



City of Longmont

# **RESILIENT LANDSCAPES POLICY ASSESSMENT**

January 2024

Prepared by  
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# 1 EXECUTIVE SUMMARY

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## 1.1 PROJECT PURPOSE

Longmont attended the Sonoran Institute's Growing Water Smart program where they identified the need to understand water wise landscape best practices and examples across the Front Range and Colorado. Longmont received financial support from the Sonoran Institute's Growing Water Smart's Technical Assistance program to engage Del Corazón Consulting to complete this task. The goals of this project included:

- Conduct a scan of City of Longmont's plans and policies to assess codes and policies for water conservation, water efficient landscapes, and climate resilience.
- Identify the presence or absence of best practices.
- Identify any current policy gaps and conflicting or confusing policy requirements.
- Share best practices for climate resilient and water efficient landscapes, particularly for native plants and public right of ways.
- Identify opportunities for strengthening water conservation and efficiency standards in land use code and landscape regulations.
- Inform City of Longmont staff and leadership of opportunities for future code and plan updates or where the strength or effectiveness of a policy could be improved to achieve desired outcomes or plan goals.

Landscape regulations are evolving and now play a critical role in climate adaptation by integrating water conservation and efficiency, water quality protection, promotion of natural habitats, and heat island mitigation. Within this context, water efficient landscape policies prioritize the sustainability of water resources while introducing a new arid design aesthetic that is climate resilient. The goals of a water efficient landscape ordinance are to:

- Reduce the amount of water needed for irrigation by enhancing soil conditions, appropriate plant types and landscape design.
- Decrease water waste by improving site-specific water efficiency through irrigation system design, irrigation system management, and water efficient technology.
- Establish a maximum amount of water permitted for landscapes using tools such as water allowances or water budgets.
- Reduce strain on the treated water system by requiring alternative water sources (rainwater harvesting, raw water, reused).

The policy scan revealed that the City of Longmont development regulations already include many components of water efficient landscape best practices. However, there are deficiencies that may limit the policies effectiveness in creating desired climate resilient landscapes. These include:

- The policies are articulated across four interrelated policy documents that reduce user friendliness and increase potential for confusion.
- The content of the landscape code and the city standards Section 600 include some redundancies and repetitions across policy elements.
- The applicability of effective water efficient best practices is not required for all developments nor in all sites.
- Many effective water efficient landscape standards are voluntary or recommended rather than required.
- In some standards, the policy makes the installation of turf easier to do than water efficient landscapes.

- References to “lower water consuming grass” or drought tolerant grass terminology is used throughout the city’s policies without clearly a preferred grass type nor articulating a vision for a grass alternative or “Coloradoscape” design aesthetic.
- Desired outcomes for stormwater management and LID lack clear guidance for effective implementation.

This report includes recommendations intended to support the City of Longmont with (1) strengthening the water efficient best practices that are already present in the city’s policies, and (2) integrate missing components that will accelerate more widespread resilient landscape installation across the city. The report includes an analysis of the city’s landscape policy sections with recommendations for code language modifications as well as examples of policy language from other cities.

## 1.2 WATER WISE LANDSCAPE POLICY RECOMMENDATIONS AND PRIORITIES

From the policy assessment, sixteen recommendations organized by six themes were developed. All but two of the themes correspond to the structural elements of landscape regulations.

CITY OF LONGMONT RECOMMENDATIONS FOR WATER WISE LANDSCAPE POLICY	
THEME 1: CITY OF LONGMONT STRATEGIC VISION	A. Clarify Longmont’s Goals For Water Efficient And Resilient Landscapes B. Plan For Climate Resilience
THEME 2: LANDSCAPE CODE PURPOSE	C. Review Landscape Retrofit Policy And Promote Landscape Plan Amendments
THEME 3: LANDSCAPE CODE PLANT MATERIALS	D. Develop Consistent Xeriscape Principles And Standards E. Revise Plant Standards F. Adopt A Non-Essential Turf Policy And Modify Drought Resilient Grass Standards
THEME 4: LANDSCAPE CODE IRRIGATION EFFICIENCY	G. Review Applicability Of Water Efficiency Standards H. Modify Irrigation Standards For Planting Trees I. Expand Applicability Of Water Efficient Irrigation Standards J. Strengthen Incorporation Of Low Impact Development (Lid) And Stormwater Landscape Requirements
THEME 5: LANDSCAPE POLICY DESIGN GUIDELINES	K. Review Design Standards With Landscape Professionals For Consistency With Climate Resiliency Goals L. Illustrate The Streetscape Standards For Private And Public Right Of Ways M. Develop Design Guidelines For Desired Residential Landscapes N. Develop A Landscape Design Manual
THEME 6: CITY OF LONGMONT SUSTAINABILITY GOALS	O. Update Plumbing Standards For Consistency With Waterwise P. Review The Greenway Standard For Setback Consistency

While this may appear to be a daunting list, updating the purpose, applicability, plant materials, and irrigation standards are all common to code updates to achieve greater water efficiency and climate resilience.

Del Corazón Consulting recommends that the City of Longmont prioritize the following recommendations:

NOW	
Theme 1	A. Clarify Longmont’s Goals For Water Efficient And Resilient Landscapes
Theme 3	F. Adopt A Non-Essential Turf Policy And Modify Drought Resilient Grass Standards
Theme 4	S. Review Applicability Of Water Efficiency Standards T. Modify Irrigation Standards For Planting Trees



There are two immediate priorities for the City of Longmont. First, to clarify internal policy goals for climate resilience and water conservation. A landscape code supports both water resource management and sustainability goals. The City of Longmont has a healthy water portfolio that does not necessarily require a more aggressive water savings target, but the city also has very strong community values around climate resilience and sustainability. While not necessarily divergent goals, the city would benefit from a strategic discussion of which goals should be prioritized in a landscape policy update.

The State of Colorado is very likely to adopt a non-functional turf policy which will accelerate landscape transformation across the state. A statewide prohibition on non-functional turf, defined as *“turf that is predominantly ornamental and located in or adjacent to a street, sidewalk, driveway, parking lot, frontage area, or median that is not regularly used for civic, community, or recreational purposes”*, will necessitate a code update for the city for non-residential landscapes. The irrigation policies should be done in tandem. The current irrigation standards require trees to be irrigated with the same irrigation system installed for turf. If the city wants to continue to promote a healthy tree canopy, it will need to adopt new tree irrigation practices as turf is replaced.

NEXT	
Theme 3	D. Develop Consistent Xeriscape Principles And Standards E. Revise Plant Standards
Theme 4	I. Expand Applicability Of Water Efficient Irrigation Standards

The second priority area, which could be done in conjunction with a turf policy change, is to update the city’s plant standards and expand the current irrigation efficiency standards to apply to all irrigated landscapes. Residential yards will not be regulated by the state non-essential turf policy. The city should have clear policy guidance for all landscapes, including residential. The city’s current plant standards inadvertently promote a turf dominated landscape. The city should be specific about the type of climate adapted landscape treatments it wants in place of turf. Additionally, the city currently requires many best practices for efficient irrigation system design, but these requirements only apply to limited types of development. The city should consider applying many of these standards to all irrigated landscapes to reduce water waste.

LATER	
Theme 2	C. Review Landscape Retrofit Policy And Promote Landscape Plan Amendments
Theme 4	J. Strengthen Incorporation Of Low Impact Development (LID) And Stormwater Landscape Requirements
Theme 5	K. Review Design Standards With Landscape Professionals For Consistency With Climate Resiliency Goals L. Illustrate The Streetscape Standards For Private And Public Right Of Ways M. Develop Design Guidelines For Desired Residential Landscapes N. Develop A Landscape Design Manual

While not as critical, these recommendations are intended to complement regulations and support successful implementation of water efficient landscape design and green infrastructure goals. Communities, non-profits, and water providers are creating these visual templates and guidelines to illustrate resilient landscapes and overcome perceptions that xeriscapes are not as aesthetically pleasing as turf. Visual resources will be beneficial if the city adopts a non-functional turf policy which will change requirements for city streetscapes and public areas. Longmont could use the existing high-quality resources, such as from Northern Water and Fort Collins, as resources for developers and property owners in the interim of developing its own resources.

OTHER	
Theme 1	B. Plan For Climate Resilience
Theme 6	O. Update Plumbing Standards For Consistency With Waterwise

During the policy scan, two policy conflicts were identified that are not directly linked to landscape policy focus. The first is that the current plumbing code standard for fixtures is inconsistent with the state policy for Water Wise fixtures. The second is an apparent contradiction for the width of the setback along the Poudre River greenway.

**1.3 CONCLUSION**

The City of Longmont has policy goals for more resilient and water efficient landscapes. However, the current policy relies too heavily on vague xeriscape principles that fail to result in these goals being achieved once a project’s landscape is installed. The city has an opportunity to take a leadership role, joining other cities across the Front Range who are responding to Colorado’s water supply challenges, adopting landscape regulations that promote climate adapted and water efficient landscapes. The likely adoption of a non-essential turf policy by the state legislature and continued funding of turf replacement programs serves as a catalyst for a policy update in 2024.



## 2 PROJECT INTRODUCTION

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Longmont attended the Sonoran Institute’s Growing Water Smart program where they identified the need to understand water wise landscape best practices and examples across the Front Range and Colorado. Longmont received financial support from the Sonoran Institute’s Growing Water Smart’s Technical Assistance program to engage Del Corazón Consulting to complete this task. The goals of this project included:

- Conduct a scan of City of Longmont’s plans and policies to assess codes and policies for water conservation, water efficient landscapes, and climate resilience.
- Identify the presence or absence of best practices.
- Identify any current policy gaps and conflicting or confusing policy requirements.
- Share best practices for climate resilient and water efficient landscapes, particularly for native plants and public right of ways.
- Identify opportunities for strengthening water conservation and efficiency standards in land use code and landscape regulations.
- Inform City of Longmont staff and leadership of opportunities for future code and plan updates or where the strength or effectiveness of a policy could be improved to achieve desired outcomes or plan goals.

To develop this report, Del Corazón Consulting reviewed the following plans and policies:

PLAN OR POLICY FOR REVIEW
Envision Longmont Comprehensive Plan
Longmont Sustainability Plan
Municipal Code
Design & Construction Standards (200, 300, 500, 600)
Development Manual
Approved Materials List Parks & Open Space
Tree Canopy Study
2017 Water Efficiency Master Plan
2022/2023 Water Supply & Drought Master Plan
2003 Raw Water Master Plan Update

## 3 WHAT IS A WATER WISE LANDSCAPE POLICY?

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Landscape regulations are evolving and now play a critical role in climate adaptation by integrating water conservation and efficiency, water quality protection, promotion of natural habitats, and heat island mitigation. Within this context, water efficient landscape policies prioritize the sustainability of water resources while introducing a new arid design aesthetic that is climate resilient. The goals of a water efficient landscape policy are to:

- **Reduce the amount of water** needed for irrigation by enhancing soil conditions, appropriate plant types and landscape design.
- **Decrease water waste** by improving site-specific water efficiency through irrigation system design, irrigation system management, and water efficient technology.
- **Establish a maximum amount of water** permitted for landscapes using tools such as water allowances or water budgets.
- **Reduce strain on the treated water system** by requiring alternative water sources (rainwater harvesting, raw water, reused).

The integration of water efficiency does not significantly change the structure of a landscape code, rather it introduces new standards into the existing policy elements.

COMMON ELEMENTS OF A LANDSCAPE CODE	
<b>A. Purpose and Intent</b> <ol style="list-style-type: none"> <li>1. Intent</li> <li>2. Applicability</li> <li>3. Exclusions</li> <li>4. Alternative Compliance</li> </ol> <b>B. Landscape Plan</b> <ol style="list-style-type: none"> <li>1. Landscape Plan Submittal Requirements</li> <li>2. Landscape Plan Approval Process and Amendments</li> <li>3. Review Procedures</li> </ol> <b>C. General Landscape Requirements</b> <ol style="list-style-type: none"> <li>1. Areas To Be Landscaped</li> <li>2. Stormwater Detention</li> </ol> <b>D. Selection and Installation of Water Efficient Plant Materials</b> <ol style="list-style-type: none"> <li>1. Plant Material Selection &amp; Plant Lists</li> <li>2. Plant Size and Installation</li> <li>3. Turf Limitations</li> <li>4. Tree Preservation</li> </ol>	<b>E. Water Budgets (<i>optional element</i>)</b> <ol style="list-style-type: none"> <li>1. Methodology</li> </ol> <b>F. Water-efficient Irrigation Systems</b> <ol style="list-style-type: none"> <li>1. Water Efficient Irrigation System Design</li> <li>2. Alternative Water Sources</li> <li>3. Irrigation Plan</li> </ol> <b>G. Landscape Design Standards and Guidelines</b> <ol style="list-style-type: none"> <li>1. Residential</li> <li>2. Commercial Industrial</li> <li>3. Parks</li> <li>4. Open Space</li> <li>5. Interior Parking Lots</li> <li>6. Streetscapes/ROW</li> <li>7. Buffers</li> </ol> <b>H. Maintenance and Enforcement</b> <b>I. Definitions</b>

Themes 2-5 are aligned with these different landscape code elements. However, two themes (Theme 1 and Theme 6) are related to interrelated city policy that were identified during the policy analysis and important to city sustainability. The themes in this report include:

- Theme 1: City of Longmont Strategic Vision
- Theme 2: Landscape Code Purpose
- Theme 3: Landscape Code Plant Materials
- Theme 4: Landscape Code Irrigation Efficiency
- Theme 5: Landscape Policy Design Guidelines
- Theme 6: City of Longmont Sustainability Goals

## 4 SUMMARY OF WATER EFFICIENT LANDSCAPE RECOMMENDATIONS

The policy audit confirms Longmont's commitment to water and natural resource stewardship. The development regulations already include many components of water efficient landscape best practices. However, there are deficiencies that may limit the policies effectiveness in creating desired climate resilient landscapes. These include:

- The policies are articulated across four interrelated policy documents that reduce user friendliness and increase potential for confusion.
- The content of the landscape code and the city standards Section 600 include some redundancies and repetitions across policy elements.
- The applicability of effective water efficient best practices is not required for all developments nor in all sites.
- Many effective water efficient landscape standards are voluntary or recommended rather than required.
- In some standards, the policy makes the installation of turf easier to do than water efficient landscapes.

- References to “lower water consuming grass” or drought tolerant grass terminology is used throughout the city’s policies without clearly a preferred grass type nor articulating a vision for a grass alternative or “Coloradoscape” design aesthetic.
- Desired outcomes for stormwater management and LID lack clear guidance for effective implementation.

The recommendations included in this report are organized by themes and not in order of priority. These recommendations aim to support the City of Longmont with (1) strengthening the water efficient best practices that are already present in the policies, and (2) integrating missing components that will accelerate more widespread resilient landscape installation across the city. These recommendations include:

CITY OF LONGMONT RECOMMENDATIONS FOR WATER WISE LANDSCAPE POLICY	
THEME 1: CITY OF LONGMONT STRATEGIC VISION	A. Clarify Longmont’s Goals For Water Efficient And Resilient Landscapes B. Plan For Climate Resilience
THEME 2: LANDSCAPE CODE PURPOSE	C. Review Landscape Retrofit Policy And Promote Landscape Plan Amendments
THEME 3: LANDSCAPE CODE PLANT MATERIALS	D. Develop Consistent Xeriscape Principles And Standards E. Revise Plant Standards F. Adopt A Non-Essential Turf Policy And Modify Drought Resilient Grass Standards
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THEME 5: LANDSCAPE POLICY DESIGN GUIDELINES	K. Review Design Standards With Landscape Professionals For Consistency With Climate Resiliency Goals L. Illustrate The Streetscape Standards For Private And Public Right Of Ways M. Develop Design Guidelines For Desired Residential Landscapes N. Develop A Landscape Design Manual
THEME 6: CITY OF LONGMONT SUSTAINABILITY GOALS	O. Update Plumbing Standards For Consistency With Waterwise P. Review The Greenway Standard For Setback Consistency

## 4.1 PRIORITIES FOR ACTION

The City of Longmont is in a semi-arid, high plains environment with an average precipitation of 14 inches annually. Nearly all non-native landscaping requires supplemental water to survive. Water efficient landscapes reduce the amount of irrigation needed promoting water supply resilience, are easier to maintain during times of drought or watering restrictions, reduce the cost of ongoing maintenance to property owners, and support urban habitats that are climate resilient and wildlife friendly. The City of Longmont has already integrated many best practices into its development policies. Of the recommendations, eight of them are process oriented changes and eight are substantive policy content additions or amendments.

- Of the content related recommendations, modifications of the plant are not significant departures from what the City is already doing, but rather clarifications and refinements for greater impact. These would likely result in minor changes to the codes.
- Illustrating the types of landscape the city wants to encourage would be beneficial, even if Longmont chose not to make any major changes to the landscape policies.
- The most significant proposed changes to the city regulations are for adopting turf limitations for all development and requiring the application of the water efficient irrigation best practices for all

development applications. These changes would align Longmont with other municipalities leading the way with water resilient landscape requirements including the Cities of Aurora, Castle Rock, Westminster, Berthoud, and Colorado Springs.

Del Corazón Consulting recommends that the City of Longmont prioritize the following recommendations:

NOW	
Theme 1	A. Clarify Longmont's Goals For Water Efficient And Resilient Landscapes
Theme 3	F. Adopt A Non-Essential Turf Policy And Modify Drought Resilient Grass Standards
Theme 4	Q. Review Applicability Of Water Efficiency Standards R. Modify Irrigation Standards For Planting Trees

There are two immediate priorities for the City of Longmont. First, to clarify internal policy goals for climate resilience and water conservation. A landscape code supports both water resource management and sustainability goals. The City of Longmont has a healthy water portfolio that does not necessarily require a more aggressive water savings target but the city also has very strong community values around climate resilience and sustainability. While not divergent goals, the city needs to discuss which perspective should be prioritized in a landscape policy update.

The State of Colorado is very likely to adopt a non-functional turf policy which will accelerate landscape transformation across the state. A statewide prohibition on non-functional turf, defined as *"turf that is predominantly ornamental and located in or adjacent to a street, sidewalk, driveway, parking lot, frontage area, or median that is not regularly used for civic, community, or recreational purposes"*, will necessitate a code update for the city for non-residential landscapes. The irrigation policies should be done in tandem. The current irrigation standards require trees to be irrigated with the same irrigation system installed for turf. If the city wants to continue to promote a healthy tree canopy, it will need to adopt new tree irrigation practices.

NEXT	
Theme 3	D. Develop Consistent Xeriscape Principles And Standards E. Revise Plant Standards
Theme 4	I. Expand Applicability Of Water Efficient Irrigation Standards

The second priority area, which could be done in conjunction with a turf policy change, is to update the city's plant standards and expand the current irrigation efficiency standards to apply to all irrigated landscapes. The city's current plant standards inadvertently promote a turf dominated landscape. The city should be specific about the type of climate adapted landscape treatments it wants in place of turf. Additionally, the city currently requires many best practices for efficient irrigation system design, but these requirements only apply to limited types of development. The city should consider applying some of these standards to all turf landscapes to reduce water waste.

LATER	
Theme 2	C. Review Landscape Retrofit Policy And Promote Landscape Plan Amendments
Theme 4	J. Strengthen Incorporation Of Low Impact Development (Lid) And Stormwater Landscape Requirements
Theme 5	K. Review Design Standards With Landscape Professionals For Consistency With Climate Resiliency Goals L. Illustrate The Streetscape Standards For Private And Public Right Of Ways M. Develop Design Guidelines For Desired Residential Landscapes N. Develop A Landscape Design Manual

These recommendations are intended to complement regulations and support successful implementation of water efficient landscape design and green infrastructure goals. Communities, non-profits, and water providers are creating these visual templates and guidelines that illustrate resilient landscapes and combat perceptions that

xeriscapes are not as aesthetically pleasing as turf. Visual resources are especially important if the city adopts a non-functional turf policy which will change requirements for city streetscapes and public areas. In the interim, Longmont should use the existing high-quality resources, such as from Northern Water and Fort Collins, as resources for developers and property owners.

OTHER	
Theme 1	B. Plan For Climate Resilience
Theme 6	O. Update Plumbing Standards For Consistency With Waterwise P. Review The Greenway Standard For Setback Consistency

During the policy scan, two policy conflicts were identified that are not directly linked to landscape policy focus. The first is that the current plumbing code standard for fixtures is inconsistent with the state policy for Water Wise fixtures. The second is an apparent contradiction for the width of the setback along the Poudre River greenway.

## 5 ASSESSMENT OF CITY OF LONGMONT WATER CONSERVATION, SUSTAINABILITY, AND RESILIENCY POLICY GOALS

The City of Longmont has a long history of successful water resource management and a strong community value for sustainability and natural resource stewardship. However, the community's goals for climate resiliency and an adequate and reliable water supply are not wholly aligned when it comes to the level of urgency for promoting water conservation and efficiency.

The City of Longmont has effectively used its water dedication policy to establish a healthy water rights portfolio. As a result, Longmont has a very moderate water conservation goal of 10% water savings by build out around 2050. This water saving target was established in the 2003 Raw Water Master Plan and has essentially remained unchanged. The 2017 Water Efficiency Plan (WEP) estimated that Longmont had already achieved an annual treated water savings of 2,400-acre feet. The WEP update focused on achieving an additional annual treated water savings of another 1,100-acre feet consistent with meeting Longmont's goal. The 2019 Water Demand Evaluation next updated Longmont's water demand forecast based on the Envision Longmont future land use plan. This assessment identified a future water supply – demand gap of 1,750-acre feet at build out (a reduction from prior water supply gap estimates) and determined the planned Windy Gap Firming Project, as well as other capital improvements, would be sufficient to reliably meet future demand.

Unlike many communities on the Front Range, Longmont is not experiencing a critical water supply challenge when it comes to accommodating projected growth and development. This lack of a water supply crisis is reflected in the moderate water conservation target. The Longmont community, on the other hand, has expressed very strong support for a stewardship ethic. Community goals for climate resilience are driving more aggressive pursuit of water efficient landscapes as reflected in the city's comprehensive plan and in the sustainability plan. Longmont has already been adjusting its landscape management to adopt a more resilient approach, particularly on public lands, striving for landscapes that provide functional benefits beyond simply water savings to include drought resilience, heat island mitigation, equitable utility costs, restored wildlife habitat, and enhanced watershed health. This report offers recommendations not only for policy options that support water conservation but these other desired outcomes.

### 5.1 CURRENT CITY OF LONGMONT PLAN GOALS

Many of the desired outcomes of Envision Longmont, the Sustainability Plan, the WEP and other plans are consistent and complementary. These plans are all being implemented and as a result many of the specific actions are either underway or completed.

TABLE 1   CITY OF LONGMONT CURRENT WATER RELATED POLICIES	
ENVISION LONGMONT AND SUSTAINABILITY PLAN TARGETS	PLAN
Reduce customer and City raw water demands by 10% by community buildout (3,500 AF by 2048).	Water Efficiency Plan
Reduce GPCD from 2014 baseline of 143.	Envision Longmont
Revise City Design Standards and Construction Specifications to incorporate sustainability related principles by the end of 2018.	Sustainability Plan
Increase tree canopy to 18% of more of the Longmont Planning Area covered by regionally appropriate tree canopy and vegetation.	Sustainability Plan
Decrease the utility cost burden for low-income households through conservation measures.	Sustainability Plan
Maintain or increase watershed health.	Sustainability Plan
Increase urban density 10% in 20 years focused in areas of change.	Envision Longmont
PLAN GUIDING PRINCIPLES OR STRATEGY	PLAN
<b>4.2D Edible Landscapes</b> Consider the introduction of edible landscapes - fruit trees and/or vegetables and herb gardens on private and public property such as parks, open space, or public right of way where they may be accessible by the community.	Envision Longmont
<b>5.1A</b> Actively pursue the preservation of Longmont's unique natural areas, areas of environmental significance, and important wildlife habitat by: c) encouraging wetlands preservation and minimizing developments impact on wetlands by requiring appropriate mitigation measures, including appropriate setbacks from riparian areas. d) encouraging the use of native plants in landscaping as well as plants that provide habitat, food, and other resources to wildlife.	Envision Longmont
<b>5.1G Sustainable Development Practices</b> Encourage sustainable development practices in public and private development projects focusing on the ability to minimize the short and long term impacts of future growth on the natural environment and improve city operations: b) use water or energy conserving fixtures, c) use LID principles,) Promote the use of LEED or other green building standards.	Envision Longmont
<b>5.2D Water Conservation</b> Expand efforts to actively promote water conservation in both the public and private sector by: a) encouraging multiple uses of untreated water where such uses will not compromise the quality of the supply or supply of water available for treatment for domestic use or the health and safety of residents. b) promote the most efficient use of treated and untreated water resources and wastewater effluent. c) encourage the use of native and drought tolerant landscape materials and water conserving irrigation systems. d) consider use of untreated water and grey water for irrigation when it proves to be an efficient and environmentally acceptable alternative to treated water and does not pose a threat to the health and safety of residents or vegetation irrigated with this water.	Envision Longmont
<b>5.5A Park Design, Maintenance, and Operations</b> Protect the long-term health of the parks system through sustainable maintenance and operations practices, as well as responsible planning and design. Incorporate sustainable design features or elements such as native or drought tolerant plants, or features that help manage stormwater and improve water quality, such as rain gardens, retention basins, pervious surfaces, and bioswales, into the design of new parks or into existing parks.	Envision Longmont
<b>5.5B Greenway Functions</b> Enhance existing greenways to accommodate multiple functions, including stormwater management, water treatment, groundwater infiltration, wildlife habitat or corridors, and passive recreation; locate improvements and ensure appropriate setbacks within greenways to minimize negative impacts on wildlife habitat, particularly its fragmentation and on native vegetation.	Envision Longmont
<b>BI-5</b> Revise and update Longmont Design Standards and Construction Specifications to include sustainability (LID, green infrastructure, complete streets, native landscaping and xeriscape	Sustainability Plan

and water waste and recycling).	
<b>W-1:</b> Implement identified strategies within the water efficiency master plan.	Sustainability Plan
<b>W-2:</b> Complete an analysis of water loss and recommend strategies for subsequent actions.	Sustainability Plan
<b>W-3:</b> Develop a strategic water quality improvement and enforcement plan for consecutive systems.	Sustainability Plan
<b>W-4:</b> Coordinate with Boulder County Public Health on a model greywater water reuse ordinance	Sustainability Plan
<b>W-5:</b> Create an active watershed management program	Sustainability Plan
<b>NE-3</b> Work with community partners to promote education and awareness about regenerative land management practices for private properties. (water conserving landscapes)	Sustainability Plan
<b>NE - 4</b> Update the Tree Canopy Management and Replacement Plan	Sustainability Plan

## 6 STATE OF COLORADO POLICY AND GOALS FOR LANDSCAPE TRANSFORMATION

The City of Longmont is well positioned with a healthy water rights portfolio. However, Colorado as a whole is projected to have a municipal and industrial sector gap up to 740,000-acre foot per year. In the South Platte Basin, the Plan predicted a gap ranging from 185,000 to over 540,000-acre feet annually by the year 2050 depending on future demand and supply scenarios. Resilient landscapes are one of the State of Colorado’s key strategies for meeting the municipal and industrial water supply gap. In the Colorado Water Plan’s Action 1.7, it calls for CWCB to *“Identify turf replacement options that support transformative landscape change.”* In 2023, CWCB launched a turf replacement program after the legislature allocated funding.

During the 2024 session the State Legislature will be taking additional action towards this goal and debating a non-essential turf bill to aggressively accelerate local action on installation of resilient landscapes in new development. The State Legislature’s Agricultural Committee has proposed Bill 6 which would prohibit local governments or homeowners’ associations from installing, planting, or placing nonfunctional turf, artificial turf, or invasive plant species on any commercial, institutional, or industrial property as well as limit non-essential turf at state facilities by 2025. The proposed bill defines non-functional turf as *“turf that is predominantly ornamental and located in or adjacent to a street, sidewalk, driveway, parking lot, frontage area, or median that is not regularly used for civic, community, or recreational purposes.”* This bill will trigger significant changes in local government landscape management practices and regulations.

Additionally, the Governor’s Drought Task Force and the Urban Landscape Conservation Task Force both recommended a non-essential turf policy and sustained funding for the turf replacement program in their recently released reports.

## 7 RECOMMENDATIONS FOR CLIMATE RESILIENT LANDSCAPES

### THEME 1 | CITY OF LONGMONT STRATEGIC VISION

#### 7.1 RECOMMENDATION A | CLARIFY LONGMONT’S GOALS FOR WATER EFFICIENT AND RESILIENT LANDSCAPES.

The purpose statement for the City’s landscape regulation adequately references goals for water conservation as well as habitat protection and water quality, but does not capture goals for tree canopy, climate resilience and heat island mitigation.



**TABLE 2 | CITY OF LONGMONT LANDSCAPE CODE PURPOSE STATEMENT**

A. Purpose. These regulations are intended to achieve the following purpose:

1. Further the goals, policies, and strategies stated in the comprehensive plan;
2. Preserve open areas, wildlife habitat, water quality, and sensitive natural lands or features;
3. Enhance the visual quality of Longmont;
4. Promote safe and compatible design;
5. Provide passive and active recreation opportunities and amenities;
6. Provide off-street multi-modal transportation routes;
7. Provide for stormwater systems, including low-impact development (LID);
8. Screen or separate incompatible uses; and
9. Conserve water, energy, and other limited resources.

The long-term reliability of the water supply is not Longmont’s only purpose for pursuing more aggressive water efficient landscape policies. Longmont needs to work across departments (public utility, parks, forestry, planning, etc.) and city leadership to determine if Longmont wants to advance sustainable landscape practices as a priority for climate resilience despite the water utility having a healthy water portfolio. A more aggressive approach to outdoor water efficiency would advance the 2048 deadline for the city achieving its water savings target, possibly have implications for the drought management plan response, and potentially reflect additional water savings in future water supply/demand estimates. During the next update to the Water Efficiency Plan, several conservation scenarios should be assessed with a “sustainability focused” scenario driving more aggressive water conservation.

The benefits from greater reductions in outdoor water demand, depending upon projected savings, could be:

- A reduction in new water requirements for dedications which given the increasingly high market rates for water rights could save future homebuyers and ratepayers money.
- The ability to dedicate saved water to a *strategic drought reserve* as more storage becomes available.
- The ability to allocate more water to support river environmental flows to support the Saint Vrain River.
- Position Longmont to be able to temporarily lease excess water to other communities during drought conditions as a revenue source to help offset loss of revenue from water conservation in the city.
- Resilient landscapes for community members that respond better to hotter and drier summers and are less stressed by future drought cycles and irrigation curtailment.

The recommendations in this report are not a significant departure from Longmont’s current practices. Rather the recommendations aim to enhance existing practices to maximize water efficiency and climate resilience. Building cross department and political consensus for this goal will make implementation more likely to succeed.

## 7.2 RECOMMENDATION B | PLAN FOR CLIMATE RESILIENCE

The 2003 Raw Water Master Plan made eleven assumptions regarding Longmont’s future water supply related to the following factors:

- |                                |                                     |
|--------------------------------|-------------------------------------|
| • Longmont Planning Area       | • Transbasin Water Availability     |
| • Rate of Development          | • Climate Change                    |
| • Infill                       | • Federal Law and Regulations       |
| • Industrial Users             | • SEO Administration                |
| • Water Demand and Consumption | • Non-potable Water Consumptive Use |

The 2019 Water Demand Evaluation updated the water demand forecast to adapt land use factors based on the Envision Longmont future land use plan and using nearly 20 years of historical demand data. The outcome of the assessment was that the future water demand would have a water supply gap of 1,750-acre feet at build out and the Windy Gap Firming Project would sufficiently meet this future gap.

The 2019 Water Demand Evaluation also assessed Longmont’s ability to meet projected demand at buildout under drought conditions. Again, the Windy Gap Farming Project provided the best drought resilience assurance with a modest supply shortage following a 7-year drought.

In the 2019 Water Demand Evaluation, two modeling assumptions were changed from the 2011 Water Demand Evaluation. These assumptions projected a change in the water rights portfolio including (1) a reduction in future raw water acquisitions and (2) a reduction in municipal return flow factors based on increased state administration of the St. Vrain Basin.

It appears the other assumptions from the original water supply plan remained unchanged. In particular, the 2003 Raw Water Master Plan assumes the following climate change and trans-basin water availability:

- (6) Transbasin Water: No significant change in C-BT or Windy Gap system operation, yield, or allocation of water will occur.
- (7) Regulatory Climate and Laws: No significant changes in the regulatory climate that might affect the yield of the water rights in Longmont’s portfolio or might affect the operation of new or existing raw water storage facilities will occur. Also, no significant changes in federal laws, administration, or current laws, or federal requirements for environmental releases of water.
- (8) Climatic Change: There will be no significant climatic change that might adversely affect supplies or demands.

Research ([Milley and Damian](#)) indicates that in the Upper Colorado River Basin for each degree Celsius increase in temperature the river flow has decreased 9.3%, or, on average, 5% less per 1 degree Fahrenheit. The Colorado Climate Plan projects future warming by 2050 of 2-5 degrees. Because hotter and drier influences future water supplies, the Colorado Water Plan integrated climate change into its water supply and demand modeling.

While a crisis in the Colorado River Basin has been averted for now until 2026, the negotiations of a new plan for the Upper and Lower Basin states still creates immense unpredictability on how the Colorado River may be managed in the future and what changes, if any, the Upper Basin states will need to make.

The challenges of the Colorado River Basin have resulted in Northern Water communicating to its allottees that C-BT water should be considered a supplemental water supply only and that future assumptions about reliability per share should be reduced from historical averages of 0.76 per acre foot per unit to as little as 0.4 per acre feet per unit.

The City of Longmont could use scenario planning in future water supply assessments and drought assessments integrating worst case assumptions about climate and the Colorado River. This might help the city determine how well adapted the city is to future climate realities. The recommendations in this report could help better prepare Longmont for a worst-case climate scenario.

## THEME 2 | LANDSCAPE CODE PURPOSE

### 7.3 RECOMMENDATION C | REVIEW LANDSCAPE RETROFIT POLICY AND PROMOTE LANDSCAPE PLAN AMENDMENTS.

Within Envision Longmont and in the city’s current planning trend has been towards more infill development and retrofitting of existing development. The densification of lower density urban areas has a positive effect on per capita water demand with smaller yards requiring less irrigation. Longmont’s land use code has a retrofit requirement for non-conforming landscape site features in code section 15.08.100.

**TABLE 3 | CITY OF LONGMONT LANDSCAPE CODE NON-CONFORMING USE**

**B. Nonconforming landscaping, buffers, screening, and outdoor lighting.**

1. Nonconforming buffers and landscaping shall be upgraded to comply with this development code if the site containing the nonconforming site feature is proposed for any of the following development activities:

- a. An increase in the total square footage of the vehicular use area, including parking, loading, circulation, and driveway areas;
- b. A structural addition that increases the combined total gross floor area of all existing structures by more than 25 percent;
- c. Building elevation changes involving 50 percent or more of the exterior walls of a roofed structure on the property, excluding minor cosmetic maintenance such as painting, replacing lighting fixtures, or replacing awnings or signs.

On its face, this is a good policy. The city may want to review whether there have been any projects that were not captured by this requirement that should have been, such as a change a use from single family to a nonresidential use or a significant landscape modification or expansion.

For common areas in homeowner’s associations, Longmont uses an administrative review process for landscape modifications. This process has been working successfully. However, if there were a legal reason to formalize this process, the city could update *15.02.040 Common Review Procedures*. The code differentiates when an approved project can apply for a modification versus when a plat amendment is necessary.

**TABLE 4 | CITY OF LONGMONT MUNICIPAL CODE COMMON REVIEW PROCEDURES**

**G. Modifications and amendments to approved plats, plans, or permits.**

1. Modifications.

Modifications to an approved subdivision plat, PUD overall development plan, or site plan shall be subject to section 15.02.080.B. Review standards and procedures for specific administrative applications.

2. Amendments.

- a. Changes to an approved plat, plan, or permit, including all changes in use and density that do not qualify as an administrative modification or site plan waiver, are considered amendments.
- b. Proposed amendments are treated as new applications subject to the applicable procedures and review criteria set forth in this chapter.
- c. At applicant’s expense, Longmont will record all approved amendments to a recorded plat, site plan, or PUD overall development plan within 90 days of the amendment’s approval.

For modifications, 15.02.080.B.1 specifically gives administrative authority to the director to modify approved site plans, site-specific development plans, and final and minor subdivision plats for numerical standards including 15.05 Development Standards up to a maximum of 25 percent change. The intended purpose of these administrative modifications is “encourage the implementation of alternative or innovative practices that provide equivalent benefits to the public.” Modifications to an approved plan are then noted on a revised plat or plan.

In 15.02.080B.1.c. the code provides authority to the director to exceed the 25% modification limitation where the project is infill and redevelopment. For HOAs, a limit of a 25% modification or less for turf dominated landscapes could be a barrier to pursuing water wise landscape conversions. If Longmont wants to formalize the existing administrative process, a text amendment to this code section could add a statement that specifically references Section 15.05 and water efficiency goals. It could read:

*For approved landscape plans, the director may grant administrative modifications beyond 25 percent for Chapter 15.05. The modification to an approved landscape plan must achieve conversion to a water-efficient landscape.*

## THEME 3 | LANDSCAPE CODE PLANT MATERIALS

### 7.4 RECOMMENDATION D | DEVELOP CONSISTENT XERISCAPE PRINCIPLES AND STANDARDS

The type of plants, how they are grouped, the number of plants, and how they are planted greatly affects water demand. To advance best practices for water efficient landscapes, Longmont adopted xeriscape principles into the code and city standards. Xeriscape principles, as developed by Denver Water, typically refer to activities that incorporate the following for purposes of saving water:

- Planning and Design
- Soil Improvements
- Efficient Irrigation
- Plant Zones
- Mulches
- Turf Alternatives
- Maintenance

Principles offer guidelines for developers to consider in landscape design, but principles do not provide specific implementation requirements. As water efficient landscape codes have evolved and acceptance of xeric practices has become more widespread, principles are being replaced with specific standards that ensure higher levels of water efficiency. Longmont includes xeriscape principles in multiple sections across its policies.

TABLE 5   CITY OF LONGMONT XERISCAPE PRINCIPLES	
POLICY DOCUMENT	POLICY STANDARD
<b>Development Regulations</b>	
15.05.040C.2.e iii Ground Covers	Xeriscape practice shall be applied in all areas (e.g. groundcover and plant selection, irrigation design based on water needs) unless the director determines the application is not appropriate given the proposed use of the area.
15.05.040C.2.b.iii Irrigation Systems	Irrigation of xeriscape areas shall comply with the following standards: (A) The plant materials will be maintained in a healthy condition without regular irrigation after the plant establishment period. (B) Underground irrigation shall provide reliable automated irrigation during the establishment period and as otherwise needed to maintain plants in a healthy condition. (C) The applicant has demonstrated the ability to provide ongoing maintenance of xeriscape areas necessary to keep plant material healthy with no or reduced irrigation.
<b>Design and Construction Standards</b>	
603.01 Irrigation	General Criteria Section shall also apply to (1) all City capital design and construction projects that reference these Standards and (2) common open space areas.  (5) Xeriscaping is required within all City owned areas and in privately owned common areas. a. Xeriscaping in this section shall be defined as reducing water use in landscaped areas through: proper planning and design (zoning plant materials and recognition of micro-climates); good soil improvements (topsoil and soil amendment); limiting turf areas and using water thrifty turf types (see approved materials list); efficient irrigation (zoning irrigation to separate turf areas from shrubs, minimize overspray onto hard surfaces, use of water saving equipment (see approved materials list), and recognition of microclimates); use of mulches (and avoidance of impermeable weed barriers); use of water thrifty materials (natives encouraged); and through appropriate maintenance practices.
603.02 Minimum Design Criteria (2)	For Common Open Space areas... Temporary establishment irrigation of native grass areas <i>may</i> be an allowable variance if accepted by Planning. Principles of Xeriscape shall be utilized in the design of irrigation system. Design considerations that must be included are shrub and perennial beds are to be zoned separately from turf areas, sloped areas to have separate zoning for heads at the higher elevations from those at the lower elevation and areas with different exposures to be zoned separately.

The City of Aurora code does not include an articulation of xeriscape principles but rather relies on the regulatory standards to implement xeriscape best practices (see the City of Aurora code). Aurora does include xeriscape in the definitions:

- **Xeriscape.** A landscaping method typically used in arid or semi-arid climates that considers individual site conditions, soils and the use of specific water conserving plants, mulch and efficient irrigation to maximize water usage.

The City of Fort Collins case study demonstrates how xeriscape principles can be listed in a code with specific citations for implementation requirements. For example, in 6. Soil preparation, the principle references the standard: *Soil preparation must be in accordance with City of Fort Collins Municipal Code 3.8.21.*

WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #1   XERISCAPE PRINCIPLES
<p>CITY OF FORT COLLINS <a href="#">LANDSCAPE REGULATIONS</a> WATER EFFICIENT LANDSCAPE DESIGN PRINCIPLES</p> <p>(3) Water Conservation. Landscape plans shall be designed to incorporate water-efficient techniques.</p> <p>(a) Landscape designs shall be designed according to the xeriscape landscaping principles described as follows:</p> <ol style="list-style-type: none"> <li><b>1. Plan and design.</b> Plan for how people will use and interact with the landscape. Group landscape materials accordingly based upon hydrozone.</li> <li><b>2. Landscape arrangement.</b> Provide a cohesive arrangement of turf, plants, mulch, boulders, and other landscape elements that support the criteria in Section 3.2.1(H). Landscape elements shall be arranged to provide appropriate plant spacing and grouping and to avoid disproportionate and excessive use of mulch areas.</li> <li><b>3. Appropriate use of turf.</b> Limit high water-use turf to high-traffic areas where turf is functional and utilized.</li> <li><b>4. Appropriate plant selection.</b> Selected plants shall be well adapted to the Fort Collins climate and site conditions. Plants shall be grouped according to water and light requirements.</li> <li><b>5. Efficient irrigation.</b> Design, operate and maintain an efficient irrigation system. Select equipment appropriate to the hydrozone. Water deeply and infrequently to develop greater drought tolerance.</li> <li><b>6. Soil preparation.</b> 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.</li> <li><b>7. Mulch.</b> 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.</li> <li><b>8. Maintenance.</b> 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.</li> <li>9. Xeriscape principles do not include or allow artificial turf or plants; paving of areas not used for walkways, patios, or parking; excessive bare ground or mulch; weed infestations; or any landscaping that does not comply with the standards of this section.</li> </ol>

Longmont should consolidate the mentions of xeriscape into a single statement of xeriscape principles and rely on specific standards for each principle. The development regulations are currently a mix of principles and standards with an inconsistent definition and application. For example, in the city standards Section 600 requirements for city owned and common areas, xeriscape is defined differently than in the landscape code.

TABLE 6   RECOMMENDATIONS FOR XERISCAPE PRINCIPLES		
XERISCAPE PRINCIPLE	CITY OF LONGMONT PRINCIPLE	STANDARD TO IMPLEMENT
Planning and Design	proper planning and design (zoning plant materials and recognition of micro-climates)	Revise and adopt a specific hydrozoning standard (see Open Space below)
	use of water thrifty materials (natives encouraged)	Adopt a requirement for integration of native landscapes as a percentage of plant material, in zoning districts, or creating an allowable native landscape typology (e.g. pollinator gardens)
Soil Improvements	good soil improvements (topsoil and soil amendment)	Make current standards applicable to all
Efficient Irrigation	efficient irrigation (zoning irrigation to separate turf areas from shrubs, minimize overspray onto hard surfaces, use of water saving equipment (see approved materials list)	Adopt revised irrigation standards that is applicable to all installed irrigation systems
	(B) Underground irrigation shall provide reliable automated irrigation during the establishment period and as otherwise needed to maintain plants in a healthy condition (C) The applicant has demonstrated the ability to provide ongoing maintenance of xeriscape areas necessary to keep plant material healthy with no or reduced irrigation	
Plant Zones – Open Space Only	shrub and perennial beds are to be zoned separately from turf areas, sloped areas to have separate zoning for heads at the higher elevations from those at the lower elevation and areas with different exposures to be zoned separately	Revise and adopt a specific hydrozoning standard based on water demand (very low, low, medium, and high)
Mulches	use of mulches (and avoidance of impermeable weed barriers)	Make standards applicable to all and assess if mulch for native landscapes can be reduced.
Turf Alternatives	limiting turf areas and using water thrifty turf types (see approved materials list)	Adopt turf limits and expand native and drought tolerant grass use in low traffic areas. Define water thresholds or criteria for H, M, L turf
Maintenance	through appropriate maintenance practices	Define and adopt clear maintenance requirements applicable to landscapes over a minimum project size.
	(A) The plant materials will be maintained in a healthy condition without regular irrigation after the plant establishment period	

## 7.5 RECOMMENDATION E | REVISE PLANT STANDARDS

Plant standard cover material, location, density, plant type, plant size, plant quantity, plant coverage. Longmont has good content and intent, but the code clarity could be refined and strengthened.

### 7.5.1 Living Plant Material and Ground Cover Standards

Landscape requirements are generally applicable to all areas of a site, known as the landscape area, that are not buildings or structures, sidewalks, driveways, pavement or infrastructure that can be planted plant materials, allowed hardscapes or water features in a landscape design plan.

Included in general landscaping standards are standards for the plant materials and requirements for a minimum amount of plant coverage. Plant material refers to living materials including trees, shrubs, ornamental grasses, and groundcover plants. Non-living material generally refers to mulches, rock, stamped concrete and other treatments that provide coverage for the landscape area not covered by living materials. Ground plane refers to a requirement for how much of the landscaped area is required to be covered, at maturity, with living plant material.

Longmont’s landscape code reads: “Landscaped areas shall be covered with live irrigated, lower water consuming **ground cover over at least 75% of the landscaped area**”. Longmont’s code does not clearly define lower water consuming. Under the groundcover standard, it reads: “Irrigated **lower water consuming grass or other vegetation or material suitable for the area** shall be the primary groundcover where hardscape is not proposed.” Where hardscapes are proposed, they can be up to 25% in residential and 50% in noncommercial. The non-living material standard is confusing and reads “No large mulch or bare areas allowed except that rock mulch areas may be provided as long as they do not exceed 10%” although mulch is required in shrub/planting beds. Additionally, for developments that are required to comply with the city standards Section 600, the groundcover requirement could potentially limit the use of a broad range of xeric plants as the section prohibits plant materials that do not provide coverage year-round and that do not establish within 2 years.

TABLE 7  CITY OF LONGMONT SUMMARY OF LIVING MATERIAL REQUIREMENTS	
<b>Development Regulations</b>	
75% irrigated lower water consuming grass or other vegetation shall be the primary groundcover. No large mulch or bare areas allowed except that rock mulch areas may be provided as long as they do not exceed 10% Artificial turf and plants prohibited	
Alternative hardscape options 25% allowed in residential zones. 50% nonresidential and mixed use where hardscaping a recreation purpose	
<b>Design and Construction Standards Section 600</b>	
Groundcover other than grass <i>may</i> be planted in required landscape if they are reasonably able to provide complete coverage within two growing seasons and they provide cover year-round. Vines shall not be used adjacent to pedestrian areas. River rock, cobble, boulders, patterned concrete, mulch, and pole peelings shall be limited to shrub beds and other small areas that shall not exceed 25% of the required landscape areas. Bark mulches shall not be used in areas unshielded from high wind. Loose gravel shall not be used in areas abutting public streets or sidewalks, but cobble greater than 3” minimum may.	
Minimum Design Guarantee/Warranty. Where turf grass is required, the grass must reach 90% coverage at maturity and where native grass or low water grass is used, 70% coverage at maturity.	

The case study examples provided below do not necessarily differ in intent but offer language that is clear and more specific in terms of how to consistently achieve desired outcomes. The case study examples also incorporate these emerging approaches:

- Xeric and native plant materials achieve maturity slower than turf. If a timeframe is desired as a code standard, a 3 to 5-year time frame permits the recommended plant list materials to reach mature coverage and achieve ground plane coverage requirements.
- Where efforts are being made to increase tree canopy at the same time as reducing water use, regulations can allow a percentage of the tree canopy at maturity to count towards ground plane coverage.
- Requiring a specific percentage of water efficient materials, for natives, or for both.
- Allowing rock mulch, but specifying the type, amount, preferred design elements, and where it is appropriate/inappropriate.
- Reducing the percentage of ground plane coverage of living materials coverage by 10% (e.g. from 85% to 75%) and increasing the use of non-living organic materials and design elements.
- Allowing for a percentage of winter dormancy in planting beds as long as it is mulched in the winter.

Longmont should refine the ground cover and living plant material standards in the development code to be more explicit about the goals it wants to achieve. Longmont could revise its code language for plant materials to read:



- Landscaped areas shall be covered with 65% living material except where additional hardscape is allowed in an alternative landscape plan. Thirty-five (35%) of the ground plane is permitted to be non-living material including rock, cobble, boulders, mulch, permeable paving, patterned concrete, paving stones, and pole peelings.
- Vegetative groundcover may consist of deciduous and evergreen shrubs, ornamental grasses, perennials, bulbs, native/drought tolerant grass or seed mixes, and where appropriate, turf.
- Plants must be selected from the approved City of Longmont Plant List.
- 75% of plant materials shall be water efficient selected from the Longmont Plant List low to very low categories.
- Deciduous and coniferous tree canopy may count towards a maximum of 10% of the living material ground plane coverage.
- High water use turf is permitted as a percentage of groundcover only as defined in Turf Limitations.
- Artificial plant materials are prohibited.
- Plants, including trees, identified as noxious are prohibited.

Within plant material standards, incorporating native plants can provide multiple community benefits. They are naturally adapted to soils and climate, often require fewer soil amendments, restore habitat and support pollinators, and contribute to local biodiversity. Native plants can be integrated as part of a city plant list or be a standard with a minimum percentage of the total low use water use plants. For example, 75% of all plants shall be selected from the low to very low plants with 10% natives. Subdivisions could also be offered an incentive, such as a small reduction in total landscaping requirement, for increasing the use of native plants. The Colorado Native Plants Society and the Colorado Native Landscaping Coalition both offer excellent resources for local governments on how to incorporate natives.

#### WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #2 | PLANT MATERIAL STANDARDS

##### ARAPAHOE COUNTY, COLORADO PROPOSED [LANDSCAPE CODE UPDATE](#)

###### 1. Selection and Installation of Plant Materials

###### a. Plant Material Selection

- All installed plants shall be selected from the approved Arapahoe County plant list unless an alternative plant species is approved through County review of the proposed design.
- Applicable Water Quality Control Measures shall use the vegetation specified in the Arapahoe County Stormwater Management Manual.
- All plants shall meet or exceed the plant quality and species standards of the American Standard for Nursery Stock.
- Plants shall be grouped together by soil suitability and water use in distinct hydrozones (very low, low, medium). No combining of hydrozones is permitted except between low and very low.
- A minimum of 75 percent of plants shall be native and/or drought-tolerant species selected from the plant list low to very low categories.
- Plants listed as noxious species by Arapahoe County Weed Control or on the Colorado State Noxious Weed lists are prohibited.
- Plant substitutions may be made provided that the substituted plants are from the same hydrozone and of similar plant type (shrub for shrub, tree for tree, etc.) as the plants originally specified in the approved landscape plan.
- Plants shall be selected and planted appropriately based on their adaptability to the climatic, geologic, and topographical conditions of the project site including solar orientation for plant placement to maximize summer shade and winter solar gain. Trees shall be planted to maximize summer shade and minimize winter shade.
- Planting of evergreen trees planted on the south and west side of a roadway shall be reviewed on its' impacts to the road right-of-way.
- Evergreen and deciduous shrubs planted within sight triangles and sight line areas shall be kept below 36-inches in height from the existing roadway flowline or 30inches from the top of existing curb.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #3 | PLANT MATERIAL STANDARDS

### CITY OF BROOMFIELD, COLORADO [LANDSCAPE CODE](#)

(5) Living Material Requirements. This section applies to all required landscapes except as provided below:

(i) A homeowner's yard visible from the right-of-way shall not consist of entirely non-living materials.

(ii) Ornamental grasses, groundcovers, deciduous and evergreen shrubs and trees and turf grass shall be considered as living plant materials. Weeds shall not be considered as living plant materials.

(iii) Alternate Standard. Areas within and immediately adjacent to right-of-way having no reasonable means of providing an underground automatic irrigation system shall be landscaped with plant material and one of the materials listed below provided that forty percent (40%) of the total landscape area must be permeable materials and of that 40%, half of the permeable material are a must be plant material:

(a) Rock, no white quartz rock,

(b) Natural or man-made pavers over a compacted base; or

(c) Integrally colored stamped decorative concrete. Hydroseeding with a native, low water seed mix is an acceptable plant material.

### 7.5.2 Soil Preparation, Soil Amendments and Mulch

Plants need good soil and mulch to thrive and maximize water efficiency. Plant material and tilling improves permeability, water holding capacity, and the nutrient value of the soil. Longmont's requirements are consistent with best practices, but the standards are in different place in the landscape code and there are differences between the development regulations and Section 600.

**TABLE 8 | CITY OF LONGMONT SOIL AMENDMENT REQUIREMENTS**

POLICY	MULCH	COMPOST ADDITION IN CUBIC YARDS	DEPTH IN INCHES TO TILL
<b>Development Regulations</b>			
Shrub beds	Installed in plant beds and shrubs to reduce evaporation	--	--
All development		3 cu. yds. /1,000 sq. ft.	6"
<b>Design and Construction Standards</b>			
	--	--	Friable soil, no clumps or rocks over 2" diameter, appropriate ph
Tree pits	4" deep, 2" from trunk	--	--
Shrub pits	3"	--	--
Shrub beds	4"	--	--
Groundcover beds	3"	--	--

The city's soil amendment standards apply to all development and all plant material types. Many front range communities have reduced the soil amendment requirement for native grasses to 2 cubic yards per 1,000 square feet. The mulch standards, however, are not consistently applied. Given mulch materials play a significant role in xeric landscape design, not just in reducing evaporative loss, the standards should be applicable to all.

Recommendations for improvements to Longmont's soil amendment and mulch standards are to make them applicable to all landscapes:

- All landscape areas shall be tilled to a minimum depth of 6" of depth and amended with a minimum of 3 cubic yards per 1,000 square feet or 2 cubic feet per 1,000 square feet for native seed areas, unless otherwise specified in the city standards Section 600.

- All planting beds, raised beds, plant containers, shall be mulched with a minimum of 3” shredded wood mulch or cobble.
- Rock mulch application directly around the base of plants is discouraged.
- For trees, mulch shall be applied in a diameter around the drip line with bare dirt exposed a minimum of 2 inches around the base of the trunk. *(note that many communities are expanding the bare dirt around the trunk up to 6-8”)*
- Bark mulches shall not be used in areas unshielded from high wind.
- Loose gravel shall not be used in areas abutting public streets or sidewalks, but cobble greater than 3” minimum may.

There are many good websites for Colorado’s Front Range including [Front Range Wild Ones](#) that offer guidance on mulching native and xeric landscapes. Communities are using third-party inspections paid for by the developer or with development fees for non-public landscapes.

## 7.6 RECOMMENDATION F | ADOPT A NON-ESSENTIAL TURF POLICY AND MODIFY DROUGHT RESILIENT GRASS STANDARDS

In plant material standards, turf can be regulated as a plant type. Colorado communities are making significant strides in using native and drought tolerant grasses to replace water intensive turf with Kentucky Bluegrass. Communities across the Front Range and Grand Junction on the west slope have adopted turf limitations, grass material specifications, and non-essential turf prohibitions. The City of Longmont should be commended for its leadership promoting native and drought tolerant grass types of in lieu of high water use turf. Longmont should seize the opportunity to build on what the city is already doing and get ahead of likely state legislation prohibiting non-functional turf.

### 7.6.1 Native and Drought Resilient Grasses

In Longmont, native grasses are encouraged but not required except in some specific areas. Dryland seed mixes, which include natives, are used for Waterway Adjacent Native Areas, Residential Adjacent Native Areas, and in Right of Ways in areas of future road expansion. Longmont should strengthen these standards to be implemented more easily and in more desired landscape locations.

TABLE 9   CITY OF LONGMONT LANDSCAPE NATIVE GRASS STANDARDS
<b>Development Regulations</b>
<p><b>2. Drainage detention/water quality areas. A drainage detention/water quality area shall comply with the following standards:</b></p> <p>b. Low water-consuming grass or other approved vegetation shall be the primary ground cover. All detention/water quality areas within the five-year floodplain shall be covered with sod or other approved vegetation. Native grass may be used if it is maintained free of weeds and irrigated until the grass is fully established. Live plant material other than grass may be planted if it is suitable to the area and is maintained free of weeds and irrigated until fully established;</p>
<b>Design and Construction Standards Section 600</b>
<p><b>Seeding General Criteria</b></p> <p><b>3. All dry land-seeded areas must have a temporary irrigation system for establishment purposes.</b></p> <p>4. Drought-tolerant grasses are encouraged in all areas and required in City owned areas. Dry land grasses may be permitted in required landscape areas <i>if deemed appropriate by City staff</i>. These grasses shall be maintained free of weeds and debris and shall not present a fire hazard. The use of several species is encouraged (required in City-owned areas).</p>
<p><b>Minimum Design Criteria Native Grass</b></p> <p>1. Seed mix: Shall be approved by City staff based on the activity to take place, planned irrigation method and maintenance to be performed in the area being seeded. In all cases, a drought tolerant seed mix is encouraged and shall be required in all City owned areas with a seed mix that does not contain more than 10% bluegrass.</p> <p>a. For pre-approved Native Grass Mixes, see the Approved Materials List</p>

b. For pre-approved turf grass mixes, see the Approved Materials List. 2. Turf grass seed mix shall be used between the property line and the concrete path in primary greenways and on detention pond side slopes. Native grass mix may be used between the concrete path and ditch.
<b>Minimum Design Criteria</b> (1) For City owned areas, temporary establishment of native grass areas <i>may be an allowable variance</i> if accepted by Parks and Forestry.
(7) Drip irrigation can be used for all trees and shrubs located in shrub beds and in all native seed areas.

While incorporating native grasses on a large scale is new to Colorado, there is a growing number of community experiences to build upon, including Longmont. Codes address locations for installation, temporary irrigation, fire mitigation, and maintenance standards. The length of time for this temporary irrigation is not consistent but appears to be between 2-5 years. Standards for ongoing maintenance are also incorporated into the code with specific time of year mowing, weeding, and fire hazard mitigation. The new [native grass guide](#), which the city participated in developing, includes a thorough section on irrigation best practices. Additionally, Denver Water has a [sustainable landscape conversion guide](#) with lessons learned and best practices. Longmont's standards are not easily accessible given they were developed to be used for city owned property but should be incorporated into broader landscape applications. To more widely promote the adoption of native and lower water use planting areas, the City should consolidate best practices and standards for native grasses and recommend native landscapes in more areas.

Some communities across the country have identified specific areas where native landscapes are more desirable. The City of Longmont does this successfully with the Waterway Adjacent Native Areas. This approach could be expanded to include a broader range of locations or by developing a "landscape typology" to be incorporated into landscape plans. The case study examples below demonstrate how local governments have identified areas for higher percentage of native plants as well as providing the options to include "xeric zones", "natural landscape areas", or "managed landscape areas" as a permissible landscape element.

WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #4   NATIVE LANDSCAPE STANDARDS
<b>CITY OF AURORA WATER EFFICIENT LANDSCAPING CODE XERISCAPE ZONE</b>  <b>Z-Zone Program Option.</b> Applicants may choose to temporarily water native seed areas for a three-year period for establishment purposes under the Z-Zone Program administered by Aurora Water. The annual water allocation will be adjusted accordingly after three years or upon successful establishment of the z-zone areas as determined by Aurora Water. The adjusted water allocation will be based upon the permanently irrigated areas. Contact Aurora Water, Water Conservation Division for details on the Z-Zone Program.

WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #5   NATIVE LANDSCAPE STANDARDS
<b>CITY OF AURORA, COLORADO LANDSCAPE CODE</b>  (E) Landscape Standards. All development applications shall include landscape plans that meet the following minimum standards: (2)Landscape Area Treatment. (a)Turf grass. High-use areas shall be planted with irrigated turf grass. Non-irrigated shortgrass prairie grasses or other adapted grasses that have been certified as Xeriscape landscaping may be established in remote, low-use, low visibility areas.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #6 | NATIVE LANDSCAPE STANDARDS

### COLORADO SPRINGS, COLORADO LANDSCAPE CODE NATIVE GRASS STANDARDS

- Native seed shall be maintained and provide the necessary maintenance practices to aid in the growth of the approved native seed mix and long-term goal of naturalization. This includes weed control, overseeding, irrigation (if installed), and correct mowing schedules. The approved native seed mix will determine the height of the native seed grasses and should be allowed to grow and establish new seed heads and repopulate the growing area.
- Native seed establishment shall meet uniform coverage and gap (six (6) inch by six (6) inch) criteria with low weed content (eighty (80) percent Native Grasses to twenty (20) percent weeds, or better).
- Medians. All trees and shrubs located within medians shall be low water-use plants or plants adaptable to low-water-use conditions. All species shall be shown on the current Selected Plants for Colorado Springs in Appendix A as allowable for planting in medians. Proposed native seed shall use the approved seed mixes as shown in Appendix B.
- Landscape Manual Appendices and Addendums
  - Selected Native Seed Mixes for Colorado Springs
  - Native and Water Wise Grass Installation and Maintenance Manual Addendum

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #7 | NATIVE LANDSCAPE STANDARDS

### CITY OF GRAND JUNCTION, COLORADO LANDSCAPE POLICY

#### 21.07.080 RESIDENTIAL SUBDIVISION PERIMETER ENCLOSURES

##### (e) Residential Subdivision Landscape Buffer

On the outside of a perimeter enclosure adjacent to a right-of-way, a 14-foot-wide (on average) landscape buffer shall be provided between the perimeter enclosure and the right-of-way for major and minor arterial streets and major or minor collectors. A five-foot-wide landscape buffer for side and rear yard perimeters shall be provided on all other streets between the perimeter enclosure and the right-of-way.

- (1) In the landscape buffer, one tree per 40 linear feet of perimeter must be provided;
- (2) All perimeter enclosures and landscape buffers must be within a tract dedicated to and maintained by the homeowners' association. The perimeter enclosure and landscaping must be installed by the developer and made a part of the development improvements agreement;
- (3) A minimum of 75 percent of the landscape buffer area shall be covered by plant material including tree canopy coverage, shrubs, and groundcover at maturity.
- (4) A minimum 25 percent of the proposed shrubs and ground cover shall be identified as native or native alternative on the Suitable Plants List, and 90 percent of the proposed shrubs and ground cover shall be identified as xeric, xeric-low, xeric-medium, or low water on the Suitable Plants List.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #8 | NATIVE LANDSCAPE STANDARDS

### COLLIER COUNTY, FLORIDA DESIGNATED NATIVE AREAS

For sites South and West of US-41 all required landscaping shall be 100% native species as determined by accepted valid scientific reference. For sites South and West of I-75 and North and East of US-41, a minimum of 75% native trees and 50% Native shrubs are required.

For sites North and East of I-75, a minimum of 75% native trees and 35% native shrubs are required. In addition, for all sites, at least 75 percent of the trees and shrubs used to fulfill these requirements shall be drought-tolerant species as listed in the Xeriscape Plant Guide and Native Trees and Trees for South Florida (IFAS).

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #9 | NATIVE LANDSCAPE STANDARDS

### MINNEAPOLIS, MINNESOTA LANDSCAPE CODE DEFINITIONS

**Managed natural landscape** means a planned, intentional, and maintained planting of native or non-native grasses, wildflowers, forbs, ferns, shrubs, or trees, including but not limited to rain gardens, meadow vegetation, and ornamental plantings.

**Meadow vegetation** means grasses and flowering broad-leaf plants that are native to, or adapted to, the State of Minnesota, and that are commonly found in meadow and prairie plant communities, not including noxious weeds.

**Rain garden** means a native plant garden that is designed not only to aesthetically improve properties, but also to reduce the amount of stormwater and accompanying pollutants from entering streams, lakes, and rivers.

### VILLAGE OF SHAUMBURG, ILLINOIS NATURAL LANDSCAPE AREAS

#### (2) Natural Landscaping Areas:

(a) Permitted: It shall be lawful to grow native plants including ferns, grasses, sedges, rushes, forbs, shrubs, and trees in lieu of turf grass lawn in designed and managed natural landscaping areas.

(c) Annual Cutting: Natural landscaping shall be mowed or cut to twelve inches (12") or less at least once prior to June 1st of each calendar year.

The City of Tucson, Arizona is one of the most water resilient communities in the Southwest with a long commitment to native and drought tolerant landscaping. Tucson's zoning requires native plant material in two zoning districts, the [Scenic Corridor Zone \(SCZ\)](#) and the [Environmental Resource Zone \(ERZ\)](#). It is also a requirement in other sections where native vegetation is required to be retained or where the property is required to be revegetated with native plant material. The structure of the landscape code includes a specific section that clearly articulates what native and drought tolerant plant materials are to be installed, how, and maintenance expectations.

Longmont's code already includes a significant amount of information and guidance, but it is presented in different policy documents including in stormwater, Section 600, and the development regulations. A single clear reference might enhance the application of water saving and native plant material installation. Using the Tucson [Technical Standards Manual](#) as an example, the section includes standards for each types of plant materials with specific subsections including:

- Native Vegetation
- Native Seeds
- Drought Tolerant Vegetation
- Drought Tolerant Seeds
- Seeding Programs including site preparation, irrigation, plant establishment, and plant guarantee.
- Plant Lists for native, drought tolerant, and to be preserved.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #10 | PLANT MATERIAL STANDARDS

### CITY OF TUSCON LANDSCAPE REGULATIONS [LANDSCAPE PLANT MATERIALS](#)

#### 5-02.1.0 PURPOSE

This standard has been prepared for the purpose of establishing plant and seed lists for use with various City of Tucson regulations that either require or regulate landscaping.

#### 5-02.2.0 APPLICABILITY

This standard applies on development projects, including repair and infrastructure installation, when city regulations mandate the use of drought tolerant or native plant and seed material.

### 5-02.3.0 TYPES OF PLANT MATERIAL

Most projects, with some exceptions, are required to be landscaped with either native vegetation or drought tolerant vegetation. The following subsections describe how vegetation is selected to comply with those requirements. For information on any exceptions, refer to the individual ordinance requiring or regulating the landscaping.

#### 7.6.2 Prohibit Non-Essential Turf and Limit Residential Turf

Turf, in particular high water use turf such as Kentucky Bluegrass, are increasingly considered an inappropriate landscape treatment for Colorado's arid climate. Local government can adopt landscape regulations that:

- limit turf by limiting it to a percent of total landscaped area,
- limit turf to specific locations within the landscape,
- allow a maximum amount of turf within a project/site,
- or, as Longmont has done, limit the types of grass that can be installed.

Turf prohibitions are gaining momentum in Colorado. Aurora, Castle Rock, and Colorado Spring have all recently adopted Colorado's first policies specifically targeting non-essential turf and are rapidly being followed by more. Additionally, a growing number of communities have already adopted policies placing a maximum square footage allowance for residential essential turf and prohibitions on turf in front yards.

The City of Longmont initiated a turf replacement program in 2022 and demand has exceeded available funding. The CWCB's Turf Replacement Program has expended all its initial allocated funding, and it is unclear if funding will be renewed. However, given the state is likely to pass policy this coming legislative session or next prohibiting nonessential turf, it is in the best interest of the City of Longmont to act now to adopt a non-essential turf policy and limits the need to pay for turf installed in new development.

The City of Aurora and the City of Castle Rock's turf limitations apply to all development including residential. The turf limitations, including for residential, use both a total percentage of landscaped area as well as a maximum square footage to not exceed. Photographic images are provided to illustrate the desired landscape.

#### WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #11 | TURF LIMITATIONS

##### CITY OF AURORA LANDSCAPE CODE RESIDENTIAL TURF LIMITATION

Turf option: Shall not exceed the lessor of 45% or 500 sq. ft. New turf installations are limited to the rear lots of residential homes and the front yards of alley-loaded residential homes and shall not exceed the lessor of 45% or 500 square feet of the front or back yard areas.  
(see Figure 4.7-30)

**Figure 4.7-30: Residential Front Yards and Corner Side Yards**





## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #12 | TURF LIMITATIONS

### CITY OF COLORADO SPRINGS, CO LANDSCAPE CODE **TURF** POLICY

#### 2. High Water Use Turfgrass

a. High Water Use Turfgrass shall be hydrozoned and irrigated separately because of its unique water demand.

b. High Water Use Turfgrass cannot be used as an infill material and should be used as a planned amenity or element, as defined in the Landscape Manual, in the designed landscape.

The following areas would be considered an amenity/element which would allow the use of High-Water Use Turfgrass. These areas will be determined and approved by the Manager.

- Designed Active Green Space which shows that the space will be used as amenity and has pre-determined benefit for users and/or the city.
- Play fields and high use play areas designed for the benefit for users/or the city.
- Limited areas adjacent to City ROW and approved on case-by-case review.

c. High Water Use Turfgrass shall not comprise more than twenty-five (25) percent of the total green space area of the site, and shall not:

- Be used on slopes greater than 5:1; Be used in medians, parking lot islands, or parking lot planters;
- Be used within roundabouts located within a public or private ROW.
- Be used in any configuration that cannot be efficiently irrigated;
- Be used in street right-of-way between curb and sidewalk or on other locations on a site that are less than seven (7) feet wide; and
- Be used in areas with a contiguous area less than one hundred (100) square feet.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #13 | TURF LIMITATIONS

### CITY OF AURORA, COLORADO LANDSCAPE CODE

(E) Landscape Standards. All development applications shall include landscape plans that meet the following minimum standards:

(2)Landscape Area Treatment.

(a)Turf grass. High-use areas shall be planted with irrigated turf grass. Non-irrigated shortgrass prairie grasses or other adapted grasses that have been certified as Xeriscape landscaping may be established in remote, low-use, low visibility areas.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #14 | TURF LIMITATIONS

### ARAPAHOE COUNTY, COLORADO PROPOSED LANDSCAPE CODE UPDATE

4. Turf Limitations Arapahoe County recognizes that while turf grass has practical benefits in a landscape, the extent of and the location impacts of a site's total irrigation requirements is considered a high-water use plant material. Turf grass shall be limited as follows:

a. Turf grass sod or turf grass seed shall be selected from the Arapahoe County approved plant list. Kentucky bluegrass and other high water use turf grasses that require over 18-inches of irrigation annually are prohibited except as approved by Arapahoe County on a case-by-case basis for limited uses such as high pedestrian traffic areas, fields, or water quality control measures.

b. Turf grass shall be installed as a unique hydrozone and be irrigated separately.

c. In public and private parks, turf grass shall be restricted to park and open space areas intended for passive or active recreation. Turf grass in accordance with water quality control measures in the Arapahoe County Stormwater Management Manual is allowed.

- d. In single-family detached, single-family detached cluster, two-family and townhome residential development, turf shall be limited to 25 percent of the total combined yard area or a maximum of 500 square feet on a lot, whichever is less.
- e. In single-family attached developments on one lot and multi-family development (e.g. triplex, fourplex, multi-apartment or condominium) turf grass shall not exceed 20 percent of the required common area and shall be only used in high-traffic or active/passive recreation areas.
- f. In industrial and commercial development, turf grass is prohibited, except in water quality control measures as described in the Arapahoe County Stormwater Management Manual.
- g. Turf grass is prohibited in buffers, parking lot islands, street medians, subdivision entries, and shopping centers, except in water quality control measures as described in the Arapahoe County Stormwater Management Manual.
- h. Turf grass shall not be used on slopes greater than 4:1.
- i. Golf courses shall limit the use of turf to fairways and greens. Efforts to further reduce the demand for irrigation are encouraged including the use of native and low to very low water use grasses in out-of-play areas.
- j. Water quality control measures, such as grass swales and grass buffers, shall comply with vegetation specified in the Stormwater Management Manual.

## THEME 4 | LANDSCAPE CODE IRRIGATION EFFICIENCY

### 7.7 RECOMMENDATION G | REVIEW APPLICABILITY OF WATER EFFICIENCY STANDARDS

To maximize water efficiency, landscape regulations are most effective when they apply to *all development*. Longmont's landscape code is applicable to all, but all water saving standards are not necessarily applicable to all development types nor to all landscape areas. Plant materials and landscape installation and maintenance included in the city standards are only applicable to specific landscapes but are the most water efficient standards.

TABLE 10   CITY OF LONGMONT APPLICABILITY OF WATER EFFICIENT LANDSCAPE STANDARDS		
DEVELOPMENT TYPES	APPLICABLE LANDSCAPE AREAS	WATER EFFICIENCY STANDARDS
Public	Arterial ROW, primary greenway or other areas owned/and or maintained by Longmont Parks and Forestry Services, detention ponds, common areas	Section 600 Landscaping and Irrigation Standards
Mixed Use/Non-Residential	Parking Areas, Streetscapes, Buffers	Landscape Code
Residential Development	Front Yards	Landscape Code
	Pocket Parks	Landscape Code
All	Redevelopment	Landscape Code

### 7.8 RECOMMENDATION H | EXPAND APPLICABILITY OF WATER EFFICIENT IRRIGATION STANDARDS

Coupled with appropriate plant selection, water efficient irrigation systems can greatly reduce water waste. Best practices for water efficient landscaping are well researched with the different standards working together to achieve the greatest water efficiency. Longmont's landscape code itself offers little in terms of specific standards for irrigation efficiency beyond the xeriscape principle for water efficiency. The Plumbing Code Section 16.16.460 does require all lawn irrigation systems to be equipped with a rain sensing device. Longmont's City Standards Section 600 incorporates many water efficient best practices and these are indicated in bold in the list below.

- Water-use management plan or water budget that includes landscape water-use estimates and maximum allowable water allowances.
- Require hydrozones that group similar water demands.
- **Irrigation system design that includes requirements for smart irrigation system controllers, irrigation shutoff valve, master valves and flow sensors, rain sensors, soil moisture sensors.**

- Efficient emitters.
- **Standards for overhead (spray) irrigation include permitting only where sufficient width exists to prevent waste.**
- **Pop-up spray heads equipped with internal check valves, internal pressure regulations, and matched precipitation rate spray and rotary nozzle.**
- Pop-up heights consistent with mature height of plants being watered – minimum of 6 inches.
- **Rotors equipped with internal check valves and pressure regulation.**
- **Head-to-head coverage standards.**
- Prohibition of overhead sprinkler irrigation on irregular shaped beds or turf.
- **Drip systems include point source drip or subsurface drip irrigation for all trees, shrubs, perennials and annuals; internal check valves at each drip emitter and for subsurface drip systems. Subsurface drip irrigation may also be used for turf or grass areas. (Bubblers may be substituted for drip emitters. )**
- **Usage of alternative water supplies such as nonpotable water sources, recycled water, and stormwater.**
- **Separate irrigation meters.**

The South Metro Water District’s [Model Landscape Irrigation Ordinance](#) offers one of the best model codes for water efficient irrigation. It was developed for water providers in the South Metro Water District who do not have control over land use or other design elements and is focused on irrigation. An updated version developed with input from the City of Colorado Springs and Castle Rock will be available soon but was not available during the production of this report.

WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #15   IRRIGATION STANDARDS
<p><b>CITY OF BROOMFIELD, COLORADO <a href="#">LANDSCAPE CODE</a> (NEWLY ADOPTED)</b></p> <p>17-70-060 Irrigation. All irrigation systems installed pursuant to this chapter shall comply with the following requirements:</p> <p>(A) New landscaped areas, plant beds, raised planters, and plant containers, with the exception of non- irrigated native, dryland, and restorative grasses and those areas watered with reuse water, shall be watered by a permanent automatic irrigation system. Trees shall be irrigated with driplines, except when reuse water is used. The irrigation system shall be zoned separately for turf grass and shrubbed areas.</p> <p>(B) All irrigation systems to be owned and maintained by the city shall be installed in accordance with the current version of the City and County Standards and Specifications.</p> <p>(C) Automatic rain shutoff sensors shall be installed in all irrigation systems and shall have freeze sensors and evapotranspiration (ET) gauges. Irrigation systems shall be regulated with smart irrigation controllers. Irrigation systems installed shall use irrigation controllers and sprinkler bodies that are certified under EPA WaterSense.</p> <p>(D) The irrigation system shall be designed to provide peak season watering with irrigation within a six night, six hour per night watering period. The irrigation system shall provide a 36 hour watering window to ensure reasonable tap size and flexibility of watering times during extremely hot weather.</p> <p>(E) The irrigation system for non-residential, multi-family, single-family attached, manufactured home parks and commercial developments shall have a dedicated water meter for irrigation purposes.</p> <p>(F) All landscape plans shall be divided into water conserving (non-turfgrass), non-water conserving (turfgrass), and non-irrigated areas (e.g., pavement). A separate hydrozone plan is required to be submitted with the landscape plan. The hydrozone plan shall identify high, moderate, low, and very low water use zones. Refer to the Landscape Reference Manual for plan requirements.</p> <p>(G) The minimum irrigation efficiency for purposes of this ordinance is 0.623.</p>

(H) A water budget is required for all non-residential districts, multi-family, single-family attached properties and manufactured home parks which shall be submitted with the site development plan/urban renewal site plan (SDP/URSP) or with a building permit. Water budget worksheets are discussed in more detail and examples are provided in the Landscape Reference Manual. The water budget shall generally include the following information:

- (1) Evapotranspiration Reference Locations
- (2) Gallons of Water Needed by Plant Category
- (3) Irrigation Areas (zones) based on Plant Water Need Category
- (4) Water-Use Calculations
- (5) Dedicated landscape water meters

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #16 | IRRIGATION STANDARDS

### ARAPAHOE COUNTY PROPOSED LANDSCAPE CODE UPDATE

#### General Requirements for Irrigation Plan

- The irrigation plan shall be submitted concurrent with the final landscape plan or at the time of building permit application and shall be approved before any irrigation construction and issuance of a certificate of occupancy.
- The irrigated areas should be shown on the irrigation plan and correspond to the hydrozones on the landscape plan. The irrigation zones should be labeled by precipitation rates and method of water application.
- The irrigation plan shall be completed by a Certified Irrigation Association Designer.

#### Water Efficient Irrigation System Design

- Hydrozones: Irrigation systems should be designed for plants of similar hydrozones. Turf shall be designated as its own hydrozone. Turf irrigation zones should be further separated by slope, exposure, and turf-type water needs.

#### Irrigation System Requirements:

- Automatic Controllers: All landscaped areas (option: *greater than 500 square feet*) shall be served by a functioning automatic irrigation system that includes a battery backup, a weather-based smart controller (WaterSense labeled), and rain sensor to override the irrigation cycle when sufficient rainfall has occurred. Multi-program controllers shall be used when the landscape design contains more than one hydrozone and shall be designed to irrigate hydrozones separately.
- Sprinkler systems shall be designed to not exceed a precipitation rate of 1.2 inches per hour.
- Sprinkler Head Layout
  - Sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
  - Sprinkler head spacing for turf must achieve head-to-head coverage unless native grasses which should be designed for 80% coverage.
- Pressure Control
  - The irrigation systems shall be designed to ensure that the operating pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
- Equipment Selection
  - All non-residential sprinkler systems shall be equipped with master shut-off valves and flow sensor valves.
  - All sprinkler heads shall include check valves and pressure regulating devices.
  - Pop up height shall match plant height. Pop up spray heads for all manicured turf areas shall have a minimum height of 6 inches. Irrigated native grasses and perennials shall have a minimum height of 12".
  - Water Sense labeled sprinkler bodies are required for trees, shrubs, and groundcover.
  - Trees shall be placed on separate valves from shrubs, groundcovers, and turfgrass.
  - (county requirements for backflow prevention)
- Watering Schedule: All automatic irrigated landscapes shall be scheduled for no more than 3 days per week and for irrigation between the hours of 6:00 pm and 10:00 am.
- Narrow strips, parking lots, tree lawns, and medians:
  - Overhead irrigation is not permitted in areas less than 10' in width.
  - Overhead irrigation is not permitted in streetscape or parking lot islands or medians.

- Turf areas shall be sized and shaped for efficient irrigation and elimination of water waste with a minimum turf area width of 10 feet.

Water Waste. The irrigation system shall be designed to prevent water waste, overwatering, overspray, and drainage of water onto any paved or unplanted surface.

Irrigation Installation

- Irrigation systems shall be installed by a QWEL certified contractor.

Irrigation Audit

- Following construction, a landscape irrigation audit shall be conducted by a third-party certified landscape irrigation auditor at the cost of the applicant. Irrigation audits shall not be conducted by the person or company who installed the irrigation system. The irrigation audit report shall be submitted prior to certification of occupancy.

### 7.8.1 Define Hydrozones by Water Use and Implement an Outdoor Water Allocation

One significant shortcoming of Longmont’s landscape code is the application of plant grouping as hydrozones rather than by water demand. Longmont should define hydrozones by water demand and not by plant types. For example, the requirement in Design and Construction Standards Section 600 states in two different standards as (1) efficient irrigation (zoning irrigation to separate turf areas from shrubs) and shrub and (2) perennial beds are to be zoned separately from turf areas while the Development Regulations define xeriscape principles as design of irrigation based on water needs. While matching appropriate irrigation methods (drip versus overhead) to plant types and planting area is a best practice, hydrozones for water demand then ensure the plants are further grouped based on very low/low, medium, and high water demand. If plant types are not grouped by similar water demand, the default water application in an irrigation zone is the highest water use.

Water estimates are often required with a landscape plan so that a “budget” can be allocated with a development approval and the landscape water demand estimates can be used in the assessment of the landscape plan for compliance with goals for water efficiency and impacts to water supply. Rather than referring to lower and higher water demand plant materials, specific water demand metrics can be assigned to each hydrozone. Many communities require the majority (75-85%) of plant materials to be selected from the low to very low categories.

Longmont should define what is meant by very low/low, moderate, and high-water demand plant materials and require hydrozones to be grouped by water demand. Recommendations for revised policy language includes:

- Turfgrass shall be its own hydrozone and irrigated separately.
- Plants shall be grouped together by soil suitability and water use in distinct hydrozones (very low and low, medium, and high). No combining of hydrozones is permitted except between low and very low.

#### WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #17 | IRRIGATION STANDARDS

##### CITY OF FORT COLLINS LANDSCAPE CODE

(b) Landscape plans shall include:

1. A water budget chart that shows the total annual water use, which shall not exceed an average of fifteen (15) gallons/square foot/year for each water tap.

a. Accurate and clear identification of all applicable hydrozones using the following categories:

High Hydrozone	18 gallons/square feet/year
Moderate Hydrozone	14 gallons/square feet/year
Low Hydrozone	8 gallons/square feet/year
Very Low Hydrozone	3 gallons/square feet/year

WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #18   IRRIGATION STANDARDS
<p><b>CITY OF BROOMFIELD, CO LANDSCAPE CODE</b></p> <p>(F) All landscape plans shall be divided into water conserving (non-turfgrass), non-water conserving (turfgrass), and non-irrigated areas (e.g., pavement). A separate hydrozone plan is required to be submitted with the landscape plan. The hydrozone plan shall identify high, moderate, low and very low water use zones. Refer to the Landscape Reference Manual for plan requirements.</p>

### 7.8.2 Make Seasonal Day and Time of Week a Mandatory Standard

Water providers across the region already use outdoor watering schedules, either regulatory or voluntary. Making this a policy for all development types and regardless of water source is low hanging fruit that can have significant water savings, particularly with existing turf areas. The most common schedule is 3 days per week between 6:00 p.m. and 10:00 a.m.

The Alliance for Water Efficiency conducted a review of Colorado’s communities to determine the value of promoting this strategy as low hanging fruit. [The analysis](#) found that that mandatory watering restrictions of all kinds lead to significant decreases in water demand. Some cities involved in the study saw up to a 42 percent reduction in peak monthly demand. Meanwhile, voluntary watering restrictions produced no statistically significant difference in water demand.

While Longmont does not need mandatory day and time of week solely for the purposes of protecting its water supply when not in drought, it is a best practice that promotes a stewardship ethic, more efficient irrigation practice - particularly in residential development, and encourages the transition to drought resilient landscapes. The city has a recommended day/time of week schedule and irrigation cycle schedule on the utility website. At a minimum, the watering schedule could be required for all developments that require a permanent irrigation system to reduce overwatering and ensure efficient seasonal irrigation scheduling as part of the maintenance requirements.

### 7.8.3 Irrigation Installation and Maintenance

Irrigation installation, design, and maintenance are critical components of achieving water efficient landscapes. The City Standards Section 600 includes landscape and irrigation installation guidance, requirements for inspection approval, and some maintenance standards. The landscape code emphasizes responsibility while the City Standards Section 600 provides explicit process for verifying compliance and operation of the irrigation system. Many local governments are now requiring that the irrigation inspector be certified by QWEL, SLA, or any other professional certification.

TABLE 11   CITY OF LONGMONT LANDSCAPE CODE LANDSCAPE INSEPTION AND MAINTAINANCE STANDARDS
<p><b>Development Regulations</b></p> <p>15.05.040 O Landscape Installation and Maintenance</p> <p>1. Property owner maintenance.</p> <p>a. Property owners, such as the property owners’ association, shall maintain all on-site and common area landscape and all landscape on adjacent right of ways.</p>
<p><b>Design and Construction Standards Section 600</b></p> <p>603.06 Testing</p> <p>1. All tests to be run in the presence of City inspector for City Owned Areas, or an Irrigation Design Professional for Common Open Space areas. Irrigation Design Professional conducting inspections is to sign the certification statement on the as-built drawings. All City irrigation inspections to be scheduled by calling 303-651-8745 for City Owned and Maintained areas or coordinating with City inspector for other areas.</p> <p>All Areas: Schedule all tests and inspections a minimum of 48 hours in advance of tests. Repeat any failed tests until full acceptance is obtained. No testing shall be done when seasonal conditions minimize the ability to sufficiently inspect the system. Generally, testing is not available between the months of November and April.</p>

No chemical spraying shall be done within ten (10) days of any irrigation inspections.

### 7.9 RECOMMENDATION I | MODIFY IRRIGATION STANDARDS FOR PLANTING TREES.

As Colorado communities move to reduce non-essential turf in streetscapes and shift towards water efficient design, historical approaches to irrigating trees need to change. In Longmont, the Development Regulations permit drip irrigation for trees located in shrub beds but prohibits trees located in irrigated turf areas from using drip. The City Standards require that trees shall be irrigated with driplines, except when reuse water is used.

Turf and trees have different irrigation needs with trees needing deeper watering at the drip line and turf requiring shallower watering. As turf areas are being converted to more xeric landscapes with less frequent irrigation schedules, underground irrigation requirements need to be modified to sustain tree health. Future landscapes should be designed to support healthy trees by requiring trees to be watered on their own emitter using a spiraled soaker hose and/or a drip system.

**WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #19 | IRRIGATION STANDARDS**

**SOUTH METRO WATER DISTRICT MODEL LANDSCAPE CODE**

Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turfgrass to facilitate the appropriate irrigation of trees. The mature size and extent of the root zone shall be considered when designing irrigation for the tree.

### 7.10 RECOMMENDATION J | STRENGTHEN INCORPORATION OF LOW IMPACT DEVELOPMENT (LID) AND STORMWATER LANDSCAPE REQUIREMENTS

Integrating stormwater into landscape design serves two purposes. First, it helps protect water quality by filtering pollutants out of stormwater runoff and infiltrating water into the ground. Second, stormwater can provide an alternative source of water that during Colorado's summers can reduce the amount of water needed on landscapes.

The City of Longmont development regulations include stormwater detention in parks and buffers as part of landscape treatments and encourage, but do not require, smaller scale low impact development integration. Implementation manuals have proven useful in defining the specific types of stormwater treatments, clarifying where they are most appropriate, preferred water adapted plant materials, and locations in site design. The City of Fort Collins and City/ County of Denver have both developed high quality manuals that illustrate the types of designs they want to incorporate into site design. The City of Fort Collins manual is user friendly and appropriately scaled to Longmont which could serve as a reference to refer builders for desired integration of stormwater treatments.



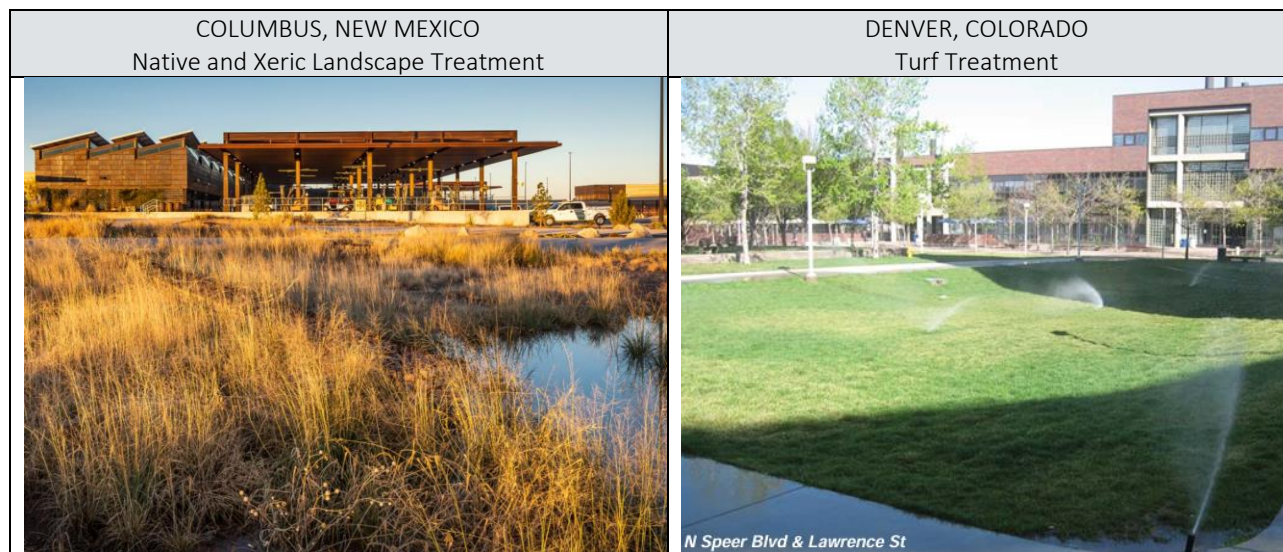
- City of Fort Collins [LID Implementation Manual](#)
- City/County of Denver [Ultra Urban Green Infrastructure Manual](#)

### 7.10.1 Landscaping Requirements for Detention Areas

In the Longmont Design and Construction Standards, stormwater detention is required for two scales, subdivision and site.

- Subdivisions with lots less than one (1) acre must provide detention for the entire subdivision.
- Lots greater than one (1) acre may be assigned individual detention responsibilities.

Landscape requirements for detention basins have historically been to mitigate the aesthetic impacts of stormwater infrastructure and to provide less functional landscapes. The City of Denver’s 2010 manual, [Aesthetically Enhanced Detention and Water Quality Ponds](#), is an example of when there was a strong emphasis on turf treatments within detention basins. Over a decade later, guidance for LID and green infrastructure, as can be seen in Denver’s more recent manuals, incorporates more xeric landscape materials and tries to tie into natural landscapes. The comparative images below show the difference in a more natural, xeric detention area with one treated with turf.



Longmont requirements in Section 1202.3 of the development code require vegetating detention areas where stormwater detention areas have embankments greater than 10 feet in height with grass to maintain slope stability. The city stormwater manual also identifies a preference for grass lined channels. In Section 704.2(7), the stormwater manual provides standards for grass types that are not highwater turf. Drought resistant, easy to establish, and able to spread grasses are preferred, but not mandatory. Recommended species includes Dutch Clover, several Wheatgrass species, several Grama species, two Brome species, and perennial Ryegrass. It clarifies that *“When the drainage is in a park and there is irrigation available, Kentucky Bluegrass is permitted, recognizing its high water and maintenance demand.”* As in the City Standards, planting guidance is provided for grass establishment that may be valuable for promoting native landscapes in other locations. These could be combined with the City Standards in a landscape manual.

This is a good policy, and the City should review whether developers are opting for native and/or drought tolerant grass over less water efficient landscape treatments. If the preferred treatments are not being incorporated, the city should consider making this a mandatory requirement. The city could also expand functional landscape standards for stormwater detention to include more natural landforms in addition to recreation use.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #20 | STORMWATER STANDARDS

### CITY OF SCHAUMBURG, IL LANDSCAPE CODE

(G)Detention and Retention Facilities: Landscaping shall be required around the perimeter of all retention and detention basins from the normal water line to a minimum of six inches (6") above the high-water line. Such landscaping shall primarily consist of native prairie and emergent plantings, but may also include tree and shrub plantings, in an arrangement that will create an aesthetically pleasing and ecologically functional environment. Such landscaping shall be in conformance with current best management practices (BMPs) as determined by the village as part of the National Pollutant Discharge Elimination System (NPDES) program. Retention and detention basins should be designed to resemble natural landforms, whenever possible. Trees, shrubs, turf, and dry prairie plantings should be located above the normal water line; emergent or wet prairie plantings should be located below the normal water line. Refer to chapter 151 "Subdivision and Land Development" of this title for grading, seeding and sodding requirements on different slopes.

### 7.10.2 Better Incorporate LID into Buffers, Right of Ways, and Parking Lots

The City of Longmont is well positioned to adapt its stormwater detention requirements to support climate resilience, water quality, and water efficiency. The development regulations, *Section 14.26.150 Stormwater Quality Technical Specifications C.*, includes a standard for incorporation of Low Impact Development (LID). Longmont requires an evaluation of LID for stormwater runoff from all applicable sites that install permanent stormwater control measures *to the maximum extent possible*. This is a vague standard which lacks clarification in the Stormwater Manual or City Standards.

The incorporation of LID into landscape treatments is more successful when specific LID treatments are identified, in place of vague language expressing a goal for LID. The case study examples below offer examples of how design guidelines for LID more explicit and support development compliance can be. In general, best practices include:

- Defining LID treatment types and where those treatments are most appropriate.
- Provide guidance on landscape treatments to make integration into landscape design easier.
- Use of physical infrastructure standards (curb cuts, slopes, percentage of total site drainage, etc.) that support site scale LID treatments and not only large detention.
- Illustrate what LID treatments look like in different landscape contexts.

## WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #21 | LOW IMPACT DEVELOPMENT

### CITY OF SCHAUMBURG, IL, LANDSCAPE CODE LID IN PARKING LOTS

4. *Continuous Bioswale Island*: A continuous planting island of at least fourteen feet (14') in width, as measured from back of curb to back of curb between parking rows, shall be provided along with either a standard island or an expanded island, depending on the number of stalls in a row, at the end of each row of parking. The continuous bioswale island shall have a depressed swale in the center of the island to promote stormwater infiltration and be planted with a combination of native plantings. The outside edge of a continuous bioswale island adjacent to parking stalls are recommended to have a section of lower plantings or mow strip to allow for vehicle overhang.

CITY OF AURORA, CO LOW IMPACT DEVELOPMENT REGULATIONS

1. Bioswales are vegetated swales planted with wet tolerant species of plants or ornamental grasses. They transport, store, and allow infiltration of water and can be designed as a landscape feature. Bioswales are not grassed, but are planted with a variety of plant species that can withstand occasional water inundation for short periods of time.



- C. 2. Grassed swales are designed conveyance devices used to transport water over the surface of the ground to a point of disposal that may be a catch basin, ditch, water body that will filter, infiltrate, evaporate, and clean the water of total suspended solids, solid waste and other pollutants. Swales are often appropriate along property lines, public streets, and around buildings.



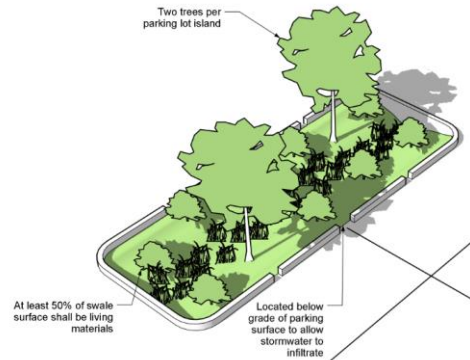
- C. 4. Rain gardens are small shallow, depressions planted with a variety of native or ornamental plants that can treat small amounts of runoff to improve water quality. Rain gardens are generally small collections of water loving plants planted on a low site area that naturally collects rainfall.





## CITY OF AURORA, CO PARKING LOT LANDSCAPE STANDARDS

To the maximum extent practicable, on-site drainage shall be integrated into the parking lot planting islands and perimeter planting areas as a means of treating storm water for water quality purposes in accordance with Public Works and Aurora Water criteria and Figure 4.7-24.



**Figure 4.7-24: Parking Lot Stormwater Treatment Design**



## THEME 5 | LANDSCAPE POLICY DESIGN GUIDELINES

### 7.11 RECOMMENDATION K | REVIEW DESIGN STANDARDS WITH LANDSCAPE PROFESSIONALS TO ASSESS DESIGN REQUIREMENTS

Design related standards establish minimum *size* of landscape areas, *quantity* of plant materials, the *location* for installation of landscape materials in site types, and *aesthetic* features. Historically, design standards were given little consideration as emphasis has been placed on promotion of xeric and native plant types, soil amendments, and irrigation efficiency to achieve water savings. That has changed recently as communities across the west find ways to address climate resilience. Approaches include:

- Offering off-the-shelf design plans for implementation of desired water efficient landscapes in streetscapes and for residential development.
- Minor reductions in plant quantities such as reducing ground plane coverage by 10% or removing 1 shrub per linear feet.
- Considering tree canopies for climate mitigation not simply as total coverage, but where trees should be planted (pedestrian areas versus car dominated parkways).

For this project, the design standards were synthesized for comparison of requirements with other communities and to assess any gaps. Opportunities, identified in the list below, are explored in more detail in related recommendations.

- Ensure the plant standards support the use of a wide range of living and non-living plant materials that reduces total vegetation quantity and saves water but without compromising visual aesthetics.
- Ensure native landscapes are easy to integrate into designs and install.
- Prioritize water efficiency in streetscapes.
- Prioritize water efficient residential front yards.
- Better integrate LID across all landscape areas, particularly streetscapes and parking lots.

Design firms who regularly apply Longmont’s city standards should be convened to discuss Longmont’s policy strengths and weaknesses, specifically how the design standards inhibit water conservation and use of drought tolerant and native plant materials. A city-landscape designer dialogue could address the following questions:

- How much water do you allocate for trees and shrubs and what would support greater water efficiency? (e.g. reduce the number of plants per linear feet by 5%)
- What are you most likely to use for groundcover and why?
- What would you like to do that the design standards prevent?
- What recommendations do you have for improving landscape design requirements for more water efficiency and resiliency of city landscapes?
- What changes to the design standards would enhance city goals for healthy tree canopy and heat island mitigation?
- What would make incorporating rain gardens, swales, and other LID principles into landscape design?
- How user friendly are the city’s policies for informing how to design landscapes?

**TABLE 11 | CITY OF LONGMONT LANDSCAPE CODE DESIGN STANDARDS**

LOCATION	AREA WIDTH	TREES AND SHRUBS		GROUNDCOVER	LID INTEGRATION
		Design Standard Minimum	Plant Material Standard		
BUFFERS	Table 15.05.040(1) and (2) 20-50 feet	1 tree and 5 shrubs per 500 to 1,000 square feet and 1 tree per 30-50 linear feet or alternative landscape plan if trees precluded	--	Combination of hardscape, berms, walls, and plants	Gateway facing no more than 50% stormwater area
STREETSCAPES					
Landscape Medians	8 feet	1 tree and 5 shrubs per 30 linear feet	100% deciduous canopy	Mulch or irrigated lower water consuming grass	--
Landscape Medians – No Walkway	10 feet	1 tree and 5 shrubs per 30 linear feet Planting with a mature height > 6” is prohibited in vehicle overhang	100% deciduous canopy	Mulch or irrigated grass*	--
RIGHT OF WAY					
Local and collector streets	8-foot tree lawn	1 tree per 40 feet in tree lawn	100% deciduous canopy	Irrigated lower water consuming grass or plants	--
Arterial streets	--	1 tree and 5 shrubs per 1,000 square feet of landscaped area  1 tree per 40 linear feet	75% deciduous canopy 25% coniferous	Grass seed mixture from approved material list	--
PARKING AREAS					
Adjacent to street, primary greenway ROW, another property	--	1 tree and 5 shrubs/30 linear feet of greenway	--	--	--
Buffer to adjacent property	10 feet	--	--	--	--

Landscape islands	9 feet	1 tree and 6 shrubs per single parking row 2 trees and 12 shrubs per double parking row	100% deciduous canopy	Mulch	--
GREENWAYS					
Primary Greenway	50 feet no waterway or 100 wide on each side of Saint Vrain	1 tree and 5 shrubs/1,500 square feet of landscaped area with 1 tree and 5 shrubs per 50 linear feet of greenway	75% deciduous canopy 25% conifers  Existing vegetation may be credited to meet requirements	Irrigated lower water consuming grass or other material except in shrub beds	--
Secondary Greenway	20 feet wide	--	--	Irrigated lower water consuming grass or other material	--
MIXED USE and NON-RESIDENTIAL**					
Streetscape	--	1 tree per 40 feet in tree lawn or grate	--	Irrigated lower water consuming grass or other suitable material	--
RESIDENTIAL STANDARDS					
Pocket Park	--	1 tree and 5 shrubs per 2,000 square feet of landscaped area	--	Irrigated lower water consuming grass or other material suitable for area covering 75% of landscaped area not including hardscapes and amenities	50% of a pocket park may be dedicated to stormwater areas, of which a minimum of 90% needs to be used for passive or active recreation
Residential Street Facing Yard***	--	--	--	60% of front facing yard and 75% if a corner lot shall be landscaped.	--
<p><i>*Note: Does not specify low water grass types.</i></p> <p><i>**Note: Preferred landscape treatment not defined for residential front yards.</i></p> <p><i>***Note: Does not require water features to be recycled water.</i></p>					

## 7.12 RECOMMENDATION L | ILLUSTRATE THE STREETScape STANDARDS FOR PRIVATE AND PUBLIC RIGHT OF WAYS

Longmont's street streetscape requirements already require the future public right of ways in areas of road expansion to be landscaped with lower water demand grasses and plant materials. The design standards are not very different from other peer communities. What Longmont lacks that other communities have is illustrations of the type of landscape treatments that are desired in the city. Generally, additional design criteria for streetscapes might include:

- How to use stamped concrete, pavers, cobble, mulch to create visual elements in medians and tree lawns.
- Examples of xeric layout options for right of ways.
- Guidance on how to ensure native landscapes are installed and maintained for success.
- Recommended plant materials for streetscapes.

The two case study examples offered here are not perfect and rely too heavily on turf as a treatment, but they do demonstrate how to illustrate design standards for water efficient landscapes. First, the City of Fort Collins' [streetscape standards](#) presents Coloradoscapes clearly and simply.

#### 4.3

#### PARKWAY LANDSCAPING - ALTERNATIVES TO TURF-TYPE GRASS



Mulched planting bed in the parkway limits water use and can provide visual interest.

#### 4.3.1 Where Appropriate.

Alternatives to irrigated turfgrass can be an appropriate choice for property owners abutting collector and local streets, depending on whether the parkway is governed by an approved Development Plan. Alternatives can also be appropriate for arterial street projects in special plan areas that have recommended alternatives.

The Town of Wellington has a very simple [Wellington Water Wise](#) design manual that emphasizes a balance on moderate to low water use and water budgets. These goals are then simply illustrating landscape types for high, moderate, low, and xeric landscape treatments for each site location including streetscapes, residential, and nonresidential.

The City of Aurora has adopted a non-functional turf prohibition that applies to right of ways and streetscapes. The example for medians below includes:

- Setting a ratio for ornamental grass substitutions for shrubs.
- Allowing native grass groundcover that is calculated after other plant material requirements are met.
- Allowing temporary above ground irrigation of native grasses for a 3-year establishment period.

#### WATER EFFICIENT LANDSCAPE CASE STUDY EXAMPLE #23 | STREETSCAPES

##### CITY OF AURORA, COLORADO LANDSCAPE CODE MEDIANS

O. Medians. All medians in the public street rights-of-way that are to be maintained by the Parks, Recreation and Open Space Department (PROS) shall be landscaped in accordance with the PROS Dedication and Development Criteria Manual. A copy of the manual is available on the City's website. The applicant shall prepare median design and construction drawings for submission to PROS for review and approval independent of the required Site Plan submittal to the Planning and Development Services Department. A separate review fee is collected by PROS at time of submission. Coordinate with PROS on specific submittal requirements.

All medians in the public street rights-of-way that are to be privately owned and maintained by a homeowner's association or Title 32 District may be landscaped in accordance with the PROS Dedication and Development Criteria Manual or shall be landscaped at a minimum in accordance with the following requirements:

Trees: One deciduous canopy/shade tree (two and one-half inches) or ornamental tree (two inches) every 35 feet on average. At least half of the trees shall be canopy or shade trees. Evergreen trees are not permitted within medians unless a narrow species is selected and preapproved by Planning staff. Ornamental trees may be grouped closer together to achieve a specific aesthetic look.

Shrubs: Shrubs shall be provided at a ratio of six shrubs per 36 linear feet of median. Shrub installation size shall be five-gallon containers.

Ornamental Grasses: Ornamental grasses may be provided but may not count for more than 30 percent of the total shrub quantity. Ornamental grass installation shall be five-gallon containers.

Water-Wise Xeric Grass Species/Native Seed: Native seed may be provided in combination with shrubs, ornamental grasses, water-wise xeric grass species and trees at a ratio of six shrubs per 36 linear feet of median. The shrub quantity is calculated first, and the remainder of the median may be native seed. Ornamental grasses



may not count for more than 30 percent of the total shrub quantity.

**Mulch:** Mulch may be either organic or inorganic or a combination of both at the discretion of the designer. Shredded cedar is the preferred mulch treatment as it has moisture retention qualities, unlike rock mulch that retains and radiates heat. No white rock or crusher fines are permitted.

**Irrigation:** Permanent irrigation is required for all plants except native seed mixes and Z-zone plant species. Overhead irrigation utilizing spray, rotor or rotary heads is prohibited as defined by Chapter 138-191 of the Aurora City Code. Above ground temporary overhead irrigation may be permitted for a three-year establishment period and permission is determined by the size and spatial layout of the landscape design. Native seed is established when no more than 10 percent of the native seed consists of nonnative species or weeds. In addition, no bare areas shall be larger than 12 inches by 12 inches.

### 7.13 RECOMMENDATION M | DEVELOP DESIGN GUIDELINES FOR DESIRED RESIDENTIAL LANDSCAPES

As landscape policies become more climate resilient local governments are working to build the capacity of residents and landscape professionals to create a new landscape typology. Offering plant lists or links to plant lists has been helpful but insufficient. To support installation of these new landscapes, communities are now developing support resources and design templates for landscape design and installation to simplify the adoption of “Coloradoscapes” and functional landscapes.

- [Fort Collins Xeriscape Design Brochure](#) Guide to laying out rain gardens with a palette of plant materials specifically selected for each design.
- Castle Rock Residential Landscape “Coloradoscape” [Design Guidelines](#)
- City of Aurora [Water Wise Residential Designs](#)
- Northern Water [Marshall Fire Recovery Landscape Templates](#)
- While not in Colorado, the Sonoma Marin Partnership [Landscape Design Templates and Maintenance Manual](#).
- Colorado Stormwater Center [Rain Garden Design Templates](#)

The city could develop its own resources or, at a minimum, get permission to offer these resources to developers and community members in Longmont.

### 7.14 RECOMMENDATION N | DEVELOP A LANDSCAPE DESIGN MANUAL

This report includes many recommendations, not all of which are likely to be pursued for implementation. Many of the recommendations may be able to be implemented through a text amendment. While the city could do an entire code rewrite, it could also use a landscape manual that integrates the different policy documents, offers implementation guidance and illustrations, and makes the process more user friendly. This may offer the city more value than a significant code rewrite.

## THEME 6 | CITY OF LONGMONT RELATED SUSTAINABILITY GOALS

The review of the city’s plans and policies also identified two conflicts that the city may want to address. These are explained below.

### 7.15 RECOMMENDATION O | UPDATE PLUMBING STANDARDS FOR CONSISTENCY WITH WATERWISE

The Municipal Code Section 14.04.500 A-E includes plumbing fixture standards which align with the 1990 Federal Plumbing Standard. Colorado has adopted a Water Wise state statute that requires a higher level of water efficiency performance than the federal standards. The Water Wise policy limits the ability of retailers and wholesalers to distribute any of the identified fixtures or appliances that do not comply with the minimum water

efficiency standards. Longmont should match its plumbing requirements to the State’s water efficiency requirements.

TABLE 13   CITY OF LONGMONT PLUMBING REQUIREMENTS		
FIXTURE	COLORADO WATER SENSE RULE	CITY OF LONGMONT MUNICIPAL CODE (CURRENT)
Lavatory Faucet	0.5 gpm	self-closing faucets and metering not to exceed 0.5 gpm or cycle
Lavatory Faucet	1.5 gpm	Not to exceed 2.5 gpm
Showerhead	2.0 gpm	Not to exceed 2.5 gall/minute with 20-80 psig
Flushing Urinal	0.5 gpf	Not exceed 1 fall/flush with 20-80 psig
Flushometer Valve Toilet, Commercial	1.28 gpf	Not to exceed 1.6 gall/flush with 20-80 psig
Tank Toilet	1.28 gpf	Not to exceed 1.6 gall/flush with 20-80 psig
Kitchen Faucet, Residential	1.8 gpm	--
Spray Sprinkler Bodies	Water Sense	--
Dishwasher, Commercial	Energy Star	--
Steam Cooker, Commercial	Energy Star	--

Additionally, in Section 01 35 63 for Green Building Certification Requirements, the city requires that municipal building renovations over 5,000 square feet meet a minimum LEED Silver Certification and incorporate design elements for water conservation including:

- Sustainable site design and landscape design
- Low impact development techniques
- Water efficient fixtures, irrigation systems, and landscape design
- Stormwater control measures and best practices

With the Colorado Water Wise policy, any new fixtures in a renovation would already need to meet minimum efficiency standards. The difference between Water Wise and LEED should be clarified. Also, Longmont has very efficient requirements for public landscape. If Longmont revises its code based on these recommendations, the difference for LEED silver and the standard requirements should be compared. It might be that to best advance water efficient green building best practices, Longmont should prioritize design elements for green building that beyond what is required in other development regulations and advance the city’s interest in demonstrations for stormwater and graywater as alternative water sources.

There is now a *water neutral development* component to complement the Net Zero Building focus on energy. Advanced by the [Department of Energy](#), a water neutral building should negate any water demand created on the potable water system by offsetting that demand from graywater, stormwater, capture of air cooling condensate, reclaimed wastewater or other water recycling. While not all these alternative sources are available to Longmont, it might offer an opportunity to pilot projects and learn how to best incorporate these methods into future green building and development regulations. Northern Water’s LEED Silver building in Granby may offer some guidance as it was able to receive the maximum points available in Colorado for rainwater management.

## 7.16 RECOMMENDATION P | REVIEW THE GREENWAY STANDARD FOR SETBACK CONSISTENCY

The greenways standards (15.05.040 I) require the inclusion of primary and secondary greenways. When adjacent to waterways, the greenway must be 100-feet wide from the ordinary high-water mark. Unless this was deliberate,

the 100-foot greenway appears to conflict with the recommended 150-foot buffer for the river setback in natural resource protection standards (and Envision Longmont).

# APPENDIX A | WATER SUPPLY AND PROVIDER SUMMARY

## CITY OF LONGMONT WATER UTILITY

Longmont of Longmont has effectively used its water dedication policy to establish a healthy water rights portfolio. As a result, Longmont has a very moderate water conservation goal of 10% water savings (3,500 AF) by build out (estimated 2048). This has been Longmont's water saving target since the 2014 Raw Water Master Plan. The 2017 water efficiency plan estimated that Longmont had already achieved an estimated annual treated water savings of 2,400-acre feet and thus the plan focused on achieving an additional annual treated water savings of another 1,100 acre feet to meet Longmont's goal.

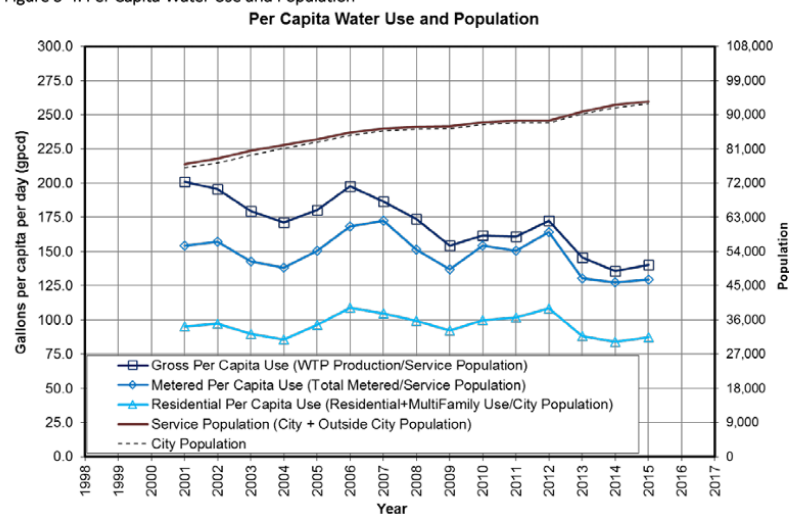
Longmont's water conservation program includes:

- Voluntary day and time of week watering schedule
- Collaboration with Resource Central on Garden in a Box, lawn replacement, and slow the flow irrigation audits, water wise yard seminars, and rebates.
- Lawn replacement program initiated in 2022 (7,317 square feet of turf)

Raw water has been identified as a better source for irrigation than treated water supply. At the time of Envision Longmont, 56% of parks, 66% of golf courses, and 60% of schools were using metered raw water. The benefits to irrigation with raw water are that it reduces water loss in the potable system, reduces peak pressure on the system, and allows for instream flows to remain in the St. Vrain Creek. These water supplies are, however, subject to curtailment during times of drought.

As water efficiency increases, communities across the west are seeing growth and demand decoupled, often referred to as water neutral growth. Total water demand and the per capita water use (GPCD) has declined in the City of Longmont. From 1998 to 2017 the population has increased while overall per capita water demand has decreased. However, GPCD appears to have flattened beginning in 2014 and should be compared to more current numbers to evaluate the impact of denser new development which is typically more water efficient.

Figure 3-4. Per Capita Water Use and Population



In addition to the water savings target, the Water Efficiency Plan has a target of prolonging the adequacy of existing water resources and, as appropriate, defer capital construction of new water projects. In the Envision Longmont water supply summary, the plan states *“Water efficiency may not influence the need for or the timing of the various large capital projects for additional raw water supply and storage”* emphasizing the water supply plan

identifies additional water rights acquisition for C-BT, Saint Vrain Creek, and annexation. The Envision Longmont Comprehensive Plan used the 2004 Raw Water Master Plan and the 2013 Integrated Treated Water Supply Master Plan as sources of water supply information and identified that future water supply reliability and flexibility are depending upon future capital projects including:

- Increased storage at Ralph Price Reservoir
- Enlargement of Union Reservoir and pipeline
- Participation in Windy Gap Firming Project
- Diversion and pipeline improvements

The WEP identifies ongoing strategies for water conservation with an emphasis placed on metering and water loss and education and outreach programs. The inclusion of land use ordinances and enforcement in the WEP references existing policies that have already been adopted including the drought watering restrictions, water waste, plumbing fixtures, inclusion of xeric principles, and adding soil amendments and irrigation to the design standards. There were no additional regulatory land use recommendations for the WEP and instead focused on improving existing landscapes through education and outreach.

### 7.16.1 Water Rates

2024	Single Family and Duplex Use Per Month in Gallons	In Longmont Per 1000 gallons	Outside Longmont Per 1000 gallons	
Tier 1	Up to 5,000	\$4.16	\$6.24	
Tier 2	5,001 – 15,000	\$6.03	\$9.05	
Tier 3	15,0001 – 35,000	\$8.15	\$12.23	
Tier 4	Over 35,000	\$11.23	\$16.85	
2024	Use Per Month in Gallons	In Longmont Per 1000 gallons	Outside Longmont Per 1000 gallons	
2024	Multi Family	Small Commercial, Mixed Use, and Airport	Outdoor Irrigation	
Inside City per 1000 gallons	\$4.87	\$5.16	\$6.55	
Outside City per 1000 gallons	\$7.31	\$7.74	\$9.83	

Longmont also charges a monthly fee for services based on the tap size as well as tap fees and system development fees for each customer class. There are also surcharges for Windy Gap and the Municipal Airport. Longmont has also adopted a fee structure to support housing affordability with lower tap fees for small lot (3,500 square foot or less) that meets specific criteria and provides at least 20% of total units as affordable. Under this provision, no residential meter may be used for outdoor irrigation and any common irrigated areas must have a separate irrigation meter. Lastly, small commercial and multifamily can have a single indoor and outdoor meter, but multifamily must have a separate irrigation meter.

Longmont has an intergovernmental agreement with the Town of Lyons where Longmont provides water services to the Town of Lyons with a contract rate of \$2.86 per 1,000 gallons.

Longmont of Longmont's Water Supply and Drought Management Plan was updated in April 2022. The updated plan assesses impacts of a 1-in-100 year drought recurrence interval on Longmont's raw water supply. The drought response action plan includes mitigation measures that relies heavily on reductions in outdoor water use.

No Drought	<ul style="list-style-type: none"> <li>• No water waste</li> <li>• Voluntary time of day watering restrictions from 10:00 am and 6:00 pm</li> <li>• Adding soil amendments/mulch</li> <li>• Behavior education (check for leaks, wash only full loads)</li> <li>• For municipal and school use:</li> </ul>
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	<ul style="list-style-type: none"> <li>○ Voluntary conservation and use of BMPs by Parks and Rec</li> <li>○ Golf course BMPs</li> <li>○ School district BMPs</li> <li>○ City owned facilities set benchmarks</li> <li>○ Customer education for BMPs</li> </ul>
Level 1 Drought	<p>Voluntary by Service Customers</p> <ul style="list-style-type: none"> <li>• Education to achieve 10% savings</li> <li>• Voluntary conservation for irrigation users on wells, raw water</li> <li>• Voluntary or Mandatory 10% conservation from irrigation taps</li> <li>• Community gardens/private gardens voluntary 10% conservation</li> </ul> <p>Mandatory municipal and school</p> <ul style="list-style-type: none"> <li>• Parks and Rec 10% savings</li> <li>• Golf courses 10% savings</li> <li>• Schools 10% savings</li> <li>• Saint Vrain Creek Corridor lease reduced or eliminated</li> <li>• Municipal water use 10% savings</li> <li>• Time and day of week irrigation restrictions will be evaluated</li> </ul> <p>Raw Water Leases/Bulk Sales</p> <ul style="list-style-type: none"> <li>• Surplus water rental reduced or eliminated</li> <li>• Historic lease back of raw water reduced or eliminated</li> <li>• No water leases guaranteed</li> <li>• Bulk water permits reviewed and irrigation curtailed</li> </ul>
Level 2 Drought	<p>Mandatory by Service Customers</p> <ul style="list-style-type: none"> <li>• Require all customers to implement 10% reduction in water use</li> <li>• Implement a formal watering program</li> <li>• No potable water replacement of raw water</li> <li>• Irrigation taps conserve 20%</li> </ul> <p>Mandatory Raw Water for Municipal and School</p> <ul style="list-style-type: none"> <li>• Parks and Recreation reduce between 20-90%. Identified critical sports fields, trees, and non-turf landscapes will be operate with 10% deficit.</li> <li>• Golf courses reduce between 20-90%</li> <li>• Saint Vrain Creek Corridor leases eliminated</li> <li>• All other municipal water use reduce to maximum extent possible</li> </ul> <p>Raw Water Leases and Bulk Water Sales</p> <ul style="list-style-type: none"> <li>• Surplus water sales eliminated</li> <li>• Lease back of raw water reduced or eliminated</li> <li>• No water leases guaranteed</li> </ul>
Level 3	<p>Mandatory by Service Customers</p> <ul style="list-style-type: none"> <li>• Outdoor watering restrictions will be set based on severity of drought</li> <li>• Water rates include drought pricing for outdoor water use</li> <li>• Moratorium on new taps</li> <li>• Irrigation taps conserve 90% minimum or eliminated</li> </ul> <p>Mandatory in Municipal and School</p> <ul style="list-style-type: none"> <li>• Parks and Recreation minimal watering of critical sports fields and parks. Maintain economic investments in non-turf landscaping, trees, and municipal facilities.</li> <li>• Golf course watering restricted to greens and tees.</li> <li>• School District irrigation water lease eliminated</li> <li>• Saint Vrain Creek Corridor water lease eliminated</li> </ul>

	<ul style="list-style-type: none"> <li>• All other municipal water use reduce to maximum extent possible</li> </ul> <p>Raw Water and Bulk Water Sales</p> <ul style="list-style-type: none"> <li>• Surplus water rental eliminated</li> <li>• Lease back of raw water eliminated</li> <li>• Bulk water permits not permitted</li> </ul>
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## St. Vrain and Left Hand Water Conservancy District

St Vrain and Left Hand Water Conservancy District, pursuant to a May 2006 Intergovernmental Agreement with the City of Longmont, rents the city's annual surplus of Colorado-Big Thompson (C-BT) water to users in the area

The District has a five point water action plan includes strategies relevant to this policy report including the following:

**Conservation:** A majority of urban water is used for outdoor irrigation. Partnerships with local water providers to increase outdoor water efficiency and conservation is effective for long term water sustainability and offer greater opportunities for environmental and recreational water uses.

**Encourage mutually beneficial water sharing between cities and farms.** In order for cities to meet growth demands, the majority of the water will likely have to come from irrigated agriculture. To help alleviate the pressure on farmers to sell their water, new policy options have been created allow for the temporary leasing of water supplies. Temporary water sharing agreements, also referred to as Alternative Transfer Methods, provide another option to farmers who are seeking alternate sources of revenue while maintain ownership of the water rights.

**In-stream flows for environment and recreation.** Mined-out gravel pits can be lined and utilized to store streamflow during times of surplus. Water can then be released later in the year to supplement baseflows for fish, recreation, and out-of-priority depletions. These "creek improvement facilities" can be strung together throughout the valley to better manage water supplies for multiple benefits.

**Environmental restoration.** The recently completed Stream Management Plan identified several reaches of St. Vrain and Left Hand Creeks in need of restoration to stabilize the creek channel and reconnect the floodplain. Multi-entity strategic partnerships and strong fundraising efforts will be necessary to achieve impact at-scale.



# APPENDIX B | LANDSCAPE CODE

## DEFINITIONS

**Landscape:** Any combination of living plants, such as trees, shrubs, vines, ground covers, flowers, or grass; natural features such as land and water forms, rock, stone, bark chips, or shavings; and structural features, including but not limited to fountains, reflecting pools, outdoor artwork, screen walls, fences, or benches.

**Landscape Area:** All the planting areas, turf areas, and water features in a landscape design plan. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or nonpermeable hardscapes, and other non-irrigated areas designated for nondevelopment, such as open spaces and existing native vegetation.

**Curbside Landscape.** The landscape portion of a street or drive lane right-of-way located between the back of curb and face of sidewalk or walk where street trees or other plant material is installed.

**Groundcover.** Plants, other than turf grass, that are low growing and spreading in character and obtain heights of 18 inches or less.

**Hardscape.** Any durable material or feature (pervious and nonpermeable) installed in or around a landscaped area, such as pavements or walls.

**Irrigated Area.** The total landscape area that receives water from an irrigation system.

**Mulch.** Non-living plant materials that are applied to plant beds and are at the base of trees and shrubs. Mulches include organic materials such as wood chips and shredded bark, and inert organic materials such as decomposed granite, cobble, and gravel.

**Non-Living Landscape Material.** Non-landscaped organic and inorganic materials such as rock, cobbles, wood chips and shredded bark, artificial turf, natural and man-made pavers, crusher fines, and crushed granite.

**Native Seed, Dryland Grasses, Restorative Grasses.** Native seed, dryland grasses, or restorative grasses shall mean grass species used in lieu of cold season turf grasses, identified as medium to low water use in the plant list reference materials, and used for the purposes of water wise landscapes or the re-vegetation of disturbed natural grass areas and that are not maintained in a uniform, consistent, and evenly cut condition.

**Turf, Lawn, or Sod.** Turf, lawn, or sod shall mean any area of grass where cool-season grasses are cultivated and maintained in a uniform, consistent, and evenly cut condition.

**Xeric Plants.** Drought tolerant, drought resistant, and native plant species that are identified as low to very low water use in the plant list reference materials.

**Xeriscape.** A landscaping method typically used in arid or semi-arid climates that considers individual site conditions, soils and the use of specific water conserving plants, mulch and efficient irrigation to maximize water usage.

# APPENDIX C | Water Efficient Landscape Policy Assessment

This table compares Longmont's landscape policy elements to thematic elements of water efficient landscape best practices. This format was used to integrate all the different policies that are contained in the development regulations, the Design and Construction Standards, the Development Manual, the Approved Materials List Parks & Open Space, and the plumbing code. This assessment was used to identify the presence and substance of what policy elements Longmont of Longmont currently has in its policies. The quality of these elements is evaluated in the Recommendations.

Landscape Best Practice	City of Longmont Policy	Policy Document
<b>Water Waste Ordinance</b>	Run off from any gutter or impervious surface from HOA/Commercial Not pipe leakage.	Development Regulations
<b>Outdoor Watering Restrictions</b>	Voluntary unless Stage 1 or 2 drought. Code states "for any exterior watering applications"	Development Regulations
<b>Purpose Statement Includes Water Conservation</b>	Yes. Conserve water, energy, and other limited resources.	
<b>Landscape Plan Required</b>	Longmont will consider variances in arterial right of ways to reduce water consumption including reducing turf areas, increasing shrub bed size, subsurface irrigation	Design & Construction Standards
	Section 600 applicable to arterial right of way, primary greenway, detention ponds, and areas owned and/or maintained by City Parks and Forestry Services, Ken Pratt Boulevard exempt.	Design & Construction Standards Section 600
	Development Manual outlines which developments must submit a landscape plan and when. Applies to all development types (subdivision, conditional use, PUD, rezone, site plan, temporary use, and administrative modification)	Development Regulations Development Manual
<b>Plan Submittal Requirements</b>		
<i>Plant Groupings</i>	In preliminary landscape plan <ul style="list-style-type: none"> <li>Deciduous</li> <li>Ornamental or Coniferous Trees</li> <li>Shrub Beds</li> <li>Flower Beds</li> <li>Water Features</li> <li>Live Ground Cover</li> <li>Mulch Areas</li> </ul>	Design and Construction Standards Section 600
<i>Plant List</i>	In preliminary landscape plan	Design and Construction Standards Section 600
<i>Plant Layout/Design</i>	Final landscape plan <ul style="list-style-type: none"> <li>2/3 mature size</li> <li>Quantity by type</li> <li>Separate plan by regulated area</li> </ul>	Design and Construction Standards Section 600
<i>Irrigation Plan</i>		
<i>Certified Landscape Architect</i>	No	
<b>Landscape Manual</b>	No	
<b>Applicability</b>	All new development and redevelopment <ul style="list-style-type: none"> <li>Landscape buffers;</li> <li>Pocket parks, plazas and courtyards;</li> <li>Parking areas (islands/medians/perimeters);</li> <li>Greenways;</li> </ul>	Development Regulations

	<ul style="list-style-type: none"> <li>○ Streetscape;</li> <li>○ Stormwater areas; and</li> <li>○ Residential, mixed-use, and nonresidential lots</li> </ul>	
<b>Xeric Principles</b>	Yes. "Xeriscape shall be applied in <b>all</b> areas"	Development Regulations
	Required within al City owned areas and in privately owned common areas <ul style="list-style-type: none"> <li>○ Plant zoning, recognition of microclimates</li> <li>○ Limiting turf areas and using water thrifty turf types</li> <li>○ Good soil improvements</li> <li>○ Efficient irrigation (zoning to separate turf areas from shrubs, minimize overspray, water saving technology)</li> <li>○ Use mulches and avoid impermeable weed barriers</li> <li>○ Use of water thrifty plants (natives encouraged)</li> <li>○ Appropriate maintenance</li> </ul>	Development Regulations
<b>Plant Materials</b>		
<b><i>Plant Standards</i></b>	All materials shall consist of healthy specimens compatible with local climate, soil characteristics, drainage, and water supply.	
<b><i>Plant List w/Water Use</i></b>	Yes. In Approved Materials List Parks & Open Space February 2021. Includes trees and grass seed mixes.	Approved Materials List Parks & Open Space February 2021
<b><i>Low to Very Low Water Demand Plant Requirements</i></b>	Yes, for groundcover "irrigated lower water consuming grass or other vegetation shall be the primary groundcover"	Development Regulations
<b><i>Prohibited Plants/Invasives</i></b>	Cotton bearing Cottonwood, Lombardy Poplar, Box Elder, Siberian Elm, Russian Olive.	
	For seeded areas, drought tolerant grasses are encouraged in all areas and required in city owned areas. In city areas, the seed mix cannot contain more than 10% bluegrass	Design and Construction Standards Section 600
	For trees, diversity of no more than 15% of any one tree species or 10% of any species considered marginally hardy. Up to 20% of trees may be fast growing.	
<b><i>Native Requirements</i></b>	Native grass is recommended	Design and Construction Standards Section 600
	Seed mix approved by City staff	
	Native grass allowed, but not required in greenway between concrete path and ditch	
<b><i>Turf Limitations or Requirements</i></b>	Turf grass seed mix required in primary greenways between path and property line and detention pond side slopes.	
	Turf required for landscaped areas on arterial ROW	
	Turf required for detention ponds in 5-year floodplain.	
	For city owned detention ponds less than ¼ acre, entire area sodded	
	For arterial rights-of-way, sod must be grown within 60 miles of the Longmont city limits and be certified as the sod grower as drought tolerant.	Approved Materials List Parks & Open Space February 2021
	Pre-approved Dryland Mixes (for temporary or permanent unmowed and/or non- permanent areas):	Approved Materials List Parks & Open Space February 2021
	<ul style="list-style-type: none"> <li>○ Waterway Adjacent Native Areas of Primary Greenways (Canada wildrye, Thickspike wheatgrass , Slender wheatgrass, Western wheatgrass, Little bluestem , Switchgrass , Alkali sacaton, Sand dropseed, Side oats grama, Blue grama, Buffalograss)</li> <li>○ Residential Adjacent Native Areas of Primary Greenways (Blue grama, Buffalograss, Inland saltgrass, Slender wheatgrass, Sandberg bluegrass, Alkaligrass)</li> <li>○ Rights of way in areas of future road expansion: Inland saltgrass, Blue Grama Alkaligrass, Sandberg bluegrass</li> </ul>	
<b><i>Existing Vegetation Preservation</i></b>		
<b><i>Tree Preservation</i></b>	Yes, a tree preservation plan is required with ability for some trees to satisfy landscape requirements	Development Regulations
<b><i>Tree Canopy</i></b>	8 feet between trees and any adjacent vertical surface Tree Spacing for Mature Canopy <ul style="list-style-type: none"> <li>○ Large deciduous trees 40 feet</li> <li>○ Mid sized trees 25 feet</li> <li>○ Small ornamental trees 15 feet</li> <li>○ Coniferous trees 10 (columnar) 25 feet (spreading)</li> </ul>	
<b><i>Ground plane</i></b>	75% irrigated lower water consuming grass or other vegetation shall be the primary groundcover 10% mulch or rock <ul style="list-style-type: none"> <li>• 25% allowed in residential zones</li> <li>• 50% nonresidential and mixed use where hardscaping a recreation purpose</li> </ul> Turf grasses acceptable when 90% coverage	Development Regulations

	<b>Groundcovers</b>	Native grasses acceptable when 70% coverage Groundcover other than grass may be planted in required landscape if they are reasonably able to provide complete coverage within two growing seasons and they provide cover year round. Vines shall not be used adjacent to pedestrian areas. River rock, cobble, boulders, patterned concrete, mulch and pole peelings shall be limited to shrub beds and other small areas that shall not exceed 25% of the required landscape areas. Bark mulches shall not be used in areas unshielded from high wind. Loose gravel shall not be used in areas abutting public streets or sidewalks, but cobble greater than 3" minimum may.	Design and Construction Standards Section 600
<b>Design Standards</b>	<b>General</b>	Yes, by development type and plant type Landscape buffers, pocket parks, <b>arterial ROW, greenways</b> , parking area perimeter, stormwater areas minimum 50% deciduous and 25% coniferous trees All landscaped areas minimum <b>75% irrigated lower water consuming ground cover</b>	Development Regulations Development Regulations
	<b>Trees</b>	For trees planted on City owned areas, trees must be planted in the center of the tree lawn when the planting area is less than 12 feet. No trees are to be planted in turf areas less than 8 feet without approval. Large canopy trees are encouraged to be placed in the tree lawn along streets. Replacement 3 ornamental trees = 1 large canopy tree Fruit bearing/thorny trees are not allowed within 5 feet of concrete paths or streets Coniferous trees should not shade road intersections, road curves, concrete paths, narrow areas or overgrow walkways or streets.	Design and Construction Standards Section 600
	<b>Shrubs</b>	Mixture of evergreen and deciduous species. Between concrete path and property line, place shrubs 4 feet height to provide buffering between the property line and path. Shrubs less 4 feet between nearest road and parking areas/structures. In primary greenway: <ul style="list-style-type: none"> <li>shrubs selected for wildlife and habitat value</li> <li>in low flow channels selected for water tolerance, flood frequency, and velocity.</li> </ul>	Design and Construction Standards Section 600
	<b>Artificial Plant Material</b>	Prohibited	Design and Construction Standards Section 600
	<b>Pocket Parks</b>	75% lower water irrigated grass and 25% other 1 tree and 5 shrubs/2,000 sq feet of landscaped area 50% of pocket park can be stormwater area, of which 90% passive or active recreation	Development Regulations
	<b>Residential Development</b>	Requires front yards to be landscaped 60% street front facing 75% corner lot No specific mention of plant composition or materials	Development Regulations
	<b>Mixed Use/Non Residential</b>	Requirement for minimum of 3 features including water feature Design sensitive to site context	Development Regulations
	<b>Streetscape</b>	1 tree/40 feet planted in tree lawn or tree grate Tree lawn required to be planted with irrigated lower water consuming grass or other material	Development Regulations
	<b>Greenways</b>	Greenways required adjacent to waterways, irrigation ditches, and other planned areas 100' width adjacent to waterway/50' no waterway 1 tree and 5 shrubs/1,500 sq feet of landscaped area 1 tree and 5 shrubs/50 linear feet 75% deciduous trees/25% coniferous Existing vegetation credit Site sensitivity to natural resources Irrigated low water grass primary groundcover	Development Regulations
	<b>Parking Islands</b>	1 deciduous tree and 6 shrubs/single parking row 2 deciduous trees and 12 shrubs/double parking row Mulch groundcover	Development Regulations
	<b>Parking Area</b>	1 tree and 5 shrubs/30 linear feet of street/greenway	Development Regulations
	<b>Landscaped Medians</b>	1 deciduous tree and 5 shrubs/30 linear feet Mulch or irrigated low water consuming grass as groundcover	Development Regulations
	<b>Medians without walkway</b>	1 deciduous tree and 5 shrubs/30 linear feet Mulch or irrigated grass or other material	Development Regulations

<b>Right of Way</b>	1 tree/40 linear feet in tree lawn or tree grate Irrigated low water consuming grass or other plants as groundcover in tree lawn Within City ROW, the following are prohibited: <ul style="list-style-type: none"> <li>o Invasives above</li> <li>o Fruit and thorn bearing trees within 5 feet of concrete path measured from edge of mature canopy</li> <li>o Willow (all varieties)</li> <li>o Tree of Heaven</li> <li>o Cottonwood (all varieties)</li> <li>o Silver maple</li> </ul>	Development Regulations
<b>Arterial Streets</b>	1 tree and 5 shrubs/1000 sq feet of landscaped area 1 tree/40 linear feet of ROW 75% deciduous trees/25% coniferous	Development Regulations
<b>Stormwater Detention</b>	1 tree and 5 shrubs/50 feet of perimeter 50% deciduous trees/25% coniferous Low water consuming grass or other vegetation as groundcover In 5-year floodplain, shall be sod Native grasses and other plants may be used if weed free and irrigated until established	Development Regulations
<b>Soil Amendments</b>		
<b>Soil Test</b>	Yes, but not explicit	Design and Construction Standards Section 600
<b>Soil Amendments</b>	In all landscaped areas <ul style="list-style-type: none"> <li>• 3 cubic yards/ 1,000 sq feet of soil</li> <li>• Till to 6" depth</li> <li>• Topsoil friable loam, free of stones over 2", clods, sticks, roots</li> <li>• Topsoil acidity in range of ph 5.5 and 8.5</li> <li>• Compost acidity in range of ph 5.5 to 7.0</li> </ul>	Development Regulations Design and Construction Standards Section 600
<b>Mulch Requirement</b>	In City owned areas, 6" minimum depth of topsoil In shrub and planting beds	Design and Construction Standards Section 600 Development Regulations
<b>Irrigation System Installation</b>	Applies to all City capital design, construction projects that reference Section 600, common areas	Design and Construction Standards Section 600
<b>Certified Irrigation Installer Inspections</b>	For City owned property, City Inspector For common open space areas, irrigation design professional and certification statement	Design and Construction Standards Section 600
<b>Irrigation Efficiency Test</b>		
<b>Irrigation System Design</b>		
<b>Automatic irrigation system</b>	Required for all arterial ROW, primary greenway, other private required landscapes	Design and Construction Standards Section 600
<b>Smart Controllers</b>	For City owned areas and common areas irrigation controller	Design and Construction Standards Section 600 Approved Materials List Parks & Open Space February 2021
<b>Rain sensors</b>	Required for all lawn irrigation systems (all development)	Plumbing Code
<b>Pressure Control Standards</b>	Yes.	
<b>Irrigation shut off valves</b>	Remote control valves	Design and Construction Standards Section 600
<b>Master Valves and flow sensors</b>	UNK	
<b>Sprinkler and Emitter Standards</b>		
<b>Efficient emitters</b>	UNK	
<b>Overhead spray irrigation only where sufficient area width</b>	See planting strip standards below	
<b>Pop up spray heads consistent with plant material – min 6"</b>	No	
<b>Pop up spray heads with internal check valves, internal pressure regulation, and matched precipitation rate spray and rotary nozzle</b>	Yes, check valves in head for all areas	Design and Construction Standards Section 600

<b><i>Rotors with internal check valves and pressure regulation</i></b>	Yes check valves	Design and Construction Standards Section 600
<b><i>Prohibition on overhead sprinklers on irregular shape beds/turf</i></b>	No, but strip width requirements and overspray requirements	
<b><i>Head to head coverage</i></b>	For City owned areas with head to head and matched precipitation rates For common areas, head to head coverage and matched precipitation rates. Heads shall not overspray Drip irrigation can be used for trees and shrubs located in shrub beds and in all native seeded areas Prohibits trees in irrigated turf areas from using drip	Design and Construction Standards Section 600
<b><i>Drip system/subsurface for all trees, shrubs, perennials, and annuals</i></b>		Design and Construction Standards Section 600
<b><i>Drip/bubblers with internal check valves at each drip emitter</i></b>	No	
<b><i>Irrigation Hydrozones</i></b>	For City owned areas and encouraged for all areas, planting zones: (not by water use) <ul style="list-style-type: none"> <li>• shrubs and perennial beds</li> <li>• turf</li> <li>• top of slopes</li> <li>• different exposures</li> </ul>	Design and Construction Standards Section 600
<b>Temporary Irrigation</b>	For native grasses, temporary irrigation for establishment requires a variance from Planning or Parks For dry land seeded areas temporary irrigation system for establishment purposes	Design and Construction Standards Section 600
<b>Water Budget or Allowance</b>	No	
<b>Vegetated Slopes</b>	4:1 irrigated turf 3:1 native grass (unmowed or mowed during establishment) and shrub beds	Development Regulations
<b>Minimum Planting Strip Widths</b>		
<b><i>Tree lawn</i></b>	Minimum 8' for deciduous canopy trees Less than 5 feet, trees may require root barrier to prevent curb heaving	Design and Construction Standards Section 600
<b><i>General ROW</i></b>	Shrub areas 4 feet minimum – 8 feet preferred. Turf areas 12 feet	Design and Construction Standards Section 600
<b><i>Local and Collector Streets</i></b>	8 feet	Design and Construction Standards Section 200
<b><i>Arterial streets</i></b>	12 feet	Design and Construction Standards Section 200
<b>Alternative Water Sources</b>		
<b><i>Irrigation &gt; 1 acre subject to special review and alternative water source (raw water, recycled)</i></b>		
<b><i>Raw water</i></b>	Raw water shall be used for irrigation when available (greenways, arterial ROW, public areas, and detention ponds) Requires a potable back up Bubbler permitted, but not required	Design and Construction Standards Section 600
<b><i>Recycled water</i></b>		
<b>Low Impact Development</b>	Yes, "Longmont encourages the use of low impact development applications" Swales or other means must be used to prevent water from draining from ROW areas into private lots	Development Regulations
<b>Irrigation Specific Taps/Meters</b>	For each lot, parcel, outlot For City owned areas and common areas, separate irrigation tap	Design and Construction Standards Section 600
<b>Water Features requires water recirculation on either potable or recycled water source</b>		
<b>Maintenance &amp; Installation</b>	Irrigation of xeriscape areas shall comply with: <ul style="list-style-type: none"> <li>• Healthy condition without regular irrigation after establishment</li> <li>• Automated subsurface irrigation for establishment period or as needed to maintain plants</li> <li>• Ongoing maintenance is of xeriscape areas demonstrated by applicant</li> </ul>	Development Regulations
	Drought tolerate grasses shall be maintained free of weeds and debris and not a fire hazard	

# APPENDIX D | Development Regulations Summary

Development Code Element	City of Longmont		Comments and Potential Code Improvements
	Policy Citation	Policy Summary	
Trees And Plants	13.24.010	<p>Purpose.</p> <p>A.Longmont recognizes substantial economic, environmental, and aesthetic importance of trees and vegetation within the community. It is the policy of Longmont to protect and enhance the community's urban forest. The purpose of this chapter is to promote and protect the public safety and general welfare by providing regulations and establishing policies regarding the planting, maintaining, and removal of trees, shrubs, and other plants through recommended horticultural and arboricultural practices.</p>	
	13.24.100	<p>Nuisance trees.</p> <p>A nuisance tree is a tree with undesirable characteristics and declared to be a public nuisance by the director of public works and natural resources or a designee.</p> <p>A.The director of public works and natural resources or a designee may declare certain tree species unlawful to be planted or allowed to grow on city property within Longmont and be subject to removal.</p> <p>B.Noxious trees that threaten natural resources, as provided by the Colorado Noxious Weed Act, C.R.S. § 35-5.5-101 et seq., shall be controlled as stated in that law.</p> <p>C.Generally, existing mature trees greater than 24 inches in diameter shall be permitted to remain, but Longmont may remove a tree of any size from city property</p> <p>D.Certain trees mentioned in subsections A and B of this section shall be identified in the forestry services standards and specifications.</p>	
	13.24.020	<p>Responsibility for trees and plants.</p> <p>The care and maintenance of trees and other plant material is the responsibility of the owner of the property on which those plants are located.</p> <p>A.Public trees and plants. Longmont is responsible for the care, maintenance, and removal of trees and plants located on city property.</p> <p>B.Private trees and plants. Owners of private property are responsible for trees and plants located on their properties.</p> <p>C.Alley tree and plants. The adjacent property owner is responsible for the care, maintenance, and removal of trees and plants up to the center of the alley.</p> <p>D.Written agreement. A written agreement, such as a landscaping plan or other document approved by Longmont, may establish responsibility for trees and plants located in public rights-of-way as the responsibility of the adjacent property owner, such as a homeowners' association, business, or private individual.</p>	
Water Service	14.04.450 A	Nonemergency watering restrictions.	Establishes authority for restrictions
	14.04.450 B	Emergency watering restrictions.	
	14.04.450 C	Special assessment for violation. When a violation occurs, 1) first violation a written notice, 2) assessment for subsequent violations \$100-1,000	
Water Waste Prohibition	14.04.490 A	Water is prohibited from running into any gutter or other impervious surface by an HOA or commercial use required to maintain irrigation systems along city streets. Does not include occasional over spray.	
	14.04.490 B	Special assessment for violation. When a violation occurs a written warning is issued with 10 days to comply. Subsequent violations \$20 - \$120	
Plumbing Fixture Standards	14.04.500 A	Water closets by flushtanks. Not to exceed 1.6 gall/flush with 20-80 psig	These standards are tied to the US Federal plumbing standards and not consistent with the more efficient
	14.04.500 B	Water closets and urinals by flushometers. Not to exceed 1.6 gall/flush with 20-80 psig. Urinals to not exceed 1 fall/flush with 20-80 psig.	



	14.04.500 C	Showerheads. Not to exceed 2.5 gall/minute with 20-80 psig		Colorado Water Wise requirements per state statute Title 6 - Consumer and Commercial Affairs Article 7.5 - Water and Energy Efficiency Standards
	14.04.500 D	Sinks 1a. self closing faucets not to exceed 0.5 gpm 1b. metering faucets not to exceed 0.5 gall/cycle 2. residential faucets not to exceed 2.5 gpm		
	14.04.510	Pressure reducing valve with a strainer shall be installed at the owner/builders expense and conform to ASSE (2) 1003		
Raw Water Policy/Dedication	14.05.010 B	To encourage the retention of historical water rights on the agricultural properties in the St. Vrain Basin by requiring the transfer of such water rights to City ownership as a condition of annexation or requiring a fee in lieu		
	14.05.010 C	Longmont will require the transfer to city ownership of not less than 3 AF per acre of land		
	14.05.010 D	When water rights are insufficient to meet the 3 AF/acre requirement, non-historical rights and/or payment of cash in lieu are acceptable	The water dedication is based on a minimum volume of water. This can be a disincentive for conservation. Great for water portfolio.	
	14.05.100 B	Colorado Big Thompson Water Allowance Calculation. An acre foot allowance per unit of Colorado Big Thompson water is 0.76 acre feet per unit.	Northern Water has adjusted their expectation for the CB-T reliability down.	
Annexation Raw Water Requirement	14.05.030 A	For all annexations, the water board shall review the water right proposed for transfer	The water dedication for annexation is, like with the raw water dedication, based on a minimum volume of water. This can be a disincentive for conservation.	
	14.05.030 B	For all other development, water resource staff shall review the adequacy and water rights		
	14.05.030 C	All documentation shall be submitted a minimum of 10 days prior to determination meeting		
	14.05.040 A	As a condition of annexation of land to Longmont, there will be transferred to Longmont ownership of all historical water rights associated with the land.		
	14.05.040 A1	As a condition of development activity (other than annexation) on lands annexed to Longmont, all historical water rights not previously dedicated at the time of annexation shall be transferred to Longmont. Not less than 1 AF/acre shall be supplied by storage water rights. Remaining may be direct flow or storage.		
	14.05.040 D	Longmont reserves the right to require the transfer of additional water, in excess of the 3 AF/acre, for users with projected demand exceeding the 3 AF/acre.		
	14.05.050 A-B	Annexation of development served by City taps receives a credit based on the dedication at time of original tap approval.		
	14.05.080 A	Continued use of historical water rights. Should the owners of the land annexed to Longmont desire to continue to its historical agricultural use, they city may lease a portion of the St. Vrain Creek Basin water rights proportional to the area of the land which will continue to be used for agricultural purposes for agricultural use only and for the year paid only.		
	14.05.110 Ba	For each 3/4 “ or 1’ tap, in addition to the payment of the regular outside tap fees, there shall be transferred to Longmont an equivalent of 2 acre feet. For taps 1” or larger, 3 acre feet shall be transferred. (or in lieu of fee)		
Watering Restrictions	14.04.450 A	Nonemergency watering restrictions. May implement a watering schedule by the Director of Public Works for irrigation. Allows for an 21-35 day exemption to establish new seed/landscapes. Does not apply to domestic or business activity.		
	14.04.405 B	Emergency watering restrictions. City Manager may declare a water emergency and establish further restrictions or prohibitions <b>for any exterior watering application.</b>	Unclear if the language in this policy means that watering restrictions can ONLY be implemented outdoors and Longmont does not have any additional authority for drought related response.	
Redevelopment Credits for Water Supply	14.07.010	To foster redevelopment in areas which Longmont Council has identified as redevelopment or revitalization areas, to recognize when existing water and sewer infrastructure is sufficient to support redevelopment, and acknowledge that fees or improvements paid previously to service and original development may not need to be repaid.		



		<p>setback shall be <b>measured from the outer edge of the riparian vegetation, including the outer edge of the canopy edge of riparian trees and shrubs, or from the ordinary high-water mark when riparian vegetation is not present.</b></p> <p>For all other stream and creek corridors and riparian areas, as defined in chapter 15.10, not listed below, the setback shall be <b>100 feet from the outer edge of riparian vegetation, including the outer edge of the canopy of riparian trees and shrubs, or the ordinary high-water mark when riparian vegetation is not present.</b></p>	<p>high water mark for greenways landscaping. Concern would be the overlap would result in degradation to the riparian area and instead natural areas should be incorporated into design.</p>
		2.Wetlands. All features included in subsection F.3 of this section shall be set back at least 100 feet from the delineated edge of wetlands.	
		4.Vegetation preservation and enhancement within setback. <b>Existing desirable and significant trees and other native vegetation shall be preserved within the setback.</b> Recommendations for additional plantings to enhance wildlife and plant habitat within the setback shall be included in the species and habitat conservation plan under section 15.05.030.H.	
		<p>b.Increased setbacks. The planning and development services director, in consultation with the public works and natural resources department, may increase the setbacks to protect stream and creek corridors, riparian areas, or wetlands, based on site specific conditions if any of the following conditions are present on a site:</p> <p>i.An established tiered vegetative system with native ground cover, shrub areas or mature canopy trees creating a diverse habitat;</p> <p>ii.Adjacency or proximity to like areas or other associated habitat or other wildlife resources;</p> <p>iii.Oxbows or meanders in the adjacent waterway that would create diverse aquatic habitat; or</p> <p>iv.Presence of a known state or city species of special concern, including, but not limited to, threatened and endangered species and species that increase Longmont's biodiversity that would enhance the wildlife values of Longmont.</p>	
		G.Prohibited activities. No person shall engage in any activity that shall disturb, remove, fill, drain, dredge, clear, destroy, or alter any area, including vegetation and wildlife habitat, within stream and creek corridors, riparian areas, wetlands, and their setbacks, except as may be expressly allowed in this development code, or by federal or state laws or regulations, or by other applicable city laws or regulations.	<p>This may cover the Sackett decision and nonjurisdictional wetlands</p>
		<p>K.Design and aesthetics. Projects adjacent to natural areas, including, but not limited to, the waterbodies listed in section 15.05.020.F.1, shall be designed to complement the visual context of the natural area. Techniques such as architectural design, site design, <b>the use of native landscaping</b>, and choice of colors and building materials shall be used in such manner that scenic views across or through the site are protected, and manmade facilities are screened from off-site observers and blend with the natural visual character of the area.</p>	<p>Enhance river corridor and greenway design to enhance native landscape functionality</p>
Landscape and common area standards	15.05.040 A	<p>Purpose</p> <p>9.Conserve water, energy, and other limited resources.</p>	
	15.05.040 B	<p>Applicability.</p> <p>1.New development or redevelopment. Unless otherwise exempted in this development code, the standards in this section shall apply to all development.</p> <p>2.Nonconforming landscaping. Nonconforming landscaping shall be subject to section 15.08.100.</p>	
	15.05.040 C	<p>Landscaping requirements.1.Landscape areas.a.The following areas are required to be landscaped according to the standards in this section:</p> <p>i.Landscape buffers;</p> <p>ii.Pocket parks, plazas and courtyards;</p> <p>iii.Parking areas (islands/medians/perimeters);</p> <p>iv.Greenways;</p> <p>v.Streetscape;</p> <p>vi.Stormwater areas; and</p> <p>vii.Residential, mixed-use and nonresidential lots not covered by structures, parking areas, drives and other hardscape areas.</p>	
		<p>b.The following existing natural areas shall be preserved, reserved, or dedicated to the maximum extent practicable:</p> <p>i.Floodplains;</p> <p>ii.Lakes, rivers, stream corridors, wetlands, and riparian areas, including setbacks from river/stream corridors, riparian areas, and wetlands required under section 15.05.020.F;</p> <p>iii.Important wildlife habitat and migration corridors as identified in a species or habitat conservation plan submitted as part of an approved application;</p> <p>iv.Steep slope areas or geologic hazard areas such as expansive soils, rockfalls, faulting;</p> <p>v.Significant stands of mature desirable trees and existing vegetation; and</p>	<p>This is a good standard. Opportunity to expand to more natural landscapes for broader inclusion in Longmont.</p>

	vi. Significant cultural and historical resources as identified in a cultural resource survey completed by a qualified individual consistent with state cultural resource survey standards, and submitted as part of an approved application.	
	2. Landscaping standards. a. Landscaping types and specifications. iii. In landscape buffers, pocket parks, arterial rights-of-way, greenways, parking area perimeters, and stormwater areas, a minimum of 50 percent of the required trees shall be deciduous canopy species, and a minimum of 25 percent of the required trees shall be coniferous. Conifers shall not be planted where they shade public street and sidewalk intersections during the winter months.	landscape buffers, pocket parks, arterial rights-of-way, greenways, parking area perimeters, and stormwater areas 50% trees deciduous/25% coniferous
	2v. Landscaped areas shall be covered with live irrigated, lower water consuming ground cover over at least 75 percent of the landscaped area, except for areas where additional hardscape is allowed or as allowed for an alternative landscape plan.	Lower water consuming is vague in this context and should refer to hydrozone or water use as "VL and L" or to break out the percentage of the 75% allowed VL, L, and M. Assumption is 25% is allowed as H which is a large percentage of a total landscaped area depending upon lot size.
	2vi. No large mulch or bare soil areas are allowed, except that rock mulch areas may be allowed provided they do not exceed ten percent of the landscaped area.	10% mulch or rock is a small percentage and increases the total amount of required groundcover to 90%. In Alternative Hardscape Requirements options to increase include: 25% for residential zones and 50% in nonresidential/mixed use where hardscaping serves a recreational function. This is good. Rock mulch sizes can be identified to prevent pea gravel. Large rocks that are decorative and not mulch should be permitted.
	2.e. Ground covers i. Irrigated lower water consuming grass or other vegetation or material suitable for the areas shall be the primary ground cover in areas where hardscape is not proposed. ii. Mulches and other inorganic ground cover shall be installed in shrub/planting beds to reduce water evaporation. iii. Soil amendments at a ratio of three cubic yards of organic matter or compost per 1,000 square feet of soil shall be applied and tilled to a depth of at least six inches on all landscape areas not covered by approved impervious surfaces and permeable paving.	Define lower water consuming grass and other vegetation  3 cu yd/1,000 sq ft of soil 6" till depth May want to offer alternative amendment and mulch for native grasses.
	3. Installation and maintenance.  iii. Xeriscape practice shall be applied in <b>all areas</b> (e.g., ground cover and plants selection, irrigation design based on water needs) unless the director determines that application is not appropriate given the proposed use of the area.	These principles are emedded in the design manual but not explicit. The xeriscape principles here are focused on plant types, hydrozones but without specificity. For example, M and L be in same hydrozone
	b. Irrigation systems. ii. A separate irrigation tap and system shall be provided for each legal lot, outlot, or parcel iii. Irrigation of xeriscape areas shall comply with the following standards: (A) The plant material will be maintained in a healthy condition without regular irrigation after the plant establishment period. (B) Underground irrigation shall provide reliable automated irrigation for all plants during the establishment period and as otherwise needed to maintain plants in healthy condition. (C) The applicant has demonstrated the ability to provide ongoing maintenance of xeriscape areas necessary to keep plant material healthy with no or reduced irrigation.	Irrigation taps Irrigation system required  Temporary irrigation is often permitted for native grass once established
15.05.040 D	D. Tree preservation. 1. All trees within areas proposed to be disturbed by development on- and off-site and in the adjacent right-of-way shall be surveyed and have location, species, size, and condition or health noted in a tree preservation plan. 2. Existing desirable trees shall be preserved and protected from damage during site development. 3. Existing desirable trees shall be incorporated into the design in their existing location whenever possible. 4. Existing desirable trees may be used to satisfy the quantity (number or caliper) requirements of landscape standards.	
15.05.040 E	E. Developments adjacent to public lands. Developments adjacent to public parks, greenways, natural areas, and other public open space shall meet the following criteria:	

	I.Private lots shall not be immediately adjacent to public lands, as defined in chapter 13.20, and shall be separated by public streets or required buffers.	
15.05.040 F	F.Landscape buffers.1.General buffer standards. b.Buffers may contain a combination of landscaping, berms, walls and fences. d.Buffers in mixed-use districts may include hardscape as part of buffer design. f.Gateway buffers are required on lots fronting the following community gateway areas and may comprise no more than 50 percent stormwater areas	
15.05.040 G	G.Residential standards. The following standards shall apply to all residential development unless specifically exempted in this section 15.05.040: 1.Pocket parks. d. Design Standards v.Pocket parks shall not include:(A)Primary or secondary greenways; or(B)Right-of-way landscaped areas. f.Landscaping standards. i.Pocket parks shall contain irrigated, lower water-consuming grass over at least 75 percent of the landscaped area, excluding approved structures, non-landscaping amenities, and hardscape areas. ii.Landscaping shall be provided for pocket parks at a rate of one tree and five shrubs per 2,000 square feet of landscaped area. Non-landscaping amenities, such as swimming pools, recreation courts, and common area structures, shall not be counted as landscaped area in this calculation. g.Stormwater areas. Stormwater areas meeting the following standards may comprise up to 50 percent of a pocket park area: ii.A minimum of 90 percent of the stormwater area shall be used for passive and active recreation. 2.Minimum landscaping required. a.Any residential development subject to the standards of this section shall provide landscaping as indicated in table 15.05.040(3). [Landscaped area per street-facing yard - A minimum of 60 percent of the street-facing yard or 75 percent of the street facing yards for corner lots shall be landscaped]	Irrigated 75% lower water grass/25% other 1 tree and 5 shrubs/2,000 sq ft of landscaped area 50% park for stormwater and 90% of that passive or active recreation use
		Residential require front yards to be landscaped 60% front facing 75% corner lot Does not provide a standard for what type of landscaping treatment nor irrigation efficiency
15.05.040 H	H.Mixed-use and nonresidential standards.1.Plazas/courtyards. 1d.Design standards. Plazas/courtyards shall include at least three of the following amenity elements: iii.Art or water features; 2.Streetscape standards. Streetscapes in the public right-of-way shall be designed according to the following standards: b.Attached sidewalks shall be a minimum of ten feet wide. Detached sidewalks shall be a minimum of eight feet wide in all areas, except that a detached sidewalk adjacent to exclusively residential at-grade uses along local or collector streets shall be a minimum of five feet wide. c.Landscaping in the right-of-way shall be provided according to the following requirements: i.Trees in the right-of-way shall be spaced every 40 feet and, depending on the street type and adjacent uses, shall be planted in approved tree grates or in a tree lawn area. ii.Tree lawns, where applicable, shall be landscaped with irrigated lower water-consuming grass or other material suitable for the area.	Require water features to be recycling water
		Streetscape ROW 1 tree/40 feet planted in tree lawn or tree grate No LID integration Trees in the right-of-way 1 per 40 feet and, depending on planted in approved tree grates or in a tree lawn area.
		Tree lawns landscaped with irrigated lower water-consuming grass or other material suitable for the area. Watering requirements for trees and low water grass different
15.05.040 I	Greenways. 2.Design of greenways. The applicant is responsible for landscaping and designing the primary greenways within or adjacent to the applicant's property. a.Primary greenways. Primary greenways shall meet the following standards: i.Primary greenways shall be at least 50 feet wide on each side of the centerline of an irrigation ditch or waterway; ii.Primary greenways shall be at least 50 feet wide where no irrigation ditch or waterway is present; iii.Primary greenways shall be at least 100 feet wide on each side of the St. Vrain Creek as measured from the ordinary high-water mark; ix.Primary greenways shall be landscaped at a ratio of at least one tree and five shrubs for every 1,500 square feet of landscaped area (excluding the ditch or river channel and concrete paths), with at least one tree and five shrubs for every 50 linear feet of greenway. The following standards shall apply to the landscaped area: (A)75 percent of the trees shall be deciduous canopy and 25 percent of the trees shall be conifers. (B)Tree placement shall be sensitive to the greenway design, existing vegetation, and wildlife habitat, and shall provide screening and materials beneficial to wildlife where appropriate. (C)Existing desirable vegetation may be credited toward the landscaping requirements.	Greenways that are adjacent to waterbodies should enhance natural habitat and plant structures as it provides additional buffer and habitat  Primary greenway 50' Secondary greenway 20' <b>100'</b> on St Vrain Creek 1 tree and 5 shrubs/1,500 sq feet of landscaped area and 1 tree and 5 shrubs/50 linear feet 75% deciduous trees/25% conifer Existing vegetation <b>may be credit</b> Irrigated low water grass primary groundcover in primary Secondary can also use other approved vegetation as groundcover

	<p>x.Irrigated lower water-consuming grass shall be the primary ground cover except for shrub bed areas;</p> <p>xi.A greenway irrigation system shall be provided separate from the irrigation system on adjacent private or common property and rights-of-way; and</p> <p>3.Secondary greenways. Secondary greenways shall be designed and installed by the applicant and meet the following standards:</p> <p>b.Secondary greenways shall be at least 20 feet wide, with a minimum eight-foot-wide concrete path.</p> <p>e.The primary ground cover shall include irrigated, lower-water consuming grass or other approved vegetation.</p>	
15.05.040 J	<p>Parking area landscaping. All uncovered and non-structured parking areas except for those for detached dwelling units shall meet the following regulations:</p> <p>1. Perimeter landscaping requirements.</p> <p>a.The perimeter of a parking area shall be landscaped with at least one tree and five shrubs per 30 linear feet along a street or primary greenway right-of-way or abutting another property.</p> <p>c.Parking areas shall include a landscape buffer at least ten feet wide between parking lots on abutting properties, or for a parking area abutting another property or a shared driveway, unless a wider landscape buffer is required between different types of uses or different zoning districts according to subsection E of this section.</p>	1 tree and 5 shrubs/30 linear feet of street/greenway ROW
	<p>2.Landscape islands. Landscape islands shall be provided within parking areas and shall:</p> <p>a.Be located within and at the end of each parking row so that there are no more than ten consecutive parking spaces without a landscape island separating them;</p> <p>b.Be a minimum of nine feet wide, measured from face of curb, by the depth of the adjacent parking space;</p> <p>c.Contain mulch with at least six shrubs per single parking row or 12 shrubs per double parking row; and</p> <p>d.Contain at least one tree per single parking row and two trees per double parking row. All trees shall be deciduous canopy trees.</p>	<p>Are ornamental grasses permitted with shrubs? Unclear on groundcover</p> <p>9 feet wide 6 shrubs/single parking row or 12/double 1 deciduous tree/single parking row or 2/double No LID standards</p>
	<p>3.Landscape medians. Landscape medians with and without walkways shall be provided as follows:</p> <p>v.The landscaped area shall be a minimum of eight feet wide;</p> <p>vii.Landscape medians shall have at least one deciduous canopy tree and five shrubs for every 30 linear feet along the length of the median;</p> <p>viii.Landscape medians shall contain mulch or irrigated lower water consuming grass or other material suitable for the area; and</p>	<p>8 feet wide 1 deciduous tree and 5 shrubs/30 linear feet of median Mulch or irrigated low water grass as groundcover</p>
	<p>c.Medians without walkway. Landscape medians without a pedestrian walkway shall be ten feet wide and have at least one deciduous canopy tree and five shrubs for every 30 linear feet along the length of the median. Landscape medians shall contain mulch or irrigated grass and plantings with a mature height of six inches or more shall not be planted in the vehicle overhang area.</p>	<p>1 deciduous tree and 5 shrubs/30 linear feet of median Mulch or irrigated grass as groundcover Does not specify low water type grass</p>
	<p>K.Right-of-way landscaping.</p> <p>1.Local and collector streets.</p> <p>a.Detached sidewalks, as addressed in Longmont standards, shall be installed to allow for a landscaped eight-foot planting strip (tree lawn) between the back of curb and the edge of sidewalk, except where attached walks are required or allowed.</p> <p>b.Deciduous canopy trees shall be planted in the tree lawn, or in a tree grate as addressed in Longmont standards in attached walks, at a rate of one tree for every 40 linear feet of right-of-way.</p> <p>c.Live irrigated lower water-consuming grass or plants shall be the primary ground cover in tree lawns.</p>	<p>1 tree/40 linear feet of ROW Irrigated lower water grasses/plants groundcover in tree lawns</p>
	<p>2.Arterial streets. Arterial right-of-way landscaping shall comply with the following:</p> <p>a.The right-of-way shall be landscaped at a ratio of at least one tree and five shrubs for every 1,000 square feet of landscaped area (excluding concrete paths) with at least one tree for every 40 linear feet of right-of-way. Seventy-five percent of the trees shall be deciduous canopy species and 25 percent of the trees shall be coniferous species.</p>	<p>1 tree/5 shrubs per 1000 sq feet of landscaped area and 1 tree per 40 linear feet of ROW 75% trees deciduous 25% coniferous</p>
	<p>3.In the Longmont Downtown Development Authority (LDDA) boundary. Streets, streetscape, and alleys located in Longmont downtown development authority boundaries shall be constructed consistent with the downtown master plan for development and existing streetscape designs within the LDDA boundaries.</p>	
15.05.040 L	<p>Stormwater facilities.</p> <p>1.Low-impact development. Longmont encourages the use of low impact development (LID) applications in developments. Benefits include reduced public infrastructure costs, increased developable land, improved water quality and reduced development costs.</p> <p>2.Drainage detention/water quality areas. A drainage detention/water quality area shall comply with the following standards:</p>	<p>Not many options or standards for how to incorporate LID</p> <p>Could be an issue with nonfunctional turf policy</p>

		a.The perimeter shall be landscaped with at least one tree and five shrubs for every 50 linear feet of perimeter. At least 50 percent of the trees shall be deciduous canopy species and 25 percent shall be coniferous species; b.Low water-consuming grass or other approved vegetation shall be the primary ground cover. All detention/water quality areas within the five-year floodplain shall be covered with sod or other approved vegetation. Native grass may be used if it is maintained free of weeds and irrigated until the grass is fully established. Live plant material other than grass may be planted if it is suitable to the area and is maintained free of weeds and irrigated until fully established; d.Be designed and located to provide maximum recreational use of the detention/water quality area.	1 tree and 5 shrubs/50 linear feet of perimeter 50% deciduous canopy and 25% coniferous Low water grass or other vegetation groundcover In 5 year floodplain sod Native grass may be used if maintained free of weeds or other plant material  Good multibenefit standards
	15.05.040 N	Landscape plans. All landscape and irrigation plan submittal requirements are addressed in the administrative manual and section 600 of Longmont standards.	
	15.05.040 O	Landscape installation and maintenance. 1.Property owner maintenance.a.The property owner, such as a property owners' association, shall maintain all on-site and common area landscaping and all landscaping on adjacent rights-of-way.	The maintenance requirements could include adjustments for season and water schedule, guidance on natives and xeric
Mixed-use and nonresidential design standard.	15.05.120	C.General design standards.1.Site layout.a.Compatibility with natural site conditions.i.Development shall be avoided on sites with steep slopes and other sensitive environmental and natural areas and habitat to the maximum extent practicable.ii.Building envelopes and areas of site disturbance shall be selected based on the location of natural landforms, native vegetation, mature trees, underlying geology, mapped hazard areas, and setbacks required pursuant to this development code.	Enhance landscape design standards to allow for more naturalized areas
Plumbing Code	16.16.460	All lawn irrigation systems shall be equipped with a rain sensing device.	

*All arterial right-of-way, primary greenway or other areas owned and/or maintained by Longmont Parks and Forestry Services, including detention pond areas are subject to the Design and Construction Standard Section 600 Landscaping and Irrigation. The exception to this is the Ken Pratt Boulevard Landscaping Guidelines.*

#### Section 600 Summary of Related Water Efficient Landscape Requirements

- 600.01 General (7) Longmont will consider variances to City Standards in an effort to reduce water consumption in arterial rights-of-way. The Public Works and Water Utilities Department recommends reducing turf area by increasing the size of shrub beds or using subsurface irrigation in turf areas. Subsurface irrigation is only advised in areas without extensive buried utilities. Financial assistance with increased costs may be available. (a.) Untreated (raw) water sources for irrigation systems will be used when available per the Water Conservation Master plan.

The preliminary landscape plan should identify plant groupings, general plant type (deciduous, ornamental, or coniferous trees); shrub beds; flower beds; water features; live ground covers or mulch areas, and other unique features as well as a plant list.

The final landscape plan is required to show individual plant layout at 2/3 mature size, specific plant species for each plant as identified by a key that relates to a full landscape schedule showing key, quantity per species, botanical name, common name, size, and condition purchased (e.g., balled & burlapped/B&B, and mature height and spread etc.). Separate landscape schedule to be provided for each regulated area: common open space areas, arterial right-of-way, primary greenway, etc.

- 601.02 Minimum Design Criteria
  - Width of tree lawns between concrete paths and curbs or other hard surfaces to be a minimum of eight (8) feet where canopy deciduous trees are used for ease of maintenance operations and long-term tree health.
  - Canopy trees will not be allowed where tree lawns are less than eight (8) foot in width. Where available right-of-way width is insufficient for the required offset, variances may be allowed if landscape provisions are met, but will be restricted to ornamental or small tree canopy trees.
  - In areas narrower than five (5) feet, depending on tree type, a root barrier may be required to prevent concrete path and/or curb heaving.
  - Optimally sized landscape areas on both sides of the concrete path within the right-of-way to allow for efficient irrigation and to eliminate nuisance strips – optimal shrub areas four (4) feet



minimum and eight (8) feet preferred; optimal turf areas twelve (12) feet.

- 602.00 Grading And Fine Grading 602.02 Minimum Design Criteria

- (1) Berms and other slopes shall not exceed 4:1 for areas scheduled for irrigated and mowed turf. Berms and other slopes shall not exceed 3:1 for native grass areas (unmowed or mowed only during establishment), and for shrub beds.
- (3) Grading is to be designed to contain right-of-way area nuisance water within the right-of-way. Swales or other means must be used to prevent water from draining from right-of-way areas into private lots.
- (4) Grading shall take into account all desirable existing vegetation that is and scheduled to remain. No grading will be allowed within the drip line of existing trees scheduled to remain. Cut or fill not exceeding six (6) inch may occur within the drip line, but shall be done by hand methods. Grading will be designed to save as many mature, good quality and desirable species trees as possible, but shall include removal of all invasive or undesirable trees, shrubs, vegetation, and noxious weeds (see plant list in appendix).
- (8) All grading shall adequately allow for a six (6) foot wide mowing deck, especially at tops and sides of berms, along sides and bottoms of swales, etc. Where areas are graded steeper than 4:1 adjacent to the concrete path, a six (6) foot wide shoulder with a 10:1 maximum slope shall be required.
- (9) Grading shall provide a one (1) foot minimum width flat buffer area with a +/-2% slope at the toe of slopes with shrub beds steeper than 4:1 and where adjacent to a concrete path, sidewalk, or curb.
- (10) For detention ponds to be owned and maintained by Longmont Parks and Forestry Services, the following shall also be provided: a perimeter landscaped area, ten (10) feet in width, around the top of the pond to allow for landscaping and other amenities; benches, picnic tables, play equipment, sports courts and/or fields, and other amenities, as determined by City Parks and Forestry Services, that are in scale with the size of the detention facility.

- (3) Public Improvement Plan notes that read as follows:

- (c1) In City-owned areas, replace topsoil to the depth available or six (6) inch minimum. Where sufficient topsoil is not available on-site, additional imported topsoil shall be utilized to allow for six (6) inch minimum depth of topsoil in all landscape areas.

- (e) Soil amendments per Section 602.04 of Longmont Standards and Specifications shall be used in all landscaped areas. Soil amendment shall be applied no more than thirty (30) days before seeding. A minimum of three (3) cubic yards soil amendment per 1000 square feet of landscape area shall be incorporated into Parks - 23 – Effective July 1, 2007 the top six (6) inches of topsoil by tilling. Increase amendment quantities as needed per Soils Test recommendations.

- 602.04 Materials

- (2) Topsoil: A friable loam, typical of cultivated local topsoils, containing at least 2% humus. It must be taken from a well drained, arable site and shall be reasonably free of subsoil, stones, clods, sticks, roots and other objectionable extraneous matter or debris. No stones or other materials over two (2) inches in size shall be allowed. It shall contain no toxic materials. Topsoil shall have an acidity in the range of pH 5.5 to pH 8.5.
- (3) Soil Amendment: A high quality composted material containing a minimum of 30% organic matter by dry weight. The mixture shall be free from clay subsoil, stones, lumps, plants or roots, sticks, weed stolons, seeds, high sodium content and other materials harmful to plant life. The compost shall be coarsely ground with an even composition and have an acidity in the range of PH 5.5 to PH 7.0. All material shall be sufficiently composted such that no material used is recognizable. The following nutrient analysis should be provided on a dry basis: Nitrogen: 1% min; Phosphorus: .4%; Potassium: 1.2%; Salts: 6.5% (as received basis).

- 603.00 Irrigation 603.01 General Criteria Section shall also apply to (1) all City capital design and construction projects that reference these Standards and (2) common open space areas.

- (4) All arterial right-of-way, primary greenway and other private required landscaped areas shall have an automatic, clock-activated irrigation system of sufficient coverage to irrigate all plant material.
- (5) Xeriscaping is required within all City owned areas and in privately owned common areas. a. Xeriscaping within this section shall be defined as reducing water use in landscaped areas through: proper planning and design (zoning plant materials and recognition of micro-climates); good soil improvement (topsoil and soil amendment); limiting turf areas and using water thrifty turf types (see approved materials list); efficient irrigation (zoning irrigation to

separate turf areas from shrubs, minimize overspray onto hard surfaces, use of water saving equipment (see approved materials list), and recognition of micro-climates); use of mulches (and avoidance of impermeable weed barriers); use of water thrifty plant materials (natives are encouraged); and through appropriate maintenance practices.

- (6) Installation of an irrigation system within Common open space and City owned areas shall include a separate tap (private areas separate from public areas), backflow preventer, meter, meter pit and power source for the irrigation controller which will not be subject to disconnection should the fronting property be vacated. Where raw water irrigation is available, it shall be used for irrigation with potable back-up also provided.

- 603.02 Minimum Design Criteria

- (1) For City-owned areas, a system is to be designed to provide head to head coverage with matched precipitation rates. Heads shall not overspray walkways, pavements, or other hard surface areas. Temporary establishment irrigation of native grass areas MAY be an allowable variance if accepted by Parks and Forestry. Principles of Xeriscape shall be utilized in the design of irrigation system. Design considerations include: shrub and perennial beds are to be zoned separately from turf areas, sloped areas to have separate zoning for heads at the higher elevations from those at the lower elevation and areas with different exposures to be zoned separately. This design criteria is encouraged for all areas.
- (2) For Common Open Space areas: a system is to be designed to provide head to head coverage with matched precipitation rates. Heads shall not overspray walkways, pavements, or other hard surface areas where possible. Temporary establishment irrigation of native grass areas MAY be an allowable variance if accepted by Planning. Principles of Xeriscape shall be utilized in the design of irrigation system. Design considerations that must be included are: shrub and perennial beds are to be zoned separately from turf areas, sloped areas to have separate zoning for heads at the higher elevations from those at the lower elevation and areas with different exposures to be zoned separately.
- (4) For City-owned areas, if a tap fee waiver is requested for arterial right-of-way or primary greenway areas, the water from Longmont

tap (with waived fee) shall not irrigate areas outside of City-owned areas.

- (5) For all areas, check valves-in-head required.
- (7) For City-owned areas, design system shall not exceed available pressure at time of Longmont Planning Area final build-out of area. Where available pressure exceeds 85 psi, design the system to 85 psi and include provision for pressure regulator installation to reduce actual pressure to 85 psi if necessary.
- (8) Remote control valves shall be located to minimize lateral piping and sleeving under walkways and hard surface areas. For all areas, isolation valves shall be placed at both sides of each road crossing, at the upstream end of each leg in the mainline and at other areas as needed to minimize disruption to overall system in the event of system failure.
- Plan submission requirements clarify that raw water allows use of drip bubblers, but it is not required. For irrigation, check valves are required in all heads and head to head coverage is required for all seeded and sodded areas. Drip irrigation can be used for all trees and shrubs located in shrub beds and in all native seeded areas. Trees located in irrigated turf areas shall not receive drip.
- 603.06 Testing 1. All tests to be run in the presence of City inspector for City Owned Areas, or Irrigation Design Professional for Common Open Space areas. Irrigation Design Professional conducting inspections is to sign the certification statement on the as-built drawings.
- 604.00 Seeding 604.01 General Criteria
  - 3. All dry land-seeded areas must have a temporary irrigation system for establishment purposes.
  - 4. Drought-tolerant grasses are encouraged in all areas and required in City owned areas. Dry land grasses may be permitted in required landscape areas if deemed appropriate by City staff. These grasses shall be maintained free of weeds and debris and shall not present a fire hazard. The use of several species is encouraged (required in City-owned areas).
- 604.02 Minimum Design Criteria Native Grass
  - 1. Seed mix: Shall be approved by City staff based on the activity to take place, planned irrigation method and maintenance to be performed in the area being seeded. In all cases, a drought tolerant seed mix is encouraged and shall be required in all City owned areas with a seed mix that does not contain more than 10% bluegrass. a.

For pre-approved Native Grass Mixes, see the Approved Materials List b. For pre-approved turf grass mixes, see the Approved Materials List.

- 2. Turf grass seed mix shall be used between the property line and the concrete path in primary greenways and on detention pond side slopes. Native grass mix may be used between the concrete path and ditch.
- 604.04 Materials
  - 6. Native grass seeded area signs: A sign is to be erected in all permanent dry land seeded areas in Primary Greenways reading "Native grass seeding is being established in this Primary Greenway. Prior to establishment, the grasses will be mowed approximately four to five (4-5) times per year to help control noxious weeds. After establishment, the dry land grass will be maintained according to approved maintenance procedures and accepted industry standards, including growth heights of over twelve (12) inches and the irrigation system will be turned off. Eventually, these grasses will provide habitat for wildlife in the greenway and will help conserve water. Please call 303-651-8446 with any questions. Thank you for your cooperation." The sign shall be brown with white letters with City logo and shall be mounted on six (6) inch x six (6) inch wood post, mounted five to six (5-6) feet above grade.
- 604.06 Execution
- 2. Seeding: a. Do not sow seed in windy weather or when ground is frozen or otherwise untillable. b. Use brilliant type drill for slopes less than 3:1 in grade. Drill seed in manner such that after surface is raked and rolled, seed has one quarter (¼) inch of cover. c. Hydraulic seeding methods can be used only on slopes steeper than 3:1 or in areas that are not accessible for machine methods. Hydraulic pump capable of being operated at one hundred (100) gallons per minute and at one hundred (100) pounds per square inch pressure to be used. The equipment shall have an acceptable pressure gauge and a nozzle adaptable to hydraulic seeding requirements. Storage tanks shall have a means of agitation and a means of estimating the volume used or remaining in the tank. Do not seed and mulch in the same operation. d. Broadcast seeding can be used only on areas not accessible for machine methods and too small to justify hydraulic seeding. Where broadcast seeding is done, seeding rates are to be doubled. Hand rake seed to cover at one quarter (¼) inch depth. e. Seeding rates (drilled and hydraulic): 1. Urban, Non-wildlife Native Grass Mix – twenty (20) lbs. pure live seed per acre. 2.

Native Grass Mix – twelve (12) lbs. pure live seed per acre. 3. Turf Grass Mix - 150 lbs. pure live seed per acre. 3. Mulching: a. Native Grass Mulch: Apply at a rate of two (2) tons per acre. Crimp into seed bed with disk set straight forward and two (2) inch deep. Disk mulch across slopes to prevent erosion. Mulch seed beds within twenty four (24) hours after seeding. b.

Hydromulching: Wood cellulose fibers must become evenly dispersed when agitated in water. When sprayed uniformly on the soil surface, the fibers shall form a blotter like ground cover, which readily absorbs water and allows infiltration to the underlying soil. Cellulose fiber mulch shall be added with the proportionate quantities of water and other approved materials in the slurry tank. All ingredients shall be mixed to form homogenous slurry. Using the color of the mulch as a metering agent, apply the slurry mixture by spraying uniformly over the seeded area. Apply with the specified tackifier at a rate of one hundred twenty (120) pounds per acre. Unless otherwise ordered for specific areas, fiber mulch shall be applied at the rate of two thousand (2,000) pounds per acre. 1. Hydraulic mulching shall not be performed in the presence of free surface water resulting from rains, melting snow or other causes. 4. Netting: Net areas with slopes greater than 3:1. If contractor fails to net and subsequent soil erosion occurs, contractor shall re-establish finish grade, soil preparation, seed bed and apply netting at no cost to Longmont. Staple per manufacturer's specifications. 5. Watering: Immediately after seeding and mulching, water seeded areas lightly to a depth of two inches, but with care so that no erosion takes place and no gullies are formed. Water lightly as needed to maintain moist seedbed until turf is established. Sloped areas should be hand watered until turf is established to prevent erosion; water these areas more often but for shorter periods of time.

- 604.09 Guarantee/Warranty
  - 1. Warrant seeded areas for consistency and completion of coverage. Re-seed as needed to ensure a successful stand of grass as accepted by Longmont. Once a vigorously growing stand of grass is achieved, the request for Final Acceptance may be made. A Parks stand of grass is considered to be acceptable when each square foot of grass area has at least 90% coverage in turf grass areas. In native grass areas, it is considered established when the grass area has at least 70% coverage. Maximum single bare spot acceptable in dry land areas is two (2) sq. ft. All seeded areas that do not meet the satisfactory standard of establishment qualifications shall be re-seeded and mulched.
- 605.02 Minimum Design Criteria Sod

- 1. Sod Mix: Turf mix for all areas shall be approved by City staff based on the activity to take place, planned irrigation method and maintenance to be performed in the area being sodded. In all cases a drought tolerant mix shall be encouraged. In City-owned areas a drought tolerant mix shall be required using a mix that does not contain more than 10% bluegrass.
- 2. Sodded Areas: Sod is required for landscaped areas on arterial rights of way and in all areas of detention ponds to be maintained by Longmont that are within the five year flood areas. Other areas may require use of sod as determined by Longmont staff. a. If the size of a detention pond area to be owned by Longmont is ½-acre or less, then the entire area shall be sodded.
- 606.01 General Criteria 1. All nursery stock shall conform to the American Standard for Nursery Stock (ANSI Z60.1) and the Colorado State Nursery Act
- 606.02 Trees, Plants And Groundcover Minimum Design Criteria
  - (2) Landscape plans to be designed and plant materials installed for long term vigor of urban forest. Diversity of species, selection for hardiness, and suitability for areas shall all be considered in the design (see Plant Materials List in Appendix A of these Standards and Specifications). a. FOR ANY ONE PROPOSED DEVELOPMENT PROJECT (including common open space areas): Diversity requirements shall insure that no more than 15% of any one species of tree (for trees considered hardy in this area), or 10% or any one species of tree considered average or marginally hardy for this area, are proposed. This shall be measured per total trees in the development, including existing trees. 1. Up to 20% of the proposed trees for a project may be of fast-growing species. The remainder of the proposed trees shall be varieties with slower and medium growth rates.
  - 3. There shall be a minimum distance of eight (8) feet between trees and any adjacent vertical surface unless a variance is obtained. Trees to be spaced to accommodate the full canopy of the mature tree. Large deciduous trees to have minimum spacing of forty feet (40'), mid -sized trees to have minimum spacing of twenty-five (25) feet and small trees (ornamental) to have minimum spacing of fifteen feet (15'). Coniferous trees to have a minimum spacing of twenty-five (25) feet for large spreading varieties, ten (10) feet for upright columnar varieties. a. When space is limited or a special design effect is desired, closer spacing may be allowed upon agreement from Longmont Forester. b. In City owned areas, trees shall be planted in the center of the tree lawn (area between sidewalk and curb) when the space is less than twelve (12) feet wide. No trees are to be planted in turf areas narrower than eight (8) foot in width without approval from Longmont Forester. Narrow tree lawns approved as a variance would be required to use ornamental or small canopy trees (See Approved Materials List – Tree Recommendations). c. Spacing in tree lawns between hard surfaces (including concrete paths and curbs) to be a minimum of eight (8) foot, where possible.
  - 5. Principles of Xeriscaping are to be followed in all City owned landscape areas, and are strongly encouraged for all other areas.
  - 7. Large canopy deciduous trees are encouraged in the design for placement between the curb and the concrete path/ walkway along streets. Ornamental and small canopy deciduous trees shall be used in these areas where space is limited.
  - 8. Ornamental trees can only replace large canopy deciduous trees at a rate of three (3) ornamental trees to one large canopy deciduous tree and not to exceed 25% of the total tree requirement when calculating minimum materials per City code requirements. Ornamental trees may be used in addition to large canopy deciduous trees. Fruit bearing or thorny trees are not allowed within five (5) feet of concrete paths or streets (as calculated from mature canopy width of tree).
  - 9. Coniferous trees shall comprise 25% of any landscape area where suitable. Unsuitable areas include areas where icy conditions may be created with the use of conifers at road intersections, road curves, concrete path intersections, concrete path curves, site distance restricted areas, or narrow areas. Place Conifers so mature spread will not overgrow walks or streets.
  - 10. Shrubs to be a mixture of evergreen and deciduous species of reasonable diversity. Large (over four (4) feet in height) species should be placed between the concrete path and the property line to provide buffering. Shrubs four (4) feet and less in height to be used between the concrete path and the curb along street rights of way to avoid safety obstructions. Shrubs four (4) feet and less in height to be used between the nearest road / parking area and restroom or other structures to enhance visibility. Shrubs should be selected for wildlife habitat value along primary greenways. Shrubs

within primary greenway low-flow channels shall be selected for water tolerance, flood frequency and velocity.

- 13. No artificial or synthetic plant materials such as artificial grass, shrubs, trees, or flowers shall be used to fulfill any landscaping requirement.
- 14. All landscaping materials shall consist of healthy specimens compatible w/ local climate, soil characteristics, drainage and water supply. All plant material shall be reasonably resistant to drought and disease. The use of native and drought-tolerant species is encouraged. Non-nursery derived stock shall not be used to satisfy these requirements.
- 15. Ground covers other than grass may be planted in required landscape areas if they are reasonably able to provide complete coverage within two growing seasons and if they provide cover year-round. Vines shall not be used adjacent to pedestrian areas.
- 16. Materials such as river rock, cobble, boulders, patterned concrete, mulch and pole peelings shall be limited to shrub beds and other small areas that shall not exceed 25% of the required landscape area. Lightweight matter such as bark mulches shall not be used in areas unshielded from high wind.
- 18. Loose gravel shall not be used in areas abutting public streets or sidewalks. Cobble greater than three (3) inch minimum aggregate size is permitted in these areas. In commercial areas where on-street parking is prevalent and the sidewalk is off set from the curb, the area between the curb and walk shall be landscaped to safely and comfortably accommodate pedestrians crossing to the walk. Cobble, gravel, and other uneven surfaces shall not be permitted.
- 21. Trees prohibited from planting within Longmont include the following: cotton-bearing Cottonwood, Lombardy Poplar, Box-elder, Siberian Elm, and Russian Olive. a. Trees prohibited from planting within City street
- right-of-ways, unless otherwise approved by Longmont Forester, include the above plus the following: Fruit and/or thorn bearing trees (prohibited from within five (5) feet of concrete path as measured from edge of mature canopy), willow (all varieties), Tree of Heaven, Cottonwood (all varieties), and Silver Maple.
- 23. Where Siberian Elm or Russian Olive trees exist within land to be dedicated to Longmont, these trees shall be removed by the Developer as part of Construction. The trees shall be cut to grade

and treated with tinted Garlon herbicide to prevent re-growth except where hardscape is proposed, where stump must be ground and removed in its entirety.

- 24. Beaver Protection: Projects by or adjacent to waterways, including ditches, streams, lakes, ponds, creeks, etc. may be required to include beaver protection at the direction of Longmont inspector. A site visit to coordinate this issue is to be scheduled during construction design.
- 26. Trees recommended for use within Longmont include those listed in Plant Materials List found in the Approved Materials List of these Standards and Specifications.
- 606.04 Plant Materials
  - 1. Large or small canopy deciduous trees (>thirty (30) foot mature height): two (2) inch caliper measured six (6) inches above ground, balled and burlapped. 2. Ornamental deciduous trees (< thirty (30) foot mature height): One and on half (1½) inch caliper measured six (6) inches above the ground, balled and burlapped. 3. Evergreen trees: six (6) feet in height, balled and burlapped. 4. Shrubs: #5 plastic container with deciduous shrubs approximately two (2) feet high and spreading shrubs having eighteen to twenty four (18 – 24) inch spread. 5. Groundcovers, vines, perennials: #1 plastic container.
  - 6. Mulching: a. Mulch depth: 1. Tree pits - four (4) inches deep, keep two (2) inches from trunk. 2. Shrub pits – three (3) inches deep (minimum). 3. Remaining shrub bed - four (4) inches deep (minimum). 4. Groundcover beds – three (3) inches deep (minimum). b. Place geo-textile landscape fabric under mulch in all areas except in individual tree rings or in any other areas specifically approved for omission. Lay straight and even with eight (8) inch overlap at edges. Staple along edges with steel U pins on twenty four (24) inch spacing. Staple folds in fabric to keep below mulch material. c. Tree rings – mulch to extend to edge of planting pit and shall encompass tree stakes in mulch area. d. Timing: Longmont recommends delaying mulch application at tree rings in irrigated turf areas until after turf is established to minimize moisture build-up at tree bases. All other plants shall be mulched within two days of planting or after specified number of waterings for individual trees and shrubs.