, RLA, and Krystle Morey, P.E.

From: Logan Burba, P.E. and Tara Meininger, P.E.

Date: November 22, 2024

Subject: Water Efficient Landscaping and Irrigation Standards Review and Recommendations for Boulder Code Revisions

The City of Boulder (City or Boulder) is in the process of evaluating and updating its municipal code related to landscaping, last updated in 2003. Boulder has enlisted the support of Martin and Wood to assess the City's current landscaping and irrigation requirements under City codes, processes, and practices and to recommend standards based on best practices and code review to consider integrating into the City's Municipal Code to improve water efficiency. In 2023, the City updated its Water Efficiency Plan (WEP), prepared with support by Martin and Wood, which identified updating of water efficient landscaping and irrigation standards as a specific water efficiency project.[1]

Water Efficient Landscaping and Irrigation Regulations

New and redeveloped landscaped areas provide a fundamental opportunity for water conservation. This includes both indoor water use (like plumbing codes) and outdoor water use (like landscaping regulations). While indoor water use codes are generally more standardized and more widely incorporated into building codes, regulations relating to outdoor water use are becoming more advanced and can be highly effective in supporting outdoor water conservation. Embedding water efficiency into new construction from the outset can avoid the cost of retrofitting later. New developments landscaped according to newer standards can also help in communicating to the public about appropriate and expected water use practices.

Entities with land use authority can incorporate water efficient landscaping and irrigation standards and requirements into codes and regulations in order to help reach water efficiency goals. It is generally recommended that an entity's land use and water planners work closely together to develop these standards and monitor how the standards impact outdoor water use.

[1] https://bouldercolorado.gov/media/13386/download?inline

Common Components of Landscape and Irrigation Standards

Landscape regulations and standards establish the requirements for plant material types and specifications required with new development and re-development projects. These standards generally address new and redevelopment projects and associated common areas including parking lots, screening, setback and buffer areas, and streetscapes. Many landscape standards apply to both residential and non-residential development areas. These standards can restrict certain types of plants, including cool-season (or high water use) turfgrass and invasive plants and may include soil amendment practices and mulching requirements.

Irrigation standards generally are designed to work with landscape standards and may include irrigation system design standards, such as requiring smart controllers, shut-off valves, flow sensors, and efficient heads and emitters as well as irrigating frequency/ maintenance standards which relate to long-term operations including day-of-week watering restrictions or requirements for irrigation system maintenance.

Frequently, landscape plans and/or irrigation plans may be required for submittal to the city, meeting certain minimum requirements for the proposed landscape design. These generally require the design and management of each “hydrozone,” a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same irrigating schedule.

Code Structure and Standards Integration

Typically, there are two approaches for incorporating landscaping and irrigation standards into municipal codes.

1. Embedding specific standards directly into a municipal or county development code.
2. Within the development code, referencing a separately maintained design manual or standards report with detailed specifications and requirements.

While there may be benefits to embedding standards directly into a municipal code, we recommend that Boulder consider developing a separate standards reference document for adoption in conjunction with the planned code updates. Updating municipal codes can result in delayed updates due to lengthy approval timelines and some standards may be lost within different code sections. Maintaining a separate standards document can allow for greater ease of updates, resulting in more flexibility and growth within those standards, and can provide ease for applicants to have one focused document to reference for compliance.

City of Boulder Municipal Code Overview

City of Boulder landscape standards are principally located in Section 9-9-12 of the Boulder Municipal Code, with additional requirements for streetscape design standards specified in Section 9-9-13 and in Boulder’s external Design and Construction Standards (DCS), as well as in Section 9-9-14, Parking Lot Landscaping Standards.

When Boulder’s current landscaping standards were implemented in 2003, they were relatively progressive, limiting high water use turf to 25% of the landscaped area for most new projects, not allowing turf on steep slopes or narrow strips, and referencing Xeriscaping™

landscaping principles.[2] However, relative to recent State-level legislation and code changes made by other Colorado municipalities to limit non-functional cool season turf (such as Kentucky bluegrass in medians, office parks, or curbsides), as well as to restrict irrigation based on time-of-day or day-of-week restrictions, Boulder's landscaping standards have room for water efficiency improvements.

As part of the 2023 Boulder WEP, evaluating the Boulder Municipal Code to support water efficiency improvements was proposed as a program to be completed in 2025 and 2026. Water providers of Boulder's size are required to consider whether new rules and ordinances can improve their system-wide water efficiency, per C.R.S. 37-60-126. Historically, Boulder relied on its water budget-based billing structure to influence customer water use rather than on prescriptive landscaping or irrigation standards. However, Boulder recognizes the benefits to adopting a greater degree of prescription on landscape requirements for new and redevelopment projects as well as general irrigation requirements.

Feedback from the Boulder public that was provided during the WEP process in 2023 indicated that the most popular conservation action for Boulder to promote was to require water-wise landscaping (limiting the amount of bluegrass turf in new and redeveloped properties). The majority of survey respondents preferred climate-adaptive landscapes and native vegetation in residential and retail/office/commercial areas.

Drought-tolerant landscapes can increase the City's resilience during droughts and with a changing climate. As identified in the Boulder's 2022 Drought Plan, irrigation rules such as day-of-week watering restrictions can also be beneficial to enforcement of drought restrictions.[3]

Boulder's current landscape standards apply to new or redevelopment projects that exceed certain thresholds for project value, but essentially, at least some landscape standards apply to most new or redevelopment projects. For applicable projects, Boulder requires a landscaping plan, but the standards are not as prescriptive in Boulder as they are in some other communities. Boulder currently has only one landscape architect who reviews, approves, and verifies all landscaping plans. Key requirements under the current code include:

- Limits on cool-season turf (25% of the landscape for most projects, no sprinkler-irrigated turf in strips less than 10 feet wide, and no turf on slopes greater than 25%);
- Living plant material must cover 100% of landscaped area by three to five years from initial planting; and
- Hydrozoning of plantings is required.

Opportunities for Improvement

The following specific best practices were notably missing from Boulder's current code.

- Boulder Municipal Code does not currently comply with SB 24-005 requirements to prohibit nonfunctional turf on new or redeveloped properties in the following categories: commercial, industrial, institutional, parking lots, medians, street rights-of-way, transportation corridors, and "common interest properties" or HOAs.

[2] Xeriscape landscaping principles were trademarked by Denver Water in 1981.
[3] https://bouldercolorado.gov/media/415/download?inline

- Boulder requires landscaping plans for most new or redeveloped properties but does not prescribe as many requirements for those plans as some other municipalities. For example, Boulder's soil amendment requirements, mulch requirements, and approved plant lists are limited or require updates. Boulder does not currently require landscape water budgets as part of its landscaping plans.
- Boulder has an approved tree list for specification of trees within public properties or rights-of-way, but it does not currently have a drought-tolerant or native plant list to accompany its landscape code.
- Boulder has no formal program for temporary establishment irrigation, though general language is included about case-by-case approval of temporary irrigation of low water use landscaping. Temporary establishment irrigation would allow initial irrigation of low to no water use plant materials directly following planting to allow healthy establishment of the vegetation, typically a three-year period. Once established, irrigation of those plants could permanently cease, except in situations where extreme weather conditions would require additional temporary irrigation to preserve plant health.
- Boulder does not have detailed standards related to irrigating frequency or requiring maintenance of irrigation systems. We understand that Boulder currently focuses on its water budget-based billing structure to penalize over-watering, and that this structure may be updated in the near future.
- Boulder does not have a water efficiency certification requirement for landscapers, as some other Colorado municipalities or regions have adopted.
- Boulder does not currently have code related to firewise landscaping, although two of the projects envisioned in the Community Wildfire Protection Plan (April 2024) include elements related to weed control and firewise landscaping on properties within Boulder's municipal water service area.[4]

Landscaping and Irrigation Standards Best Practices and Requirements

Martin and Wood completed a literature review including model ordinances and guidance documents to develop a general list of best practices for water efficient landscaping codes. The following standards are generally determined to be best practices for consideration and inclusion in water efficient landscaping and irrigation requirements:

- Landscaping Standards/Landscaping Plan
    - Require submittal and approval of landscape plan prior to installation for projects triggering landscaping improvements per the code. Landscape plan must meet all minimum defined standards.
    - Require landscape water budget for landscaping materials based on anticipated water use for the select plant types. These tend to require plantings of similar water use type plant types within each zone, referred to as a "hydrozone." Set maximum limits on the total planned water use allowed within each landscape.

[4] https://bouldercolorado.gov/guide/community-wildfire-protection-plan-cwpp

- May require landscape plans to be prepared by a landscape architect licensed through the Colorado Department of Regulatory Agencies, or other accepted certification program.
    - Establish basic landscape standards (for example, turf and/or high-water-use plant limitations, approved plant list, restricted plant materials) for all development projects.
- Plant Materials Specifications
    - Specify plant lists for approved plant materials, identify discouraged and/or prohibited plant materials. Plant list can be provided as a detailed local plant list within code or as a reference to other manuals/lists/resources for ease of update and maintenance (such as the Plant Select List[5] or a locally developed plant list).
    - Organize approved plant lists by water needs, tying plants to defined water use type if setting a maximum applied landscape water budget.
- Turf Standards
    - Different approaches for limiting or regulating turf grass including:
        - maximum areas for turf, maybe as % of total landscape area or square footage;
        - maximum average water use for turf and/or landscape areas through landscape water budget;
        - requiring contiguity/slope/minimum width for turf areas; and
        - maximum allowed seasonal water use for turf grass types, prohibiting species exceeding the seasonal water use limits.
    - Functional turf grass designations and allowances.
    - Non-functional turf restrictions (see SB 24-005 below).
    - Artificial turf standards.
- Irrigation Standards/Irrigation Plan
    - Specify system requirements such as smart controllers, irrigation shutoff valves, master shut-off valve and flow sensors, rain and soil moisture sensors, efficient emitters (drip vs. spray), backflow prevention.
    - Require irrigation efficiency based on emitter type in landscape water budgets by designated hydrozone.
    - Require submittal and approval of an irrigation plan prior to installation, meeting all minimum defined standards.
    - Irrigation plan should align with hydrozones and other site and plant material characteristics and be designed in accordance with any landscape water budget requirements.
    - May require irrigation plans to be prepared by an irrigation professional meeting minimum local certification requirements. May require irrigation installations to be completed by an irrigation professional meeting minimum local certification requirements.
    - Colorado House Bill 19-1231,[6] "New Appliance Energy and Water Efficiency Standards," requires that all new spray sprinkler bodies sold in Colorado must

[5] https://plantselect.org/plants/our-plants/
[6] https://leg.colorado.gov/sites/default/files/2019a_1231_signed.pdf

include an "integral pressure regulator" and meet EPA WaterSense specifications,[7] unless specifically excluded.

- Soil and Mulch Standards
  - Soil amendment standards.
  - Organic and inorganic mulch standards.
  - May require soil testing to determine soil quality and composition and adopt standards for soil amendment and quality for new development.
- Waste of Water
  - Waste of water is prohibited and subject to fee schedule for enforcement.
  - Water shall not be applied to impervious surface, eliminate or reduce overspray.

Senate Bill 24-005 (SB 24-005) Prohibition of Nonfunctional Turf, Artificial Turf, and Invasive Plant Species

On March 15, 2024, SB 24-005 was approved, which prohibits the new installation, planting, or placement of nonfunctional turf, artificial turf, and invasive plant species on commercial, industrial, institutional, or transportation (e.g. parking lots, medians, street rights of way, or transportation corridors) properties or on "common interest properties (HOAs) across the State of Colorado.

The bill concerns cool-season turf (non-native grasses or grasses that have not been hybridized for arid conditions) and defines "functional turf" as turf included in a recreational use area or other space that is regularly used for civic, community, or recreational purposes. Nonfunctional turf is defined as turf that is not functional. "Artificial turf" is defined as synthetic materials developed to resemble natural grass. If artificial turf is installed on athletic fields, it can be defined as functional under SB 24-005.

Beginning January 1, 2026, local governmental entities are required to enact or amend ordinances, resolutions, regulations, or other laws regulating new development projects on those property types in accordance with the bill requirements. This new law applies to any project that requires a building or landscaping permit, plan check or design review and a disturbance of more than 50 percent of the aggregate landscape area. The bill does not apply to residential developments but does not discourage local entities from having more stringent regulations that would apply to all developments. Maintenance of existing turf, artificial turf, or invasive species installed prior to January 1, 2026 is permitted.

Section (3) of the bill prohibits the addition of nonfunctional turf, artificial turf, or invasive species to any construction or renovation of a state-owned facility, which has a project design phase commencing on or after January 1, 2025, regardless of if construction would be complete before January 1, 2026, or not.

WaterNow Alliance has provided examples of landscape codes that meet the requirements outlined in SB 24-005. At this time, only the City of Aurora and the City of Edgewater have begun limiting non-functional turf in their landscape standards in accordance with SB 24-005.

[7] https://plattecanyon.org/wp-content/uploads/2019/07/specsforsprinklersws-products-spec-ssb.pdf

Review of Select Reference Landscaping Codes and Standards

Martin and Wood worked with Boulder staff to select eight external landscaping and irrigation codes and standards to review: six municipalities located in Colorado and two located out of state. The referenced codes and standards were selected based on preliminary review of codes, ordinances, and standards, selecting those that were comprehensive, reflected communities with similar hydrological conditions, similar demographics, and codes and standards that have been commonly referenced by or recently updated in partnership with organizations at the forefront of outdoor water efficient codes.

Martin and Wood completed a review of the selected landscaping and irrigation codes, ordinances, and standards and provided Boulder with a detailed summary of those materials. From this, a summary matrix documenting primary landscaping and irrigation standards by entity was prepared and is included as **Attachment A**. Attachment A includes information about how the standards interact with the municipal codes and/or ordinances, a high-level overview of how the primary code components are addressed, applicability of standards, and code/standards structure.

Evaluation of Code Components

The intent of evaluating the comprehensive list of reviewed code components is to provide Boulder with recommended code updates for consideration that align with the City's adopted policies, result in effective water efficiency practices, and are implementable and enforceable. **Table 1** below outlines the categories and metrics that were considered in the evaluation and ranking/prioritization of recommended code updates and landscaping and irrigation standards development.

Table 1: Evaluation Categories and Metrics

Category	Level of Effort for Implementation and Enforcement
Foundational: Standards or practices that Boulder should strongly consider adopting or keeping because they have already been identified as best practice or because they lay a foundational basis for other key practices.	Each standard or practice was qualitatively evaluated for level of effort for implementing and enforcing the standard or practice. Low, Medium, and High anticipated effort levels are assigned based Martin and Wood's professional opinion and publicly available documents. "Low" level of effort may be achievable by Boulder's current staff, which is limited to one full-time landscape architect. Medium or high levels would require more staffing. Note that specific requirements will influence the level of effort required, these designations serve as a best guess.
Water Efficiency: Standards or practices that lower customer water use or increase efficiency of customer water use.	
Ecosystem Services: Standards or practices that support healthy ecosystems and environmental priorities, including protecting pollinators, reducing urban heat island effects, increasing or protecting tree canopy and shade areas, or enhancing natural habitat.	 LOW  MEDIUM  HIGH

While some quantitative data may be available to support the criteria above, standards and practices were reviewed qualitatively, considering data where available. The icons corresponding with each criterion are included in the best practice recommendations in the following section. These icons reflect which evaluation categories are met and expected enforcement levels for the recommendations described below.

Best Practice Recommendations

Based on Martin and Wood's review of selected municipal codes and landscaping standards, our experience working with other cities, and our discussions with Boulder, we recommend that Boulder update its current code to include general provisions related to minimum landscaping and irrigation system requirements and also prepare a separate water efficient landscaping and irrigation standards reference document to include more specific criteria. Boulder's land use code would be updated to directly reference this external standards document. This provides Boulder with more flexibility in modifying and refining the prescribed standards in the future and provides greater ease in referencing those requirements. We have also specified requirements that may be better suited for inclusion directly in the land use code.

In the descriptions below, we have included example standards as well as potential mechanisms for implementing these components into a landscaping code. Additionally, we have noted considerations for the applicability for each standard type and recommendations for how to incorporate these into Boulder's standards, either as part of the Municipal Code or through a separate standards document.

Nonfunctional Turf 

Recommendation: In order to comply with SB 24-005, Boulder is required to prohibit the installation of cool-season turf on commercial, industrial, institutional, and transportation (parking lots, medians, street rights-of-way, transportation corridors) properties or areas and "common interest properties" (HOAs) by 2026, except if the turf would be located in a recreational use area or other space that is regularly used for civic, community, or recreational purposes. SB 24-005 also prohibits the installation of artificial turf on these properties except on sporting fields and the installation of invasive plant species. Implementing these required changes will require updates to Boulder's Municipal Code.

We recommend that Boulder add specificity to the definition of nonfunctional turf in its code. First, Boulder should define the applicable properties or areas based upon the defined characteristics of its existing zones. In addition to HOAs, we recommend that these restrictions apply to multifamily residential properties (fourplex or larger).

Second, the definition of functional turf in SB 24-005 is cumbersome, and the two Colorado municipalities whose municipal codes currently comply with the bill defined "active or programmed recreation areas" as a term supporting their definition of nonfunctional turf.[8] We recommend that Boulder consider a similar definition.

Third, given the value that Boulder places on living landscapes, Boulder should consider defining cool-season turf and warm-season turf in its code and plant lists, specifically prohibiting cool-season non-functional turf. This would comply with SB 24-005 yet still allow warm-season turfs (which have lower water use) to remain a potential landscaping option on the applicable properties. We recommend that nonfunctional turf restrictions reside in Boulder's Municipal Code.

Examples:

- The City of Aurora defines turf as "any cool-season turf species, variety or blend, including but not limited to Kentucky bluegrass and fescue" and does not allow turf that primarily serves an aesthetic purpose. Turf can only be installed in active or programmed recreation areas.
- The City of Edgewater does not allow cool-season turf to be installed in rights-of-way, medians, or parking lots. On commercial, industrial, or institutional properties, cool-season turf is only allowed in "active or programmed recreation areas."
- The University of Colorado, Boulder, as a state property, is subject to the SB 24-005 requirements by 2025.

Applicability: Boulder is required to apply nonfunctional turf restrictions to commercial, industrial, institutional, and transportation (parking lots, medians, street rights-of-way, transportation corridors) properties or areas and "common interest properties" properties

[8] City of Aurora and City of Edgewater. Information gleaned from Western Resources Advocates 10/29/2024 Presentation on SB 24-005 as well as from a brief review of the two applicable municipal codes.

(HOAs). We recommend Boulder additionally apply the restriction to multifamily residential properties of fourplex or larger.

Implementation Needs: Consultant and/or staff support required for development of required code. Enforcement is expected to be similar to current review requirements.

Landscape Water Budgets

Recommendation: Boulder should consider requiring a landscape water budget for some or all landscape plan submittals, helping to ensure that these projects meet water efficiency requirements. Although the addition of a landscape water budget would increase review time for each landscape plan and would require additional staffing to support, the wide adoption of landscape water budgets by other cities who recently updated their landscaping standards speaks to the importance of these as mechanisms for landscape water efficiency and healthy landscapes.

Landscape water budgets provide a customized and limited target for water usage, which allows property owners and landscape professionals to better understand water needs, manage irrigation, and manage water use while maintaining a healthy landscape. Boulder already requires grouping of plants by water use zone, so this would build upon an existing successful practice to further promote water efficiency.

The work to implement landscape water budgets includes determining a maximum applied landscape water budget for landscapes (typically in gallons per square-foot per season or gpsf/season), the classification of plants by water use (usually included in an approved plant list), and developing a standard landscape water budget application template or downloadable worksheet. Additional reporting elements may include irrigation efficiencies based upon irrigation method for each hydrozone, local reference evapotranspiration, and water features such as fountains or hot tubs.

Boulder currently bills using a water budget-based tiered rate structure. Indoor and outdoor water allocations are assigned for each property, with a base rate for water used within the assigned allocation and any water used in excess of the water budget being billed at a higher rate. Prior to considering a landscape water budget requirement, Boulder should determine if and how these two water budgets may be aligned with each other.

Boulder should also consider whether a post-installation inspection to verify consistency with the approved landscape water budget and associated landscape plan is necessary. Boulder currently conducts post-installation site inspections, so ensuring compliance with the landscape water budget may minimally increase staff time. Development of the landscape water budget limits, components, calculations, and any post-construction verification requirements would require additional staff time. We recommend that specific requirements for the landscape water budget and any associated form templates be included in an external standards document.

Examples:

- City of Aspen requires a landscape water budget worksheet be submitted with the landscape plan to document the square-footage of each defined hydrozone, documenting that hydrozone water use code, plant factor, irrigation category, irrigation

efficiency, hydrozone area, and calculated plant water need. Water use and irrigation categories also include swimming pools and hot tubs as part of the landscape water budget. The maximum applied landscape water budget is 7.5 gpsf/season. Aspen has a landscape water budget workbook that can be downloaded and utilized to prepare the landscape water budget. See example attached.

- City & County of Broomfield requires a landscape water budget be prepared and submitted with the landscape plan, similar to Aspen but with fewer plant categories and does not consider irrigation efficiency. The maximum applied landscape water budget is 12 gpsf/season. See example attached.
- Best practice is to organize approved plant lists by water needs, tying this to defined water use type if requiring a landscape water budget. Grouping by water, soil, and sun needs (hydrozones) help landscape plans target water efficiency.

Applicability: Landscape water budgets tend to apply to new development and redevelopment. Boulder should consider what level of redevelopment would trigger this requirement.

Implementation Needs: Additional staffing to support increased review time, establish landscape water budget, develop plant list, develop landscape water budget calculations worksheet.

Soil Amendment Standards and Testing

Recommendation: Boulder should consider strengthening its current soil standards to require that soil testing be completed and submitted along with soil amendment recommendations and plans for new and redeveloped landscapes. Enhanced soil testing and amendment requirements would increase staff review time, requiring additional staffing to support. Appropriate soil amendments are difficult to implement after landscape has been installed and are critical to supporting a healthy landscape, increasing irrigation efficiency and plant health, and supporting appropriate drainage. Strengthened standards should specify testing requirements, amendment requirements and/or reporting requirements. Boulder should also consider whether site verification of amended soils is necessary or beneficial. We recommend that soil testing and amendment requirements reside in Boulder's Municipal Code.

Examples:

- City & County of Broomfield requires organic soil amendments prior to seeding or sodding.
- City of Colorado Springs requires a Soil Analysis Report to be submitted with the required Irrigation Plan. If needed, soil amendments to improve drainage, moisture penetration or retention, and nutrient availability must be provided as determined by soil analysis.
- Best practice is to require soil testing to determine soil quality and composition and adopt standards for soil amendment and quality for new development.

Applicability: Soil testing and amendment requirements tend to apply to new development and redevelopment. Boulder should consider what level of redevelopment would trigger this requirement.

Implementation Needs: Additional staffing to include review of soil testing report and amendment plans, potential staff time for site verification of amended soils.

Mulch Standards

Recommendation: Boulder currently requires organic mulch in its landscape code but does not include detailed specifications. Boulder should consider more prescribed mulch standards to further encourage the use of organic mulches and to allow for limited rock mulch in only limited non-planting areas or in the Wildland Urban Interface (WUI) as needed for fire safety. To protect against heat island impacts on the vegetation, rock mulch should be restricted except as noted. Development of these standards would require additional staff time and enforcement and would be tied to the landscape plan submittal and approval process. However, organic mulch is valuable for water efficiency and ecosystem services because it can support plant health by retaining moisture and cooling soils and it mimics the natural ecosystem. We recommend that any general mulch requirements reside in Boulder's Municipal Code, with additional details to be included in a separate standards document.

Examples:

- City of Broomfield mulch standards include:
  - Where rock is the chosen mulch treatment, weed barrier fabric shall be used to block weed growth and conserve moisture.
  - Trees and shrubs shall be mulched by either rock or wood mulch, or a combination of both, at the discretion of the applicant. Shredded cedar is the preferred mulch treatment around all plant material. If rock mulch must be utilized due to exposure to areas with high winds, plant material shall be chosen which can tolerate heat exposure.
  - For wood mulch applications, all trees shall be surrounded by an area of mulch that shall be no less than three inches in depth and no less than three inches from the trunk to reduce potential damage from insects. Mulch shall be a minimum of three inches from trunks to reduce insect and trunk damage.
  - All plant beds shall be mulched to a minimum depth of three inches. Areas planted with perennials and groundcover species shall be mulched to a minimum of two inches in depth.

Applicability: Mulch requirements tend to apply to new development and redevelopment. Boulder should consider what level of redevelopment would trigger this requirement.

Implementation Needs: While staff time will be required to develop more detailed mulch standards, the anticipated review and enforcement time is not expected to increase drastically.

Temporary Irrigation Zone Allowance

Recommendation: Boulder should consider allowing for a portion of the landscape to have temporary irrigation over a maximum three-year establishment period for native plantings

which require no supplemental water use. This can be implemented either through administrative approval via the landscape plan and landscape water budget or through a signed agreement or contract between Boulder and the applicant.

Hydrozones with temporary irrigation would reflect a zero-use planting type under a landscape water budget, noting that a three-year establishment period is expected. Temporary irrigation supports the healthy establishment of very low or no supplemental water use plant species, reducing long-term water use and supporting native ecosystems.

Depending on the selected approval structure, Boulder may increase staff needs for review and approval of an agreement or request for temporary irrigation and would need to consider whether the City would also require applicants to prove that the established landscaping would no longer be irrigated at the end of the three-year period. Particularly for larger applications, Boulder should require that these areas be verified through the site review process at the beginning and end of the establishment period.

While some other cities require proof that the irrigation system has physically been removed or disabled, we do not recommend Boulder require this, to allow for re-irrigation if needed.

Re-irrigation of these landscaped areas should be allowed following sustained drought conditions after which temporary supplemental irrigation may be required to save plant life and support plant viability.

We recommend that temporary irrigation zone allowance guidance reside in Boulder's Municipal Code, with additional details to be included in a separate standards document including how this is addressed through the landscape water budget.

Examples:

- City of Aspen requires applicants to operate under a Temporary Irrigation Water Service Agreement. Aspen will provide treated water service to the subject property "for purposes of temporary irrigation of a predetermined amount of irrigated square feet for a predetermined period of time. The location, amount, plants, specifications, etc. of planned temporary irrigation on the subject property will be reviewed and approved prior to executing a Temporary Irrigation Water Service Agreement." A $25,000 deposit is required to execute the Agreement with an existing customer for a parcel already receiving city water.
- City of Aurora permits temporary overhead irrigation for a three-year establishment with approval. Code does not specify how approval is specifically awarded except through a submitted, approved landscape plan. This applies to non-water "Z" zones defined as "any turf or plant species needing no water through automatic irrigation connected to a permanent tap to survive or needing only water by a temporary tap for re-establishment in normal weather conditions."
- City & County of Broomfield allows for non-irrigated hydrozones to be temporarily irrigated until established with no official program or agreement. This would be specified in the landscape plan submittal and landscape water budget calculations would consider these hydrozone areas to be Xeric.
- City of Bozeman allows temporary irrigation and requires users to disconnect or disable temporary irrigation systems by or before three years have passed.

Applicability: This allowance could be available for new and redevelopment. Existing property owners replacing higher water use plantings may be allowed to install temporary irrigation zones if Boulder sees benefit to extending this flexibility to existing landscapes.

Implementation Needs: Staff time requirements will depend on the level of review needed, which will be influenced by application requirements, process, and whether a signed agreement will be required to approve temporary irrigation. Internal tracking of approved temporary irrigation will require additional staff time.

Firewise Standards 

Recommendation: Boulder should incorporate firewise standards and plant requirements into the Municipal Code. Standards should include some allowance for rock mulch in areas with no plantings. This may include a maximum percentage allowance for rock mulch within the full landscaping area in those specified areas (for example, no more than 5% of the total landscaped area may include rock mulch, which will not be allowed within areas with live materials or as mulch around tree bases). We recommend that standards related to rock mulching be specified in the Municipal Code and incorporated into the landscape water budget to be reviewed and approved by staff.

Examples:

- City of Aspen code recommends avoiding fire-prone plant materials and highly flammable mulches. Projects in fire-prone areas must address fire safety and prevention. Properties in Moderate or High Wildfire Hazard zone must be firewise.
- Best practices recommend that in fire prone areas, landscape standards should be developed to provide defense against wildfire using concepts for creating a "defensible space."

Implementation Needs: Staff time will be required to develop firewise standards that address Boulder's specific fire-related risks.

Professional Training and Certification Requirements 

Recommendation: Boulder should consider offering a no-cost, bilingual training program focusing on water efficient landscape and irrigation design and installation to landscape and irrigation professionals who work in Boulder. This training may focus on local hydrologic conditions and water supplies, plant selection and proper installation, irrigation system design and installation best practices, and provide an overview of Boulder's landscape and irrigation standards.

Boulder would develop, schedule, market, and cover all costs to host this workshop at a regular frequency determined by Boulder, preferably during late winter or early spring, prior to the busier installation season. Boulder should consider potential challenges in hosting and requiring this specific training or other certification requirements based on labor levels and

time and cost commitments that this would require from the landscape and irrigation professionals and businesses.

As a more advanced best practice, this training would be offered and required or highly encouraged for all landscape and irrigation professionals completing work in Boulder. Boulder should consider any certification or registration requirements for landscaping professionals and/or irrigation professionals 1) preparing designs submitted through landscape and irrigation plans and 2) installing landscaping and irrigation systems approved under the submitted plans. We recommend that Boulder consider the following requirements based on work being completed:

1. Landscape professionals preparing landscape plans be required to complete a free training hosted by Boulder or completing another accepted landscaping training focused on efficiency (for example, the Qualified Water Efficient Landscaper or "QWEL" certification). To be registered through City of Boulder.
2. Landscape professionals completing landscaping installation under an approved landscape plan be required or highly encouraged to complete a free training hosted by Boulder or completing another accepted landscaping training focused on water efficiency. Additional training or certification requirements may be considered on installations for larger properties over a specified area. To be registered through City of Boulder.
3. Irrigation professionals preparing irrigation plans be required to have an accredited certification for irrigation professionals (for example, Certified Irrigation Contractor through Irrigation Association). Irrigation designers would be required or highly encouraged to complete a free training hosted by Boulder. To be registered through City of Boulder.
4. Irrigation professionals completing irrigation system installation under an approved irrigation plan be required to have an accredited certification for irrigation professionals (for example, Certified Irrigation Technician through Irrigation Association). Irrigation designers would be required or highly encouraged to complete a free training hosted by Boulder. To be registered through City of Boulder.

Boulder's approach and requirements for landscape and irrigation plan submittals may inform the certification requirements. Implementing a certification requirement and developing and hosting a training program would increase staff time requirements. Offering a free training in addition to certification requirements may help to increase the number of Boulder-area landscaping companies which market and practice water efficient landscapes as a specialty.

We recommend that Boulder staff reach out directly to employees with other cities that host and require professional certification for landscape and irrigation professionals to discuss how others transitioned to requiring these professional certifications. It would also help to discuss staffing needs for developing and implementing a local training program in addition to managing certification requirements and registration. These discussions will help Boulder further evaluate an implementation approach and identify any challenges other cities have experienced.

Proper design and installation of plant materials and irrigation systems is critical to the health of a landscape and directly supports the efficient use of water within the landscaped area. Local training can contribute to professional understanding of Boulder's natural environment

and ecosystems, leading to more designs that directly support local pollinators, enhancing natural habitats, and creating thriving landscapes. Proper irrigation system design and installation as well as appropriate irrigation system programming supports irrigation efficiencies that are directly in support of the landscaped areas, again helping these landscapes to thrive over time. We recommend that specific professional certification requirements based on work being completed be included in an external standards document.

Examples:

- City of Aspen pays for and hosts QWEL workshops and maintains the certification list through QWEL. Certification is required for Irrigation Audit, Signed Landscape Design Plan, and Signed Irrigation Designed Plan. They accept accredited certifications for irrigation and landscaping professionals, as specified in Aspen's Water Efficient Landscape Standards.
- Town of Castle Rock has also adopted the QWEL program as a local certification program and has the same certification requirements as Aspen. Castle Rock also requires registration through the Town for supervision of any landscape or irrigation installation occurring within the Town.
- City & County of Broomfield requires that a Landscape Plan and landscape water budget must be prepared and stamped by a Colorado licensed landscape architect, except for single-family or manufactured homes.

Applicability: Boulder will need to determine training, registration, and certification requirements for each of the planning and installation elements listed above. Customer applicability would be tied to landscape plan triggers for new development and redevelopment. Typically, existing single-family detached dwellings completing a landscape project would not trigger this requirement as it likely would not trigger the landscape plan requirement. Site Review typically involves a landscape architect; as such, Boulder may consider a certain minimum area to trigger the certification requirements.

Implementation Needs: Implementing the development of and hosting of a professional landscape and irrigation training program will require additional staff time and may also require external contracting support. If professionals completing this training will be registered with Boulder to satisfy any training requirements, staff time to manage this registration is required. Beyond the local training, any external certification requirements will also require additional staff time to verify and potentially manage a professional registration list.

Watering Schedules

Recommendation: Boulder should consider designating a maximum number of days per week that each customer can water and restrict watering during certain hours of the day. Maximum number of days per week reduces water use, and if implemented along with assigned days of the week (for example, odd addresses water Tuesday, Thursday, Saturday) can help with water treatment plant peaking concerns.

Limiting watering to only late evening through early mornings when temperatures are lower increases irrigation efficiency, improving plant health and reducing water use. If adopted, Boulder should consider whether these maintenance guidelines are required through code,

or if they are unenforced efficiency recommendations. Watering schedules are difficult to enforce for systems like Boulder's which are not equipped with advanced metering infrastructure (AMI).

Boulder may define restricted hours for watering in its Municipal Code. Designated days of week for properties, if implemented, should be assigned outside of the code to allow for flexibility if adjustments are needed.

Examples:

- City of Aspen requires overhead irrigation to be scheduled between 6:00 pm and 8:00 am unless prevented by weather conditions or alternate schedule is declared under City's Water Shortage Ordinance.
- City of Bozeman municipal code assigns every property three days of watering allowed per week, and watering may not occur from 10am to 8pm.
- City of Fort Collins encourages voluntary watering restrictions which include watering no more than twice a week (three days a week when temperatures are consistently above 90 degrees) and watering overnight and when there is less wind.
- Best practice is to note that irrigation schedule requirements often reside in other parts of the municipal or county code and apply to all development, not just new development.

Applicability: This would apply to all water service customers within Boulder's service area. Boulder should consider if parks would also have schedule limitations or if that is possible based on zone irrigation cycle needs. Certain larger irrigation users like parks and large commercial properties may be exempt or have different scheduling guidelines.

Implementation Needs: Unless and until Boulder transitions its metering system to incorporate AMI or similar metering technologies, enforcement of a day of the week and time of day watering schedule is difficult. Staff time will be required to develop these recommendations and for all communication and outreach to inform water service customers of these recommended or required schedules.

Flexibility for Small Landscaping Projects

Recommendation: Boulder should avoid adopting code language which applies to small "do it yourself" landscaping or irrigation projects. Boulder should consider explicitly exempting some existing property landscape modifications from certain requirements and standards to avoid inconsistent enforcement across properties. If small installations occur on an existing property, enforcement of any standards or permit requirements may be difficult or impossible. We recommend that any exemptions or inclusions to trigger the landscape and irrigation standards be defined in the Municipal Code.

Examples:

- City of Aspen landscaping and irrigation requirements defined under its Water Efficient Landscape Standards do not apply to any existing landscapes with disturbance areas less than 1,000 square-feet or less than 25% of the entire lot or parcel. These

properties are exempt from those requirements and would allow for system updates without any permitting requirements.

- City & County of Broomfield specifically exempts landscape plan requirements for any modifications by a property owner or homeowner's association to existing landscaping.

Applicability: Boulder should consider either specifying properties and redevelopment/landscape or irrigation update projects that would be exempt from landscape and irrigation standards requirements. Boulder could consider adopting language into its Municipal Code that clarifies that a certain percentage or area of re-landscaping would trigger code requirements. Boulder currently defines triggers for redevelopment that would require a building permit, so this should also be considered.

Implementation Needs: Developing these exceptions would require staff time during the code update. Ongoing support for allowing small do-it-yourself landscape projects likely will not require additional staff time to support.

Additional Recommendations and Considerations

Maintain and expand on existing turf restrictions.

Boulder currently restricts high water use turf to cover no more than 25% of the landscaped area, not allowed on slopes of 4:1 or greater, and not allowed to be watered by overhead spray in areas less than 10 feet wide. Boulder should also consider further restricting high water use turfs based on a maximum total landscaped area. Combining limitations on total physical high water use turf areas, nonfunctional turf restrictions, and a maximum applied landscape water budget will advance water savings and increase the installation of lower water use plant materials.

Waste of water penalties.

Boulder should consider whether its water budget-based billing structure is adequate to penalize over-watering by its water users. Boulder should consider whether stronger enforcement is consistent with City values and goals.

Waste of water requirements and penalties can serve as an enforcement mechanism for some landscaping and irrigation requirements and is an important water efficiency measure.

Restrict artificial turf.

Boulder should consider restricting the installation of any artificial turf to replace existing living landscapes. Artificial turf can cause negative environmental impacts, such as exacerbating heat island effects in urban areas and releasing harmful chemicals, including plastics, microplastics, and perfluoroalkyl and polyfluoroalkyl chemicals, into the environment and watersheds. Boulder should consider if any exceptions may be made for public sports fields, school fields, or other functional areas.

Definitions

Advanced metering infrastructure (AMI): an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers.

Backflow prevention device: a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

Best practice: a standard or set of guidelines that is known to produce good outcomes if followed. A procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption.

Certified irrigation designer: a person certified to design irrigation systems by an accredited academic institution, Irrigation Association's Certified Irrigation Designer program, American Society of Irrigation Consultant's Professional Irrigation Consultant designation or other irrigation designer program labeled by U.S. Environmental Protection Agency's WaterSense program. The local entity will need to determine the acceptable certification criteria.

Certified landscape irrigation auditor: a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program labeled by U.S. Environmental Protection Agency's WaterSense program. The local entity will need to determine the acceptable certification criteria.

Established landscape: the point at which plants in the landscape have developed roots into the soil adjacent to the root ball. Typically, most plants are established after one or two years of growth.

Establishment period: the period after installing the plant in the landscape if irrigation will be terminated after establishment. Typically, most plants are established after one to three years of growth. Native habitat mitigation areas and trees may need three to five years for establishment.

Evapotranspiration: the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time. See below for "reference ET."

Hydrozone: a portion of the landscaped area having plants with similar water needs grouped together that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a non-irrigated hydrozone.

Irrigation efficiency: the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. Greater irrigation efficiency can be expected from well designed and maintained systems.

Landscaped area: any land set apart for planting grass, shrubs, trees, or similar living materials, including, without limitation, land in an arcade, plaza, or pedestrian area, and of which fences and walls may be a part.

Master shut-off valve: an automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system.

Maximum applied landscape water budget: the upper limit of annual applied water (supplemental irrigation water) for the established landscaped area as specified in Appendix A. It is based upon the area's reference evapotranspiration and is adjusted for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.

Mulch: any organic material such as leaves, bark, straw, compost or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

New construction: for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt.

Nonfunctional turf: turf that is not functional. Includes turf located in a street right-of-way, parking lot, median, or transportation corridor. Does not include turf that is designated to be part of a water quality treatment solution required for compliance with federal, state, or local agency water quality permitting requirements that is not irrigated and does not have herbicides applied.

Non-residential landscape: landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments with designated recreational areas.

Overhead sprinkler irrigation systems: systems that deliver water through the air (pop-ups, rotors, etc.)

Overspray: the water that is delivered beyond the target area.

Residential landscape: landscapes surrounding single-family detached, townhomes, or multifamily development.

Smart irrigation controller: an irrigation system automatic timing device that uses sensors to monitor the weather, soil moisture, and other conditions to determine how much water to provide to your plants.

Soil moisture sensing device or soil moisture sensor: a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

Sprinkler head: a device that sprays water through a nozzle.

Turf or turfgrass: a surface layer of earth containing mowed grass with its roots. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, fescue, and Tall fescue are cool-season grasses. Bermudagrass, Blue Grama, and Buffalo grass are warm-season grasses.

Valve: a device used to control the flow of water in the irrigation system.

Wildland Urban Interface (WUI): Where human habitation and development meet or intermix with wildland fuels. For Boulder, the WUI is shown in Figure 2.1 of the 2024 Boulder Community Wildfire Protection Plan and covers much of downtown Boulder and foothills.

References

Broomfield Code Explainer, Prepared by WaterNow Alliance and Western Resource Advocates

Broomfield Landscape Reference Manual

Broomfield Municipal Code, Chapter 17-70 - Landscape Code

City of Aspen Municipal Code Chapter 25.30. - Water Efficient Landscaping Standards.

City of Aspen Water Efficient Landscaping Standards. https://aspen.gov/199/WELS---Water-Efficient-Landscaping-Stand

City of Aurora Lawn and Irrigation Permits: https://www.auroragov.org/business_services/development_center/inspections___certificate_of_occupancy/lawn_and_irrigation

City of Aurora Unified Development Ordinance, Chapter 146-4.7

2023 Boulder Design and Construction Standards – Chapter 3 Streetscape Design and Tree Protection

City of Boulder Municipal Code

City of Bozeman Municipal Code

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Larimer County Urban Area Street Standards, Appendix C: Fort Collins Streetscape Design Standards and Guidelines

Town of Castle Rock ColoradoScape Guidelines, Prepared by Norris Design (October 17, 2022)

Town of Castle Rock Landscape Information and Forms, https://www.crgov.com/1711/Landscape-Forms

Town of Castle Rock Municipal Code, Title 15 - Buildings, Construction and Public Improvements

Town of Castle Rock Landscape and Irrigation Criteria Manual (May 7, 2024)

Western Resource Advocates, The State of WaterWise Landscaping Standards in Colorado, August 2024

Attachment A: Landscape and Irrigation Standards Summary

Code Entity	Applicability of Landscape Requirements	Landscape Standard and Code Structure	Establishment Irrigation Program	Pre-Construction Landscape Plan and Enforcement
Boulder - Current	Landscaping standards apply to new or re-development projects based on project value relative to property value. Parking lot landscaping requirements apply to just the new parking spaces or to the whole lot if 25% or more parking spaces are added.	Municipal Code & Boulder Streetscape Design and Construction Standards (DCS)	No formal program, but temporary irrigation of low-water use landscaping may be approved by City Manager (9-9-12(d)(16)).	Landscape Plan required for all new development and redevelopment meeting certain criteria, but the prescription of landscape and irrigation standards is minimal compared to other municipalities. Site review process may allow exceptions from the landscaping standards. Landscape inspections by City staff are performed for virtually all new landscape projects via the building permit process.
Aspen	Required for projects using City potable water or raw water including: 1) Landscaping, grading, installing or disturbing hardscapes, additions to structures, etc. that has a disturbance area greater than one thousand (1,000) square feet and greater than twenty-five percent (25%) of the entire lot or parcel. 2) All building permits that trigger a "substantial remodel" per Title 25 of the Municipal Code, defined as the increase by fifty percent (50%) or more in the water using capacity of new water using devices or fixtures installed on a property, as measured by the ECU rating of the existing and proposed structure(s).	Municipal Code references external Water Efficient Landscape Standards (WELS)	Temporary Irrigation Agreement	Requires Landscape Plan including development of site-specific Water Budget for plant material water needs and irrigation efficiency, Irrigation Design Plan, Irrigation Audit, plan approval, and landscape and irrigation inspection following installation. Requires one-year post project audit to be completed by third-party Certified Landscape Irrigation Auditor.
Aurora	1) all development on vacant or cleared land 2) all new development of residential, mixed-use, and non-residential primary structures 3) redevelopment of a site that involves replacement of an existing structure or expansion of the gross floor area by more than 25 percent 4) construction of new parking lots containing 10 or more parking spaces, and the redesign or reconfiguration of existing primary use parking lots containing 10 or more parking spaces	Municipal Code references Unified Development Ordinance and external Landscape Reference Manual Standards defined in Unified Development Ordinance Landscape Reference Manual defines Landscape Plan Requirements and includes design and plant material specifications	Acknowledge that the first year of irrigating new landscaping may require additional water for establishment. Temporary overhead irrigation may be permitted for 3-year establishment period with approval.	Requires Landscape Plan specifying designed "Water Zones" based on plant water use. Water usage table submitted aligning with the designed Water Zones. Following approval of Landscape Plan, applicant must submit Irrigation Plan (managed through Aurora Water Department) and Tree Protection Plan if Black Forest tree species are involved.
Broomfield	Applies to residential, commercial, and industrial development (the landscape plan requirements do not apply to modifications by a property owner or homeowner'sassociation to existing landscaping only.) 1) All new construction, including residential and non-residential 2) Any total redevelopment of a parcel that includes demolition and new construction 3) All construction projects that cumulatively increase the gross floor area of a property by 65% or more 4) Construction of parking lots containing 10 or more spaces, or expansion of an existing parking lot by more than either 10 spaces or 50% of the existing parking lot area, whichever is greater	Municipal Code references external Landscape and Irrigation Criteria Manual Municipal Code includes minimum requirements for all landscaping, specific requirements for different user types, enforcement, and maintenance Landscape Reference Manual describes landscape and irrigation plan submittal requirements including drawing specs, water budget requirements and calculations, plant lists, and landscape material placement criteria	Allows for non-irrigated hydrozones to be temporarily irrigated until established, no official program or agreement. This would be specified in the Landscape Plan submittal and water budget calculations would consider these hydrozone areas to be Xeric (requiring no supplemental irrigation during normal weather conditions)	A landscape plan and water budget is required for all applicable development and should be submitted with site plan or building permit. Landscaping zones to be grouped based on water use of plant types. Landscaping plan shall be prepared and stamped by a Colorado licensed landscape architect, except for plans for a single-family dwelling detached or manufactured home. Upon approval, construction drawing level landscape and irrigation plans are required as part of the construction drawing set.
Castle Rock	Landscape Manual applies to all land within the incorporated areas of the Town of Castle Rock, or served by the Town, including public lands. Customer types have specific requirements as detailed in separate sections within the Landscape Manual.	Municipal Code references external Landscape and Irrigation Criteria Manual	Temporary irrigation allowed following criteria for soils, seeding, irrigation operation, and signage	Requires Pre-Application Meeting followed by submittal of Landscape Plan and Irrigation Plan. Both plans require water budget based drawings meeting specific water use requirements and hydrozone designations.
Colorado Springs	Applies to all new construction, greater than 50% expansion of floor area of existing building, specific land use conversions, redevelopment, public service facilities, alteration or reconfiguration of 50% or more of existing developed landscape area, project seeking major modification. General landscaping standards do not apply to individual detached SFR or two-family dwelling on its own lot or Master Planned public parks. Note that individual requirements do apply to these customer types.	Municipal Code includes general landscape and green space requirements Code references Landscape Policy Manual, which contains provisions that implement and supplement the provisions in the Code. Landscape Policy Manual provides additional requirements and specifications around landscaping and irrigation and details submission requirements for the landscape plan, irrigation plan, and other materials required to be filed with the City.	Temporary irrigation may be proposed where allowed to support native seed vegetation establishment but design techniques for water re-use must be exemplified such as grading (depressions or swales) to direct water and supplying soil moisture to support vegetation.	Requires approval of Final Landscape Plan and Final Irrigation Plan prior to any Building Permit approval, any landscape construction, and issuance of Certificate of Occupancy. Specific requirements for new single-family construction, which include turf restrictions, irrigation plan, and landscape plan.
Fort Collins	Landscaping and tree protection standards apply to all development, except for development on existing lots for single-unit detached dwellings, within the designated "limits of development" ("LOD") and natural habitat buffer zones	Streetscape Design Standards and Guidelines are detailed in the Larimer County Urban Area Street Standards, prepared collectively with Loveland and Larimar County Fort Collins is currently evaluating and preparing additional updates to its code and standards Fort Collins completed an evaluation of targeted best practices for soils, xeriscape, tree protection, and tree canopy to help the City implement its "Nature in the City Initiative"	Temporary irrigation allowed for plantings that do not require any irrigation beyond establishment.	Landscape plan and irrigation plan submittal is required for all development applications based on specified minimum standards. Must be approved prior to issuance of building permit or, if no permit required, prior to commencement of construction. Total annual water budget 15 gpsf/year for each water tap, based on hydrozone use designations.
Bozeman	All new projects, with a track for residential projects up to fourplex and a separate track with more oversight for all other projects. Applies regardless of water source (municipal, wells, other non-potable systems). Exemptions include public parks, reclamation and restoration projects that do not require a permanent irrigation system and plant nurseries or botanical gardens or arboretums. Edible gardens must be included on landscape plans but do not count toward the landscaping water budget, and drip irrigation is required if they are watered by an automated irrigation system. Non-irrigated watercourse setback planting, stormwater detention/retention ponds, and constructed wetlands can be excluded from the site area coverage requirements and are not subject to landscaping requirements.	Municipal Code & External Landscape Design Standards	Temporary irrigation allowed. Requirement to disconnect or disable temporary irrigation systems by or before 3 years have passed.	Landscape Plan required for all new projects. One of two approaches may be used to meet landscape requirements: use percentage-based landscape area limits or use performance-based landscape water budget limits. For larger projects (i.e. not small-scale residential projects), a pre-installation meeting and post-installation inspection are both required.
Moab	Applies to any project that requires building permit approval or another approval process by the land use authority (Level I Site Plan, townhome/condo plat, PUD , PAD, MPD, subdivision). The following types of projects/properties only have to comply with the irrigation design criteria portion of the landscape plan requirements: replacement of irrigation systems, active recreation areas, cemeteries, registered local, state, or federal historical sites, and botanical gardens/arboretums. There also exceptions for agriculture and "properties located in the defined USGS geo-hazard, shallow soluble-soil zone"	Municipal Code & External Approved Planting Lists	No formal program. If temporary irrigation is needed (for low water use areas only), it is envisioned as being shown on the Landscape Plan.	Landscape Plan is required for any landscaping required per code. Three different levels, based on the development approval process: 1) General Landscaping Plan (building permit approval only). --> Presciptive OR Performance (Water Budget) approach. Not required to be completed by a landscape architect. 2) Level I Landscaping Plan (more detailed "Level I Site Plan" required for some residential projects up to six units or for commercial projects up to 8,000 SF) --> Prescriptive AND Performance (Water Budget) approach, but no cool-season turf limits *(This seems inconsistent with the rest of their code!)* 3) Level II Landscaping Plan (most detailed approval process for condo/townhome plats, PUD, PAD, MPD, or subdivision) --> Prescriptive AND Performance (Water Budget) approach, including turf limits

Attachment A: Landscape and Irrigation Standards Summary

Code Entity	*Soil and Mulch Standards*	*Plant Materials*	*Turf Standards*
Boulder - Current	No detailed soil preparation standards. Code includes a mention that tilling to at least 6 inches and adding amendments is required. The [Streetscape] Design & Construction Stds have additional requirements for preparation of soil for streetside trees. Code requires Xeriscape™ landscaping principles, including "improving soils to allow better water absorption and proper drainage" Mulch/rocks are encouraged to protect soil moisture, but are not allowed for long-term use as landscaping elements unless approved. Instead, living ground covers are encouraged.	The City has an tree list approved tree list for ROW and City property only. There is no current drought-tolerant/native plant list maintained by the City. There is no specification to use low-water turf in certain areas.	High water-use turf restricted to no more than 25% of the landscaped area, not allowed on slopes of 4:1 or greater, and not allowed to be watered by overhead spray in areas less than 10 feet wide.
Aspen	Criteria related to: 1) Soil Amendment 2) Soil Preparation 3) Soil Inspection Mulch criteria for organic and inorganic mulch specified.	Any plant species can be utilized in the Landscape Plan, except invasive and/or noxious plant species. GreenCO Plant list referenced for use in assigning water use categories for the Water Budget.	Turf restricted through Water Budget Maximum Applied Water Budget of 7.5 gallons/season/sq-ft (gpsf/yr)
Aurora	Replace expansive soils with non-expansive soils. Amend soil with organic matter.	At least 75% of all annuals and trees, and 100% of shrubs, perennials, groundcovers, and ornamental grasses, shall be selected from approvied references (e.g. Landscape Reference Manual, CSU Extension Facts Sheet, etc.). Minimum specified plant sizes by plant type. Prohibit noxious weeds or specific plant species described in Ordinance.	Turf that primarily serves an aesthetic purpose not permitted. Turf can only be installed in active or programmed recreation areas. This is in accordance with SB 24-005. Turf installation is restricted based on yard size and shall not be installed following removal of water-wise landscaping. Defines turf as "any cool-season turf species, variety or blend, including but not limited to Kentucky bluegrass and fescue". Water-wise landscape means landscapes designed with shrubs, perennials and warm-season grasses with an annual irrigation water requirement of less than 15 inches of annual irrigation (9.4 gpsf/yr). Allows use of artificial turf.
Broomfield	Requires organic soil amendments for areas to be seeded or sodded Allow use of rock or wood mulches but do not note specifications. Mulch application requirements include minimum depth depending on plant types and must be at least 3 inches from tree trunks.	Landscaping shall include a variety of water-wise plant materials that will provide visual interest during all seasons. At least 75% of all annuals and trees, and 100% of shrubs, perennials, groundcovers, andornamental grasses used to landscape each site regulated by this chapter shall beselected from the water-wise plant list in contained in the Landscape Reference Manual or other accredited reference	Residential: Turf up to a maximum of 30% of the total landscape area. Turfgrass or sod,seed and seed mixtures that contain more than 20% mixture of cool-season grass species shall be prohibited Maximum applied water budget of 12 gpsf/watering season functions to limit high hydrozone plants including cool-season turf
Castle Rock	Criteria related to: 1) Soil Evaluation 2) Stockpiling 3) Soil Amendment 4) Soil Preparation 5) Structural Soil 6) Inspections to review adherence to all criteria	Plant Material Specification and Planting Standards defined by Castle Rock. Specific turf and water use restrictions are defined based on customer use type (e.g. single-family residential, parks, etc.)	No turf allowed in front yard of single-family residential new development; irrigated turf allowed in backyards, but no turf species requiring more than 19 inches of water per growing season (11.8 gpsf/yr) allowed. Traditional turf not allowed for non-residential properties, in streetscapes, rights-of-way and tracts along the rights-of way. Allows use of artificial turf.
Colorado Springs	Soil Analysis Report required for submittal with Irrigation Plan. If needed, soil amendments to improve drainage, moisture penetration or retention, and nutrient availability shall be provided as determined by soil analysis. Provides a soil amendment and fertilzation table recommending amount of amendment materials by area based on plant materials	Specific selected plants listed for Colorado Springs including water use designation, code requirements, and plant specs. Also provide standards for selecting native seed mixes.	High water use turfgrass shall be hydrozoned and irrigated separately High water use turfgrass cannot be used as infill material Shall not comprise more than 25% of total green space area
Fort Collins	Incorporate soil amendments appropriate to the soil and the plant material. Soil preparation must be in accordance with City of Fort Collins Municipal Code 3.8.21 Maintain a minimum depth of three inches of mulch in planting beds to conserve soil moisture and control weeds, with careful placement and adjustment of depth near plant stems as needed to allow unimpeded plant establishment and vigorous growth	Selected plants shall be well-adapted to the Fort Collins climate and site conditions. Plants shall be grouped according to water and light requirements. Xeriscape principles do not include or allow artificial turf or plants	Limit high water-use turf to high-traffic areas where turf is functional and utilized. Xeriscape principles do not include or allow artificial turf or plants Turf and non-turf areas shall be irrigated on separate zones.
Bozeman	For all projects, prior to planting, one of the following three methods must be implemented: i) Amend existing topsoil at a rate of 4 cubic yards of compost/1000 square feet; ii) Amend existing topsoil based on the recommendations of a soil test *(additional requirements for a soil test are specified)* ; or iii) Import topsoil to achieve a minimum depth of 6 inches of topsoil. Larger projects require a pre-installation meeting or soils approval. Mulch or rocks may only take up 40% of the landscaped area.	Besides turf restrictions, no restrictions on living plant material, as long as it is hardy in Zones 1 through 5a. They have a recommended list of climate-adapted perennials, shrubs, ornamental grasses, and vines, as well as a tree guide. Artificial plant materials are prohibited from larger projects and cannot count toward required landscape area for smaller, residential projects.	For new residential projects up to fourplex: Turf restricted to the maximum of 35% of the landscaped area or 400 square feet (prescriptive method), or total landscape water budget is restricted to 10 gpsf/yr (performance method). For all other new projects: Turf restricted to 20% of the landscaped area (prescriptive method), or total landscape water budget is restricted to 8 gpsf/yr (performance method). They have a turf removal program. The installation of turfgrass in City right-of-way street medians is prohibited.
Moab	No soil standards. Mulch: a. Shall be applied at a minimum depth of two inches to three inches and as appropriate to each species. Nonporous material shall not be placed under the mulch. b. Shall be applied to the soil surface, not against the plant stem, or high against the base of trunks to minimize disease. c. Because mulching can limit the successful propagation of some native plants, native plants, when appropriate, are exempt from these mulching requirements. d. To provide habitat for beneficial insects and other wildlife, up to five percent of the landscape area may be left without mulch.	A minimum of twenty-five percent of the landscaped area coverage must be living plant materials, measured by the spread of plants at maturity. Tree canopies can be included as up to fifteen of the required twenty-five percent. Artificial plants do not count toward the required landscape area and do not figure into the water budget calculation. At least ninety percent of all forbs, shrubs, and trees and one hundred percent of groundcovers and ornamental grasses used to landscape each site regulated by this section shall be selected from the City of Moab approved plant list, as calculated by applicant's choice of quantity or percent spread at maturity. Plant material that is not on the approved plant list must meet the other requirements within this section. Spring bulbs that do not require additional irrigation are exempt from the approved plant list requirement. Pursuant to the Utah Noxious Weed Act, Section 7, no plants shall be planted from the Grand County Noxious Weeds List (available here: https://www.grandcountyutah.net/168/Noxious-Weeds)	(Applicable to General Landscaping Plan and Level II Landscaping Plan only): Cool season turf shall not be used in more than 10% of total landscaped area or two hundred square feet of turf, whichever is greater. In any landscaping plan including a water budget, turf may exceed cool season turf limits if additional turf fits within the budget. Turf still must meet the other requirements in this section. No turf grasses or overhead irrigation is allowed on slopes greater than twenty-five percent. Park strips and other landscaped areas less than eight feet wide shall be landscaped with water-conserving plants that do not include cool season turf.

Attachment A: Landscape and Irrigation Standards Summary

Code Entity	*Irrigation System Design*	*Irrigating Frequency/ Maintenance Standards*	*Landscaping Professional Certification*	*Firewise Landscaping Standards*
Boulder - Current	Permanent, automatic irrigation systems required. Overspray not allowed. Low-volume, drip, or subsurface irrigation systems shall be used in all non-turf grass areas. A soil moisture sensing device or other irrigation management system shall be required for irrigation systems in turf areas.	No detailed standards. Generally requires Xeriscape™ landscaping principles, including "continued maintenance, including weeding, pruning, fertilizing, pest control, and irrigation maintenance." Per code, water customers have a duty to avoid waste of water and to maintain fixtures.	None	The DRAFT Community Wildfire Protection Plan (April 2024) cites some target projects: - Implement home hardening, defensible space, and fire resilient landscaping skills training. -Create a structured vegetation overgrowth removal program aligned with local regulations and guidelines.
Aspen	Criteria related to irrigation system specifications, irrigation controllers, backflow preventers, check valves, sprinkler head and drip line specifications, Require irrigation plan approval, meeting all applicable criteria. Operation requirements include time of day watering and other irrigation scheduling and management requirements.	Designated time of day watering for overhead irrigation. Require irrigation scheduling to be regulated by smart irrigation controllers set to consider landscape materials, root depth, precipitation, slope, shade, soil moisture data.	Irrigation audit report, Landscape Design Plan, Irrigation Design Plan, and landscape irrigation audits required to be completed by qualified Certified professional. Aspen sponsors QWEL certification and offers training and testing to professionals at no cost	Avoid fire-prone plant materials and highly flammable mulches. Projects in fire-prone areas must address fire safety and prevention. Properties in Moderate or High Wildfire Hazard zone must be firewise.
Aurora	Irrigation Plan required. Must include permanent automatic irrigation system meeting Aurora Water engineering standards, automatic rain shutoff sensors, and irrigation to be designed by hydrozone or "Water Zone".	Designated time of day for watering and maximum three watering days per week from May 1 through September 30.	Irrigation Design Plan to be designed by certified irrigation designer or registered landscape architect.	For Black Forest Areas, routine forestry management and fire safety practices are required.
Broomfield	Irrigation plan to be included in submittal with landscape plan. New landscape areas (with exception of non-irrigated native, dryland, and restorative grasses and areas water with reuse water) shall be watered by permanent automatic irrigation system. Trees shall be irrigated with drip, except using reuse water. Irrigation systems shall be zoned separately for turf and shrub bed areas. Require automatic rain shutoff sensors, freeze sensors, ET gauges, regulated with smart irrigation controllers, controllers and sprinkler bodies must be EPA WaterSense. Dedicated water meter for irrigation on non-residential, multi-family, single-family attached, manufactured home parks, and commercial developments.	All property owners are required to keep all landscaping in a well-maintained and healthy growing condition. Applies to new development, redevelopment and existing landscape.	Required Landscape Plan and water budget shall be prepared and stamped by Colorado licensed landscape architect, except for single-family or manufactured homes.	None
Castle Rock	Criteria related to irrigation design and materials, water service connections on larger irrigated properties, irrigation system controls, and irrigation system design, installation, and maintenance. Require irrigation plan approval, meeting all applicable criteria. Operation requirements include time of day watering, day of week watering, and other irrigation scheduling and management requirements.	Designated time of day watering for both establishment irrigation and permanent irrigation. Assigned watering days and seasonal application rates defined.	Registration with the Town of Castle Rock is required to conduct: 1) landscape design (unless licensed by the State of Colorado) 2) irrigation design 3) supervision of landscape or irrigation installation 4) supervision of landscape or irrigation maintenance of non-residential properties Registration for projects exempt from State licensure require QWEL certification, offered through Castle Rock or SMWSA	Some general guidelines included to increase awareness of and design for defensible space for fire mitigation. No specific firewise standards.
Colorado Springs	Irrigation plan required. A Landscape Architect licensed by the State of Colorado, or a Certified Irrigation Designer shall prepare all required irrigation plans and supporting material. Irrigation design specs include prevention of runoff, rate management to not exceed soil infiltration rate, metered and have appropriate backflow prevention, backflow specs.	Included in irrigation design specs: For all design irrigation systems, if more than three days a week are required to provide required coverage with spray/rotor stations/valves, a Water Allocation Plan is required from Colorado Springs Utilities.	A Landscape Architect licensed by the State of Colorado shall prepare all required landscape plans and supporting material. A Landscape Architect licensed by the State of Colorado or a Certified Irrigation Designer shall prepare all required irrigation plans and supporting material	Wildfire concerns are identified and note that dry grasses can be managed to reduce the risk from wildfire. Strategies noted include: 1) Choose shorter grass species 2) Water periodically 3) Mow grasses in fall 4) Manage ladder fuels (e.g. shrub and tree branches close to the ground)
Fort Collins	Final irrigation plan submitted to and approved by Director prior to issuance of a building permit or prior to commencement of construction if no permit required. Requirements include: Irrigation system to be designed according to hydrozones Each zone to irrigate a landscape with similar water needs Turf and non-turf irrigated on separate zones Steep grades must minimize runoff Do not combine different heads in same zone Master shut-off valve installed downstream of backflow device For combined-use tap, water meter install upstream to measure total water use Controllers shall be "smart" controllers, using climate-based or soil moisture-based technology, selected from the WaterSense labeled irrigation controllers list An evapotranspiration (ET) sensor or weather monitor shall be installed on each irrigation controller Sprinkler and nozzle requirements Remote control valves shall have flow control A backflow prevention assembly shall be installed in accordance with local codes Water pressure requirements	Frequency not included in code. voluntary watering restrictions includ watering no more than twice a week (three days a week when temps are consistently above 90 degrees); water overnight and when there is less wind. Provide regular maintenance including but not limited to weeding, pruning, mowing to an appropriate height, deadheading, replacement of dead plant material, and replenishment of mulch surfaces.	A sprinkler performance audit shall be performed by a landscape irrigation auditor who is independent of the installation contractor, and who is certified by the Irrigation Association (a nonprofit industry organization dedicated to promoting efficient irrigation).	None
Bozeman	Irrigation systems are not required for residential projects up to fourplex, but they are requierd for all other new projects. Irrigation systems must: -Have backflow prevention -Irrigation controller (WaterSense) WITH precipitation sensor for automatic turn-off -Overhead irrigation requires MSMT nozzles or approved equals and/or rotors -Sprinkler heads must have a 6" minimum riser, be 2" minimum from hardscape edges, and be equipped to regulate pressure *(pressure regulators or check valves, depending on project type)* -Hydrozoning -Trees on separate zone -Non-turf areas must use drip irrigation -Areas less than 8 feet wide drip irrigation only And other requirements.	Irrigating standards are in the municipal code. Every property has three assigned days of watering allowed per week, and watering may not occur from 10am to 8pm.	None	None
Moab	They have a very prescriptive list of irrigtaion system design requirements for commercial and large-scale developments only. See Moab tab. Other projects are just recommended to also follow the list.	No restrictions on when irrigation occurs. They have a waste-of-water ordinance that says "No water user shall waste water or allow it to be wasted due to defective taps, valves, leaky joints or pipes"….but no specific mentino in their water waste rule about sprinkler overspray or irrigation system malfunction.	None	None

Attachment B

APPENDIX A – OUTDOOR WATER BUDGET WORKSHEET

	City of Aspen Water Efficient Landscaping Ordinance	
CITY OF ASPEN	**OUTDOOR WATER BUDGET WORKSHEET**	City of Aspen Utilities 427 Rio Grande Place Aspen, CO 81611 970-920-5110
Notes:	1. Project Applicant must complete this worksheet as part of the 2024 ECU Calculator Workbook. 2. Information entered here in the Outdoor Water Budget Worksheet will autopopulate in the ECU Calculator. 3. Project cannot exceed maximum applied water budget or the maximum residential ECU rating per Title 25. 4. Hot tubs and swimming pools are included in the calculation of the average Maximum Applied Water Budget.	
Directions for Use:	Fill in the green sections below. Some columns have drop down menus to assist in filling out the cells. The formulas will calculate the site average seasonal water use. Once completed, insert the Hydrozone Water Budget Calculation table on the Irrigation Design Plan.	

Address:		**Contact Info:**	

CALCULATING GALLONS OF WATER NEEDED BY PLANT CATEGORY AND IRRIGATION TYPE

The specific irrigation water needs of each hydrozone in the design is determined using the following formula and factors:

Irrigation Water Budget = [(ETo x Plant Factor) - Re] x Irrigated Area / Irrigation Efficiency x 0.623

Where:

ETo = Reference Evapotranspiration in inches/season (May - Oct.)
Re = Effective Precipitation in inches/season (May - Oct.)
Irrigated Area = Hydrozone Area in square feet

Water Use Category	Code	Plant Factor
Swimming Pool/Hot Tub	VH	0.90
Cool Season Turf	VH	0.90
High	H	0.80
Medium	M	0.65
Low	L	0.40
Very Low	VL	0.25

Parameter	inches/season	gal/sf/season
Reference Evapotranspiration	27.4	17.1
Effective Precipitation	6.8	4.2

Irrigation Category	Irrigation Efficiency
Swimming Pool/Hot Tub	75%
Overhead	75%
Drip	90%
Bubbler	82.5%

HYDROZONE WATER BUDGET CALCULATION

Complete the hydrozone table for each hydrozone. Use as many rows as necessary to provide the square footage of landscape are per hydrozone. Update the calculation formulas at the bottom if additional rows are inserted.

Maximum Applied Water Budget (gal/sf/season)	7.5
Hot Tub Volume (gallons)	0
Swimming Pool Volume (gallons)	0

Hydrozone	Water Use Code	Plant Factor	Irrigation Category	Irrigation Efficiency	Hydrozone Area (sf)	Plant Water Need (gal/season)
Example	*L*	*0.40*	*Drip*	*0.90*	*2000*	*5759*
Zone 1						0
Zone 2						0
Zone 3						0
Zone 4						0
Zone 5						0
Zone 6						0
Zone 7						0
Zone 8						0
Zone 9						0
Zone 10						0
Other Outdoor Features	**Water Use Code**	**Plant Factor**	**Irrigation Category**	**Irrigation Efficiency**	**Hydrozone Area (sf)**	**Portion of Water Budget (gal/season)**
Hot Tub	VH	0.90	Swimming Pool/Hot Tub	0.75		0
Swimming Pool	VH	0.90	Swimming Pool/Hot Tub	0.75		0
				Sub-total, Hot Tub/Swimming Pool	0	0
				Sub-total, Overhead	0	0
				Sub-total, Drip	0	0
				Sub-total, Bubbler	0	0
				TOTAL	0	0

AVERAGE IRRIGATION WATER NEED - ALL ZONES (gallons/sf/season) = 0.0

updated: 12.28.23

Section 4: Water Budget Chart

A Water Budget is the target amount of water that should be applied during a typical watering season, post-establishment.

Instructions:

1. Divide the plan into hydrozones: specific areas or grouping of plants together based on their similar water needs — xeric, low, moderate or high. Check the City and County of Broomfield Water-Wise Plant List to determine the appropriate hydrozones for plants in your design.
2. Calculate the area (in square feet) for each hydrozone and enter the square feet in the green shaded cells in the first table below. Add the square feet together for all the areas that have the same hydrozone designation, even if they are in separate areas within the landscape plan. For example, if there are three Moderate hydrozone areas, add the areas together for a total and use that total in the table below.
3. Calculate the total area for the landscape plan (the sum of all hydrozones) and enter that value in the orange cell below.
4. Calculate a total water use (in gallons) for each type of hydrozone by multiplying the area by the gallons per square foot shown below. Enter the result for each hydrozone in the blue cells below.
5. Add the water use for all the hydrozones together to determine a total annual water use for the site and enter that value in the purple cell below.
6. Divide the total annual water use by the total square footage to determine the overall average water use per square foot for the entire site. **The overall site should use no more than 12 gallons per square foot per watering season.**

Water Budget Chart

Hydrozone	Area (square feet)	*times*	Water Need (gallons per square foot)	*equals*	Annual Water Use (gallons)
High (H)		X	24.9	=	
Moderate (M)		X	11.4	=	
Low (L)		X	3.5	=	
Xeric (Z)		X	0	=	
Totals	*(sum)*		**N/A**		*(sum)*

Average water use calculation. Enter numbers where shaded gray below.

Average water use per square foot = $\frac{\text{Total Annual Water Use}}{\text{Total Area of Landscape}}$ = ____ =