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AGENDA
PLANNING & ZONING COMMISSION REGULAR
MEETING
CELINA COUNCIL CHAMBERS
112 N. COLORADO ST.
THURSDAY, JUNE 18, 2026
5:00 PM

- I. **CALL TO ORDER AND ANNOUNCE A QUORUM PRESENT:** The Chair will call the meeting to order, establish a quorum, and lead those present in a salute to the United States and Texas flags.
- II. **OPEN FORUM:**
Open Forum is for information only. If you wish to speak, please sign one of the “Speaker Cards” and present to the Staff Liaison prior to the beginning of the meeting. **Speakers are limited to three (3) minutes.** No action can be taken. No charges and/or complaints will be heard against any elected official or employee of the city that are prohibited by law.
- *Please note* Anyone wishing to furnish copies/handouts regarding their item of interest must provide nine (9) copies and present them to the Staff Liaison for distribution.
- III. **WORKSESSION:** The Planning & Zoning Commission will hold a Worksession to receive the Director’s report, discuss future agenda items, update on Council actions, training topics, and request for new business consideration. The meeting is open to the public.
Reconvene to the Council Chambers.
- IV. **PRESENTATIONS:**
- A. Presentation of the 2025 Tree City USA & Growth Award.
 - B. Discussion regarding Water Conservation.
- V. **CONSENT AGENDA:**
Items are considered self-explanatory and will be enacted with one motion. No separate discussion of these items will occur unless so requested by at least one member of the Planning and Zoning Commission.
- A. Minutes Approval:
 - 1. Minutes from the May 21, 2026, Planning & Zoning Commission meeting.
- VI. **PUBLIC HEARING/ACTION:**
- A. Conduct a public hearing to consider and act upon a request for a Specific Use Permit (SUP) to allow for a Child Care Center, Primary use on approximately 2 acres; generally located 580 feet west of Legacy Dr and approximately 1,000 feet north of Frontier Parkway, within the City Limits. (Lightbridge Academy Daycare – Specific Use Permit)
- VII. **ADJOURNMENT:**

“I, the undersigned authority, do hereby certify that the Notice of Meeting was posted on the bulletin board at City Hall of the City of Celina, Texas, a place convenient and readily accessible to the general public at all times and said Notice was posted on the following date and time: _____ at ____:_____ and remained so posted continuously for at least three (3) business days prior to the scheduled time of said meeting.”

Staff Liaison

City Council Chambers is wheelchair accessible. Persons with disabilities who plan to attend this meeting and who may need auxiliary aids or services such as interpreters for persons who are deaf, or hearing impaired, or readers of large print, are requested to contact the City Secretary's Office at 972-382-2682, or fax 972-382-3736 at least two (2) working days prior to the meeting so that appropriate arrangements can be made.



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Planning
City of Celina, Texas

Memorandum

To: **Planning and Zoning Commission**
From: Melissa Kleineck, Long Range Planning Manager
CC: Madhuri Mohan, Assistant Director of Development Services
Date: June 18, 2026
Re: Discussion regarding Water Conservation.

Action Requested:

Discussion regarding Water Conservation.

Background Information:

In February 2026, the City approved a contract with Freese & Nichols, Inc. to compare Celina water ordinances and practices against that of benchmark cities, and to provide recommendations for updates. The consultant, in collaboration with staff, has provided potential options to address water conservation for discussion. The direction from the Planning & Zoning Commission and City Council will guide the associated ordinance amendments.

Legal Review:

NA

Supporting Documents:

1. Staff Presentation
2. Consultant Memo
3. Consultant Presentation

Financial Consideration:

NA

Staff Recommendation:

NA



Water Conservation

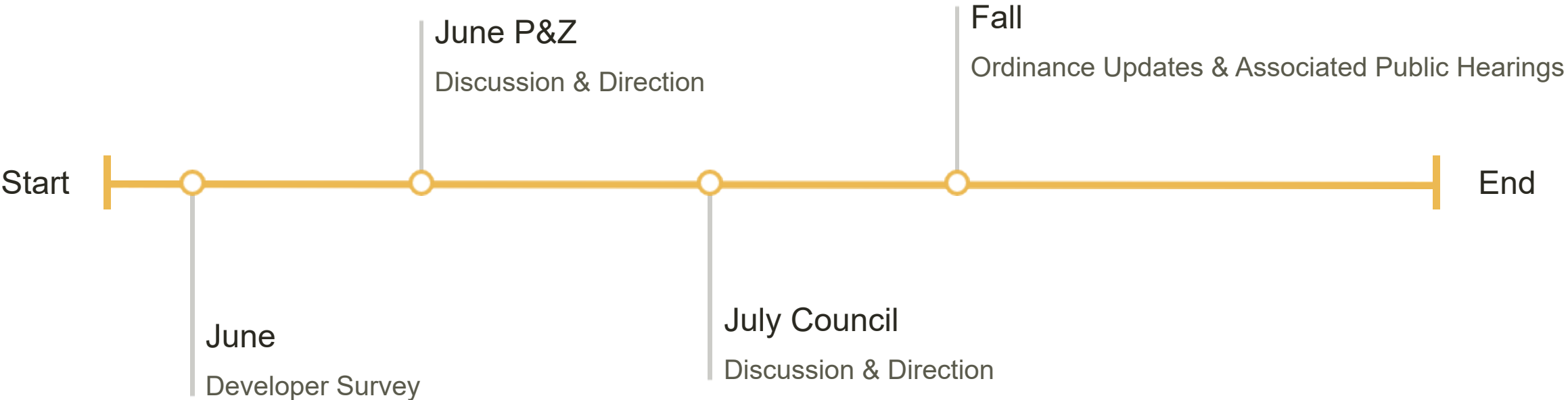
Discussion

Planning & Zoning Commission
June 18, 2026

BACKGROUND

- Water is a strategic planning priority of the City Council
- The City is addressing water thru a multi-pronged approach, including:
 - Water conservation & enforcement (8-2025 presentation & 1-2026 discussion)
 - Education, outreach, & awareness
 - Exploring new water sources & supply (1-2025 update)
 - Increasing water infrastructure capacity (CIP)
 - Median Landscape Pattern Book (Adopted 6-2026)
- In February 2026, the City approved a contract with Freese & Nichols, Inc. to compare Celina water ordinances and practices against that of benchmark cities, and to provide recommendations for updates

TIMELINE



POLICY CONSIDERATIONS

- Celina could establish the regional standard for responsibly managing water resources thru new development design that limits water usage and modeling the behavior in its own projects
- Ordinance updates, educating on design options, permitting, and construction is not over night
- Xeriscape design can be costly
- Broad support from the Builder and Development communities is not anticipated (survey goes out in June)

ORDINANCE REVIEW

- Codes that regulate water & landscaping include Zoning, Subdivision, Engineering Design Standards, and others
Regulations already *allow* for Xeriscape design options
Regulations already *allow* for native and adapted plants that are drought-tolerant
Regulations *require* irrigation systems on all projects
- The consultant's presentation & findings were included in the packet

IRRIGATION OVERVIEW

- Approximately 50% of water usage during peak summer heat is outdoor irrigation
- Drip irrigation, such as along foundations, and bubblers on trees, is an existing exemption to conservation restrictions
 - The City has required bubblers on trees since 2017
- Key Takeaways
 - It's not the trees, but the grass – specifically, the watering of grass during summer – that uses the water
 - An improved plant list, without addressing irrigation, will not conserve water

OPTIONS FOR DISCUSSION (CIP)

- Council adopted the Median Design Guidelines earlier in June for future roadways and arterials
- At a work session in January, Council directed staff to extend the Median guidelines to all future CIP projects and facilities
- The biggest difference is replacing turf grass (and associated irrigation) with decorative aggregate options
- The number of trees and the use of shrubbery and decorative grasses were not reduced
- The consultants forecast an approximate 60% water-use reduction through requiring a more xeriscape design for medians

PLANT OVERVIEW

- Xeriscape design is not necessarily fewer plants - just significantly less grass and irrigation
- Should the City's approved plant list be updated to remove water-thirsty options, such as magnolias, hollies, etc.?
- Should drip irrigation and bubblers continue to be exceptions to any new regulations?

OPTIONS FOR DISCUSSION (EXCEPTIONS)

- Xeriscape regulations often include a distinction between "functional" and "non-functional" turf areas
- That distinction would provide an exception for sports fields, parks, or other facilities/areas needing turf grass for their intended function
- Prohibiting the irrigation of non-functional grass is a foundational element of xeriscape design
- Is this distinction (i.e. exception) important to include within the Xeriscape regulations?

OPTIONS FOR DISCUSSION (COMMUNITIES)

- Several master planned communities have established design brands and/or entitlements that might differ from new xeriscape regulations
- Should existing communities be able to continue their existing brand, or should new phases comply with new regulations?
- Should future (and existing) development be eligible for an exception if they design their irrigation systems to draw water from alternative water sources, such as detention/retention ponds, wells, and reclaimed water sources?
- Should future communities be compelled to secure alternative water sources for irrigation prior to development?

OPTIONS FOR DISCUSSION (HOAs)

- HOAs own land used in various manners:
 - Parkway flanking roadways (HOA landscape buffers) adjacent to subdivisions
 - Interior open space and pocket parks (required for adherence to existing entitlements)
 - Neighborhood Amenity Centers
 - Detention ponds, drainage, and other infrastructure
- Which of the above areas, if any, should qualify for a functional turf distinction?
- Options:
 - Status quo (heavy landscaping & irrigation)
 - Replace irrigated grass areas with decorative aggregate material
 - Allow for turf grass, but prohibit it from being irrigated
 - Allow alternative surfacing material, such as artificial turf

OPTIONS FOR DISCUSSION (Landscape Buffers)

- Policy Considerations:
 - Celina's landscape buffers are wider than regional standard
 - Land acquisition costs are high
 - Installation costs are not cheap
 - Wider landscape buffers help create space for critical infrastructure
 - Wider sidewalks enhance the City's trails plan
 - The purpose of wider landscape buffers was to help Celina maintain its rural feel
 - Public feedback during the Comprehensive Plan supported wider landscape buffers
- Landscape buffers help alleviate "tunnel effect" of masonry screening walls adjacent to arterials (*see picture below*)



OPTIONS FOR DISCUSSION (Landscape Buffers)

- Celina requires the following Landscape Buffers & Sidewalks:
 - 40' - adjacent to 6-lane divided arterials (Preston, Custer, etc.) with 10' sidewalk
 - 30' - adjacent to 4-lane divided arterials (Sunset, Light Farms Way, etc.) with 10' sidewalk
 - 20' - adjacent to collectors & other streets with 8' sidewalk
- Regional standard varies:
 - 10-20' landscape buffers with 6' sidewalks (generally)
 - 10' sidewalks or wider if part of the Master Trails Plan
 - 30' landscape buffer if along DNT or SRT
- Should Celina consider the following, a combination, other, or stay the same?
 - 40' - adjacent to DNT & CCOL with 10' sidewalk
 - 30' - adjacent to 4&6-lane divided arterials with 8' sidewalk
 - 20' - adjacent to collectors & other streets with 6' sidewalk

OPTIONS FOR DISCUSSION (Landscape Buffers)

- Grass, shrubs, & trees (all with irrigation) is the primary design approach within landscape buffers (along with the sidewalk) today
- Exterior landscape buffer options:
 - Status quo (heavy landscaping & irrigation)
 - Replace irrigated grass areas with decorative aggregate material
 - Allow for turf grass, but prohibit it from being irrigated
 - Allow alternative surfacing material, such as artificial turf
- If the landscape buffers are reduced in width, does that change the answer to the above question
- If irrigated from an alternative water source, does that change the answer to the above question?

OPTIONS FOR DISCUSSION (Commercial)



- Should commercial developments be eligible for functional turf exceptions, if they qualify?
- Many areas in commercial are smaller in nature and would benefit from xeriscape design (e.g. parking islands)
- Larger expanses on commercial areas, such as perimeter landscape buffers or leftover space, would need new policy direction:
 - Status quo (heavy landscaping & irrigation)
 - Replace irrigated grass areas with decorative aggregate material
 - Allow for turf grass, but prohibit it from being irrigated
 - Allow alternative surfacing material, such as artificial turf
- The current code allows for areas along creeks, floodplains, and ponds to remain in their native state (riparian buffer allowance)

OPTIONS FOR DISCUSSION (Residential Homes)

- Any major changes would be considered a paradigm shift for the region
- Any proposed revisions could be distinguished between front and back yards or mandatory, optional, or compulsory
- Options:
 - Status quo (grass with irrigation)
 - Require aggregate options to replace turf grass
 - Allow for turf grass, but prohibit irrigation of it
 - Allow alternative surfacing material, such as artificial turf (currently allowed only in back yards)
 - Optional v. compulsory
 - Back yard v. front yard

RECOMMENDATION

- Discussion & Feedback



Thank You!

DRAFT

CITY ORDINANCE REVIEW FOCUSED ON WATER CONSERVATION

Prepared for:

City of Celina

June 2026



Life Connected.

Prepared by:

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List of Abbreviations

Acronym	Name
EBMUD	East Bay Municipal Utility District
ECM	Environmental Criteria Manual
ET	Evapotranspiration
ETWU	Estimated Total Water Use
FNI	Freese and Nichols, Inc.
gpf	Gallons per flush
gpm	Gallons per minute
IRIS	Irrigation Reduction Information System
LCRA	Lower Colorado River Authority
LDC	Land Development Code
LID	Low Impact Development
LVVWD	Las Vegas Valley Water District
MAWA	Maximum Applied Water Allowance
MWEL0	Model Water Efficiency Landscape Ordinance
SAWS	San Antonio Water System
SNWA	Southern Nevada Water Authority
TAC	Texas Administrative Code
UCM	Utilities Criteria Manual
UDC	Unified Development Code
UTRWD	Upper Trinity Regional Water District
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

The City of Celina (City) is experiencing rapid growth, with significant expansion in both residential and commercial development. As development continues, long-term water supply reliability is becoming an increasingly important consideration. Water resources in North Texas are subject to variability due to population growth, regional demand, and climate conditions. In this context, managing water demand through effective policy and development standards is a critical component of long-term planning for the City.

One of the most effective opportunities to influence water demand occurs at the development stage. Ordinances that guide subdivision design, landscaping, and irrigation practices can have lasting impacts on water use patterns across the City. By ensuring that these regulations promote efficient water use and reduced irrigation demand, the City can proactively support water conservation reducing per capita water use.

This memorandum evaluates the City’s current code of ordinances through a water conservation lens and compares those regulations to selected benchmark entities including cities and water providers in Texas and other western US states. The goal is to identify opportunities to strengthen Celina’s regulatory framework to better support long-term water conservation.

1.1 PURPOSE AND GOALS

The purpose of this analysis is to evaluate how effectively Celina’s current ordinances support water conservation and to identify opportunities for improvement based on practices used by peer jurisdictions.

Celina’s rapid growth presents both an opportunity and a challenge. New development will shape the City’s long-term water demand, particularly through landscape design, irrigation systems, and subdivision planning. At the same time, future water supply conditions are uncertain and will require proactive demand management strategies. Updating development regulations to support water conservation is a practical way to reduce long-term demand.

The analysis emphasizes new residential and commercial development, where the greatest opportunities exist to influence future water use. The goal is to provide clear, actionable recommendations that could be incorporated into Celina’s ordinances to support sustainable growth and long-term water resource management.

1.2 METHODOLOGY

This analysis was conducted in two primary phases: a review of Celina’s existing ordinances and a comparison to selected benchmark entities.

First, the City of Celina’s code of ordinances and related standards were reviewed from a water conservation perspective. The review focused on regulatory areas that directly influence outdoor water use and development patterns, including:

- Subdivision and Zoning regulations
- Landscaping and Irrigation regulations
- Engineering Standards
- Water Conservation and Drought Management regulations

These documents were evaluated to identify existing strengths, gaps, and areas where water conservation is supported either directly or indirectly.

Second, Celina’s current regulations were compared to six benchmark entities selected by City staff:

- Austin, Texas
- Cedar Park, Texas
- Denver, Colorado
- East Bay Municipal Utility District (EBMUD), California
- Las Vegas, Nevada
- San Antonio, Texas

These entities were selected to represent a range of approaches to water conservation, including both Texas cities and national leaders in water conservation. Each benchmark entity was reviewed to identify specific ordinance provisions, standards, and regulatory approaches that effectively support water conservation. The comparison focused on identifying key practices that:

- Reduce landscape water demand
- Improve irrigation efficiency and performance
- Integrate water conservation into development review processes
- Strengthen enforcement and long-term compliance
- Encourage reclaimed water usage

Based on this analysis, high-level recommendations were developed to highlight potential updates to Celina’s Code of Ordinances that could improve water conservation outcomes while remaining practical and implementable within the City’s regulatory framework.

2.0 REVIEW OF EXISTING CODE OF ORDINANCES

Celina’s Code of Ordinances and associated development standards include a range of provisions that influence water use, particularly through landscape design, irrigation systems, and development planning. These water conservation related regulations are found in various articles of the Code of Ordinances— including the Subdivision Ordinance (§10.03), Zoning Ordinance (§14), and Water Conservation and Drought Contingency Plans (§13.04)— as well as the City’s Engineering Standards¹.

This section summarizes Celina’s existing regulatory framework as it relates to water conservation, with a focus on how current standards influence water demand in new development. The review evaluates both direct and indirect mechanisms that support water conservation, including irrigation efficiency requirements, landscape design standards, and operational water use restrictions.

Overall, Celina’s code demonstrates a strong foundation in certain areas, particularly in the design and regulation of irrigation systems and enforcement mechanisms tied to development approval and inspection. At the same time, opportunities exist to strengthen the code’s ability to reduce long-term water demand through landscape design, plant selection, and more explicit water conservation standards.

The following sections summarize key provisions within several area’s of the City’s code and highlight how they contribute to or limit water conservation outcomes.

2.1 SUBDIVISION AND ZONING

The City of Celina regulates landscape design, planting requirements, and certain aspects of irrigation and water use primarily through the Subdivision Ordinance and the Zoning Ordinance, which are found in Article 10.03 and Article 14 of the City’s Code of Ordinances, respectively. These regulations establish requirements for new and existing developments, including residential subdivisions and nonresidential site development, and therefore play a key role in shaping long-term water demand.

2.1.1 Subdivision Ordinance

¹ City of Celina, Texas. 2024. *Engineering Standards*. City of Celina, TX.

Celina’s Subdivision Ordinance establishes requirements for the design and development of new subdivisions, including provisions related to landscaping, common areas, and irrigation. These requirements are generally located within the subdivision regulations governing infrastructure, open space, and development standards.

A key provision related to water conservation is found in §10.03.078(h), which requires that:

- “Residential subdivisions containing 500 lots or more shall irrigate their common area lots from on-site wells or detention/retention devices.”

This requirement is significant because it directly reduces long-term potable water demand for large developments at the subdivision scale by requiring the use of alternative water sources for irrigation. This type of provision is not commonly found in many peer cities.

The Subdivision Ordinance also includes provisions related to open space and common area maintenance, which indirectly influence water use by establishing expectations for landscaped areas within developments. These areas, which often include entry features, parks, and buffer zones, can represent a substantial portion of total irrigation demand within a subdivision.

In addition, Celina includes provisions that limit the ability of homeowners’ associations (HOAs) to restrict water-conserving landscapes. Specifically, the code prevents HOAs from prohibiting landscaping designs solely on the basis that they incorporate water-efficient or drought-tolerant practices (§10.03.079(h)(1)). This provision helps remove a common barrier to the adoption of low-water landscaping at the individual lot level.

2.1.2 Zoning Ordinance

Celina’s Zoning Ordinance includes a dedicated article addressing Landscaping and Tree Preservation (§14.04 Pt 2), which establishes requirements for plant materials, landscaped areas, and site design. These standards apply to a wide range of development types and therefore have a direct influence on landscape-related water demand. The Zoning Ordinance defines key terms such as “drought tolerant/low water demand plant”, “turf grass” , and “groundcover”. These definitions provide a foundation for regulating plant selection, but the ordinance does not require the use of drought-tolerant or low-water plant materials across landscaped areas. Landscape requirements in the zoning code generally require that:

- landscaped areas be planted with living plant material (§14.04.203(d)(5))

- a combination of plant types be used to meet minimum landscaping standards for development (§14.04.204)
- front yards must be irrigated with an automatic underground irrigation system with rain and freeze sensors and evapotranspiration (ET) weather-based controllers (§14.04.206(a)(1))

In many cases, these requirements result in the installation of irrigated landscape areas by default. While the ordinance allows for the use of native grasses and drought-tolerant species, it does not appear to establish minimum percentages or thresholds requiring their use. As a result, higher-water-use plant materials, including turf grass, may still be widely used to satisfy landscaping requirements.

The ordinance also includes limitations on the use of non-plant materials. For example, §14.04.206(a)(4) requires all residential lawns to be covered with vegetation, grass, or other living groundcover in order to help retain the soil and prevent erosion. Stone, gravel, rock, or other non-plant derived materials are limited to no more than 30 percent of the front yard area, and artificial or synthetic turf is prohibited in any yard that can be viewed from a public street. Some exceptions are made for xeriscape practices if other landscape standards are still met. The ordinance also includes an approved plant list which can be found in Appendix A. The code requires compliance with this list but does not mandate a minimum percentage of native or xeriscape species.

Finally, the Zoning Ordinance established required landscape buffers and tree planting standards for non-residential developments. These includes:

- A minimum ten (10) foot landscape buffer adjacent to land uses other than single-family
- A minimum twenty (20) foot landscape buffer when adjacent to single-family residential
- Required canopy and ornamental tree spacing within buffers (e.g., one large canopy tree every 30–40 linear feet, depending on adjacency)

These provisions regulate planting density and buffer width, which may increase landscaped area; however, they do not prescribe irrigation methods or water-efficient plant selection standards.

2.2 ENGINEERING STANDARDS

The City of Celina Engineering Design Standards¹ establish requirements for infrastructure design that directly influence irrigation practices and landscape water use, particularly within public rights-of-way and common areas. From a water conservation perspective, the most relevant provisions relate to irrigation system design and landscape installation standards.

2.2.1 Irrigation Design Requirements

The Engineering Standards include a dedicated section (§7.02) addressing irrigation within public right-of-way areas, primarily medians and parkways. These standards contain several provisions intended to improve irrigation efficiency and reduce water waste. Irrigation systems must be designed to minimize runoff and prevent overspray onto paved surfaces, including streets and sidewalks. The standards also require that irrigation zones be organized based on plant water needs and site conditions, ensuring that vegetation with similar water requirements is irrigated together.

In addition, the standards require the use of ET-based controllers for irrigation systems. These controllers adjust watering schedules based on environmental conditions, which can reduce overwatering compared to fixed irrigation schedules. Irrigation heads are also required to achieve a minimum level of distribution uniformity and be adjusted to prevent overspray, further reinforcing efficient water application.

2.2.2 Landscape Requirements within Public Right-of-Way

Landscape standards within the Engineering Standards also influence long-term irrigation demand, particularly through requirements for plant material and groundcover in medians and parkways. Section 6.02 requires that irrigation be provided for landscaped median areas in accordance with the irrigation design standards. This establishes irrigation as a standard component of public landscape areas. The standards require sod installation in specific locations, including areas immediately adjacent to curbs within medians and parkways. These requirements indicate that irrigated turfgrass is expected in portions of the public right-of-way. Additionally, the standards specify that mowed grass is required within a defined distance of the curb unless otherwise approved. This reinforces the use of turfgrass in highly visible and functional areas of the streetscape. These provisions collectively indicate that while irrigation efficiency is addressed at the system design level, the standards also require the installation and ongoing irrigation of turf and landscaped areas within public infrastructure.

2.3 WATER CONSERVATION AND DROUGHT MANAGEMENT

Celina regulates water use through its Water Conservation and Drought Contingency Plan, codified in Article 13.04 of the Code of Ordinances. The plan establishes requirements for water use efficiency, defines prohibited uses of water, and outlines staged drought response measures that apply to all customers, including residential and commercial properties.

2.3.1 Outdoor Water Conservation Measures

Celina seeks to promote efficient use and stewardship of water through the implementation of several landscape water management strategies (§13.04.034(a)), including limiting outdoor watering with automatic systems or hose-end sprinklers to no more than two days per week between the hours of 6:00 pm to 10:00 am, prohibiting water waste by irrigation systems such as watering impervious surfaces, watering during precipitation or freezing temperatures, and avoiding excessive runoff. However, §13.04.034(b) states that these “strategies become mandatory and enforceable under the drought and emergency response stages 1 through 3” which suggests they are not enforceable under normal conditions.

2.3.2 Drought and Emergency Response Stages

Celina’s Water Conservation and Drought Contingency Plan establishes a framework for responding to water supply conditions through a series of drought and emergency response stages. The plan includes multiple drought stages, each with progressively stricter water use restrictions, triggered by internal City or Upper Trinity Regional Water District (UTRWD) water supply or demand conditions (§13.04.077). The most significant restrictions associated with these stages is the irrigation restrictions which are shown in **Table 2-1**. The stages also include other water use restrictions and conservation strategies, however, until stage 3 is reached, these are primarily focused on encouraging public participation through outreach or internal city water use. Stage 3 introduces stricter and enforceable restrictions prohibiting almost all non-essential outdoor water use with minimal exceptions.

Table 2-1: Celina Irrigation Restrictions by Drought Stage

Drought Stage	Automatic Sprinkler Systems	Drip Irrigation	Hand Watering / Soaker Hose	Key Additional Restrictions
Stage 1 (Water Watch)	Twice per week on assigned days: <ul style="list-style-type: none"> Residential (Odd address): Wednesday & Saturday Residential (Even address): Thursday & Sunday Non-residential: Tuesday & Friday No watering Monday Only before 10 a.m. or after 6 p.m. 	Allowed any day or time	Allowed any day or time	<ul style="list-style-type: none"> Water waste prohibited (runoff, overspray, irrigation during rainfall)
Stage 2 (Water Warning)	Once per week on assigned day based on last digit of address: <ul style="list-style-type: none"> 1 or 3: Monday 0 or 2: Tuesday 5 or 7: Wednesday 4 or 6: Thursday 9: Friday 0: Saturday Non-residential: Sunday Only before 10 a.m. or after 6 p.m. 	Permitted for a maximum of 2 hours per day	Permitted for a maximum of 2 hours per day	<ul style="list-style-type: none"> Water waste prohibited Increased restrictions on non-essential outdoor water uses
Stage 3 (Water Emergency)	<u>Prohibited</u>	Permitted one day per week for a maximum of 2 hours	Permitted one day per week for a maximum of 2 hours	<ul style="list-style-type: none"> Water waste prohibited Increased restrictions on non-essential outdoor water uses

Mandatory water use restrictions imposed in stages 1, 2, and 3 are enforced through a graduated approach that includes both warnings and penalties (§13.04.080). Key enforcement provisions include:

- **Notice of Violation:** Customers found in violation of drought stage restrictions may receive written notice identifying the violation and required corrective action (§13.04.080(1)).
- **Escalating Enforcement:** Repeated violations may result in progressively stricter enforcement measures, including disconnecting water service (with reconnection fees) and charging violators with a misdemeanor and imposing fines ranging from \$500 to \$2,000 (§13.04.080(8)).

Any City employee, police officer, or other employee designated by the city manager may issue a citation for a violation of the mandatory water use restrictions (§13.04.080(10)).

2.3.3 Additional Water Conservation Provisions

In addition to outdoor watering restrictions, Celina’s code includes several provisions aimed at reducing overall water demand and improving system efficiency. The ordinance includes requirements related to leak detection and water loss control, which are intended to reduce system inefficiencies and non-revenue water (§13.04.035). These provisions support conservation by addressing water loss within the distribution system. It also mentions the City’s plan to evaluate the feasibility and merits of an optional rebate program to encourage replacement of older water fixtures with water conserving fixtures (§13.04.036(1)(B)). Finally, it outlines internal water conservation efforts by the City, including operational and programmatic measures intended to reduce water use and promote conservation within municipal activities (§13.04.036(9)).

2.4 RECLAIMED WATER

The City of Celina’s current regulatory framework includes limited provisions related to reclaimed or alternative water use. While the City has identified reclaimed water as a potential component of its long-term water conservation strategy, detailed standards and requirements are not yet established within the Code of Ordinances or Engineering Standards.

Within the Engineering Standards, Section 2.04 (Reclaimed Water System) is designated as “Reserved,” indicating that no design criteria or infrastructure requirements for reclaimed water systems are currently in place. As a result, there are no established standards governing the planning, design, or implementation

of reclaimed water infrastructure for irrigation or other non-potable uses. However, the City has expressed interest in developing this section of the Engineering Standards.

Although detailed technical standards are not yet developed, the City's Water Conservation Plan identifies reclaimed water as a potential strategy for reducing potable water demand. Specifically, §13.04.036(2) references the City's cooperation with UTRWD in promotion of the reuse of treated wastewater effluent, and the City's own utilization of treated effluent for washdown purposes at the wastewater treatment plant (WWTP).

3.0 BENCHMARKING ANALYSIS

To evaluate opportunities for strengthening Celina's water conservation framework, the City's ordinances and standards were compared to those of selected benchmark entities. These entities were chosen by City staff in coordination with Freese and Nichols, Inc. (FNI) to represent a range of approaches to water conservation, including water conservation leaders in Texas and the western US. The benchmark entities evaluated in this analysis include:

- Austin, Texas
- Cedar Park, Texas
- Denver, Colorado
- East Bay Municipal Utility District (EBMUD), California
- Las Vegas, Nevada
- San Antonio, Texas

These entities were reviewed to identify specific ordinance provisions, design standards, and regulatory approaches that support water conservation. The analysis focused on measures that influence outdoor water demand, irrigation efficiency, landscape design, and overall water use management. The purpose of this section is not to provide a comprehensive review of each entity's code, but rather to identify key practices that may be applicable to Celina. These findings form the basis for the recommendations presented in subsequent sections.

3.1 SAN ANTONIO

The City of San Antonio regulates water conservation through a combination of its Unified Development Code (UDC)², and their Drought Management, Water Conservation and Reuse Ordinance found in Chapter 34 Article IV of the Code of Ordinances. These regulations address both development-related water demand and operational water use, providing a coordinated framework for managing water consumption.

3.1.1 Subdivision and Zoning

A. Unified Development Code

San Antonio’s UDC incorporates landscape and irrigation requirements into zoning and development regulations, which influence water use through both plant selection and irrigation practices. These provisions are primarily located in UDC Article V, Division 3 (Landscape and Tree Preservation). The UDC requires that landscaped areas be installed as part of development, including street yards, buffer yards, and parking lot landscaping (§35-511). These areas must be planted with living plant material and maintained over time, which establishes a baseline level of irrigated landscape associated with development.

In addition to general landscaping requirements, the UDC includes provisions that address irrigation for landscaped areas. §35-511(c)(6) establishes requirements related to irrigation systems serving landscaped areas, including expectations for proper installation and operation to support plant establishment and long-term maintenance. According to this section of the UDC, no irrigation systems are required for turf areas. In-ground irrigation systems are required to have a separate water service if San Antonio Water System (SAWS) is the purveyor. Additionally, irrigation system designs must provide separate zones for turf, plants with dissimilar water requirements, areas with greater or lesser sun exposure, and slopes from flat/level areas. These provisions recognize irrigation as a necessary component of required landscaping and establish a regulatory connection between landscape requirements and irrigation practices.

To guide plant selection, the UDC includes an approved and recommended plant list (Appendix A), which identifies plant species, including turfgrasses, suitable for the local climate, all of which are suited to xeriscape planting methods. This list provides a mechanism to encourage the use of lower-water-use

² City of San Antonio, Texas. 2025. *Unified Development Code*, Supp. No. 23.

plants, although the UDC does not require a minimum percentage of drought-tolerant planting across all developments.

Landscape plans are required as part of the development review process, which allows the City to evaluate proposed plant materials and associated irrigation systems prior to approval (UDC §35-511). This process provides an opportunity to influence irrigation demand through plant selection and landscape design at the time of development. The UDC does not include provisions that establish maximum allowable turf area, distinguish between functional and nonfunctional turf, or require reductions in irrigated landscape area. As a result, while irrigation systems are required to support landscaped areas, and plant selection is guided through recommended species lists, the overall amount of irrigated landscape is not directly limited within the zoning framework.

B. Water Conservation Landscaping Regulations

§34-275 of the Code of Ordinances also includes landscaping regulations related to water conservation. The ordinance promotes water-efficient landscaping practices by requiring that developers offer a xeriscape option in new residential developments and provide at least one model home utilizing xeriscape design (§34-275(1)–(2)). These provisions encourage the use of low-water-use landscaping at the point of development. It also includes requirements related to soil preparation and plant performance. Turfgrass installed as part of new construction must include a minimum soil depth of 4 inches and organic matter content depth of 0.25 inches to support plant health and reduce irrigation demand (§34-275(4)). In addition, turfgrass species must have summer dormancy capabilities, and irrigation of such turf during dormancy periods is not allowed (§34-275(5)). These provisions are intended to reduce irrigation needs during peak summer conditions.

This ordinance further addresses irrigation system operation and user behavior. Irrigators are required to provide property owners with a recommended seasonal irrigation schedule and instructions for system operation, which must be approved by the City’s conservation staff (§34-275(6)). This requirement supports long-term efficient use of irrigation systems beyond initial installation. The code also includes provisions that remove potential barriers to water conservation at the subdivision or property level. Specifically, dedicatory instruments may not require the installation of irrigation systems or the use of turfgrass, allowing property owners greater flexibility to implement water-efficient landscapes (§34-275(8)). These provisions collectively support water conservation by influencing landscape design, irrigation practices, and long-term system use, independent of drought-stage restrictions.

3.1.2 Engineering Standards

San Antonio does not maintain a consolidated set of irrigation and landscape engineering standards comparable to Celina’s Engineering Standards. Instead, irrigation-related requirements are addressed through the UDC and by reference to statewide regulations.

For landscaped areas where irrigation is required, the UDC specifies that irrigation systems must comply with Title 30 Texas Administrative Code (TAC), Chapter 344, which establishes minimum statewide standards for irrigation system design, installation, and maintenance (§35-510(j)). These standards include requirements related to system zoning, prevention of runoff and overspray, and installation practices. By referencing 30 TAC Chapter 344, San Antonio relies on state-level regulations rather than adopting more detailed or prescriptive local irrigation design criteria.

San Antonio’s UDC also does not include detailed prescriptive requirements for landscape installation within public right-of-way comparable to Celina’s standards for medians and parkways. While the UDC requires landscaped areas as part of development, it does not establish requirements such as mandatory irrigation of public landscape areas, required sod installation adjacent to curbs, or defined turf or planting zones within the right-of-way. This indicates that landscape treatment within public areas is regulated more through general development requirements than through detailed engineering specifications.

San Antonio does, however, include provisions related to Low Impact Development (LID) that are relevant to water conservation. Under §35-210 the City allows certain stormwater management features that utilize native vegetation to be installed without permanent irrigation systems, provided that performance criteria are met. In these cases, applicants are required to provide an alternative irrigation plan for plant establishment and maintenance.

The UDC also encourages the use of non-potable water sources within LID features. For example, it recommends that air conditioning condensate be directed to landscape areas or best management practices for irrigation where feasible (§35-210(b)(2)(A)(11)). Additionally, the code provides incentives for developments that incorporate LID practices, including stormwater fee reductions and credit toward impervious cover limits (§35-210(b)(2)(B)). These LID provisions represent an alternative approach to water conservation that focuses on reducing the need for irrigation through site design and plant selection, rather than improving irrigation system efficiency through detailed engineering standards.

3.1.3 Water Conservation and Drought Management

San Antonio regulates water use through its Drought Management, Water Conservation and Reuse Ordinance, codified in Chapter 34 Article IV. The ordinance establishes requirements for outdoor water use, defines prohibited water waste, and outlines staged drought response measures applicable to all water customers.

A. Outdoor Water Conservation Measures

San Antonio’s ordinance includes year-round measures intended to reduce water waste and improve irrigation efficiency. These provisions apply regardless of drought stage. The ordinance prohibits water waste including specific practices such as allowing irrigation water to run off onto streets, sidewalks, or other impervious surfaces, and failure to repair any controllable leaks (§34-271). The code also restricts irrigation practices that result in inefficient water use. These provisions establish baseline expectations for system operation and maintenance and apply to all water users.

In addition, the ordinance includes restrictions on outdoor watering in effect year-round when drought stage restrictions are not in effect. Outdoor watering of all types is allowed any day of the week but is limited to the hours of 9:00 pm to 10:00 am (§34-272). These measures are enforceable and serve as the foundation for water conservation under normal operating conditions.

B. Drought Management Stages

San Antonio’s ordinance establishes a structured drought response framework with four drought management stages of increasing restriction based on specific levels of the Edwards Aquifer, the primary water source for San Antonio. Outdoor watering restrictions for each stage are shown in **Table 3-1**. The stages also include other water use restrictions and conservation strategies, especially at stage 3 and beyond. Stage 3 implements a drought surcharge for high water use which is applied to a water customer’s bill based on the volume of water used (§34-128.1). In stage 4, the threshold for the drought surcharge decreases and most non-essential outdoor watering is prohibited.

The ordinance provides San Antonio with broad authority to enforce water use restrictions through a combination of administrative, civil, and criminal mechanisms. SAWS is authorized to enforce the provisions of Chapter 34, including issuing notices of violation, initiating enforcement actions, and enforcing utility service regulations (§34-277; §34-290). The ordinance establishes that the water customer, property owner, occupant, or resident of the property is responsible for violations unless another party formally accepts responsibility (§34-277). Violations of the ordinance may be prosecuted as Class C misdemeanors, with escalating fines for repeated offenses, and each day a violation continues is

considered a separate offense (§34-295). In addition to criminal penalties, the City may pursue civil enforcement actions, including injunctive relief and civil penalties as authorized by state law. The ordinance also allows for the discontinuation of water service for repeated or continued violations (§34-289). SAWS is further authorized to access properties to conduct inspections and verify compliance with water conservation requirements (§34-297). Violations may also be treated as a public nuisance, allowing the City to abate the condition, recover associated costs, and place liens on the property if necessary (§34-296). Collectively, these provisions establish a comprehensive enforcement framework that supports compliance with water conservation and drought management requirements.

Table 3-1: San Antonio Irrigation Restrictions by Drought Stage

Drought Stage	Automatic Sprinkler Systems	Drip Irrigation	Hand Watering / Soaker Hose
Year-Round	Allowed any day before 10 a.m. or after 9 p.m.	Allowed any day before 10 a.m. or after 9 p.m.	Allowed any day before 10 a.m. or after 9 p.m.
Stage 1 (Mild Drought)	<p>Once per week on assigned day based on last digit of address:</p> <ul style="list-style-type: none"> • 0 or 1: Monday • 2 or 3: Tuesday • 4 or 5: Wednesday • 6 or 7: Thursday • 8 or 9: Friday • Only before 10 a.m. or after 9 p.m. 	May water up to three times per week on MWF, only during watering hours (before 10 a.m. / after 9 p.m.)	Allowed any time any day using handheld hose
Stage 2 (Moderate Drought)	<p>Once per week on assigned day</p> <ul style="list-style-type: none"> • 5 to 10 a.m. and 9 p.m. to midnight 	May water up to two times per week on M or F, only during watering hours (5 to 10 a.m. and 9 p.m. to midnight)	Allowed any time any day using handheld hose
Stage 3 (Severe Drought)	<ul style="list-style-type: none"> • Same as Stage 2 • Drought surcharge assessed 	<ul style="list-style-type: none"> • Same as Stage 2 • Drought surcharge assessed 	<ul style="list-style-type: none"> • Same as Stage 2 • Drought surcharge assessed
Stage 4 (Critical Drought)	<p>Once every other week on assigned day</p> <ul style="list-style-type: none"> • 5 to 10 a.m. and 9 p.m. to midnight • Drought surcharge assessed 	<p>Once per week on Friday</p> <ul style="list-style-type: none"> • 5 to 10 a.m. and 9 p.m. to midnight • Drought surcharge assessed 	<ul style="list-style-type: none"> • Same as Stage 2 • Drought surcharge assessed

C. Additional Water Conservation Provisions

In addition to outdoor watering restrictions and drought response measures, San Antonio’s code includes several provisions that support broader water conservation through system efficiency, technology requirements, and operational practices.

San Antonio also includes requirements for irrigation system performance and evaluation. Certain large properties, including golf courses, athletic fields, and large irrigation users, are required to conduct annual irrigation system evaluations and submit documentation verifying that systems are operating without leaks and do not result in water waste (§34-273(3)).

There are also provisions related to water-efficient fixtures and equipment, such as requirements for low-flow plumbing fixtures and restrictions on water-cooled equipment (§34-273(9)). Additionally, the ordinance incorporates measures to reduce water use in commercial operations, including requirements for water reuse in vehicle wash facilities and limitations on water use in cooling systems.

Finally, the ordinance promotes water-efficient landscaping practices through provisions such as requiring builders to offer xeriscape options in new residential developments and prohibiting HOAs from requiring turfgrass or irrigation systems (§34-275).

3.1.4 Reclaimed Water

San Antonio incorporates reclaimed water use into its water conservation framework through provisions in Chapter 34 Article IV of the Code of Ordinances. These provisions allow and, in some cases, encourage the use of non-potable water sources for irrigation and other uses.

The ordinance defines recycled water and on-site reclaimed water and recognizes these sources as acceptable alternatives to potable water for irrigation and other non-potable applications (§34-271). The code further establishes that the use of reclaimed water, gray water, condensate, and other alternative water sources may be used for irrigation and, in certain cases, may serve as a defense to prosecution for violations of watering restrictions (§34-332). These provisions effectively allows greater flexibility for properties utilizing non-potable water sources.

San Antonio’s code also includes requirements to facilitate the use of alternative water sources in new development. For example, new commercial buildings are required to include infrastructure to collect air conditioning condensate for potential reuse in irrigation or other beneficial uses (§34-274). In addition,

non-potable water storage systems above certain thresholds must be registered with the City, providing a mechanism for tracking and managing alternative water use (§34-273).

The ordinance further supports reclaimed water use through its treatment of irrigation restrictions. Properties that utilize 100 percent non-potable water sources for irrigation, including recycled water or condensate, may be allowed to irrigate outside of otherwise restricted days or times, provided that water waste does not occur. This creates an incentive for the use of alternative water sources by reducing regulatory limitations associated with potable water use.

3.2 AUSTIN

The City of Austin regulates water conservation through various sections of the Code of Ordinances including the Land Development Code (LDC), Environmental Criteria Manual (ECM), Utilities Criteria Manual (UCM), and Water Conservation and Drought Contingency Plan (Chapter 6-4). These provisions address water use through both development standards and operational controls, with a particular emphasis on reducing landscape irrigation demand.

3.2.1 Development Landscaping and Irrigation Regulations

Austin’s landscaping and irrigation provisions related to water conservation are primarily found in their LDC (Chapter 25 of the Code of Ordinances) and implemented through Section 2 of the ECM. While the LDC does not contain extensive standalone landscaping and irrigation requirements, it does require subdivisions to comply with the applicable provisions and related development criteria manuals, including drainage, water quality, tree and natural area protection, and utility service requirements (§25-4-1).

A key requirement for Austin is that at least 50 percent of the total required landscaped area on a project must either be undisturbed natural area or undisturbed existing trees with no potable irrigation, or be irrigated by stormwater runoff conveyed from on-site impervious surfaces (§25-2-1008; ECM §2.4.6(A); ECM §2.4.9.1). The ECM explains that, for this purpose, the “required landscaped area” includes the required street-yard landscaping plus required islands, medians, and peninsulas outside the street yard (ECM §2.4.9.1). This is one of Austin’s strongest development-side water conservation provisions because it ties required landscaping directly to either preserved natural area or non-potable stormwater irrigation rather than conventional potable irrigation.

Austin's landscape standards also direct the types of plant materials used in required landscaped areas. In the street yard, at least 20 percent of the street yard must be landscaped, and grass areas using grasses not listed on the Preferred Plant List (Appendix A) are generally not credited as landscaped area except in shaded areas (ECM §2.4.1(A)).

The ECM also includes provisions that reduce irrigation demand through turf and soil standards. Areas receiving more than six hours of sunlight per day must be planted with turf species from the Preferred Plant List (ECM §2.4.4(B)). Non-turf areas must receive at least three inches of organic mulch, non-porous material may not be placed under mulch, and required turf and landscaped areas must have at least six inches of permeable soil, with deeper soil requirements for tree planting areas (ECM §2.4.5). These standards support water conservation by improving soil moisture retention and limiting planting practices that increase irrigation demand.

Austin's irrigation requirements within the landscape standards are also notable. The ECM expressly provides that permanent irrigation is not required for newly planted landscaping, other than newly planted trees, when the area receives stormwater runoff, uses native or adapted drought-tolerant plants, is located in low-foot-traffic areas, and receives temporary irrigation for the first two growing seasons (ECM §2.4.6(C)). The ECM further specifies how stormwater irrigation can be achieved. It allows runoff to be conveyed to landscaped areas by overland flow, storm drains, downspouts, rainwater harvesting, retention-irrigation, or other approved methods, and it requires the drainage area used for stormwater irrigation to be large enough to support the landscaped area, with a minimum drainage-area-to-landscaped-area ratio of 1:2 (ECM §2.4.9.2(A)-(B)).

Austin also provides some flexibility through its alternative compliance framework, but that framework still contains water-conservation-oriented incentives. The ECM's alternative compliance ratings award positive points for features such as approved rainwater storage and irrigation distribution systems, approved integrated stormwater management systems, and the use of all native plant materials (ECM §2.5).

Overall, Austin's subdivision and zoning framework is strong because it regulates how required landscaping is irrigated, requires a substantial portion of required landscaped area to rely on stormwater or non-potable irrigation, and ties plant selection and landscape design more directly to water conservation outcomes.

3.2.2 Water Conservation and Drought Management

Austin regulates water use through its Water Conservation Code (Title 6, Chapter 6-4), which establishes year-round water conservation measures, defines water waste, and provides a framework for drought response and staged restrictions.

A. Outdoor Water Conservation Measures

Austin's code includes year-round provisions intended to reduce water waste and improve irrigation efficiency. These measures apply regardless of drought stage. The ordinance defines water waste and prohibits specific practices such as irrigation that results in runoff onto impervious surface and failure to repair controllable leaks (§6-4-12).

Austin also established a year-round Water Conservation Stage that includes irrigation restrictions that are mandatory and enforceable at all times, unless a drought stage that introduces further restrictions is in effect (§6-4-15). The applicable watering days are assigned by property type, irrigation type, and address classification through the Outdoor Water Use Schedule in §6-4-13. These measures are enforceable and serve as the foundation for water conservation under normal operating conditions.

B. Drought Response Stages

Austin's drought response framework is established in Article 3 of Chapter 6-4. There are five drought response stages that take effect if certain water demand or water supply reservoir level based triggers are met, or if ordered by the City Manager when necessary to protect the public health, safety, or welfare (§6-4-13). The drought response stage regulations include restrictions on outdoor water use, primarily through irrigation restrictions, which are shown for each stage in **Table 3-2**. When Stage 5, or the emergency stage is reached, all irrigation is prohibited. Other types of outdoor water use become more restricted with higher drought response stages, including imposing drought surcharges on customers and limiting non-essential outdoor water uses such as vehicle washing or filling pools and spas.

Table 3-2: Austin Irrigation Restrictions by Drought Stage

Drought Stage	Automatic/Manual Sprinkler Systems	Drip Irrigation	Hand Watering / Soaker Hose
Conservation Stage	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 10 a.m. or 7 p.m. to midnight 	<p>Twice per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 10 a.m. or 7 p.m. to midnight 	<p>Twice per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 10 a.m. or 7 p.m. to midnight
Stage 1	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 8 a.m. or 7 p.m. to midnight 13-hr maximum 	<p>Twice per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 8 a.m. or 7 p.m. to midnight 26-hr maximum 	<p>Twice per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 10 a.m. or 7 p.m. to midnight 30-hr maximum
Stage 2	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 5 a.m. or 7 p.m. to midnight 10-hr maximum 	<p>Twice per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 5 a.m. or 7 p.m. to midnight 20-hr maximum 	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 10 a.m. or 7 p.m. to midnight 15-hr maximum
Stage 3	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 6 a.m. 6-hr maximum 	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> Midnight to 6 a.m. 6-hr maximum 	<p>Once per week on assigned day based on last digit of address and customer type</p> <ul style="list-style-type: none"> 7 a.m. to 10 a.m. or 7 p.m. to 10 p.m. 6-hr maximum
Stage 4	<p>Non-functional Turf: no watering Functional Turf:</p> <ul style="list-style-type: none"> Once per week on assigned day Midnight to 6 a.m. 6-hr maximum 	<p>Non-functional Turf: no watering Functional Turf:</p> <ul style="list-style-type: none"> Once per week on assigned day Midnight to 6 a.m. 6-hr maximum 	<p>Non-functional Turf: no watering Functional Turf:</p> <ul style="list-style-type: none"> Once per week on assigned day 7 a.m. to 10 a.m. or 7 p.m. to 10 p.m. 6-hr maximum
Stage 5 (Emergency)	<u>NO OUTDOOR IRRIGATION ALLOWED</u>		

Violations of water conservation and drought stage restrictions are enforceable as violations of the City’s Code of Ordinances, with enforcement procedures governed by §2-13 (Administrative Adjudication of Ordinance Violations) as referenced in §6-4-52. This process allows the City to pursue enforcement through administrative hearings, where violations may result in civil penalties and orders requiring corrective action. The code authorizes designated City officials to issue notices of violation and initiate enforcement proceedings for noncompliance with Chapter 6-4 requirements. In addition to administrative enforcement, violations may be subject to other remedies available under City code, including municipal court action, consistent with the City’s general enforcement authority. Collectively, these provisions provide Austin with the ability to enforce water conservation and drought-related restrictions through formal legal and administrative processes

3.2.3 Reclaimed Water

Austin incorporates reclaimed water and alternative water sources into its water conservation framework through provisions in Chapter 6-4 of the Code of Ordinances and ECM. These provisions support the use of non-potable water for irrigation and other beneficial uses and, in some cases, provide regulatory flexibility when such sources are used.

Austin’s code recognizes the use of reclaimed water and alternative water sources as a component of its water conservation strategy. Properties that utilize reclaimed water or alternative water sources that are not supplemented by potable water are exempt from certain watering restrictions (§6-4-14). This provision creates a regulatory incentive for the use of non-potable water by allowing greater flexibility in irrigation practices.

In addition to reclaimed water, Austin’s code and technical standards support the use of on-site alternative water sources, including rainwater harvesting and stormwater reuse. The ECM allows required landscaped areas to be irrigated using stormwater runoff conveyed from on-site impervious surfaces or other approved methods such as rainwater harvesting systems (ECM §2.4.9.2(A)). These systems are subject to design criteria, including minimum drainage area requirements and documentation of contributing drainage areas. Austin’s code also recognizes the use of alternative water sources such as gray water and condensate in certain applications.

While Austin supports and incentivizes the use of reclaimed and alternative water sources, the code does not establish a universal requirement for reclaimed water use in all new development. Instead,

implementation is driven by site design, infrastructure availability, and compliance with applicable development and water conservation requirements.

3.3 CEDAR PARK

Cedar Park is a suburb of Austin that with a population of around 80,000. Similar to Celina, the city has experienced rapid growth and development due to urban sprawl, with Cedar Park’s peak population surge occurring between 2000 and 2010. Having experienced a development boom just prior to Celina, Cedar Park is a suitable benchmark to analyze water conservation framework in a rapidly growing Texas suburb.

Cedar Park regulates water conservation through multiple sections of its Code of Ordinances, with primary provisions located in Chapter 14 (Site Development), Chapter 18 (Utilities), and Chapter 3 (Building Regulations). Water conservation is addressed through both development standards and operational programs.

3.3.1 Development Landscaping and Irrigation Regulations

Cedar Park’s primary landscaping and irrigation requirements are established in Chapter 14 (Site Development) of the Code of Ordinances. Cedar Park consolidates most landscape and irrigation-related requirements within its site development regulations, which apply broadly to new development. Landscape and irrigation requirements are incorporated into the site development plan review process. Site development applications must include landscape plans and irrigation plans prepared in accordance with the requirements of Chapter 14, including detailed information on plant materials, irrigation systems, and site conditions (Article 14.07). Automatic irrigation systems are not required, however, property owners are responsible for the irrigation of all required landscape areas and plant materials, unless otherwise approved and all irrigation systems must be designed and installed in accordance with the City’s standards (§14.07.012). The code provides a limited exception for certain landscape types. “No irrigation shall be required for undisturbed natural areas or undisturbed existing trees” (§14.07.015(e)). In addition, areas utilizing xeriscape plantings may use temporary irrigation systems and are only required to provide irrigation for the first two years (§14.07.012(c)). Cedar Park’s preferred plant list can be found in Appendix A, while the code also states that the City’s preferred plant list also includes those of the City of Austin and the Lower Colorado River Authority (LCRA).

Overall Cedar Park’s code requires:

- installation of landscaping as part of development,
- irrigation of all required landscape areas (with limited exceptions),
- installation and operation of irrigation systems or methods prior to certificate of occupancy, and
- inclusion of irrigation design information in landscape plans

3.3.2 Water Conservation and Drought Management

Cedar Park regulates water conservation and drought response through Chapter 18 (Utilities) of the Code of Ordinances, including Article 18.08 (Drought Contingency and Water Emergency Plan) and Article 18.11 (Water Conservation Plan). These provisions establish retail water use restrictions during normal conservation and drought conditions. They also include utility-level conservation measures such as leak detection, metering, and water conservation programs.

A. Outdoor Water Conservation Measures

Cedar Park’s code establishes water conservation measures through its Drought Contingency and Water Emergency Plan, codified in Article 18.08. The water use restrictions for each drought response stage are established in §18.08.009. While Stage 1 is technically referred to as a drought response stage, this is considered the baseline water conservation stage for Cedar Park and will be implemented anytime another drought stage is not in effect. Stage 1 is designed to promote water efficiency throughout the City (§18.08.009(b)(1)(A)). Stage 1 restrictions include limiting outdoor irrigation to twice per week on designated watering days between 7:00 pm and 10:00 am, with certain exceptions.

The code also prohibits water waste and “unreasonable use” of water during all drought response stages (§18.08.001-002). Unlike other benchmark entities, Cedar Park does not explicitly define water waste or provide examples of prohibited activities that constitute water waste.

B. Drought Response Stages

Cedar Park’s drought response framework is established in §18.08.009, which defines the triggering and termination criteria for drought response stages and associated water use restrictions. As previously mentioned, Stage 1 acts as the baseline water conservation stage and is in effect year-round unless a more severe drought stage is in effect. Cedar Park has four additional drought stages which can triggered based on water demand as a percentage of water treatment capacity, water supply reservoir storage level, weather conditions, or at the City Manager’s discretion. Each stage includes a demand target reduction goal ranging from 10% in Stage 2 to 30% in Stage 5, along with water outdoor water use restrictions that

become increasingly more restrictive with higher drought stages. Restrictions on irrigation for each drought stage are shown in **Table 3-3**. Additional outdoor water uses are somewhat restricted under Stages 2 through 4 but generally allowed. Once Stage 5 is reached, all non-essential outdoor water use is prohibited.

Enforcement authority for water use restrictions is established in §18.08.012, which provides that violations of water use restrictions are subject to enforcement actions by the City. The City Manager or their designee may issue notices if they believe a customer is in violation of the plan. After the first violation, fines may be issued ranging from \$50 to \$1,000 depending on customer type and number of violations (§18.08.012(c)). The City is also authorized to install a flow restricting device or discontinue water service after the fourth violation (§18.08.012(g)) or for “willful and negligent waste of water due to leaks during an established emergency” (§18.01.007(a)(5)).

Table 3-3: Cedar Park Irrigation Restrictions by Drought Stage

Drought Stage	Automatic/Manual Sprinkler Systems	Drip Irrigation / Soaker Hose	Hand Watering
Stage 1 (Conservation)	Twice per week on assigned days based on last digit of address and customer type <ul style="list-style-type: none"> Prohibited between 10:00 am and 7:00 pm 	<ul style="list-style-type: none"> Allowed any day or time 	<ul style="list-style-type: none"> Allowed any day or time
Stage 2	Twice per week on assigned days based on last digit of address and customer type <ul style="list-style-type: none"> Prohibited between 10:00 am and 7:00 pm 	<ul style="list-style-type: none"> Allowed any day or time 	<ul style="list-style-type: none"> Allowed any day or time
Stage 3	Once per week on assigned day based on last digit of address and customer type <ul style="list-style-type: none"> Prohibited between 10:00 am and 7:00 pm 	Once per week on assigned day based on last digit of address and customer type <ul style="list-style-type: none"> Allowed any time of day 	<ul style="list-style-type: none"> Allowed any day or time
Stage 4	Once per week on assigned day based on last digit of address and customer type <ul style="list-style-type: none"> Allowed from 5:00 am to 8:00 am and 8:00 pm to 11:00 pm 	Once per week on assigned day based on last digit of address and customer type <ul style="list-style-type: none"> Allowed from 5:00 am to 8:00 am and 8:00 pm to 11:00 pm 	Once per week on assigned day based on last digit of address and customer type <ul style="list-style-type: none"> Allowed from 5:00 am to 8:00 am and 8:00 pm to 11:00 pm
Stage 5 (Emergency)	<u>NO OUTDOOR IRRIGATION ALLOWED</u>		

3.3.3 Reclaimed Water

Cedar Park addresses reclaimed water through provisions in its Water Conservation Plan (Article 18.11). These provisions document the City’s use of reclaimed water for irrigation and identify reclaimed water as a component of the City’s water conservation strategy. The City’s water reclamation facility provides treated effluent for irrigation purposes and identifies specific projects where reclaimed water is used in place of potable water. For example, the ordinance notes that reclaimed water is used for irrigation at City facilities, including parks and municipal sites. Cedar Park is continuing to expand reclaimed water infrastructure. The ordinance notes that pipeline infrastructure has been constructed to deliver reclaimed water for irrigation to additional parks and landscaped areas, and that additional reclaimed water projects are planned (§18.11.013).

3.4 LAS VEGAS

Las Vegas was selected as a benchmark entity due to its nationally recognized water conservation policies, which represent some of the most aggressive and innovative approaches in the US. Las Vegas receives water from the Colorado River watershed, one of the most over-allocated and drought-stressed water sources in the US. This water supply limitation, along with an arid desert climate receiving minimal rainfall and a large commercial water demand driven by the tourism and entertainment industry, has driven Las Vegas to adopt a highly proactive and regulatory approach to water conservation. These factors have necessitated policies that directly regulate landscape design, irrigation practices, and overall water use in both public and private development. As a result, Las Vegas has implemented prescriptive and enforceable water conservation measures, including restrictions on turf, water-efficient landscaping requirements, and system-wide conservation mandates.

Water conservation in Las Vegas is regulated through a layered framework involving the City of Las Vegas, the Southern Nevada Water Authority (SNWA), and the Las Vegas Valley Water District (LVVWD). SNWA is the regional wholesale water authority and is responsible for regional water resources and conservation planning. LVVWD is the primary retail water provider for most City of Las Vegas customers and implements enforceable customer-side conservation requirements through its Service Rules³. The City of Las Vegas separately regulates development, landscaping, and outdoor water use through the Las Vegas municipal code and UDC.

³ Las Vegas Valley Water District. 2026. *Service Rules*. Las Vegas, NV.

Although the climatic, economic, and regulatory contexts of Las Vegas differ significantly from those of Celina, its policies provide a valuable case study in how water scarcity can shape land development standards and municipal code requirements. Analyzing Las Vegas allows this study to identify forward-looking conservation strategies and regulatory tools that may be adaptable—at least in part—to rapidly growing communities like Celina as water supply constraints become increasingly important over time.

3.4.1 Development Landscaping and Irrigation Regulations

Las Vegas regulates landscaping and irrigation through both City code and LVVWD’s Service Rules. On the City side, the Drought Plan found in §14.11 of the municipal code sets permanent water use restrictions including irrigation limitations, these are further discussed in **Section 3.4.2**. The City’s UDC also provides water-conservation direction for landscape design. Its stated purpose includes encouraging “the most appropriate use of land, water and natural resources” (§19.00.030(B)).

The most restrictive landscape-water provisions appear in LVVWD’s Service Rules. Beginning in 2027, using water provided by LVVWD to irrigate nonfunctional turf (as defined by SNWA) will be prohibited without an approved waiver (§3.10(b)). New turf in development is also restricted, with limited exceptions for schools, parks, and cemeteries, the LVVWD will not serve customers who use LVVWD water to irrigate turf on properties issued a certificate of occupancy after April 5, 2022, which essentially applies to all new development. Where turf is allowed, there are strict installation standards that require turf areas be at least 1,500 contiguous square feet, no turf area may be less than 30 feet in any dimension, turf must be at least 10 feet from a street unless fenced for recreational safety, slopes may not exceed 25 percent, and turf cannot be installed in medians, along streetscapes, or at entryways (§3.10(c)). The rules also sharply limit irrigation method. Except for schools, parks, and cemeteries on permitted turf installations, LVVWD will not serve customers who use District water for spray irrigation (sprinkler systems) of non-turf landscape areas on new developments.

Taken together, the Las Vegas framework provides several specific regulatory tools that are stronger and more prescriptive than those typically seen in Texas cities and water providers: prohibition of nonfunctional turf, near-elimination of turf in new development except for limited functional uses, and prohibition of spray irrigation for non-turf areas in new development.

3.4.2 Water Conservation and Drought Management

Las Vegas’s water conservation framework differs from the Texas benchmark cities in both form and emphasis. Nevada, like Texas, requires water providers to adopt and update water conservation plans on a five-year cycle. However, the Las Vegas approach does not mirror the Texas model of a relatively moderate year-round conservation stage followed by multiple drought stages with increasingly restrictive irrigation limits. Instead, water conservation is implemented through a combination of permanent, enforceable water use restrictions administered by LVVWD and supported by Chapter 14.11 (Drought Plan) of the municipal code. As a result, the baseline water use restrictions in Las Vegas are comparable to the more severe drought stages of Texas cities.

A. Outdoor Water Conservation Measures

Outdoor water use in Las Vegas is primarily regulated through the LVVWD Service Rules, which establish enforceable requirements as a condition of receiving water service. The rules require that customers use water in a manner that avoids waste and define water waste to include conditions such as allowing water to run off property, failure to repair leaks, and operation of irrigation systems during prohibited times (§10.3(a)).

The Service Rules include specific, permanent irrigation restrictions. For example, spray irrigation is prohibited between 11:00 a.m. and 7:00 p.m. from May 1 through August 31, and irrigation is limited to assigned watering days based on customer schedules, which differs depending on time of year. Outdoor irrigation is prohibited on Sundays year-round. The seasonal watering schedule is shown in **Table 3-4**. These requirements are not tied to drought stage activation and instead function as continuous conservation measures.

Table 3-4: Las Vegas Seasonal Watering Schedule

Season	Watering Schedule
Winter (Nov-Feb)	One assigned day per week
Spring (Mar-Apr)	Three assigned days per week
Summer (May-Aug)	Any day except Sunday
Fall (Sept-Oct)	Three assigned days per week

Las Vegas enforces similar requirements through municipal code Chapter 14.11, which makes certain water uses unlawful within the City. For example, it is unlawful to irrigate in excess of assigned watering schedules or during prohibited times (§14.11.090; §14.11.100). Chapter 14.11 also establishes a general prohibition on water waste, including allowing water loss from leaks or system malfunctions after it should have been reasonably discovered and corrected (§14.11.070(B)).

B. Drought Management Approach and Enforcement

Rather than implementing multiple drought stages with escalating restrictions, Las Vegas relies on a single, consistently enforced set of conservation requirements supplemented by the authority to impose additional measures if necessary. The LVVWD Service Rules authorize them to limit water use or take action in response to water shortages or emergency conditions, including discontinuation of service. Enforcement of water use restrictions in Las Vegas operates through a dual framework involving both LVVWD and the City:

- **LVVWD Enforcement (Primary):** The Service Rules provide the primary enforcement mechanism. Violations of water waste provisions result in notices, fees, and potential service actions. The rules include specific, objective standards, such as requiring leaks to be repaired within 48 hours after discovery or notification.
- **City Enforcement (Supplemental):** Chapter 14.11 provides parallel enforcement authority through the municipal code. The City establishes broader legal prohibitions, such as requiring that water loss be corrected within a reasonable timeframe (§14.11.070(B)). These provisions allow the City to pursue enforcement actions independent of utility enforcement if necessary.

C. Additional Water Conservation Provisions

Las Vegas also incorporates additional conservation measures that extend beyond traditional irrigation restrictions. These include:

- Water budgets for certain customer classes, including large landscapes and golf courses, which limit total water use rather than only regulating irrigation schedules, and imposed rates or surcharges for varying levels of use related to the budget (LVVWD Service Rules, §10.6).
- Turf installation limitations including:

- Prohibition of nonfunctional turf installations in residential common areas or any new property development including single-family yard areas
- Prohibition of functional or nonfunctional turf in non-residential developments except for schools, cemeteries, and parks (§14.11.140)
- Prohibition on residential swimming pools, spas, and hot tubs exceeding 600 square feet (§14.11.193)
- Prohibition of new golf courses (Municipal Code, §14.11.195)

3.4.3 Reclaimed Water

Reclaimed water use in Las Vegas is addressed primarily through regional water management practices implemented by SNWA and the local LVVWD programs and operations. SNWA manages regional water resources, including the treatment and reuse of wastewater. The agency reports that a significant portion of indoor water use in the Las Vegas Valley is treated and returned to Lake Mead, where it is credited back to the region's Colorado River allocation. This return-flow system is a central component of the region's water supply strategy and allows the community to maximize use of its limited water resources.

At the local level, LVVWD implements reclaimed water (or non-potable water) use through its water system operations and conservation programs. LVVWD requires the use of non-potable water for irrigation and other approved uses by non-residential users where infrastructure is available (Service Rules §3.9). In practice, reclaimed water is used for irrigation at certain public facilities, including parks, golf courses, and other large landscaped areas. LVVWD has established separate non-potable water rates that are at or below the annual average cost that water users would pay for potable water service (Service Rules §7.11).

3.5 DENVER

Denver was selected as a benchmark due to its long-standing emphasis on water conservation, along with climate and water supply factors unlike previously discussed benchmark entities, which offer valuable insights into a unique approach to water conservation. Unlike Celina and other Texas cities, Denver relies heavily on snowpack-driven surface water supplies and trans-basin diversions, creating a supply system that is both variable and highly constrained. These conditions have led to the adoption of conservation-oriented policies that emphasize efficient water use, landscape management, and system-wide demand

reduction. Denver’s water conservation approach is more decentralized and utility-driven than many Texas cities, with significant authority vested in the Board of Water Commissioners (or Denver Water) and implemented through a combination of municipal code provisions and utility rules. The Denver Code of Ordinances establishes baseline legal authority for regulating water use, while detailed operational policies, conservation programs, and drought response measures are often administered through Denver Water. Denver’s water conservation framework is concentrated in Chapter 56 (Utilities) of the Code of Ordinances and in the Denver Water Operating Rules⁴, with additional, but less relevant provisions in other areas of the Code of Ordinances.

3.5.1 Development Landscaping and Irrigation Regulations

Denver’s Code of Ordinances includes limited provisions directly regulating landscape water use. Chapter 57 (Vegetation) acknowledges that traditional landscaping can impose a significant burden on water resources but does not establish specific requirements related to irrigation efficiency, plant selection, or turf limitations (§57-100). Unlike other benchmark entities, Denver does not rely on development regulations to control landscape water demand and instead relies on a utility-driven conservation approach.

3.5.2 Water Conservation and Drought Management

Water conservation in Denver is implemented through a utility-driven regulatory framework administered by Denver Water, rather than being fully codified within a single municipal ordinance. The Code of Ordinances establishes that it is unlawful to use water in violation of the rules and regulations adopted by the Board of Water Commissioners (§56-16). As a result, the detailed water conservation requirements applicable to customers are primarily established through Denver Water Operating Rules and associated conservation policies, which are enforceable through both utility authority and municipal code. This approach differs from the Texas benchmark cities, where water conservation and drought contingency plans are typically codified within city ordinances. In Denver, the City code provides the legal framework, while Denver Water establishes and implements the specific conservation measures, including outdoor watering restrictions and drought response actions.

⁴ Board of Water Commissioners, City and County of Denver 2025. *Operating Rules*. Denver, CO.

A. Outdoor Water Conservation Measures

Denver Water establishes year-round and seasonal outdoor water use requirements which apply to all customers as a condition of water service. These rules regulate irrigation practices through assigned watering schedules, seasonal limitations, and restrictions on inefficient water use. These requirements apply at all times unless a drought response stage is in effect. Chapter 14 of the Denver Water Operating Rules defines and prohibits water waste which includes activities such as watering landscaped areas during rain or high wind, watering impervious surfaces, failure to repair leaking irrigation systems or plumbing fixtures, and violating irrigation restrictions. Watering with spray irrigation is limited to three days per week and must take place between 6:00 pm and 10:00 am from May 1 to October 1 (§14.01.1). Spray irrigation of narrow strips of land is prohibited or limited depending on the width. Spray irrigation is prohibited and low-flow irrigation systems are required for strips of land less than six feet wide. For strips of land greater than six feet but less than 25 feet in width, any spray irrigation system must be designed for the specific width of land and be pressure reducing and designed to prevent low head drainage (§14.02.3). These provisions are intended to limit water waste through watering of impervious areas that often results from typical spray irrigation of narrow strips of land such as medians, traffic islands, and street rights-of-way.

Unlike Las Vegas, Denver does not impose permanent restrictions on landscape types such as turf or prohibit specific irrigation system types (in most cases) through its code or utility rules. Instead, the focus is on managing irrigation behavior and reducing water waste through operational controls.

B. Drought Response Stages

Denver Water implements a staged drought response framework through its Operating Rules, under which the Board of Water Commissioners may declare drought conditions and impose increasingly restrictive water use limitations. These drought stages are applied system-wide and are enforceable as part of the utility's regulatory authority. The drought response framework includes three stages with each stage introducing progressively stricter measures, similar to the approach found in Texas. Drought stage restrictions focus on reducing water demand by limiting irrigation frequency and imposing additional outdoor water use limitations. Denver's drought-based irrigation restrictions are less prescriptive than Celina and other Texas benchmark entities. They do not prescribe fixed watering schedules for each stage. Instead, the Board has discretion to adopt specific restrictions based on current water supply conditions. For example, during Stage 1 the Operating rules state that irrigation is "...limited to one or two days per

week in accordance with a schedule adopted by the Board.” (§15.03.1(a)(i)) and outdoor lawn watering may be prohibited between October and April (§15.03.1(a)(iv)). This provides Denver Water with the flexibility to set restrictions to the appropriate level given the situation. Irrigation is generally prohibited in Stage 2 and beyond, with exceptions for certain types of plants, and most other types of outdoor water use is prohibited. Stage 3 allows the Board to “...implement a rationing program for an indefinite period of time to ensure, to the extent possible, that there is adequate water for essential uses.” (§15.05.1). During this stage, all outdoor watering may be prohibited, and indoor water use may be restricted.

C. Additional Water Conservation Programs

Although not explicitly included in the Denver Water Operating Rules or Code of Ordinances, Denver has implemented several other programs to encourage and promote water conservation. Denver Water established a Water Budget Program to provide more flexibility to large irrigation customers who may have difficulty complying with outdoor watering restrictions such as two-day per week watering. Eligible non-residential customers receive an allocated water budget from Denver Water and must achieve a 20% reduction in water use from May 1 through October 31, but gain flexibility in how they use their allocated water if they cannot comply with current restrictions. Denver also offers a rebate program to commercial customers who install high efficiency water fixtures, irrigation system fixtures, and smart irrigation controls.

D. Enforcement Mechanisms

Water conservation requirements in Denver are enforced through a combination of utility authority administered by Denver Water and legal authority established in the Code of Ordinances. This dual framework allows water use restrictions and conservation requirements to be enforced through both operational and legal mechanisms.

Denver Water enforces water use restrictions as a condition of service under its Operating Rules. The utility has authority to monitor customer water use and identify violations of watering restrictions, water waste provisions, and drought response measures. Enforcement actions include notification of violations and escalation of enforcement measures for continued noncompliance, including additional fines added to water bills and suspension of water service. Violations of year-round water conservation restrictions result in fines of \$50 to \$100 for the second and third violations, respectively, and temporary suspension of service for continuation of violations (§14.07). Penalties for violations of the drought stage restrictions are more severe, with fines of up to \$500 for second violations, \$1,500 for third violations, and \$2,000 for

fourth violations (§15.06.1). Failure to comply with any provisions related to drought response is considered a cause for suspension of water service under Denver Water’s service conditions (§15.06.2).

The City of Denver provides additional enforcement authority through the Code of Ordinances. The code establishes that any use of water in violation of rules adopted by the Board of Water Commissioners is unlawful (§56-16) . This provision allows violations of Denver Water’s conservation requirements to be addressed through municipal enforcement mechanisms, including issuance of citations and other legal remedies available under City code.

3.5.3 Reclaimed Water

Reclaimed, or recycled water in Denver is addressed through the Denver Water Operating Rules, which regulate the use of recycled water and other types of nonpotable water. Recycled water is defined as water that has been treated to a quality suitable for irrigation or industrial use but not for human consumption (§1.05(dd)). The Operating Rules establish the framework for how alternative water supplies are integrated into the water system.

Chapter 4 of the Operating Rules governs the use of nonpotable and recycled water systems and establishes requirements intended to protect the potable water supply. These include provisions related to system design, operation, and prevention of cross-connections between potable and nonpotable systems. The rules allow the use of recycled water for applications such as irrigation, provided that these requirements are met. While recycled water may be used for irrigation and other nonpotable purposes, the rules do not establish a requirement that new development utilize recycled water in place of potable water. Instead, recycled water use is permitted where systems are available and compliant with Denver Water requirements.

With respect to water use restrictions, the applicability of Denver Water’s drought and conservation measures is tied to water furnished by the utility. As a result, recycled water sources may not be subject to the same restrictions, depending on how those rules are implemented (§15.01.2). This creates a distinction in how potable and recycled water use are regulated during drought conditions, and may incentivize water users to establish recycled water sources.

3.6 EAST BAY MUNICIPAL UTILITY DISTRICT

East Bay Municipal Utility District (EBMUD) is a public utility district that provides water service to approximately 1.4 million people in the eastern San Francisco Bay area. Unlike the other benchmark entities evaluated in this study, EBMUD is not a municipal government but a regional water provider serving multiple cities such as Oakland, Berkeley, Richmond, and others. EBMUD employs a comprehensive, utility-driven approach to water conservation and has direct authority over both development-related water use and customer water consumption. EBMUD’s authority over water use is similar to the utility-centered framework seen in Las Vegas and Denver, but EBMUD also integrates multiple layers of water conservation regulation into its service rules, including development requirements, ongoing water use restrictions, drought response measures, and recycled water provisions.

Overall, EBMUD’s framework addresses water conservation through:

- mandatory water efficiency requirements tied to development and service approval,
- ongoing water use restrictions and waste prohibitions,
- a staged drought response system based on volumetric water use limits, and
- requirements and authority related to recycled water use

as implemented through the EBMUD’s Regulations Governing Water Service⁵ and associated ordinances. This integrated, utility-driven approach provides a distinct model for regulating water demand that differs from the ordinance-based frameworks used by most Celina and Texas cities and offers several potential strategies that could inform future water conservation policies in Celina.

3.6.1 Water Efficiency Requirements for Development

A. Applicability and Service Conditioning

EBMUD regulates water conservation in new development and expanded service through Section 31 of its Regulations Governing Water Service, which makes compliance with detailed water-efficiency requirements a condition of receiving water service. The regulations state that water service “shall not be furnished” for new, increased, or expanded service, or for a change in customer classification that includes new or retrofitted water-using equipment, unless all applicable water-efficiency measures have been reviewed and approved by the District, and all required measures must be installed at the applicant’s

⁵ East Bay Municipal Utility District. 2025. *Regulations Governing Water Service*. Oakland, CA.
<https://www.ebmud.com/development-services/new-or-modified-service/regulations/regulations-governing-water-service>

expense (§31(B)). In addition, EBMUD reviews applications for compliance, requires submission of design and construction documentation, and may inspect installations to verify that required measures are properly installed and functioning (§31(A)).

B. Indoor Water Efficiency Requirements

EBMUD establishes detailed indoor water efficiency standards for fixtures and appliances (§31(C)). These include:

- Toilets limited to 1.28 gallons per flush (gpf), or 1.0 gpf for pressure-assisted models,
- Wall-mounted urinals limited to 0.125 gpf or zero-water use, and floor-mounted urinals limited to 0.5 gpf,
- Showerheads limited to 1.8 gallons per minute (gpm),
- Residential lavatory faucets limited to 1.2 gpm and public lavatory faucets limited to 0.5 gpm,
- Kitchen faucets limited to 1.8 gpm (with optional temporary flow to 2.2 gpm),
- Clothes washers with a water factor of 4.5 or less,
- Residential dishwashers limited to 5.0 gallons per cycle (standard) or 3.5 gallons per cycle (compact).

Additional requirements apply to commercial and industrial equipment, including:

- Recirculating cooling towers with conductivity controls,
- Boilerless or low-water-use food steamers,
- Air-cooled or closed-loop refrigeration systems (no once-through systems allowed),
- Energy Star commercial dishwashers meeting specified water use limits,
- Vehicle wash systems that reuse water,
- Covered pools and spas when not in use

C. Outdoor Water Efficiency and Irrigation Requirements

EBMUD requires compliance with District regulations and applicable state standards, including the Model Water Efficient Landscape Ordinance (MWELO)⁶. These requirements apply to irrigation system design, landscape design, and documentation (§31(D)).

⁶<https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance>

For projects with 500 square feet or more of irrigable landscape area, required irrigation system components include:

- Weather-based smart irrigation controllers with rain or soil moisture sensors,
- Manual shutoff valves, backflow prevention devices, and pressure regulators, and
- System design allowing irrigation coverage of all landscape areas

Additional requirements include:

- Flow sensors with master shutoff valves for larger landscapes
- Dedicated irrigation meters based on landscape size thresholds

Supporting landscape documentation requirements include:

- Hydrozoning based on plant water needs
- Turf limitations (maximum 25% of landscaped area)
- Soil amendment and mulch requirements
- Submission of detailed planting and irrigation plans (MWELo compliance)
- Prohibition of non-functional turf for commercial, industrial, and institutional properties (MWELo compliance)

D. Water Budgeting and Landscape Demand Limits

For landscape areas above specified thresholds, EBMUD requires project-specific water budget calculations. Applicants must demonstrate that Estimated Total Water Use (ETWU) does not exceed Maximum Applied Water Allowance (MAWA) (MWELo requirements). The ETWU represents projected water demand based on landscape design, while MAWA establishes the maximum allowable annual water use for the project. Compliance with this requirement is mandatory for service approval, making it one of the most direct mechanisms used by EBMUD to regulate outdoor water demand.

3.6.2 Water Use Restrictions and Drought Response

EBMUD regulates ongoing water use and drought response through a combination of Section 29 (Water Use Restrictions) of its Regulations Governing Water Service and Ordinance No. 373-21 (Excessive Water Use Penalty Ordinance). Together, these provisions establish enforceable restrictions on water use, prohibit wasteful practices, and implement a staged drought response framework based on total water consumption.

A. Water Use Restrictions and Prohibited Practices

Section 29 establishes baseline prohibitions on inefficient and wasteful water use practices that apply regardless of drought stage. These provisions regulate how water may be used and are enforceable as conditions of service. The regulations prohibit:

- Irrigation that results in runoff beyond the landscaped area,
- Irrigation during or within a specified period following measurable rainfall,
- Use of potable water for washing hard surfaces such as driveways and sidewalks,
- Use of potable water for decorative fountains or water features that do not recirculate water, and
- Operation of irrigation systems or equipment that are not properly maintained, including failure to repair leaks.

Section 29 limits inefficient equipment and practices including restrictions on the use of once-through cooling systems and requirements for water recycling in certain commercial or industrial applications. Collectively, these provisions establish a baseline standard for efficient water use and prohibit practices that result in unnecessary water loss.

B. Drought Response Framework

EBMUD implements drought response through a staged framework established in its Excessive Water Use Penalty Ordinance. The ordinance defines Stage 2, Stage 3, and Stage 4 drought conditions, which correspond to increasing levels of water supply shortage, ranging from significant to critical shortages. Stages are declared by the Board of Directors based on water supply conditions, with recommendations provided by the General Manager. The stages may be implemented in any order and may be adjusted or terminated as conditions change. The ordinance also allows for additional rules and regulations to be implemented if necessary to protect the water supply.

Unlike many cities that regulate irrigation practices through watering schedules and time-of-day restrictions, EBMUD regulates water use during drought conditions through volumetric limits on total water consumption.

For single-family residential customers, the ordinance establishes maximum allowable water use per billing cycle based on the declared drought stage. For example:

- Under Stage 2, customers are limited to specified volumetric thresholds of potable water use per billing cycle,

- Under Stage 3, these limits are reduced further to reflect more severe water shortages, and
- Under Stage 4, the most restrictive limits are applied, representing critical shortage conditions.

These limits apply to total potable water use, including both indoor and outdoor consumption, rather than targeting specific uses such as irrigation.

C. Enforcement and Penalties

EBMUD enforces drought-related water use limits through a combination of administrative penalties and service-based enforcement mechanisms. Water use in excess of the established limits is considered a violation and is subject to penalties. Customers are subject to a civil administrative penalty based on the volume of water used in excess of the allowable limit, applied an additional charge of \$2.00 per hundred cubic feet (CCF) equivalent to 748 gallons. In addition to financial penalties, the District may pursue other enforcement actions, including limiting or discontinuing water service, installing flow-restricting devices, and seeking legal remedies such as injunctive relief. The ordinance includes provisions to address unintentional violations, such as allowing a first exceedance during a drought cycle without penalty, with subsequent violations subject to enforcement.

D. Key Characteristics of EBMUD's Approach

EBMUD's water use restriction and drought response framework is distinguished by several characteristics that differ from other benchmark entities reviewed:

- Regulation of total water consumption rather than specific irrigation practices,
- Use of volumetric thresholds tied to billing cycles
- Implementation of financial penalties tied to the volume of excessive water use directly through utility billing

This approach differs from the irrigation-focused drought restrictions used by many Texas cities and demonstrates an alternative model in which water conservation is achieved by regulating overall demand rather than specific end uses.

3.6.3 Irrigation Demand Management and Monitoring

EBMUD supplements its development requirements and water use restrictions with irrigation demand management and monitoring tools that provide customers with information on expected water use and

support ongoing conservation after service is established. These tools are implemented through EBMUD’s irrigation service application requirements and customer information systems. As part of the application for irrigation service, customers are required to provide detailed information regarding the type and extent of irrigated landscape area, including the square footage of turf, shrubs and groundcover, trees, water features, and non-irrigated areas. This information is used by EBMUD to estimate irrigation demand associated with the property and to establish a baseline for evaluating water use.

EBMUD utilizes an Irrigation Reduction Information System (IRIS) to provide customers with feedback on irrigation water use. The IRIS system compares the amount of water used during a billing period to an estimate of how much water should have been used based on landscape area and current weather conditions. This information is provided to customers on their water bill, allowing them to compare actual consumption with estimated irrigation demand and adjust their water use accordingly. The IRIS system represents a demand management approach that differs from traditional regulatory restrictions by providing data-driven guidance rather than prescriptive limits. Customers are informed of appropriate irrigation levels based on site-specific conditions, including landscape composition and climate factors, which supports more efficient water use without requiring fixed irrigation schedules.

3.6.4 Recycled Water

EBMUD regulates the use of reclaimed water—referred to in its regulations as recycled water or nonpotable water—through Section 30 (Recycled Water Service) of its Regulations Governing Water Service. These provisions establish a framework under which recycled water is not only permitted, but may be required as a condition of service for certain applications. EBMUD may require customers to use recycled water for nonpotable purposes where such water is available and feasible, including irrigation and other approved uses (§30(A), §30(B)). Unlike most benchmark entities, this allows EBMUD to mandate substitution of potable water with recycled water under specified conditions.

The regulations also establish recycled water service areas or reuse zones, within which customers may be required to connect to recycled water infrastructure (§30(B)). Within these areas, EBMUD may require connection to recycled water systems, installation of dual plumbing systems, and conversion of existing potable water systems to recycled water service where applicable (§30(B), §30(C)). These provisions allow EBMUD to implement recycled water use at both the development stage and for existing properties where system expansion occurs.

3.6.5 Implementation and Enforcement Mechanisms

EBMUD enforces water conservation requirements primarily through control of water service, plan review, and billing-based penalties. This approach allows them to regulate water use at multiple points, including development approval and ongoing customer use.

A key enforcement mechanism is the ability to condition and withhold water service. Water service will not be provided unless all applicable water-efficiency requirements are reviewed, approved, and installed (Regulations Governing Water Service, §31(B)). EBMUD may also withhold meter installation or service activation until compliance is achieved (§31(E)). This ensures that water conservation measures are implemented prior to occupancy or operation. EBMUD also enforces compliance through a plan review and inspection process, including the ability to require documentation, verify installation of efficiency measures, and require retrofits of existing systems when service is expanded (§31(A)). This extends enforcement beyond new development to existing properties undergoing changes.

For ongoing water use, EBMUD applies billing-based penalties tied directly to consumption. During drought conditions, customers exceeding allowable water use thresholds are subject to administrative penalties applied through their water bill (Ordinance No. 373-21, §3.F.1). EBMUD also retains authority to limit or discontinue water service or install flow-restricting devices for violations (§3.F.6).

While some of these mechanisms are specific to a utility district, several concepts—such as conditioning service approval, requiring verification of installed measures, and applying consumption-based penalties—may be adaptable within the legal framework of a municipal utility system like Celina’s.

4.0 KEY FINDINGS FROM BENCHMARKING ANALYSIS

The benchmarking analysis identified several key patterns in how water conservation is addressed across the evaluated entities, including San Antonio, Austin, Cedar Park, Las Vegas, Denver, and EBMUD. While each entity operates within a different regulatory and climatic context, the comparison highlights consistent strategies for reducing water demand, particularly in new development. Overall, the benchmark entities approach water conservation through a combination of:

- **development-related requirements**, which influence long-term water demand through landscape design, irrigation systems, and building-level efficiency measures, and

- **operational controls**, which regulate ongoing water use through irrigation restrictions, drought response measures, and enforcement mechanisms.

The relative emphasis placed on these approaches varies significantly. Texas cities, including Celina, primarily rely on ordinance-based frameworks with structured drought stages and irrigation restrictions, while western entities such as Las Vegas, Denver, and EBMUD rely more heavily on utility-driven regulatory systems that are implemented through service rules, operational policies, and conditions of water service.

In general, the most effective water conservation frameworks observed in the benchmark entities incorporate mechanisms to reduce landscape irrigation demand at the time of development, tools to improve irrigation system efficiency and performance, and enforceable restrictions or incentives that influence long-term water use behavior. The following sections summarize the common themes identified across the benchmark entities and highlight how Celina’s current regulations compare.

4.1 COMMON THEMES

The benchmarking analysis identified several consistent strategies used across the evaluated entities to reduce water demand, particularly related to landscape irrigation and outdoor water use. While the specific regulatory frameworks differ, the underlying focus is largely the same: reducing irrigation demand, improving system efficiency, and strengthening enforcement mechanisms to influence long-term water use behavior.

Emphasis on Outdoor Irrigation as a Primary Driver of Water Demand

A primary theme across all entities is the emphasis on outdoor irrigation as a major driver of water demand. Each benchmark entity includes provisions intended to limit irrigation-related water use, recognizing that landscape irrigation often represents a significant portion of total potable water demand. The methods used to address this vary. Texas cities such as Cedar Park, Austin, and San Antonio rely primarily on irrigation schedules and time-of-day restrictions, while Las Vegas and EBMUD incorporate more direct controls on landscape design, including limitations on turf and requirements for hydrozoning and low-water-use plant materials. Austin and EBMUD also integrate landscape design standards that reduce reliance on potable irrigation, such as stormwater-based irrigation or water-efficient landscape requirements.

Shift Toward Demand-Based and Performance-Oriented Standards

Another theme seen in several entities is a shift toward performance-based or demand-based approaches. Several entities regulate water use by limiting overall demand rather than prescribing specific irrigation practices. Several entities' use of landscape water budgets, which require that estimated water use not exceed a maximum allowable threshold, is a clear example of this approach. Similarly, Las Vegas limits turf and irrigation practices in a way that indirectly constrains total water use. These approaches provide flexibility in how water savings are achieved while still establishing measurable limits on demand.

Utility-Driven Water Conservation Frameworks

The role of the water utility is also a key differentiator across the benchmark entities. In Las Vegas, Denver, and EBMUD, water conservation is largely implemented through utility-driven frameworks, where rules are enforced as conditions of water service. This allows for more direct control over customer water use and enables enforcement through billing, service limitations, or other operational mechanisms. In contrast, Texas cities primarily rely on municipal ordinances and development standards, with utilities playing a more limited regulatory role. Despite this difference, all entities use some combination of regulatory and operational tools to manage water demand.

Integration of Irrigation System Efficiency Requirements

Across all entities, there is also a consistent emphasis on irrigation system efficiency and design standards. Requirements such as weather-based irrigation controllers, rain or soil moisture sensors, system zoning based on plant water needs, and design standards to prevent runoff and overspray are commonly used to improve irrigation performance. These measures are typically required for new development and are intended to reduce water waste over the long term.

Expanded Enforcement Mechanisms

Finally, the benchmark entities demonstrate a range of enforcement mechanisms that extend beyond traditional ordinance-based citations. These include billing-based penalties tied to water use, service-based enforcement such as flow restrictors or service discontinuation, and administrative enforcement through utility or municipal processes. These approaches provide more direct and scalable tools for achieving compliance and are often more effective at influencing customer behavior than traditional enforcement methods alone.

4.2 AREAS WHERE CELINA ALIGNS WELL WITH BENCHMARKS

The review of Celina’s existing ordinances indicates that the City already incorporates several water conservation practices that are consistent with those used by the benchmark entities. In particular, Celina demonstrates a strong foundation in areas related to irrigation system design, drought response structure, and enforcement mechanisms.

4.2.1 Drought Response Framework

Celina’s drought contingency framework is generally well aligned with other Texas benchmark cities and provides a clear, structured approach to managing water use during periods of limited supply. Similar to Austin, San Antonio, and Cedar Park, Celina utilizes defined drought stages with progressively stricter restrictions, including limitations on irrigation frequency and timing. This is primarily due to Texas state regulations, but comparing Celina’s drought stage structure to other Texas cities helps identify potential areas for additional water savings.

4.2.2 Irrigation Design Standards

Celina also aligns well with benchmark entities in its regulation of irrigation system design and performance through its Engineering Standards. Requirements such as the use of ET-based controllers, zoning irrigation systems based on plant water needs, and design standards to minimize runoff and overspray are consistent with best practices observed across the benchmark entities. These types of provisions are widely recognized as effective tools for improving irrigation efficiency and reducing water waste, particularly in new development.

4.2.3 Water Waste Enforcement

Celina’s code further aligns with benchmark practices through its inclusion of water waste prohibitions and enforcement mechanisms. Celina prohibits inefficient irrigation practices such as runoff and watering during precipitation, which is consistent with requirements found in Austin, San Antonio, Denver, and EBMUD. In addition, Celina’s enforcement framework, which includes notices of violation, escalating penalties, and the ability to discontinue service, is comparable to the enforcement approaches used by most benchmark entities. These provisions provide Celina with the tools necessary to achieve compliance with water conservation requirements.

4.2.4 Summary of Alignment

Overall, Celina’s current regulatory framework demonstrates a solid foundation in several key areas of water conservation. Celina’s approach to drought management, irrigation system design, and enforcement is generally consistent with practices used by the benchmarks. These strengths provide a strong basis for building additional water conservation measures, particularly in areas related to landscape design and long-term demand reduction.

4.3 AREAS FOR POTENTIAL IMPROVEMENT

While Celina’s current ordinances provide a strong foundation in several areas, the benchmarking analysis identified opportunities to strengthen the City’s regulatory framework to more directly reduce long-term water demand, particularly in new development.

4.3.1 Development-Level Water Efficiency Requirements

One key opportunity is to expand development-level water efficiency requirements. Celina’s current code includes standards related to irrigation system design and operation but does not require comprehensive indoor and outdoor water efficiency measures as a condition of development approval. In contrast, EBMUD requires applicants to demonstrate compliance with detailed water efficiency standards prior to receiving water service, including both fixture-level requirements and landscape irrigation standards. While Celina operates within a different regulatory framework, incorporating additional water efficiency requirements at the time of development, such as **minimum fixture efficiency standards or enhanced irrigation system criteria**, could help reduce long-term demand.

4.3.2 Landscape Water Demand Reduction

Another area for improvement is reducing landscape-related water demand through design standards. Celina’s zoning and subdivision ordinances regulate the installation of landscaped areas but do not significantly limit the water demand associated with those areas. Requirements such as **turf limitations, hydrozoning, or minimum percentages of drought-tolerant plant materials** are not currently included. Benchmark entities such as Austin and EBMUD incorporate these types of provisions to reduce irrigation demand by influencing plant selection and landscape design. Incorporating similar standards into Celina’s code could help reduce the amount of water required to maintain landscaped areas over time.

In addition, some benchmark entities include more targeted landscape restrictions aimed at reducing inefficient irrigation. For example, Denver **limits or prohibits spray irrigation in narrow landscape areas**

and requires low-flow irrigation systems for strips below certain widths. These types of provisions are intended to reduce water waste associated with irrigating small or irregularly shaped areas, such as medians and parkways, where conventional irrigation systems are often inefficient.

4.3.3 Demand-Based Water Use Limits

Closely related to landscape design is the opportunity to implement demand-based or performance-oriented water use limits. Celina’s current regulations focus on how irrigation systems are designed and operated but do not establish limits on the total amount of water that may be used for irrigation. Denver, Las Vegas, and EBMUD’s use of water budgets, which require that estimated water use not exceed a defined maximum, represents an alternative approach that directly regulates demand. While this type of requirement may not be feasible to implement in full, elements of a demand-based approach, such as limiting irrigated area or establishing guidelines for expected water use, could potentially be adapted to Celina’s framework.

4.3.4 Water Reuse Framework

Celina also has an opportunity to strengthen its water reuse framework. The City has identified water reuse as a potential conservation strategy, but detailed requirements and design standards are not yet established in the Code of Ordinances or Engineering Standards. Benchmark entities demonstrate a range of approaches, from incentives and regulatory flexibility (Austin) to required use of recycled water where available (EBMUD). As Celina continues to develop its reclaimed water infrastructure, establishing clear standards and requirements for its use could help reduce reliance on potable water for irrigation and other non-potable applications.

4.3.5 Enhanced Enforcement Mechanisms

There is also an opportunity to enhance enforcement mechanisms related to water use. Celina’s current framework includes provisions such as notices of violation, fines, and the ability to discontinue service, which are consistent with many benchmark entities. However, other entities incorporate additional tools, such as billing-based penalties tied directly to water use or a stronger linkage between consumption and enforcement. While some of these approaches may be constrained by local regulatory authority, exploring ways to strengthen the connection between water use and enforcement could improve compliance and conservation outcomes.

5.0 RECOMMENDATIONS FOR CELINA

FNI will complete this section once we receive feedback from City on what the final recommendation to take to council should be

APPENDIX A

Recommended Plant Lists

City of Austin Recommended Plant List

APPENDIX N - CITY OF AUSTIN PREFERRED PLANT LIST

Other native or well adapted plant may be used if drawings are sealed by a registered Texas Landscape Architect and approved by the Director of Planning and Development Review. The invasive potential of non-native plants should be considered when developing landscape plans.

EVERGREEN TREES	HEIGHT	FEATURES (N = Native)
Arizona Cypress Cupressus arizonica	30'-75'	good heat and drought tolerance, aromatic foliage
Cherry Laurel Prunus caroliniana	25'-30'	N, screening plant, wildlife food
Deodar Cedar Cedrus deodara	40'-50'	fine texture, needs drainage
Live Oak Quercus virginiana	50'-60'	N, oak wilt susceptible
Mountain Laurel Sophora secundiflora	15'-25'	N, fragrant purple spring blossoms, small tree, large shrub
Texas Madrone Arbutus texana	2'-30'	N, distinctive, attractive bark, difficult to propagate and transplant
Yaupon Holly Ilex vomitoria	15'-20'	N, red berries in winter, small tree, large shrub
DECIDUOUS TREES	HEIGHT	FEATURES (N = Native)
American Elm Ulmus americana	60'-80'	N, vase-shaped canopy, susceptible to Dutch Elm disease

American Smoketree Cotinus obovatus	15'-25'	N, spring floral "clouds", fall color
Arizona Walnut Juglans major	40'-50'	N, nuts attract wildlife
Bald Cypress Taxodium distichum	60'-70'	N, fine texture, rust fall color
Bigtooth Maple Acer grandidentatum	30'-40'	N, outstanding fall foliage, requires drainage
Blackjack Oak Quercus marilandica	50'-60'	N, short-lived, bell-shaped leaves
Bradford Pear Pyrus calleryana "Bradford"	30'-40'	showy white spring flowers
Bur Oak Quercus macrocarpa	60'-100'	N, large fringed acorn, majestic, adaptable tree
Cedar Elm Ulmus crassifolia	50'-60'	N, fall color, small leaves
Chinquapin Oak Quercus Muhlenbergii	40'-60'	N, tall, slender form, dark glossy lush foliage
Crape Myrtle* Lagerstroemia indica	25'-30'	summer flowers, many varieties
Desert Willow Chilopsis linearis	15'-25'	N, orchid-like blooms, not a true willow
Drake Elm Ulmus parvifolia 'Drake'	20'-30'	nearly evergreen, drought tolerant

Durand Oak Quercus sinuata	50'-70'	N, large oak, prefers moist sites
Eastern Walnut Juglans nigra	70'-80'	N, large tree, valued for nuts
Escarpment Cherry Prunus serotina	20'-30'	N, fall color, fruit for wildlife and jellies
Eve's Necklace Sophora affinis	20'-30'	N, same genus as Mt. Laurel, pink blooms in late spring
Flameleaf Sumac Rhus copallina and R. glabra	15'-20'	N, brilliant fall color, may colonize
Fragrant Ash Fraxinus cuspidata	10'-12'	N, fragrant white flowers in late spring
Honey Mesquite Prosopis glandulosa	25'-30'	N, drought tolerant, wood valued for smoking meat
Kidneywood Eysenhardtia texana	10'-15'	N, fragrant fall flowers, small tree, large shrub
Lacey Oak Quercus glaucoides and Q. laceyi	20'-40'	N, small tree, peach colored foliage in spring and fall
Little Walnut Juglans microcarpa	20'-30'	N, small tree, strongly scented, good for attracting wildlife
Mexican Buckeye Ungnadia speciosa	10'-15'	N, pink spring flowers, small tree, large shrub
Mexican Plum Prunus mexicana	15'-25'	N, white spring blossoms, wildlife food

Orchid Tree Bauhinia spp.	6'-12'	N , showy white blossoms, small understory or patio tree
Pecan Carya illinoensis	60'-80'	N , shade tree, nut producing
Possumhaw Ilex decidua	15'-20'	N , red winter berries, large shrub, small tree
Post Oak Quercus stellata	50'-75'	N , large oak, roots sensitive to disturbance
Red Buckeye Aesculus pavia	10'-20'	N , good understory tree, requires deep well-drained soils
Rusty Blackhaw Viburnum rufidulum	10'-15'	N , good understory tree, glossy leaves, fall color
Shin Oak Quercus sinuata brevifolia	30'-35'	N , small tree, attractive bark, grows in thickets
Shumard Oak Quercus shumardii	50'-75'	N , fast growing, good fall red foliage coloration, tolerant of limestone soils
Texas Ash Fraxinus texensis	40'-50'	N , fast growing, shade tree exceptional fall foliage coloration
Texas Persimmon Diospyros texana	15'-25'	N , wildlife food, multi-trunk
Texas Redbud Cercis canadensis var. 'Texensis'	20'-25'	N , early pink blossoms, drought tolerant

Texas Red Oak Quercus texana	30'-40'	N, white patches on bark, fall color
Western Soapberry Sapindus Drummondii	30'-40'	N, showy winter fruit, yellow fall color
*susceptible to severe freeze		

EVERGREEN SHRUBS	SUN	SHADE	FEATURES (N = Native)
Agarita Berberis trifoliolata	o		N, prickly leaves, bright red berries
Barbados Cherry* Malpighia glabra	o	o	N, pale pink flowers, berries attract wildlife
Burford Holly Ilex cornuta 'Burfordii'	o	o	glossy dark green foliage, red fruit
Dwarf Burford Holly Ilex cornuta 'Burfordii nana'	o	o	glossy leaves, berries not prominent
Dwarf Chinese Holly Ilex cornuta 'Rotunda nana'	o	o	spiney foliage, no berries
Dwarf Yaupon Holly Ilex vomitoria 'Nana'	o	o	low mound-like shrub, no berries
Evergreen Sumac Rhus virens	o	o	N, glossy leaves, red fall color when mature

Indian Hawthorn* Raphiolepis indica	o		pink flowers, copper colored new foliage
Mountain Laurel Sophora secundiflora	o	o	N , showy fragrant purple flower, large shrub
Oleander* Nerium oleander	o		summer flowers, large shrub
Red Yucca Hesperaloe parviflora	o		N , coral flower spike, not a true yucca
Rock Cotoneaster Cotoneaster horizontalis	o		red fall fruit, small leaves
Rosemary* Rosmarinus officinalis	o		aromatic leaves, 'Prostratus' cultivar
Sacahuista, Bear Grass Nolina texana	o	o	N , grass-like mounding clumps
Shore Juniper Juniperus conferta	o		spreading, ground cover, blue-green
Silverleaf Cotoneaster Cotoneaster glaucophyllus	o		silver leaves, red fall fruit
Texas Sage Leucophyllum frutescens	o		N , lavender flowers, gray or green foliage
Texas Sotol Dasylirion texanum	o		N , long blade-like leaf with spines

Wax Myrtle Myrica cerifera	o	o	N, very adaptable, aromatic leaves, berries used for Bayberry fragrance
* susceptible to severe freeze			
SEMI-EVERGREEN SHRUBS**	SUN	SHADE	FEATURES (N = Native)
Cast Iron Plant* Aspidistra elatior	o		broad strap shaped leaves to 2' height
Glossy Abelia Abelia grandiflora		o	small pink flowers, glossy leaves
Muhly Grass Muhlenbergia lindheimeri	o		N, looks like small pampas grass
Pineapple Guava* Feijoa sellowiana	o		exotic fragrant flowers
Pomegranate* Punica granatum	o	o	orange flowers, yellow fall color
Primrose Jasmine* Jasminum mesnyi	o		yellow flowers, mounding form
* susceptible to severe freeze			
**influenced by severity or duration of winter			
DECIDUOUS SHRUBS	SUN	SHADE	FEATURES (N = Native)
Althaea Hibiscus syriacus	o		showy summer flowers

American Beautyberry Callicarpa americana	o	o	N, purple fruit in autumn, wildlife food
Aromatic Sumac Rhus aromatica	o	o	N, red berries in late spring, brilliant fall foliage
Arrowwood Viburnum dentatum	o	o	N, spring flowers, fall color
Black Dalea Dalea frutescens	o		N, purple summer flowers, fine foliage
Butterfly Bush Buddleia Davidii	o		N, lavender/lilac flowers, small fuzzy leaves
Flame Acanthus Anisacanthus Wrightii	o	o	N, orange flowers attracts hummingbirds
Possumhaw Holly Ilex decidua	o	o	N, red winter berries large shrub
Texas Lantana* Lantana horrida	o		N, good summer color, many varieties
Trailing Lantana* Lantana montevidensis	o	o	N, lilac colored flowers summer through fall
*susceptible to severe freeze			
EVERGREEN VINES & GROUNDCOVERS	SUN	SHADE	FEATURES (N = Native)
Asian Jasmine* Trachelospermum asiaticum	o	o	low vigorous groundcover

Carolina Jessamine Gelsemium sempervirens	o	o	N , fragrant yellow flowers in spring
Coral Honeysuckle Lonicera sempervirens	o	o	N , coral flowers, red fruit, attracts wildlife
Cross Vine Bignonia capreolata	o	o	N , yellow/red flowers, clinging vine
Damianita Chrysactinia mexicana	o		N , yellow flowers, low growing to 12" height
Fig Vine* Ficus pumila	o	o	clinging vine, fine texture
Lady Banksia Rose Rosa banksiae	o		yellow spring flowers, large cascading form
Liriope Liriope muscari		o	purple spike flowers, clump-like foliage
Monkey Grass Ophiopogon japonicus		o	tufted grass-like groundcover
Oregano Origanum vulgare	o	o	perennial, spreading herb
Santolina Santolina chamaecyparissus	o		fine textured, aromatic foliage
Stonecrop Sedum spp.	o	o	low, fast growing groundcover

*susceptible to severe freeze

DECIDUOUS VINES & GROUNDCOVERS	SUN	SHADE	FEATURES (N = Native)
Boston Ivy Parthenocissus tricuspidata 'Veitchii'	o	o	N, red fall color, clinging vine
Bush Morning Glory Ipomoea leptophylla	o	o	N, forms 1½' - 3' mounds of foliage, avender to purple flowers
Cypress Vine Ipomoea quamoclit	o		red tube-like flowers, twining vine, annual
Gregg Dalea* Dalea greggii	o	o	N, purple flowers in fall, groundcover
Mustang Grape Vitis mustangensis	o	o	N, native grape, climbs by tendrils
Old Man's Beard Clematis Drummondii	o	o	twining vine, feathery seeds
Passion Vine* Passiflora incarnata	o	o	N, lavender flowers, edible fruit: Maypop
Sweet Autumn Clematis Clematis paniculata	o		fragrant fall flowers, twining vine
Trumpet Vine Campsis radicans	o	o	N, orange-scarlet flowers, invasive
Virginia Creeper Parthenocissus quinquefolia	o	o	N, red fall color, clinging vine

*susceptible to severe freeze			
FLOWERING PERNNIALS	SUN	SHADE	FEATURES (N = Native)
Artemisia Artemisia ludoviciana	o		N, aromatic foliage, white fuzzy leaves
Black-eyed Susan Rudbeckia hirta	o	o	N, yellow dark-centered daisy, flowers May to September
Blackfoot Daisy Melampodium leucanthum	o		N, short white daisy, flowers all summer, short-lived
Butterfly Weed Asclepias tuberosa	o	o	N, orange/yellow flowers, attracts butterflies
Canna Lily Canna X generalis	o		banana-like foliage blooms in summer
Cedar Sage Salvia roemeriana		o	N, red flowers, naturalizes
Cherry Sage Salvia greggii	o	o	N, red, pink or white flowers
Cigar Plant Cuphea micropetala	o		orange-yellow fall flowers
Coreopsis Coreopsis lanceolata	o		N, yellow spring and fall flowers, clumping
Daylily Hemerocallis fulva	o		orange/yellow funnel-shaped flower

Fall Aster Aster spp.	o	o	N, blue/purple autumn flowers
Firebush* Hamelia patens	o		red-orange flowers, red fall color
Gayfeather Liatris spp.	o		N, purple flower spikes in autumn
Heartleaf Hibiscus Hibiscus cardiophyllus	o	o	N, red flowers all summer
Hinckley's Columbine Aquilegia Hinckleyana		o	bright yellow flowers in spring
Hymenoxys Hymenoxys scaposa	o		N, small yellow daisy, bitter smelling leaves
Lamb's Ears Stachys byzantina	o		unique foliage, low growing
Maximillian Sunflower Helianthus maximiliana	o		N, yellow flower, late summer to fall
Mealy Blue Sage Salvia farinacea	o		N, blue flower spikes spring and summer
Mexican Bush Sage Salvia leucantha	o		tall purple flower spikes
Mexican Heather* Cuphea hyssopifolia	o		tiny purple, pink or white flowers
Mexican Marigold Mint Tagetes lucida	o	o	yellow fall flowers, anise flavored foliage

Mexican Oregano Poliomintha longiflora	<input type="radio"/>		lavender/pink flowers, aromatic
Oxeye Daisy Chrysanthemum leucanthemum	<input type="radio"/>		white early summer flower, yellow center
Peruvian Verbena* Verbena peruviana	<input type="radio"/>		pink, purple, red or white flowers,
Pink Skullcap Scutellaria suffrutescens	<input type="radio"/>	<input type="radio"/>	pink flowers in summer, low growing
Plumbago* Plumbago auriculata	<input type="radio"/>	<input type="radio"/>	low growing, blue flowers
Purple Coneflower Echinacea purpurea	<input type="radio"/>	<input type="radio"/>	N , purple daisy-like flowers
Rose Mallow Pavonia lasiopetala	<input type="radio"/>	<input type="radio"/>	N , pink hibiscus-like flowers
Scarlet Sage Salvia coccinea	<input type="radio"/>	<input type="radio"/>	N , red, pink or white flowers, spring to fall
Spiderwort Tradescantia x Andersoniana		<input type="radio"/>	N , purple-blue flowers, informal ground cover
Turk's Cap Malvaviscus arboreus colonizing 'Drummondii'	<input type="radio"/>	<input type="radio"/>	N , red flowers and fruit, colonizing
Yarrow Achillea millefolium	<input type="radio"/>	<input type="radio"/>	off-white flowers, pink variety available

White Mistflower Eupatorium Wrightii	o	o	N , white autumn flowers, attracts butterflies
Wild Petunia Ruellia nudiflora		o	N , purple flowers from March to December
Zexmenia Wedelia hispida	o	o	N , orange/yellow flowers, May to November
*susceptible to severe freeze			
TURF & LOW GRASSES	SUN	SHADE	FEATURES (N = Native)
Bermuda Cynodon dactylon	o		seed or hybrid sod
Blue Grama Bouteloua gracilis	o		N , seed, fine-leaf tufted grass, good meadow grass, not for mowed lawns
Buffalograss Buchloe dactyloides	o		N , many seed varieties, sod available in '609' and Prairie hybrids
Little Bluestem Schizachyrium scoparium	o		N , seed, blue-green, fine texture, not for mowed lawns
Side Oats Gramma Bouteloua curtipendula	o	o	N , seed, not for mowed lawns

Source: [Rule No. R161-14.28, 12-30-2014.](#)

City of San Antonio Recommended Plant List

**APPENDIX E - SAN ANTONIO RECOMMENDED PLANT LIST—ALL SUITED TO
XERISCAPE PLANTING METHODS**

TREES				
Small: Fifteen (15) to twenty-five (25) Feet; Medium: Twenty (25) to Forty (40) Feet; Large: Forty (40) Feet and Higher (60'+)				
Common Name	Scientific Name	Height	Remarks	Shade Area
Anacacho, Orchid tree*	<i>Bauhania congesta</i>	S—M	Semi-Evergreen, tree-shrub, white flower clusters	275
Anaqua*, Sandpaper tree	<i>Ehretia anacua</i>	M—L	Evergreen broadleaf; white flower clusters	875
Arizona Cypress	<i>Cupressus arizonica</i>	M—L	Evergreen conifer; gray green foliage; pyramidal shape	875
Texas Ash*, Green Ash	<i>Fraxinus</i> sp.	M—L	Deciduous; fast growing	875
Ashe Juniper*	<i>Juniperus ashei</i>	S—M	Evergreen conifer; green foliage, females fruit	275
Bald Cypress**	<i>Taxodium distichum</i>	L	Deciduous conifer; fine textured foliage; fall color	875
Big Tooth Maple**	<i>Acer grandidentatum</i>	M	Deciduous: full to partial sun: Medium water, fall color: no	550
Black Willow*	<i>Salix nigra</i>	M—L	Deciduous; riparian species	875
Bur Oak*	<i>Quercus macrocarpa</i>	L	Deciduous; large acorns and leaves, good shade tree	1200
Carolina Buckthorn*	<i>Rhamnus caroliniana</i>	S—M	Semi-Evergreen; sun-shade, glossy leaves, reddish fruit	275
Cedar Elm*	<i>Ulmus crassifolia</i>	M—L	Deciduous; narrow canopy, good shade tree for R.O.Ws	875
Chinquapin Oak*	<i>Quercus muhlenbergii</i>	M—L	Deciduous; round-topped tree; bold foliage	875
Condalia, Brazil Tree, Bluewood Condalia*	<i>Condalia hookeri</i> , <i>C. viridis</i>	S—M	Evergreen; delicate foliage; very drought tolerant; sun-shade, good shade tree	275
Cottonwood*	<i>Populus deltoides</i>	L+	Deciduous; large leaves, females fluffy seeds, not recommended for parking lots	1200
Crabapple, Texas*	<i>Mollis texana</i>	S—M	Deciduous, full to partial sun, spring flowering tree	275

SAN ANTONIO UNIFIED LAND DEVELOPMENT CODE

TREES				
Small: Fifteen (15) to twenty-five (25) Feet; Medium: Twenty (25) to Forty (40) Feet; Large: Forty (40) Feet and Higher (60'+)				
Common Name	Scientific Name	Height	Remarks	Shade Area
Desert Willow*	<i>Chilopsis linearis</i>	S	Deciduous; pink tubular flowers; willow-like foliage, very drought tolerant	275
Deodar Cedar	<i>Cedrus deodara</i>	L	Evergreen; spreading pyramidal shape	1200
Ebony, Texas*	<i>Pithecellobium flexicaule</i>	S	Evergreen; sun; white flowers	n/a
Escarpment Black Cherry*	<i>Prunus serotina</i> var. <i>eximia</i>	M—L	Deciduous; sun to shade; fall foliage	875
Eve's Necklace*	<i>Sophora affinis</i>	M—L	Deciduous; sun-shade; white to pink flowers	875
Goldenball Lead Tree*	<i>Leucaena retusa</i>	S—M	Deciduous; delicate foliage; fragrant yellow flowers	275
Hackberry*	<i>Celtis</i> spp.	M—L	Deciduous; prolific; wildlife favorite	875
Honey Locust	<i>Gleditsia triacanthos</i>	M	Deciduous; thornless varieties available	550
Huisache*	<i>Acacia farnesiana</i>	M	Deciduous; delicate foliage; fragrant yellow flowers	550
Italian Stone pine	<i>Pinus pinea</i>	L	Drought tolerant, needs room to grow	875
Kidneywood*	<i>Eysenhardtia polystachya</i>	S	Deciduous; delicate tree-shrub; fragrant white flowers	n/a
Lacy Oak*	<i>Quercus laceyi</i>	M	Deciduous; sun-partial shade; hill county native, good shade tree	550
Live Oak*	<i>Quercus virginiana</i>	M—L	Evergreen-like; good shade tree	875
Mesquite*	<i>Prosopis glandulosa</i>	S—M	Deciduous; lacy spreading form	550
Monterrey Oak	<i>Quercus polymorpha</i>	S—M	Evergreen-like; good shade tree	875
Montezuma cypress**	<i>Taxodium mucronatum</i>	L	Semi-evergreen: full sun: low water	875
Mexican Buckeye*	<i>Ungnadia speciosa</i>	S	Deciduous; pink-red spring flowers	275

APPENDIX E: RECOMMENDED PLANT LIST, ETC.

TREES				
Small: Fifteen (15) to twenty-five (25) Feet; Medium: Twenty (25) to Forty (40) Feet; Large: Forty (40) Feet and Higher (60'+)				
Common Name	Scientific Name	Height	Remarks	Shade Area
Pecan*	<i>Carya illinoensis</i>	L+	Deciduous; needs lots of space; sensitive to root impact	1200
Persimmon, Texas*	<i>Diospyros texana</i>	S—M	Deciduous; sun-shade, smooth bark; females has black pulpy fruit	275
Plum, Mexican*	<i>Prunus mexicana</i>	S	Deciduous; sun to shade; white flowers, fruit	n/a
Possum Haw*	<i>Ilex decidua</i>	S—M	Deciduous; sun-shade; female has red fruit	275
Retama, Paloverde*	<i>Parkinsonia texana</i>	S—M	Deciduous; fast growing, yellow flowers	275
Red Oak, Shumard*	Shumard <i>Quercus shumardii</i>	L	Deciduous; fall color, good shade tree	1200
Red Oak, Texas*	<i>Quercus texana</i>	M	Deciduous; fall color, good shade tree	550
Redbud, Texas, Oklahoma, Mexican*	<i>Cercis canadensis</i> var <i>texana</i>	S—M	Deciduous; sun-shade, red/pink or white flowers	275
Rusty Blackhaw*	<i>Viburnum rufidulum</i>	S	Deciduous; fall color, white flower clusters	n/a
Silk-tassle*	<i>Garrya ovata</i>	S	Evergreen; sun-shade	n/a
Spiny Hackberry*	<i>Celtis pallida</i>	S	Evergreen; greenish white flowers, yellow orange fruit	n/a
Sycamore, Mexican	<i>Platanus mexicana</i>	L+	Deciduous; large leaves, good shade tree	1200
Sycamore, Texas*	<i>Platanus glabrata</i>	L+	Deciduous; large leaves, good shade tree	1200 a
Texas Mountain Laurel*	<i>Sophora secundiflora</i>	S	Evergreen, part shade to full sun; fragrant purple flowers	275
Texas Pistache*	<i>Pistacia texana</i>	S	Semi-Evergreen; full sun to part-shade; red fruit	n/a
Wafer Ash, Hop tree*	<i>Ptelea trifoliata</i>	S	Semi-Evergreen; sun-shade; light green foliage	n/a
Western Soapberry*	<i>Sapindus drummondii</i>	M—L	Deciduous; full to partial sun; good shade tree, cluster large yellow flowers	875

SAN ANTONIO UNIFIED LAND DEVELOPMENT CODE

TREES				
Small: Fifteen (15) to twenty-five (25) Feet; Medium: Twenty (25) to Forty (40) Feet; Large: Forty (40) Feet and Higher (60'+)				
Common Name	Scientific Name	Height	Remarks	Shade Area
Wild Olive*	<i>Cordia boissiereri</i>	S—M	Semi-Evergreen; large white flowers, hardy to 14°F	275
Yaupon Holly*	<i>Ilex vomitora</i>	S—M	Evergreen; sun-shade; female has red fruit	275

*=Texas Native

**=no credit for planting these trees for parking lot shading, these species do not thrive in these conditions

SHRUBS				
Large (Not Taller than Twenty-Five (25) Feet at Maturity)				
Common Name	Scientific Name	Height	Remarks	
Bay	<i>Laurel noblis</i>	6'—12'	Evergreen, sun-part sun, fragrant leaves	
Buckeye*	<i>Aesculus pavia</i>	6'—12'	Deciduous (even in dry weather), shade, yellow or red flowers	
Evergreen Sumac*	<i>Rhus virens</i>	4'—15'	Evergreen, sun-shade, red fruit	
Flameleaf Sumac*	<i>Rhus lanceolata</i>	5'—15'	Sun-partial shade; deciduous; red berries in fall; fall color	
Texas Mountain Laurel*	<i>Sophora secundiflora</i>	10'—25'	Tree-like evergreen shrub; purple spring flowers; sun, part shade	
Texas Pistache	<i>Pistacia texana</i>	6'—12'	Semi-evergreen, sun	

SHRUBS				
Medium (Five (5) to Ten (10) Feet at Maturity)				
Common Name	Scientific Name	Height	Remarks	
Glossy Abelia	<i>Abelia grandiflora</i>	5'—9'	Bronze evergreen foliage; white or pink; sun, part shade	
Agarita*	<i>Mahonia trifoliata</i>	5'—9'	Holly-like evergreen foliage; yellow spring; red edible berries; sun-shade	
Cenizo, Texas Sage*	<i>Leucophyllum sp.</i>	5'—9'	Dusty gray evergreen foliage; sun; blooms throughout summer; purple - pink flowers; several new varieties: including compact	
Elbow Bush*	<i>Forestiera pubescens</i>	3'—6'	Deciduous; sun-shade, small white flowers, black fruit	

APPENDIX E: RECOMMENDED PLANT LIST, ETC.

SHRUBS			
Medium (Five (5) to Ten (10) Feet at Maturity)			
Common Name	Scientific Name	Height	Remarks
Fragrant Sumac*	<i>Rhus aromatica</i>	3'—6'	Deciduous; part shade, fall color
Hogplum*	<i>Colubrina texensis</i>	4'—6'	Part shade, full sun; fragrant blooms
Juniper	<i>Juniperus</i> sp.	5'—10'	Tough evergreen; many varieties; sun, part shade
Mutablis Rose, Butterfly Rose, Old Blush	<i>Rosa chinensis</i> x (<i>Mutablis</i>)	3'—5'	Sun, large single petal flowers change color as ages
Pomegranate	<i>Punica granatum</i>	5'—10'	Sun, upright shrub; orange blooms; edible fruit; dwarf variety
Primrose Jasmine	<i>Jasminum mesnyi</i>	5'—8'	Evergreen, sun-shade, sprawling, yellow flowers
Southern Wax Myrtle	<i>Myrica cerifera</i>	3'—8'	Evergreen, sun-shade, compact variety, available
White Brush*	<i>Aloysia gratissima</i>	4'—8'	Delicate; fragrant white flower; suckers, can be used as a hedge

SHRUBS			
Small (Not Taller than Five (5) feet at Maturity)			
Common Name	Scientific Name	Height	Remarks
American Beautyberry	<i>Callicarpa americana</i>	3'—4'	Deciduous, fruit in fall and winter, purple; part shade
Agave, century plant	<i>Agave americana</i>	3'—5'	Sun, rosette, spine-tipped leaves
Barbados Cherry	<i>Malpighia glabra</i>	2'—4'	Evergreen, pink flowers, red fruit, sun-shade
Barberry	<i>Berberis thunbergii</i> <i>atropurpurea</i>	3'—5'	Evergreen; sun-part shade, color foliage
Grayleaf Cotoneaster	<i>Cotoneaster glaucophylla</i>	3'—5'	Sprawling evergreen shrub; dusty gray foliage; sun, part shade
Juniper	<i>Juniperus</i> sp.	2'—5'	Evergreen shrubs; many varieties available; sun
Mexican Butterfly Weed	<i>Asclepias tuberosa</i>	3'	Broad clusters of orange flowers
Mexican Oregano	<i>Poliomentha longiflora</i>	2'—3'	Evergreen, sun, pink flowers
Rock rose*	<i>Pavonia lasiopetala</i>	2'—4'	Deciduous; sub-shrub, pink or purple flowers
Rosemary, Upright	<i>Rosmarinus officinalis</i>	3'—5'	Evergreen, sun-part shade; blue flowers

SAN ANTONIO UNIFIED LAND DEVELOPMENT CODE

SHRUBS			
Small (Not Taller than Five (5) feet at Maturity)			
Common Name	Scientific Name	Height	Remarks
Red Yucca*	Hesperaloe parviflora	3'—4'	Sun, rosette, narrow leaves
Yucca*	Yucca spp.	3'—4'	Sun, rosette, narrow leaves, white flowers

VINES			
Common Name	Scientific Name	Height	Remarks
Autumn Clematis	Clematis sp.	n/a	Evergreen; fragrant white fall; sun, part shade
Carolina Jessamine*	Gelsemium sempervirens	n/a	Evergreen; yellow spring; sun, part shade
Confederate Jasmine	Trachelospermum jasminoides	n/a	Evergreen; fragrant white spring; sun, part shade
Coral honeysuckle*	Lonicera sempervirens	n/a	Almost Evergreen; red blooms; part shade to full sun
Coral vine, Queen's wreath	Antigonon leptopus	n/a	Pink flowers in late summer and fall; sun
Fig Ivy	Ficus pumila (repens)	n/a	Evergreen; clings to walls; sun, part shade
Lady Banksia	Rosa banksia	n/a	Evergreen, flowers in yellow or white; sun-part shade
Scarlet Clematis*	Clematis texana	n/a	Shade to part shade, spring and summer blooms; red, rust, maroon, or rose-pink
Silverlace Vine	Polygonum ambertii	n/a	Fluffy masses of white; sun, part shade
Virginia Creeper*	Parthenocissus quinquefolia	n/a	Deciduous

GROUNDCOVER			
Common Name	Scientific Name	Height	Remarks
Asiatic Jasmine	Trachelospermum asiaticum	n/a	Evergreen; green or variegated foliage; sun, part shade, no flowers
Columbine Hinckley Columbine*	Aquilegia spp. A. hinckleyana	n/a	Evergreen, gray/green foliage, yellow flowers
Confederate Jasmine	Trachelospermum jasminoides	n/a	Evergreen; fragrant, white spring flowers; sun, part shade

APPENDIX E: RECOMMENDED PLANT LIST, ETC.

GROUNDCOVER			
Common Name	Scientific Name	Height	Remarks
Frogfruit*	<i>Phyla incise (nodiflora)</i>	n/a	Semi-evergreen, creeper, sun-part sun, white flowers
Lantana purple, gold	<i>Lantana sp.</i>	n/a	Deciduous, sun, purple, white or yellow flowers
Pigeonberry*	<i>Rivina humilis</i>	1'—2'	Semi-evergreen shrub
Rosemary, prostrate	<i>Rosmarinus officinalis</i>	1'—2'	Evergreen sub-shrub, sun to part sun, blue flowers
Santolina	<i>Santolina sp.</i>	1'—2'	Species with green or silver foliage; sun
Trailing Juniper	<i>Juniperus sp.</i>	n/a	Several varieties available; not suitable for wet, humid areas; sun
Verbena*	<i>Verbena spp.</i>	n/a	Evergreen, pink, purple, white, red flowers
Yarrow	<i>Achillea millefolium</i>	n/a	Gray or green gray leaves; many varieties

GRASSES, TURF			
Common Name	Scientific Name	Height	Remarks
Bermuda grass	<i>Cynodon dactylon</i>	n/a	Excellent drought tolerance; poor shade tolerance; sun
Buffalograss*	<i>Buchloe dactyloides</i>	4"—6"	Excellent drought tolerance; poor shade tolerance; sun
Prarie mix	n/a	8"—12"	Mixture of Texas native Bunch, can add wildflowers
St. Augustine grass	<i>Stenotaphrum secundatum</i>	n/a	Produces dense turf; shade areas only; poor drought tolerance; sodded

PERENNIALS			
Common Name	Scientific Name	Height	Remarks
Butterfly Weed	<i>Asclepias spp.</i>	3'	Semi-hardy perennial, orange flowers
Cigar Plant	<i>Cuphea micropetala</i>	3'—4'	Red, yellow; summer to fall flowers; sun
Fall Aster	<i>Aster spp.</i>	2'—3'	Semi-evergreen, sun-part sun, blue or white
Firebush	<i>Hamelia patens</i>	3'—5'	Reddish orange; summer to fall flowers; sun
Hinckley's Columbine*	<i>Aquilegia hinckleyana</i>	18"	Yellow; spring flowers; shade

SAN ANTONIO UNIFIED LAND DEVELOPMENT CODE

PERENNIALS			
Common Name	Scientific Name	Height	Remarks
Indigo Spires	Sage Salvia spp.	2'—3'	Semi-evergreen, sun, dark blue flowers
Lantana	Lantana sp.	1'—2'	Many colors; spring to fall flowers; sun
Mealy Cup Sage*	Salvia farinacea	3'	Sun, part shade; blue, white, purple flowers
Mexican Oregano	Poliomentha longiflora	1'—3'	Evergreen; pink; summer flowers; sun
Mexican Petunia	Ruellia sp.	1'—3'	Evergreen; tolerates shade; purple, pink, white flowers, suckers
Mexican Sage	Salvia leucantha	3'—4'	Semi-evergreen; blue; spring to fall flowers; sun
Mist flower, Boneset	Eupatorium spp. and Ageratum spp.	2'—4'	Hardy perennial, white to blue flowers
Muhly Grass*	Muehlenbergia lindheimeri	3'	Evergreen; hardy perennial; sun
Pigeonberry*	Rivina humilis	1'—2'	Semi-evergreen shrub
Purple Cone Flower*	Echinacea purpurea	2'	Hardy perennial, rosette with pink or white flowers
Perennial verbena*	Glandularia bipinnatifida	6"—1'	Many colors; spring to fall flowers; sun
Rock rose*	Pavonia lasiopetala	2'—4'	Deciduous; sub-shrub, pink or purple flowers
Rosemary	Rosmarinus officinalis	1'—4'	Sun, part shade; blue flowers
Shrimp Plant	Justicia spp.	1'—2'	Hardy perennial, sun-part sun; orange, red flowers
Skullcap*	Scutellaria frutescens	1'	Evergreen sub-shrub; pink or purple flowers
Texas Betony*	Stachys coccinea	1'—2'	Evergreen, gray-green; red tubular flowers
Tropical Sage*	Salvia coccinea	2'—3'	Evergreen, red, pink blooms; part shade to full sun
Turk's Cap*	Malvaviscus drummondii	1'—4'	Shade; red flowers
White Rain Lily*	Zephyranthes candida	1'	Ephemeral; sun, part shade; white

APPENDIX E: RECOMMENDED PLANT LIST, ETC.

PALMS			
Common Name	Scientific Name	Height	Remarks
California Fan Palm	<i>Washingtonia filifera</i>	15'—60'	Tree-like palm; sun. Hybrids with <i>W. robusta</i> can be taller
Dwarf Palmetto*	<i>Sabal minor</i>	3'—7'	Trunkless, bushy palm; sun, part shade
Texas Palmetto*	<i>Sabal texana</i>	10'—25'	Tall, native Texas palm; sun
Windmill Palm	<i>Trachycarpus fortunei</i>	10'—35'	Tree-like; sun; not considered a canopy; good foundation plant
Mexican Blue Palm	<i>Brahea armata</i>	12'—25'	Fan palm with blue-green leaves; sun
Butia or Jelly Palm	<i>Butia capitata</i>	10'—15'	Feather palm with blue-green leaves; sun
European Fan Palm	<i>Chamaerops humilis</i>	6'—12'	Tough, clumping fan palm with spiny petioles
Mazari Palm	<i>Nannorrhops ritchiana</i>	6'—25'	Slow growing fan palm with blue-green leaves
Canary Island Date Palm	<i>Phoenix canariensis</i>	40'	Beautiful feather palm; may be damaged in very cold winters
Needle Palm	<i>Rhapidophyllum hystrix</i>	5'—6'	Clumping shrublike palm foliage for sun to part shade
Silver Saw Palmetto	<i>Sorenoa repens</i>	3'—6'	Clumping low palm in both blue and green forms

ORNAMENTAL GRASSES			
Common Name	Scientific Name	Height	Remarks
Big Bluestem*	<i>Andropogon gerardi</i>	1'—2'	Sun, clump grass
Eastern Gamagrass*	<i>Tripsacum dactyloides</i>	2'—3'	Dense, part shade, full sun
Inland Sea oats*	<i>Chasmanthium latifolium</i>	2'—4'	Shade, dappled shade, part shade
Little Bluestem *	<i>Schizachyrium scoparium</i>	1'—2'	Evergreen, part shade, full sun
Maiden Grass	<i>Miscanthus sinensis</i>	3'—5'	Full sun, part shade, specimen or screening
Muhly Grass*	<i>Muehlenbergia lindheimeri</i>	2'—5'	Evergreen, part shade, full sun
Purple Fountain Grass	<i>Pennisetum setaceum</i> 'Rubrum'	2'—3'	Delicate color accent; full sun
Sideoats Grama*	<i>Bouteloua curtipendula</i>	2'—3'	Dappled shade, part shade, full sun

SAN ANTONIO UNIFIED LAND DEVELOPMENT CODE

ORNAMENTAL GRASSES			
Common Name	Scientific Name	Height	Remarks
Switchgrass*	Panicum virgatum	3'	Part shade, full sun

RIPARIAN AND AQUATIC			
Common Name	Scientific Name	Height	Remarks
Button Bush*	Cephalanthus occiden- talis	6'—10'	Large, deciduous shrub, sun, white ball shape flowers
Indigobush*	Amorpha fruticosa	6'—10'	Large, deciduous shrub, shade-sun, spikes of purple flowers
Roughleaf Dogwood*	Cornus drummondii	6'—15'	Large, deciduous shrub or tree, shade-sun, clusters of white flowers
Crab Apple*	Crategus texana	8'—15'	Large, deciduous shrub or tree, shade-sun, large clusters of white flowers
Woolly Rosemallow*	Hibiscus lasiocarpus	3'—6'	Large shrub, white to rose flowers
Edwards Plateau Sedge*	Carex microdonta	1"—7"	Rhizomatous perennial, calcareous soils
Bear Grass*	Nolina sp	2'—3'	Large clump, grass-like, shade-sun, good for bank stabilization
Purple Iris	Iris brevicaulis	1'—1.5'	Hardy perennial, purple flowers
Pickerelweed*	Pontoderia cordata .	5'—1'	Aquatic edge, sun, spikes of purple flowers
Horsetail	Equisetum laevigatum	1'—1.5'	Rhizomatous, grass-like, shade-sun, water edge
Blue Water Lily*	Nymphaea	n/a	Floating, semi-sun-sun,
Pond Weed	Potamogeton illinoien- sis	8"—16"	Rhizomatous, whorls of purple flow- ers

* Texas Native Plant

Note: Red Tip Photinia and Oleander are no longer recommended due to new disease.

(Ord. No. 2006-11-30-1333, § 2, 11-30-06) (Ord. No. 2009-01-15-0001, § 2, 1-15-09)(Ord. No. 2015-12-17-1077, § 2, 12-17-15)

City of Cedar Park Recommended Plant List

City of Cedar Park, TX
Monday, May 18, 2026

Chapter 14. Site Development

ARTICLE 14.07. TREE & LANDSCAPE REQUIREMENTS

§ 14.07.023. Preferred plant list.

The City's preferred plant list shall include the City of Austin's "Grow Green Guide" plant list, the Lower Colorado River Authority's (LCRA) plant list, and the following. For species not listed, please request alternative acceptance from the Director of Development Services, or their designee:

Common Name	Botanical Name	Comments
(plants listed in italics are considered xeriscape or xeriscape plants)		
SHADE/CANOPY TREE		
<i>Pecan</i>	<i>Carya illinoensis</i>	Deep tap root
<i>Cedar Elm</i>	<i>Ulmus crassifolia</i>	Disease resistant
<i>Shumard Red Oak (other red oaks)</i>	<i>Quercus shumardii</i> (etc.)	Red fall color
<i>Live Oak</i>	<i>Quercus virginiana</i>	Very hardy evergreen
<i>Bur Oak and (other White Oaks)</i>	<i>Quercus macrocarpa</i> (etc.)	Nice branch char.
<i>Big Tooth Maple</i>	<i>Acer grandidentatum</i>	Fall color
<i>Chinese Pistachio (e)</i>	<i>Pistacia chinensis</i>	Fall color
<i>Ginkgo</i>	<i>Ginkgo biloba</i>	Yellow fall color
<i>Catalpa</i>	<i>Catalpa</i> sp.	Flowers, slightly messy
<i>Western Soapberry</i>	<i>Sapindus drummondii</i>	Showy winter fruit, yellow fall color
<i>Southern Magnolia</i>	<i>Magnolia grandiflora</i>	Large evergreen, large white flowers
<i>Bald Cypress</i>	<i>Taxodium</i> species	Fernlike leaves, fall color
<i>Montezuma Cypress</i>	<i>Taxodium</i> species	Fernlike leaves, fall color
<i>Texas Picchio</i>	<i>Pistacia texensis</i>	Evergreen in this area, new growth red
<i>Texas Ash</i>	<i>Fraxinus texensis</i>	Long-lived, fast growing
<i>TexMex Sycamore</i>	<i>Plantus</i> hybrid	Insect and disease resistant
ORNAMENTAL TREE		
<i>Texas Persimmon</i>	<i>Diospyros texana</i>	Smooth gray bark
<i>Possumhaw Holly</i>	<i>Ilex decidua</i>	Deciduous, redfruit in winter
<i>Texas Redbud</i>	<i>Cercis canadensis texana</i>	Longflowering in spring
<i>Desert Willow</i>	<i>Chilopsis linearis</i>	Drought tolerant, summer blooms

Common Name	Botanical Name	Comments
(plants listed in italics are considered xeriscape or xeriscape plants)		
<i>Yaupon</i>	Ilex vomitoria	Very hardy, red berries
<i>Crape Myrtle</i>	Lagerstroemia indica	Some die-back, flowers
<i>Eve's Necklace</i>	Sophora affinis	Fernlike foliage, winter fruit color
Japanese Black Pine	Pinus thunbergi	Great color, best of pines
<i>Loquat</i>	Eriobotrya japonica	Evergreen, fall fruit
<i>Tx. Mountain Laurel</i>	Sophora secundiflora	Fragrant purple flower
<i>Mexican Plum</i>	Prunus mexicana	White flowers
<i>Mexican Buckeye</i>	Ungnadia speciosa	Brilliant pink flowers in spring
<i>Eldarica Pine (Afghan)</i>	Pinus eldarica	30-80', suited to alkaline soils
SHRUBS		
<i>Hollies (most varieties)</i>	Ilex sp.	Durable, some have berries
<i>Elaeagnus</i>	Elaeagnus pungens	Large, gray, tolerates heat, drought
<i>Dwarf Wax Myrtle</i>	Myrica pusilla	Mass plantings, hedges
<i>Evergreen Sumac</i>	Rhus virens	Evergreen red fruit
<i>Flame Leaf Sumac</i>	Rhus lanceolata	Brilliant red foliage
<i>Florida Jasmine</i>	Jasminum floridum	Spring yellow blooms
<i>Indian Hawthorn (all varieties)</i>	Rhaphiolepis indica	Spring flower
<i>Red Yucca</i>	Hesperaloe parviflora	Coral flower spikes
<i>Viburnum (all varieties)</i>	Viburnum sp.	Dark green, spring flowers
<i>Moonbay Nandina</i>	Nandina moonbay	Compact, winter color
<i>Gulf Stream Nandina</i>	Nandina gulfstream	Winter color, fuller at base
<i>Italian Jasmine</i>	Jasminum humile	Flower small, bright yellow
<i>Mexican Buckeye</i>	Ungnadia speciosa	Hardy, spring pink flowers
<i>Agarita</i>	Berberis trifoliata	Holly-like foliage, flowers, berries
<i>Muhly grass (most varieties)</i>	Muhlenbergia lindheimeri	Looks like small pampas grass
GROUND COVERS		
Holly Fern	Cyrtomium falcatum	Coarse texture, dark green
<i>Rosemary</i>	Rosmarinus officinalis	Coarse texture, dark green
<i>Santolina (green and gray)</i>	Santolina spp.	Will Lake extreme heat
<i>Cherry Sage</i>	Salvia Greggii	Nearly evergreen, long bloom season
<i>Liriope</i>	Liriope muscari	Hardy, blue flower
<i>Mondo (monkey) Grass</i>	Ophiopogon japonicus	Thin, dark leaves, hardy
<i>Asian Jasmine</i>	Trachelospermum asiaticum	Some die back
<i>Ajuga (carpet bugle)</i>	Ajuga reptans	Shade, part shade, purple flower
Star Jasmine	Trachelospermum jasminoides	Sun, white flower, can be vine
VINES		
<i>Cross Vines</i>	Bignonia capreolata	Bi-colorflower
<i>Carolina Jessamine</i>	Gelsemium sempervirens	Yellow flower
<i>Coral Honeysuckle</i>	Lonicera sempervirens	Red flower

Common Name	Botanical Name	Comments
(plants listed in italics are considered xeriscape or xeriscape plants)		
<i>Lady Banksiae Rose</i>	Rose Banksia	Yellow flower, needs support
Boston Ivy	Parthenocissus tricuspidata	Climbing, bright red in fall

(Ordinance CO12-19-03-14-E1 adopted 3/14/19)

**Southern Nevada Water Authority
(Las Vegas)
Recommended Plant List**

*Southern Nevada Water Authority &
Southern Nevada Regional Planning Coalition*

Regional Plant List

December 2021



MOUSE HERE TO SEARCH THE LIST



1



SOUTHERN NEVADA WATER AUTHORITY™

Acknowledgements

This Regional Plant List is the product of countless hours of work from members of the Southern Nevada Regional Planning Coalition's (SNRPC) Regional Urban Forestry Work Group and local arboriculture and horticulture experts. Special thanks to the following individuals:

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Prohibited Plants

The following plants are no longer sold or allowed to be planted in Southern Nevada because they are on the State of Nevada's noxious weed list or are banned by the Clark County Health District for their allergenic properties. This list is subject to change.

Canopy coverage under the Water Smart Landscapes program for existing plantings:

- Green/Crimson Fountain Grass (*Pennisetum setaceum*) - 7 sq. ft.
- Fruitless Mulberry Tree (*Morus alba*) - 722 sq. ft.
- Fruiting Olive Tree (*Olea europaea*) - 530 sq. ft.
- Chaste Tree (*Vitex agnus-castus*) - 368 sq. ft.

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Introduction

The Southern Nevada Regional Planning Coalition (SNRPC) and the Southern Nevada Water Authority (SNWA) are pleased to present this list of plants for the Southern Nevada region.

The original 2011 list was created by SNRPC's Regional Urban Forestry Working Group in conjunction with local experts including arborists, horticulturists, and urban foresters. Much of the effort was built on the foundations of excellent local resources such as the Nevada Division of Forestry's 2007 Cleaner Air, Tree by Tree and the 2005 Centennial edition of *Trees for Tomorrow*, a project of the High Desert Resource Conservation & Development Council. Both projects were made possible by grants from the Nevada Division of Forestry and the United States Forest Service.

The 2021 update was produced by a reconvened working group of local experts. The most notable revisions are to the Tree section, with an emphasis on deterring use of tree species poorly adapted to current and future conditions.

The intent of this list is to provide a single, region-wide reference for homeowners, landscape designers, architects and developers to select appropriate plants when designing their projects in the Las Vegas area. In addition, it is a tool for those who review those projects—such as city planners—to determine if those plants meet applicable codes and ordinances. Lastly, it contains information on plant canopy coverage, which is used by the SNWA in the Water Smart Landscapes incentive program.

Current and changing conditions in our region make proper plant selection more important than ever. The Las Vegas area is one of the fastest growing urban heat islands, and climate projections suggest it will become hotter and drier in the future. Choosing climate resilient plants that can survive and thrive in these conditions can help to moderate these effects to sustain and enhance quality of life in our community.

For the 2021 update, the Trees, Palms and Cycads sections now include a rating system from 1-5 stars, with 1 stars being inappropriate and 5 stars highly-appropriate for our region. A plant's rating is based on a number of important factors related to climate resilience such as environmental tolerances, water efficiency, drought tolerance, pathogen resistance and maintenance demands. Additional consideration was given to the potential for the plant to increase or decrease the diversity of our urban forest.

For example, *Prunus cerasifera* 'Atropurea' "Purple Leaf Plum" has a 1-star rating due to its heat sensitivity, poor drought tolerance, and susceptibility to pests. *Acacia aneura* "Mulga Acacia," on the other hand, has a 5-star rating because it is a well adapted desert plant with few pests, and it is not widely planted, so it has potential to diversify the urban forest.

This list is not intended to be a list of the only plants allowed in the region, nor is it intended to be an exhaustive, comprehensive list of all desert-appropriate plants. In addition, it is not intended to restrict what plants residents choose to plant in their yards. Rather, we hope that this list will help residents and developers make informed decisions about which plants to choose.

How to Use the List

The list is divided between trees and other plants, including shrubs, groundcovers, vines, succulents and perennials. It is sorted alphabetically by botanical name and includes the common names of the plants. **You may use "Ctrl+F" to search the document for any term.** Several columns of attributes can be used to determine which plants are appropriate to use in specific situations.

Tree ratings depend upon a variety of factors, which are generally noted in the "comments" column.

1. **Organic mulch** – doesn't perform well without an organic surface treatment, such as wood chips or leaf litter, rather than crushed rock.
2. **Many cultivars** – your nursery may have numerous named cultivars of the same plant species.
3. **Overplanted** - A plant heavily used in the region and at risk for a catastrophic loss of urban tree canopy under adverse conditions.
4. **Poor environmental tolerance** – Likely to be damaged by cold, heat or other environmental issues.
5. **Invasive Species** – a plant that reproduces aggressively into urban or natural ecosystems, some of which may be prohibited by law.
6. **Mojave native** – A plant that grows naturally in some parts of the Mojave Desert.
7. **Poor Drought Tolerance** – unable to persist through prolonged conditions of low soil moisture.
8. **Susceptible to Pests** – Commonly attacked by diseases or insects.
9. **Short lifespan** – not expected to achieve the expected lifespan under local conditions.
10. **Protected microclimate required** – Capable of thriving, but only if protected from the harshest summer conditions, such as east and north-facing exposures.

Process for Review and Amendment

The SNWA/SNRPC Plant List is intended to be a living document and will therefore be open to periodic review and amendment. Requests to add plants or modify information must be submitted to the SNWA Conservation Division by emailing conservation@snwa.com. Requests should include the following information at a minimum:

1. the applicant's name and contact information
2. the botanical and common name(s) of the plant(s) to be considered.
3. for the revision to be considered, and supporting documentation.
4. For new plants, documentation shall include the plants' proposed attributes and information regarding the plant's history and performance in similar climates.
5. Supporting documentation must be verified by a certified arborist or horticulturist.

KEY			Rating	Tree Size	Height (average)	Width (average)	Coverage	Tree Type	Growth Rate	Water Needs	Excessive Litter	Spines or Thorns	Biogenic Volatile Organic Compounds (BVOC's)	Parking Lot Tree	Street Tree	Buffer Tree	Minimum Soil Surface Area	Minimum Soil Volume	Tolerates Compacted Soil	Compatible with Turf Grass	Compatible with Overhead Utilities	Comments	
Botanical Name	Cultivar	Common Name	S, M, L, X	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, F, S	Yes or No	L, M, H	Yes or No	Yes or No	Yes or No	(sq. feet)	(cu. feet)	Yes or No	Yes or No	Yes or No			
TREES																							
<i>Acacia aneura</i>		Mulga Acacia	5*	M	20	15	133	E	S	V	---	N	M	Y	Y	Y	120	200	N	N	Y		
<i>Acacia baileyana</i>	'Purpurea'	Cootamundra Wattle	2*	M	20	15	133															4,9,10	
<i>Acacia coriacea</i>		Desert Oak, Wiry Wattle	4*	M	20	20	236	E	M	L	L	N	L	Y	Y	Y	120	500	Y	N	Y		
<i>Acacia estrophiolata</i>		Ironwood	4*	M	25	25	368	E	M	V	---	N	---	Y	Y	Y	120	500	Y	N	N		
<i>Acacia jennerae</i>		Coonawirra Wattle	4*	M	20	15	133	E	S	L	---	N	---	Y	Y	Y	120	200	N	N	N		
<i>Acacia pendula</i>		Weeping Acacia	5*	M	25	20	236	E	M	V	S	N	---	Y	Y	Y	120	350	Y	N	N		
<i>Acacia salicina</i>		Willow Acacia	4*	L	30	20	236	E	F	L	L	N	---	Y	Y	Y	200	350	Y	N	N		
<i>Acacia cupularis (=saligna)</i>		Blue Leaf Acacia	3*	M	25	20	236	E	F	L	L	N	---	Y	Y	Y	120	350	Y	N	N	5	
<i>Acacia stenophylla</i>		Shoestring Acacia	3*	L	40	20	236	E	M	L	L	S	N	L	Y	Y	Y	200	350	Y	N	N	3, 5
<i>Acer tataricum ssp. ginnala</i>		Amur Maple	3*	S	15	15	133	D	S	H	L	N	---	N	N	N	80	200	N	Y	Y	1,7	
<i>Acer negundo</i>		Box Elder	2*	L	30	30	530															1,2,6,7,9	
<i>Acer palmatum var. atropurpureum</i>		Dwarf Japanese Maple	1*	S	12	12	85															1,2,4,7,10	
<i>Afrocarpus falcatus</i>		African Fern Pine	2*	M	25	15	133															1,4,10	
<i>Alnus altissima</i>		Tree of Heaven	1*	L	35	35	722															4,5,7,8,9	
<i>Albizia lebbekoides (=julibrissin)</i>		Mimosa, Silk Tree	1*	L	25	30	530															5,8,9,10	
<i>Arbutus unedo</i>		Strawberry Tree	3*	S	15	15	133	E	S	M	S	N	L	N	N	N	80	200	N	N	Y	4,7,10	
<i>Arbutus x andrachnoides</i>	Manna	Manna Strawberry Tree	3*	M	25	25	368	E	S	M	S	N	L	N	N	N	120	500	N	Y	Y	1,4,7,10	
<i>Bauhinia lunarioides</i>		Anacacho Orchid Tree	5*	S	12	12	85	D	M	L	---	N	---	N	N	N	80	200	N	N	Y	1	
<i>Bauhinia macranthera</i>		Chihuahuan Orchid Tree	4*	S	12	15	133	D	M	L	---	N	---	N	N	N	80	200	N	N	Y	1	
<i>Bauhinia purpurea</i>		Purple Orchid Tree, Butterfly Tree	2*	M	25	25	368															1,4,9,10	
<i>Bauhinia x blakeana</i>		Hong Kong Orchid Tree	2*	M	25	20	236															1,4,9,10	
<i>Brachychiton acerifolius</i>		Illawarra Flame Tree	2*	L	30	20	236															1,4,7,9	
<i>Brachychiton populneus</i>		Bottle Tree	2*	L	30	20	236															1,4,7,9	
<i>Callistemon viminalis</i>		Weeping Bottlebrush	3*	S	15	15	133	E	M	M	---	N	H	N	N	N	80	200	N	Y	Y	1	
<i>Calocedrus decurrens</i>		Incense Cedar	2*	L	30	10	59															4,7	
<i>Casuarina cunninghamiana</i>		River She Oak	4*	L	30	20	236	E	F	M	L	N	---	N	N	Y	200	400	N	N	N		
<i>Casuarina equisetifolia</i>		Australian Pine	4*	L	30	20	236	E	F	M	L	N	---	N	N	Y	200	400	N	N	N		
<i>Cedrus atlantica</i>	Glauca	Blue Atlas Cedar	3*	L	40	20	236	E	M	M	---	N	L	N	N	Y	200	300	N	Y	N	1	
<i>Cedrus deodora</i>		Deodar Cedar	2*	X	60	30	530															1,4,7,9	
<i>Celtis australis</i>		Mediterranean Hackberry	4*	L	45	35	722	D	M	M	L	N	---	N	Y	N	200	1300	N	Y	N	1	
<i>Celtis occidentalis</i>		Common Hackberry	4*	L	45	30	530	D	F	M	L	N	---	N	N	Y	200	1000	N	N	N	1	
<i>Celtis laevigata var. reticulata</i>		Netleaf/Western Hackberry	5*	M	20	20	236	D	S	L	M	S	N	L	N	Y	120	300	N	N	Y	6	
<i>Celtis sinensis</i>		Chinese Hackberry	2*	L	30	30	530															1,4,9,10	
<i>Ceratonia siliqua</i>		Carob	4*	L	40	20	236	E	M	L	M	S	N	M	N	Y	Y	200	400	N	Y	N	4
<i>Cercis canadensis</i>		Eastern Redbud	2*	M	20	15	133															1,2,4,10	
<i>Cercis canadensis var. mexicana</i>		Mexican Redbud	4*	M	20	15	133	D	S	M	---	N	L	N	N	N	120	500	N	Y	Y	1	
<i>Cercis canadensis var. texensis</i>	'Oklahoma'	Texas/Oklahoma Redbud	4*	M	20	20	236	D	S	M	---	N	L	N	N	N	120	300	N	Y	Y	1	
<i>Cercis chinensis</i>	'Avondale'	Avondale Chinese Redbud	2*	S	12	10	59															1,4,10	
<i>Cercis occidentalis</i>		Western Redbud	3*	S	15	15	133	D	S	M	---	N	L	N	N	N	80	200	N	Y	Y	6	
<i>Chilopsis linearis</i>		Desert Willow	4*	M	25	20	236	D	M	M	L	F	S	N	M	N	Y	120	300	Y	N	N	2,3,6
<i>Chionanthus retusus</i>		Chinese Fringe Tree	3*	S	15	15	133	D	S	M	---	N	---	N	N	N	80	200	N	Y	Y	1	
<i>x Chitalpa tashkentensis</i>		Chitalpa	1*	M	20	20	236															1,4,7,8,9	
<i>Cinnamomum camphora</i>		Camphor Tree	1*	L	40	30	530															1,4,7	
<i>Citrus spp.</i>		Citrus Tree	3*	S	15	15	133	E	M	M	H	S	N	---	N	N	N	80	200	N	N	Y	4,7,10
<i>Condalia hookeri</i>		Brazilian Bluewood	4*	S	15	15	133	D	M	V	---	Y	---	N	N	N	80	200	N	N	Y		
<i>Cordia boissieri</i>		Texas Olive	5*	M	20	15	133	S	S	M	---	N	---	N	N	Y	120	200	N	Y	Y		
<i>Corymbia papuana (=Eucalyptus)</i>		Ghost Gum	3*	X	50	30	530	E	M	L	S	N	H	N	Y	Y	240	1300	N	N	N	4	
<i>Cotinus coggygria</i>		Smoke Tree	3*	S	15	15	133	D	S	L	M	---	N	M	N	N	80	100	N	Y	Y	1,4,10	
<i>Cupaniopsis anacardioides</i>		Carrotwood	1*	L	30	25	368															4,5,9	
<i>Cupressus arizonica var. glabra</i>		Arizona Cypress	3*	X	50	15	133	E	M	L	M	---	N	L	N	N	Y	200	600	N	Y	N	1,2,9
<i>Cupressus sempervirens</i>		Italian Cypress	2*	L	40	5	15															1,4	
<i>Cupressus x leylandii</i>		Leyland Cypress	1*	L	40	15	236															1,2,4,8,9	
<i>Dalbergia sissoo</i>		Indian Rosewood	4*	L	45	35	722	E	M	L	---	N	---	Y	Y	Y	200	1300	Y	N	N	4	
<i>Ebenopsis ebano (=Pithecolobium)</i>		Texas Ebony	4*	M	25	20	236	S	S	M	V	---	Y	---	N	Y	Y	120	300	Y	N	N	8
<i>Elaeagnus angustifolia</i>		Russian Olive	1*	L	20	20	236															5,7,8	
<i>Elaeocarpus sylvestris (=decipiens)</i>		Japanese Blueberry	2*	L	25	25	368															1,4,7,10	
<i>Eriobotrya deflexa</i>		Bronze Loquat	1*	S	15	15	133															1,4,7,8,9,10	
<i>Eriobotrya japonica</i>		Loquat	1*	S	15	15	133															1,4,7,8,9,10	
<i>Eucalyptus camaldulensis</i>		Red River Gum	4*	X	50	40	942	E	M	M	---	N	H	N	N	Y	240	1800	N	Y	N	5	
<i>Eucalyptus gunnii</i>		Cider Gum	3*	L	45	25	368	E	M	M	L	N	H	Y	Y	Y	200	700	Y	N	N	5	
<i>Eucalyptus microtheca</i>		Coolbarr	4*	L	40	25	368	E	M	L	M	L	N	H	Y	Y	200	700	Y	N	N	5	
<i>Eucalyptus nicholii</i>		Willow Leaf Peppermint Gum	3*	L	35	25	368	E	F	M	---	N	H	N	N	Y	200	700	N	N	N	1,5	
<i>Eucalyptus polyanthemus</i>		Silver Dollar Gum	3*	L	40	30	530	E	F	L	M	L	N	H	N	Y	200	1000	N	N	N	1	
<i>Eucalyptus rudis</i>		Desert/Flooded Gum	4*	L	45	30	530	E	M	M	---	N	H	N	Y	Y	240	1000	N	N	N		
<i>Eucalyptus sideroxylon</i>		Red Ironbark	4*	L	40	25	368	E	M	M	---	N	H	N	N	Y	200	1000	N	N	N		
<i>Eucalyptus spathulata</i>		Narrow-leaf Gimlet	4*	M	25	20	236	E	M	L	---	N	---	N	N	Y	120	350	N	N	Y		
<i>Eysenhardtia orthocarpa</i>		Kidneywood	4*	M	20	20	236	S	M	L	---	N	---	N	Y	Y	120	350	N	N	Y	1	

KEY			Rating										Comments									
Rating: Based on a combination of factors related to climate resiliency such as environmental tolerances (heat, cold), water efficiency, drought tolerance, pathogen resistance, along with some additional factors like diversity, maintenance needs, and invasiveness. Plants rated from 1★ (least appropriate) to 5★ (most appropriate) Tree Size (based on both height and width): Small (< 20ft), Medium (20-29 ft), Large (30- 45ft), Extra Large (>45ft) Tree Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Moderate, Fast Water Needs: Very Low, Low, Moderate, High Excessive Litter: Leaves, Flowers, Seeds/Fruit Biogenic Volatile Organic Compounds: Low, Medium, High, or data not available ----			Comments: 1. Organic mulch recommended 2. Many cultivars 3. Overplanted 4. Poor environmental tolerances 5. Invasive species 6. Mojave native 7. Poor drought tolerance 8. Susceptible to Pests 9. Short lifespan 10. Protected microclimate necessary																			
			Rating	Tree Size	Height (average)	Width (average)	Coverage	Tree Type	Growth Rate	Water Needs	Excessive Litter	Spines or Thorns	Biogenic Volatile Organic Compounds (BVOC's)	Parking Lot Tree	Street Tree	Buffer Tree	Minimum Soil Surface Area	Minimum Soil Volume	Tolerates Compacted Soil	Compatible with Turf Grass	Compatible with Overhead Utilities	Comments
Botanical Name	Cultivar	Common Name	S, M, L, X	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, F, S	Yes or No	L, M, H	Yes or No	Street Tree	Yes or No	(sq. feet)	(cu. feet)	Yes or No	Yes or No	Comments		
TREES (continued)																						
<i>Fraxinus angustifolia</i>		Narrow-leaved Ash	2★	L	35	25	368													Not Recommended	1,7,8,9	
<i>Fraxinus angustifolia ssp.oxycarpa</i>	Raywood	Raywood Ash	1★	L	30	20	236													Not Recommended	1,3,4,7,8	
<i>Fraxinus anomala</i>		Single-leaf Ash	4★	M	20	20	236	D	M	M											1,6	
<i>Fraxinus uhdei</i>		Shamel Ash	1★	L	40	30	530														1,4,7,8,9	
<i>Fraxinus velutina</i>		Velvet/Arizona Ash	2★	L	40	30	530														1,2,3,4,7,8	
<i>Fraxinus velutina</i>	Bonita	Bonita/Montebello Ash	2★	L	30	30	530														1,2,6,7	
<i>Fraxinus velutina</i>	Modesto	Modesto Ash	2★	L	40	25	368														1,4,7,8	
<i>Fraxinus x velutina</i>	Fan-West, Fan-Tex	Fan-West/Fan-Tex Ash	2★	L	40	30	530														1,2,3,4,7,8	
<i>Geijera parviflora</i>		Australian Willow	2★	M	25	20	236														4,9	
<i>Geoffroea decorticans</i>		Chilean Palo Verde	4★	M	25	25	368	D	S	V	S										4	
<i>Ginkgo biloba</i>		Maidenhair Tree	3★	L	30	20	236	D	S	M											1,4,7	
<i>Gleditsia triacanthos var. inermis</i>		Thornless Honey Locust	4★	L	40	30	530	D	M	M	S										1,2	
<i>Grevillea robusta</i>		Silk Oak	2★	L	35	20	236														4	
<i>Havardia mexicana</i>		Mexican Ebony	5★	L	40	25	368	D	M	L											4	
<i>Havardia pallens (=Pithecellobium)</i>		Tenaza	4★	M	20	15	133	D	M	L											1,4,7	
<i>Ilex x altaclarensis</i>	Wilsonii	Wilson Holly	2★	S	15	10	59														1,4,7,10	
<i>Ilex cornuta</i>	Burfordii	Burford Holly	2★	S	15	12	85														1,2,4,7,10	
<i>Ilex x 'Nellie R. Stevens'</i>	Nellie R. Stevens	Nellie R. Stevens Holly	2★	S	15	10	59														1,4,7,10	
<i>Ilex vomitoria</i>		Yaupon Holly	2★	S	15	10	59														1,2,4,7,10	
<i>Jacaranda mimosifolia</i>		Jacaranda	1★	L	35	25	368														1,4,9	
<i>Juniperus monosperma</i>		One-seed Juniper	4★	S	15	15	133	E	S	L											1,6	
<i>Juniperus osteosperma</i>		Utah Juniper	4★	M	20	20	236	E	S	L											1,6	
<i>Juniperus scopulorum</i>		Rocky Mountain Juniper	4★	L	30	15	133	E	M	M											1,2,6	
<i>Koelerutera bipinnata</i>		Chinese Flame Tree	2★	L	30	30	530														1,4,7,9	
<i>Koelerutera paniculata</i>		Goldenrain Tree	3★	L	30	30	530	D	M	M											1,7	
<i>Lagerstroemia indica</i>		Crape Myrtle	2★	S	15	12	85														1,2,4,7,10	
<i>Laurus nobilis</i>		Bay Laurel	4★	M	20	15	133	E	M	M											4	
<i>Leucaena leucocephala</i>		White Lead Tree	1★	M	25	25	368														4,5,9	
<i>Leucaena retusa</i>		Golden Leadball Tree	5★	M	20	20	236	D	M	LM											4	
<i>Ligustrum lucidum</i>		Glossy Privet	1★	M	20	20	236														4,7,9,10	
<i>Lysiloma watsonii</i>		Fern of the Desert	3★	S	15	15	133	S	M	L	S										4	
<i>Maclura pomifera</i>	White Shield	Osage Orange	3★	L	30	30	530	D	M	M											1,7	
<i>Magnolia grandiflora</i>	Little Gem	Southern Little Gem Magnolia	1★	M	25	12	85														4,7,9,10	
<i>Melia azedarach</i>		Chinaberry	2★	L	30	30	530														1,5,9	
<i>Morus alba (Female)</i>	Unryu	Fruiting/Contorted Mulberry	3★	M	20	20	236	D	M	M	L	F	S								1,5,7	
<i>Olea europaea</i>	Swan Hill, Wilsonii	Fruitless Olive	3★	M	25	20	236	E	S	M											1,4	
<i>Olneya tesota</i>		Desert Ironwood	4★	M	25	25	368	D	S	V											4	
<i>Parkinsonia aculeata</i>		Mexican Palo Verde	1★	M	20	20	236														5,8,9	
<i>Parkinsonia florida</i>		Blue Palo Verde	4★	L	40	30	530	D	M	V	S	Y									5	
<i>Parkinsonia microphylla</i>		Foothill Palo Verde	5★	M	20	20	236	D	S	V											5	
<i>Parkinsonia praecox</i>		Palo Brea	5★	L	25	30	530	D	M	V	S	Y									5	
<i>Parkinsonia x 'AZ1 Thornless'</i>	AZ1 Thornless	Thornless Hybrid Palo Verde	5★	M	40	25	368	S	M	V											5	
<i>Parkinsonia x 'Desert Museum'</i>	Desert Museum	Desert Museum Palo Verde	3★	M	40	25	368	S	M	V											3	
<i>Parkinsonia x 'Sonoran Emerald'</i>	Sonoran Emerald	Sonoran Emerald Palo Verde	4★	M	25	25	368	S	M	V											8	
<i>Parkinsonia x sonora</i>		Sonoran Palo Verde	5★	M	20	20	236	D	S	V											5	
<i>Paulownia kawakamii (=tomentosa)</i>		Sapphire Dragon Tree	1★	S	15	15	133														4,5,7,9,10	
<i>Pinus brutia</i>		Turkish/Calabrian Pine	3★	X	50	30	530	E	F	M	L										1	
<i>Pinus brutia var. eldanca</i>		Afghan/Mondell Pine	2★	X	45	30	530														1,3,4,8	
<i>Pinus canariensis</i>		Canary Island Pine	2★	X	45	25	368														1,4	
<i>Pinus halepensis</i>		Aleppo Pine	2★	X	45	25	368														1,3,4,8	
<i>Pinus pinea</i>		Stone Pine	3★	X	60	40	942	E	S	M	L	N	M	N	Y	240	1600	N	Y	N	1,8	
<i>Pinus roxburghii</i>		Chir Pine	3★	L	40	25	368	E	M	M	L	N	M	N	Y	200	700	N	Y	N	1	
<i>Pinus sabiniana</i>		Foothill/Gray Pine	4★	X	55	30	530	E	M	M	L	S	N	L	N	Y	240	1300	N	Y	N	1
<i>Pinus thunbergii</i>		Japanese Black Pine	1★	S	15	15	133														1,4,8,9,10	
<i>Pistacia atlantica</i>		Mt. Atlas Mastic Tree	3★	L	30	30	530	S	M	M	S	N									1	
<i>Pistacia chinensis</i>		Chinese Pistache	4★	L	40	30	530	D	M	M	L	S	N	M	Y	Y	200	1000	Y	Y	N	1,2,3
<i>Pistacia lentiscus</i>		Mastic Tree	4★	M	15	20	236	E	S	L	L	N									4	
<i>Pistacia x 'Red Push'</i>	Red Push	Red Push Pistache	4★	L	40	30	530	D	M	M	L	S	N	M	Y	Y	200	1000	Y	Y	N	1,3
<i>Pittosporum phylliraeoides</i>		Willow Pittosporum	5★	M	20	15	133	E	M	L	L	F	N								4	
<i>Platanus acerifolia</i>		London Plane Tree, Sycamore	2★	X	60	40	942														1,2,4,7,8	
<i>Platanus mexicana</i>		Mexican Sycamore	3★	X	50	35	722	D	F	M	L	N	H	N	Y	200	1300	N	Y	N	1,7	
<i>Platanus racemosa</i>		California Sycamore	2★	X	50	40	942														1,4,7,8	
<i>Platanus wrightii</i>		Arizona Sycamore	3★	X	60	40	942	D	F	M	L	N									1,4,7,8	
<i>Platycladus orientalis</i>		Oriental Arborvitae	2★	M	20	10	59														1,2	
<i>Podocarpus macrophyllus</i>		Yew Pine	3★	M	25	10	59	E	S	M	LM										1,7,10	
<i>Populus nigra var. italica</i>		Lombardy Poplar	1★	X	50	15	133														4,7,8,9	
<i>Populus alba</i>		White Poplar	3★	X	50	40	942	D	F	M	L	N									1,2,7,8	
<i>Populus fremontii</i>		Fremont Cottonwood	2★	X	55	30	530														1,6,7,8	

KEY			Rating	Tree Size	Height (average)	Width (average)	Coverage	Tree Type	Growth Rate	Water Needs	Excessive Litter	Spines or Thorns	Biogenic Volatile Organic Compounds (BVOC's)	Parking Lot Tree	Street Tree	Buffer Tree	Minimum Soil Surface Area	Minimum Soil Volume	Tolerates Compacted Soil	Compatible with Turf Grass	Compatible with Overhead Utilities	Comments				
Botanical Name	Cultivar	Common Name	S, M, L, X	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, F, S	Yes or No	L, M, H	Yes or No	Yes or No	Yes or No	(sq. feet)	(cu. feet)	Yes or No	Yes or No	Yes or No						
TREES (continued)																										
<i>Prosopis alba</i>		Argentine Mesquite	3*	L	40	30	530	S	F	LM	S	Y	----	N	Y	Y	200	1000	Y	N	N	2,3,5				
<i>Prosopis x alba</i>	'Phoenix', 'AZT'	Thornless Hybrid Mesquite	4*	L	40	30	530	S	F	L	S	N	----	Y	Y	Y	200	1000	Y	N	N	2,3				
<i>Prosopis chilensis</i>		Chilean Mesquite	3*	L	40	30	530	S	F	LM	S	Y	----	N	Y	Y	200	1000	Y	N	N	3,5				
<i>Prosopis x chilensis</i>	'AZT', 'Arizona'	Thornless Chilean Mesquite	4*	L	40	30	530	S	F	LM	S	N	----	Y	Y	Y	200	1000	Y	N	N	2,3				
<i>Prosopis x 'Seedless AZT'</i>	'AZT'	Seedless Hybrid Mesquite	4*	L	40	30	530	S	F	L	S	Y	----	N	Y	Y	200	1000	Y	N	N					
<i>Prosopis glandulosa</i>		Texas Honey Mesquite	4*	L	40	35	722	D	F	L	S	Y	----	N	Y	Y	200	1300	Y	N	N	8				
<i>Prosopis glandulosa</i>	'Maverick', 'AZT'	Thornless Honey Mesquite	4*	L	40	30	530	D	F	L	S	N	----	N	Y	Y	200	1000	Y	N	N	8				
<i>Prosopis glandulosa var. torreyana</i>		Western Honey Mesquite	5*	M	20	20	236	D	M	V	L	Y	----	M	N	Y	120	350	Y	N	Y	6,8				
<i>Prosopis pubescens</i>		Screwbean Mesquite	5*	M	20	25	368	D	M	V	S	Y	----	M	N	Y	120	500	N	N	Y	6				
<i>Prosopis velutina</i>		Velvet Mesquite	5*	L	40	30	530	S	F	V	S	Y	----	L	N	Y	200	1000	Y	N	N	6				
<i>Prunus caroliniana</i>		Carolina Cherry Laurel	1*	M	25	20	236	Not Recommended																		
<i>Prunus cerasifera</i>	'Atropurea'	Purple Leaf Plum	1*	S	15	15	133	Not Recommended																		
<i>Prunus mexicana</i>		Mexican Plum	3*	M	25	25	368	D	M	M	S	N	----	N	N	N	120	600	N	Y	N	1				
<i>Punica granatum</i>		Pomegranate	3*	M	20	15	133	D	M	M	S	Y	----	N	N	N	120	200	N	N	Y	2				
<i>Pyrus calleryana</i>		Ornamental Pear	2*	L	30	20	236	Not Recommended																		
<i>Quercus agrifolia</i>		Coast Live Oak	2*	L	30	30	530	Not Recommended																		
<i>Quercus buckleyi</i>		Buckley/Texas Red Oak	3*	L	30	30	530	D	S	M	LM	L	N	H	N	Y	Y	200	1000	N	Y	N	1,7			
<i>Quercus canbyi</i>		Canby/Sierra Red Oak	4*	L	35	30	530	D	M	M	----	N	----	N	Y	N	200	1000	N	Y	N	1				
<i>Quercus douglasii</i>		Blue Oak	4*	L	30	25	368	D	S	M	----	N	----	N	N	Y	N	200	600	N	Y	N	1			
<i>Quercus fusiformis</i>		Escarpment Oak	4*	L	40	30	530	E	M	H	LM	S	N	H	N	Y	Y	200	1000	N	Y	N	1			
<i>Quercus gambelii</i>		Gambel Oak	4*	M	25	20	236	D	M	M	S	N	M	N	Y	Y	120	400	N	Y	N	1,6				
<i>Quercus lex</i>		Holly Oak	3*	L	40	20	236	E	M	M	S	N	H	N	Y	Y	200	400	N	Y	N	1				
<i>Quercus lobata</i>		Valley Oak	3*	L	45	40	942	D	M	M	LS	N	M	N	N	Y	N	200	1600	N	Y	N	1,7			
<i>Quercus macrocarpa</i>		Bur Oak	4*	X	55	40	942	D	S	M	LS	N	----	N	Y	N	240	1600	N	Y	N	1				
<i>Quercus muehlenbergii</i>		Chinquapin/Chinkapin Oak	4*	L	30	30	530	D	S	M	LS	N	----	N	Y	Y	200	1000	N	Y	N	1				
<i>Quercus polymorpha</i>		Monterrey Oak	4*	L	45	30	530	E	M	LM	----	N	----	N	Y	Y	200	1000	N	Y	N	1				
<i>Quercus shumardii</i>		Shumard Oak	3*	L	45	30	530	D	M	M	LS	N	----	N	Y	Y	200	1000	N	Y	N	1,7				
<i>Quercus suber</i>		Cork Oak	4*	L	40	30	530	S	S	M	S	N	H	N	Y	Y	200	1000	N	Y	N	1				
<i>Quercus texana</i>		Nuttall Oak	3*	L	45	40	942	D	M	M	LS	N	----	N	Y	Y	200	1600	N	Y	N	1,4,7				
<i>Quercus turbinella</i>		Desert Scrub Oak	5*	S	12	12	85	E	M	L	----	N	----	N	Y	N	80	200	N	N	Y	1,6				
<i>Quercus x undulata</i>		Wavy Leaf Oak	5*	S	15	12	85	S	M	L	----	N	----	N	Y	N	80	200	N	Y	Y	1,2,6				
<i>Quercus virginiana</i>		Southern Live Oak	4*	L	40	25	368	S	S	M	S	N	H	N	Y	Y	200	1000	N	Y	N	1,2,3,8				
<i>Quercus virginiana</i>	'Cathedral'	Cathedral Live Oak	4*	L	30	25	368	S	S	M	S	N	H	N	Y	Y	200	700	N	Y	N	1,8				
<i>Quercus virginiana</i>	'Heritage'	Heritage Live Oak	4*	L	30	25	368	E	S	M	S	N	H	N	Y	Y	200	700	N	Y	N	1,8				
<i>Quercus virginiana</i>	'High Rise'	High Rise Live Oak	4*	L	35	20	236	S	S	M	S	N	H	N	Y	Y	200	400	N	Y	N	1,8				
<i>Quercus wislizeni</i>		Interor Live Oak	2*	L	30	25	368	Not Recommended																		
<i>Rhamnus alaternus</i>		Italian Buckthorn	3*	S	15	12	85	E	S	M	----	N	----	N	N	N	80	200	N	Y	Y	1,4,10				
<i>Rhus lanceolata</i>		Prairie Flameleaf Sumac	4*	S	15	20	236	D	M	LM	----	N	L	N	N	N	80	300	N	N	Y	1				
<i>Robinia pseudoacacia</i>		Black Locust	2*	L	40	30	530	Not Recommended																		
<i>Robinia x ambigua</i>		Idaho Locust	2*	L	40	30	530	Not Recommended																		
<i>Salix babylonica (=matsudana)</i>		Chinese Willow	2*	L	40	35	722	Not Recommended																		
<i>Salix babylonica (=matsudana)</i>	'Tortuosa', 'Snake'	Corkscrew Willow	2*	M	20	15	133	Not Recommended																		
<i>Salix gooddingii</i>		Gooding Willow	3*	L	30	25	368	D	F	H	L,F,S	N	----	N	N	N	200	600	N	Y	N	1,6				
<i>Salix x salamonii (=x sepulcralis)</i>		Weeping Willow	1*	L	40	35	722	Not Recommended																		
<i>Sambucus cerulea (=nigra ssp. cerulea)</i>		Blue Elderberry	5*	M	15	25	368	S	M	M	L,F	N	L	N	N	Y	120	500	N	Y	N					
<i>Sapindus saponaria var. drummondii</i>		Western Soapberry	3*	M	25	25	368	D	M	M	----	N	----	N	Y	N	120	500	N	Y	N	1				
<i>Schinus molle</i>		California Pepper Tree	2*	L	30	30	530	Not Recommended																		
<i>Schinus terebinthifolius</i>		Brazilian Pepper Tree	2*	M	25	25	368	Not Recommended																		
<i>Searsia lancea (=Rhus)</i>		African Sumac	3*	M	20	20	236	E	M	H	LM	LS	N	L	N	N	Y	120	300	N	Y	N	3,4,5			
<i>Senegalia greggii (=Acacia)</i>		Catclaw Acacia, Gregg's Catclaw	5*	S	15	20	236	D	S	M	V	----	Y	L	N	N	N	80	300	Y	N	Y	6			
<i>Sophora secundiflora</i>		Texas Mountain Laurel	5*	S	15	12	85	E	S	LM	S	N	----	N	Y	Y	80	200	N	N	Y					
<i>Sophora secundiflora</i>	'Silver Sierra', 'Silver Peso'	Silver Mountain Laurel	5*	S	15	12	85	E	S	LM	S	N	----	N	Y	Y	80	200	N	N	Y					
<i>Styphnolobium japonicum</i>		Japanese Pagoda Tree	3*	L	30	30	530	D	M	M	L	N	M	N	Y	N	200	1000	N	N	N	4,7				
<i>Thuja occidentalis</i>		Arborvitae	2*	S	15	12	85	Not Recommended																		
<i>Thuja plicata</i>		Western Red Cedar	2*	M	20	12	85	Not Recommended																		
<i>Tipuana tipu</i>		Tipu Tree	1*	L	35	35	722	Not Recommended																		
<i>Triadica sebifera</i>		Chinese Tallow Tree	1*	M	25	15	133	Not Recommended																		
<i>Ulmus americana</i>		American Elm	3*	X	50	40	942	D	M	M	L	N	L	N	N	Y	240	1800	N	Y	N	1,2,7				
<i>Ulmus crassifolia</i>		Cedar Elm	4*	L	40	35	722	D	M	M	----	N	----	N	Y	N	200	1300	N	Y	N	1				
<i>Ulmus glabra</i>	'Camperdownii'	Camperdown Elm	3*	S	15	15	133	D	S	M	----	N	----	N	N	N	80	200	N	Y	Y	1,7,10				
<i>Ulmus parvifolia</i>		Lacebark Elm	2*	L	40	40	942	Not Recommended																		
<i>Ulmus pumila</i>		Siberian Elm	1*	X	50	40	942	Not Recommended																		
<i>Ungnadia speciosa</i>		Mexican Buckeye	4*	S	12	12	85	D	S	LM	S	N	----	N	N	N	80	200	N	N	Y					
<i>Vachellia constricta (=Acacia)</i>		Whitethorn Acacia	5*	S	15	15	133	D	M	V	----	Y	M	N	N	N	80	200	N	N	Y					
<i>Vachellia farnesiana (=Acacia)</i>		Sweet Acacia	4*	M	25	20	236	S	M	L	S	Y	M	N	Y	N	120	400	Y	N	N					

KEY			Comments:										Rating									
Rating: Based on a combination of factors related to climate resiliency such as environmental tolerances (heat, cold), water efficiency, drought tolerance, pathogen resistance, along with some additional factors like diversity, maintenance needs, and invasiveness. Plants rated from 1★ (least appropriate) to 5★ (most appropriate) Tree Size (based on both height and width): <u>S</u> mall (< 20ft), <u>M</u> edium (20-29 ft), <u>L</u> arge (30- 45ft), <u>E</u> xtra Large (>45ft) Tree Type: <u>D</u> eciduous, <u>E</u> vergreen, <u>S</u> emi-evergreen Growth Rate: <u>S</u> low, <u>M</u> oderate, <u>F</u> ast Water Needs: <u>V</u> ery Low, <u>L</u> ow, <u>M</u> oderate, <u>H</u> igh Excessive Litter: <u>L</u> eaves, <u>F</u> lowers, <u>S</u> eeds/Fruit Biogenic Volatile Organic Compounds: <u>L</u> ow, <u>M</u> edium, <u>H</u> igh, or data not available ----			1. Organic mulch recommended 2. Many cultivars 3. Overplanted 4. Poor environmental tolerances 5. Invasive species 6. Mojave native 7. Poor drought tolerance 8. Susceptible to Pests 9. Short lifespan 10. Protected microclimate necessary										Rating Tree Size Height (average) Width (average) Coverage Tree Type Growth Rate Water Needs Excessive Litter Spines or Thorns Biogenic Volatile Organic Compounds (BVOC's) Parking Lot Tree Street Tree Buffer Tree Minimum Soil Surface Area Minimum Soil Volume Tolerates Compacted Soil Compatible with Turf Grass Compatible with Overhead Utilities Comments									
			Botanical Name	Cultivar	Common Name	S, M, L, X	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, F, S	Yes or No	L, M, H	Yes or No	Yes or No	Yes or No	(sq. feet)	(cu. feet)	Yes or No	Yes or No
TREES (continued)																						
<i>Vachellia gerrardii</i> (=Acacia)		Red Thorn	4★	S	18	20	236	S	S	V	---	Y	---	N	N	Y	80	300	N	N	Y	
<i>Vachellia rigidula</i> (=Acacia)		Blackbrush Acacia	5★	S	12	12	85	S	S	V	---	Y	---	N	N	Y	80	200	N	N	Y	
<i>Vachellia schaffneri</i> (=Acacia)		Twisted Acacia	5★	M	20	25	368	D	M	L	S	Y	---	N	N	Y	120	500	N	N	Y	
<i>Vitex trifolia</i>	'Purpurea'	Arabian Lilac	2★	S	12	12	85														1,4	
<i>Xylosma congesta</i> (=Croton congestus)		Xylosma	3★	S	15	12	85	E	S, M	M	---	N	M	N	N	Y	80	200	N	Y	Y	
<i>Zelkova serrata</i>		Sawleaf Zelkova	2★	L	40	30	530														1,2,4,7	
<i>Ziziphus jujuba</i>		Jujube	4★	M	25	20	236	D	S	M	S	Y	H	N	N	N	80	300	N	Y	N	
TREES - Under Review																						
<i>Celtis africana</i>		African Hackberry	?	L	35	30	530	E	?	?	?	N	---	?	?	N	200	1000	?	?	N	
<i>Fraxinus cuspidata</i>		Fragrant Ash	?	M	20	15	133	E	?	?	?	N	---	?	?	N	120	200	N	?	Y	
<i>Juglans major</i>		Arizona Walnut	?	L	30	30	530	E	?	?	?	N	---	?	?	N	200	1000	N	?	Y	
<i>Juniperus deppeana</i>	'McEffer'	Alligator Juniper	?	L	40	20	236	E	?	?	?	N	L	?	?	Y	200	300	N	?	Y	
<i>Manosoua willardiana</i>		Palo Blanco	?	M	20	15	133	S	?	?	?	N	---	?	?	Y	120	200	?	?	Y	
<i>Pinus cembroides</i>		Mexican Pinyon	?	M	25	15	133	E	?	?	?	N	M	?	?	Y	120	200	N	?	Y	
<i>Pinus engelmannii</i>		Apache Pine	?	X	60	35	722	E	?	?	?	N	---	?	?	Y	240	1300	N	?	N	
<i>Pinus edulis</i>		Two Needle Pinyon	?	M	20	15	133	E	?	?	?	N	M	?	?	Y	120	300	N	?	N	
<i>Pinus monophylla</i>		Single Needle Pinyon	?	M	20	20	236	E	?	?	?	N	H	?	?	Y	120	300	N	?	Y	
<i>Pinus quadrifolia</i>		Parry Pinyon	?	M	25	20	236	E	?	?	?	N	---	?	?	Y	120	300	N	?	N	
<i>Psoralea argemone</i>		Desert Smoke Tree	?	S	15	15	133	E	?	?	?	Y	M	?	?	Y	80	200	?	?	N	
<i>Quercus arizonica</i>		Arizona White Oak	?	X	45	40	942	S	?	?	?	N	---	?	?	Y	240	1300	N	?	N	
<i>Quercus chrysolepis</i>		Canyon Live Oak	?	L	30	25	368	E	?	?	?	N	H	?	?	Y	200	500	N	?	N	
<i>Quercus emoryi</i>		Emory Oak	?	L	30	25	368	S	?	?	?	N	---	?	?	Y	200	500	N	?	Y	
<i>Quercus gambellii x macrocarpa</i>		Bur-gambel Oak	?	L	30	30	530	E	?	?	?	N	---	?	?	Y	200	1000	N	?	N	
<i>Quercus gravesii</i>		Chisos Red/Grave's Oak	?	L	35	30	530	D	?	?	?	N	---	?	?	Y	200	1000	N	?	N	
<i>Quercus grisea</i>		Gray Oak	?	L	30	25	368	S	?	?	?	N	---	?	?	Y	200	500	N	?	N	
<i>Quercus hypoleucoides</i>		Silverleaf Oak	?	L	35	30	530	E	?	?	?	N	---	?	?	Y	200	1000	N	?	N	
<i>Quercus oblongifolia</i>		Mexican Blue Oak	?	M	25	25	368	E	?	?	?	N	---	?	?	Y	120	500	N	?	N	
<i>Quercus sartorii</i>		Mexican Red/Sator's Oak	?	M	25	25	368	D	?	?	?	N	---	?	?	Y	120	500	N	?	N	
<i>Styphnolobium affine</i> (=Sophora affinis)		Eve's Necklace	?	M	25	15	133	S	?	?	?	N	---	?	?	Y	120	350	N	?	N	
PALMS AND CYCADS																						
<i>Bismarckia nobilis</i>		Bismarck Palm	1★	M	30	20	236														1,7	
<i>Brahea armata</i>		Mexican Blue Palm	4★	M	25	15	133	E	S	M	---	Y	M	N	N	N	120	200	N	N	N	
<i>Brahea decumbens</i>		Mexican Dwarf Blue Palm	4★	M	15	25	368	E	S, M	M	---	Y	---	N	N	N	120	500	N	Y	Y	
<i>Butia capitata</i>		Pindo Palm	2★	M	20	15	133														1,4,7	
<i>Chamaerops humilis</i>		Mediterranean Fan Palm	3★	S	15	15	133	E	S	M	S	Y	M	N	N	N	80	200	Y	Y	Y	
<i>Cycas revoluta</i>		Japanese Sago Palm	2★	-	5	6	28														1,7,10	
<i>Livistona chinensis</i>		Chinese Fan Palm	3★	S	15	10	59	E	S	M	---	Y	---	N	N	N	80	100	N	N	Y	
<i>Livistona decipiens</i>		Ribbon Fan Palm	3★	L	30	10	59	E	M	LM	---	Y	---	N	N	N	200	100	N	N	Y	
<i>Livistona nitida</i>		Carnarvon Fan Palm	3★	L	40	15	133	E	M	M	---	Y	---	Y	Y	N	200	200	N	N	Y	
<i>Livistona saribus</i>		Taraw Fan Palm	3★	L	30	15	133	E	S	M	S	Y	---	N	N	N	200	200	N	N	Y	
<i>Nannorrhops ritchiana</i>		Mazari Palm	5★	S	10	12	85	E	M	L	---	N	---	Y	Y	N	80	150	N	N	Y	
<i>Phoenix canariensis</i>		Canary Island Date Palm	3★	L	40	30	530	E	S	M	S	Y	M	N	Y	N	200	1000	Y	Y	N	
<i>Phoenix dactylifera</i>		Date Palm	3★	X	60	20	236	E	S	M	S	Y	M	N	Y	N	240	300	Y	Y	N	
<i>Phoenix reclinata</i>		Senegal Date Palm	2★	M	20	15	133														5,7	
<i>Phoenix roebelenii</i>		Pygmy Date Palm	1★	-	6	7	38														1,4,7,10	
<i>Phoenix rupicola</i>		Cliff Date	3★	M	20	15	133	E	S	M	F, S	Y	---	N	N	N	120	200	N	Y	Y	
<i>Phoenix sylvestris</i>		Wild Date	3★	M	25	10	59	E	S	M	F, S	Y	---	N	N	N	120	100	N	Y	Y	
<i>Phoenix theophrasti</i>		Greek/Cretan Date Palm	3★	L	40	15	133	E	M	M	F	Y	---	Y	Y	N	200	200	N	Y	N	
<i>Sabal causiarum</i>		Puerto Rican Hat Palm	3★	L	35	15	133	E	M	M	F, S	N	---	Y	Y	N	200	200	N	Y	N	
<i>Sabal domingensis</i>		Hispaniolan Palmetto	3★	M	20	15	133	E	M	M	F, S	N	---	Y	Y	N	120	200	N	Y	N	
<i>Sabal mexicana</i>		Mexican Sabal Palm	4★	L	30	15	133	E	M	M	F	Y	---	Y	Y	N	200	200	N	Y	N	
<i>Sabal palmetto</i>		Palmetto	3★	L	45	15	133	E	M	M	F, S	N	---	Y	Y	N	200	200	N	Y	N	
<i>Sabal x 'Riverside'</i>	'Riverside'	Riverside Sabal Palm	4★	L	35	20	236	E	M	M, F	F, S	Y	---	Y	Y	N	200	300	N	Y	N	
<i>Syagrus romanzoffiana</i>		Queen Palm	1★	M	25	10	59														4,7	
<i>Trachycarpus fortunei</i>		Windmill Palm	3★	M	20	10	59	E	S	M	F, S	N	---	N	N	N	120	100	N	Y	Y	
<i>Washingtonia filifera</i>		California Fan Palm	3★	X	50	15	133	E	S, M	LM	F, S	Y	M	N	Y	N	240	200	Y	Y	N	
<i>Washingtonia robusta</i>		Mexican Fan Palm	3★	X	60	15	133	E	M	M	F, S	Y	M	N	Y	N	240	200	Y	Y	N	

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
SHRUBS														
<i>Abelia x grandiflora</i>	Glossy Abelia		5	5	20	E, S	F	M	M	N	Y	Y	F, P	
<i>Phoenix sylvestris</i>	Velvet-leaf Mallow, Superstition Mallow		4	4	13	E, S	M	L, M	M	N	N	N	F, P	
<i>Acacia craspedocarpa</i>	Leatherleaf Acacia, Waxleaf A.		10	15	177	E	S	L	M	N	N	Y	F	
<i>Acacia cultriformis</i>	Knifeleaf Acacia, Knife Acacia		10	10	79	E	M	L	M	N	N	Y	F, P	4
<i>Acacia redolens</i>	Creeping Acacia, Prostrate Acacia	●	3	10	79	E	F	VL	H	N	N	N	F	
<i>Acca sellowiana (=Feijoa)</i>	Pineapple Guava		15	15	177	E	S	L	H	N	Y	Y	F, P	1, 8
<i>Alyogyne huegelii</i>	Blue Hibiscus		6	6	28	E	M	L	M	N	N	N	F	
<i>Ambrosia dumosa</i>	White Bursage, Burrobush	●	2	4	13	E	F	L	H	N	N	N	F	6
<i>Ambrosia eriocentra</i>	Woolly Bursage	●	3	3	7	E	M	L	H	N	N	N	F, P	6
<i>Anisacanthus quadrifidus-wrightii 'Mexican Flame'</i>	Mexican Flame		4	4	13	D	M	L	H	N	N	Y	F, P	
<i>Anisodonte x hypomandarum</i>	Pink Desert Hibiscus, African Mallow		4	4	13	E	F	M	L	N	Y	Y	F, P	
<i>Artemisia filifolia</i>	Sand Sage	●	4	3	7	E	M	L	H	N	N	Y	F	6
<i>Artemisia tridentata</i>	Big Sage Brush	●	4	3	7	E	M	L	H	N	N	Y	F	6
<i>Asclepias subulata</i>	Desert Milkweed	●	5	5	20	E	S	L	H	N	Y	Y	F	6
<i>Atriplex canescens</i>	Four-Wing Saltbush	●	5	8	50	S	M	M	H	N	N	N	P	6
<i>Atriplex confertifolia</i>	Shadscale	●	2	3	7	D	F	VL	H	Y	N	N	F	6
<i>Atriplex hymenelytra</i>	Saltbush, Desert Holly	●	2	2	3	E	S	VL	H	N	N	N	F	6
<i>Atriplex lentiformis</i>	Quailbush, Big Saltbush	●	6	8	50	D	M	L	H	Y	Y	Y	F	6
<i>A. l. breweri</i>	Brewer's Saltbush, Quail Bush	●	7	7	38	E	M	L	H	Y	Y	Y	F	6
<i>Atriplex polycarpa</i>	Desert Saltbush	●	6	6	28	D	S	M	H	N	N	N	F	6
<i>Baccharis sarothroides</i>	Desert Broom, Coyote Bush		6	7	38	E	M	L	H	N	Y	N	F	3, 5, 6
<i>Baccharis x 'Centennial' (female hybrid)</i>	Centennial Broom		3	5	20	E	F	L	H	N	N	N	F	
<i>Baccharis x 'Starn' (male hybrid)</i>	Thompson Broom		3	5	20	E	M	L	H	N	N	N	F	
<i>Bebbia juncea</i>	Sweet Bush	●	3	3	7	S	M	L	H	N	N	N	F	6
<i>Berberis fremontii</i>	Fremont's Barberry	●	6	4	13	E	S	L	H	Y	Y	Y	F, P	6
<i>Berberis thunbergii</i>	Japanese Barberry		4	4	13	D	M	M	L	Y	Y	Y	F, P	2
<i>Buddleja davidii</i>	Butterfly Bush		8	6	28	D, S	F	L, M	L	N	Y	Y	F, P	
<i>Buddleja marrubifolia</i>	Woolly Butterfly Bush	●	5	5	20	E	F	L	H	N	Y	Y	F, P	
<i>Buddleja utahensis</i>	Utah Butterfly Bush	●	2	2	3	E	M	L	H	N	N	N	F, P	6
<i>Buxus microphylla 'Japonica'</i>	Japanese Boxwood		4	4	13	E	S	L	M	N	N	Y	F, P, S	1
<i>Caesalpinia gilliesii</i>	Yellow Bird of Paradise		8	6	28	D, E	F	L	H	N	N	N	F	2, 7 (seed pods)
<i>Caesalpinia mexicana</i>	Mexican Bird of Paradise	●	12	6	28	D, E	F	L	H	N	N	N	F, P	2, 7 (seed pods)
<i>Caesalpinia pulcherrima</i>	Red Bird of Paradise		6	6	28	D, E	F	L	H	Y	N	N	F	2, 7 (seed pods)
<i>Calliandra californica</i>	Baja Fairy Duster	●	5	6	28	E	S, M	L	H	N	N	N	F, P	
<i>Calliandra eriophylla</i>	Pink Fairy Duster	●	3	3	7	E	S, M	L	H	N	N	N	F, P	
<i>Callistemon citrinus</i>	Bottlebrush, Lemon Bottlebrush		8	8	50	E	M	M	M	N	Y	N	F	1, 8
<i>C. c. 'Nana'</i>	Dwarf Bottlebrush		2	3	7	E	S	M	M	N	N	N	F	1
<i>Caryopteris x clandonensis 'Dark Knight'</i>	Blue Mist Spirea		3	4	13	D	M	M	L	N	Y	N	F, P	
<i>Chamaebatiaria millefolium</i>	Fern Bush, Desert Sweet		5	5	20	S	M	L	M	N	Y	N	F, P	
<i>Chrysactinia mexicana</i>	Damianita	●	2	2	3	E	S, M	L	M	N	N	N	F	
<i>Chrysothamnus viscidiflorus</i>	Yellow Rabbit Brush, Green Rabbit Brush	●	3	3	7	D	M	L	H	N	N	N	F	
<i>Cistus hybridus</i>	White Rockrose		3	5	20	E	F	L	H	N	N	N	F	
<i>Cistus purpureus</i>	Purple Rock Rose, Orchid Rockrose		4	4	13	E	F	L	H	N	N	N	F	
<i>Coleogyne ramosissima</i>	Blackbrush	●	5	5	20	S	S	L	H	N	Y	Y	F	
<i>Cordia parvifolia</i>	Little Leaf Cordia	●	6	8	50	E	M	M	H	N	Y	Y	F	
<i>Cotoneaster congestus</i>	Pyrenees Cotoneaster		2	3	7	E	M	L, M	M	N	N	Y	F, P	
<i>Cotoneaster glaucophyllus</i>	Gray-Leaf Cotoneaster		5	6	28	E	M	M	M	N	Y	Y	F, P	
<i>Cotoneaster lacteus</i>	Red Clusterberry		6	6	28	E	M	L, M	M	N	Y	Y	F, P	
<i>Cotoneaster microphyllus</i>	Rockspray		3	6	28	E	M	L, M	M	N	N	N	F, P	
<i>Dalea bicolor 'argyraea'</i>	Silver Dalea	●	3	3	7	E	F	L	H	N	N	N	F	
<i>Dalea frutescens</i>	Black Dalea	●	4	5	20	S	M	L	H	N	Y	Y	F	
<i>Dalea pulchra</i>	Pink Indigo Bush	●	4	5	20	E	M, F	L	H	N	Y	Y	F	
<i>Dodonaea viscosa</i>	Purple Hopseed Bush		10	6	28	E	M	L, M	M	N	Y	Y	F	
<i>Duranta erecta 'Sweet Memory'</i>	Golden Dewdrop, Sky Flower		15	10	79	S	S	M	L, M	N	N	Y	F, P	7 (berries), 8
<i>Elaeagnus pungens</i>	Silverberry		8	8	50	E	F	L, M	M	Y	Y	Y	F, P	
<i>Elaeagnus x ebbingei</i>	Ebbing's Silverberry		8	8	50	E	F	L, M	M	N	Y	Y	F, P	
<i>Encelia farinosa</i>	Brittlebush	●	3	4	13	D	M	VL	H	N	N	N	F	6
<i>Encelia virginensis</i>	Virgin River Brittlebush	●	2	2	3	S	M	VL	H	N	N	N	F	6
<i>Ephedra nevadensis</i>	Nevada Jointfir, Nevada Mormon Tea	●	3	3	7	E	M	VL	H	N	N	N	F	6
<i>Ephedra viridis</i>	Mormon Tea	●	3	3	7	E	S	L	H	N	N	N	F	6
<i>Eremophila decipiens</i>	Slender Fuchsia		3	3	7	E	M	L	H	N	Y	Y	F, P	
<i>Eremophila laanii 'Pink Beauty'</i>	Pink Beauty Emu Bush		6	6	28	E	F	M	H	N	Y	Y	F	
<i>Eremophila glabra 'Murchinson River'</i>	Fire and Ice Emu Bush		3	6	28	E	M	L	H	N	Y	Y	F	
<i>Eremophila maculata</i>	Spotted Emu Bush		6	6	28	E	S	L	H	N	Y	Y	F, P	
<i>E. m. 'Valentine'</i>	Valentine Emu Bush		4	5	20	E	M	L	H	N	Y	Y	F	

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		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
BOTANICAL NAME		COMMON NAME												
SHRUBS (continued)														
<i>E. m.</i> 'Winter Gold'	Winter Gold Emu Bush		4	6	28	E	M	L	H	N	Y	Y	F,P	
<i>Eremophila racemosa</i>	Easter Egg Eremophila		5	5	20	E	M	L	H	N	Y	Y	F	
<i>Eremophila</i> x 'Summertime Blue' (<i>polyclada</i> x <i>divaricata</i>)	Summertime Blue Emu Bush		6	10	79	E	F	L	H	N	Y	Y	F	
<i>Eremophila</i> sp.	Eremophila, Emu Bush		4	4	13	E	M	L	H	N	Y	Y	F,P	
<i>Ericameria cuneata</i>	Cliff Goldenbush	●	2	3	7	D	S	L	H	N	N	N	F	6
<i>Ericameria laricifolia</i>	Turpentine Bush	●	2	3	7	D	S	VL	H	N	N	N	F	
<i>Eriodictyon angustifolium</i>	Yerba Santa		3	3	7	E	M	L	H	N	N	N	F,P	6
<i>Eriogonum corymbosum</i> var. <i>nilesii</i>	Las Vegas Valley Buckwheat	●	3	3	7	D	M	VL	H	N	N	N	F	6
<i>Eriogonum fasciculatum</i>	Wild Buckwheat, California Buckwheat	●	2	3	7	E	F	L	H	N	N	N	F	6
<i>Eriogonum</i> sp.	Buckwheat	●	3	3	7	D	M	L	H	N	N	N	F	
<i>Euonymus japonica</i>	Evergreen Euonymus		6	6	28	E	S	M	M	N	Y	Y	P, S	1
<i>E. j.</i> 'Aureo-Variegata'	Gold Spot Euonymus		5	6	28	E	S,M	M	M	N	Y	Y	P, S	1
<i>E. j.</i> 'Microphylla'	Box-leaf Euonymus		2	2	3	E	S	M	M	N	N	Y	P, S	1
<i>E. j.</i> 'Silver King'	Silver King Euonymus		5	6	28	E	S	M	M	N	N	Y	P, S	1
<i>Fallugia paradoxa</i>	Apache Plume	●	6	4	13	S	F	L	H	N	Y	Y	F,P	6
<i>Forestiera pubescens</i> (=neomexicana)	Desert Olive, New Mexico Privet	●	6	6	28	D	M	L	H	N	Y	Y	F,P	6
<i>Fraxinus greggii</i>	Little Leaf Ash	●	15	12	113	E	S	M	M	N	Y	Y	F,P	8
<i>Genista tinctoria</i>	Dyer's Greenwood		6	6	28	D	S	L	H	N	N	N	F	
<i>Gutierrezia sarothrae</i>	Snakeweed	●	2	2	3	S	M	VL	H	N	N	N	F,P	6
<i>Juniperus chinensis</i> 'Blue Point'	Blue Point Juniper		10	4	13	E	M	M	M	N	Y	Y	F,P	
<i>J. c.</i> 'Spartan'	Spartan Chinese Juniper		15	6	28	E	M	L	H	N	Y	Y	F,P	
<i>J. c.</i> 'Sea Green'	Sea Green Juniper		5	6	28	E	M	M	M	N	Y	Y	F,P	
<i>J. c.</i> 'Torulosa'	Hollywood Twisted Juniper		15	10	79	E	M	L	H	N	Y	Y	F,P	8
<i>Juniperus sabina</i> 'Tamarescifolia'	Tam Juniper		3	10	79	E	M	M	L	N	N	N	P	1
<i>Juniperus scopulorum</i> 'Gray Gleam'	Gray Gleam Juniper		15	6	28	E	S	M	M	N	Y	Y	F,P	8
<i>Juniperus</i> sp.	Juniper		20	10	79	E	M	L, M	M	N	var	var	F, P	2
<i>Justicia californica</i>	California Justicia, Chuparosa	●	3	4	13	D	M	L	H	N	N	N	F	
<i>Justicia candicans</i>	Red Justicia	●	5	3	7	D	M	H	L	N	N	N	P, S	
<i>Justicia spicigera</i>	Mexican Honeysuckle	●	3	4	13	E	M	M	M	N	N	N	F,P	2
<i>Keckelia antirrhinoides</i>	Yellow Snapdragon Bush	●	4	4	13	S	M	L	H	N	N	Y	F,P	6
<i>Krascheninnikovia lanata</i>	Winterfat	●	2	3	7	E	F	VL	H	N	N	N	F	6
<i>Lantana camara</i>	Bush Lantana		3	6	28	E	F	L	H	N	N	N	F	2,7 (berries, leaves)
<i>Larrea tridentata</i>	Creosote Bush	●	8	6	28	E	M	VL	H	N	N	Y	F	6
<i>Leucophyllum candidum</i> 'Silver Cloud'	Silver Cloud Texas Ranger	●	5	5	20	E	S	L	H	N	Y	Y	F	
<i>L. c.</i> 'Thunder Cloud'	Thunder Cloud Texas Ranger	●	3	4	13	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum frutescens</i>	Texas Ranger, Texas Sage, Cenizo	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>L. f.</i> 'Compacta'	Compact Texas Ranger	●	5	5	20	E	S	L	H	N	Y	Y	F	
<i>L. f.</i> 'Green Cloud'	Green Cloud Texas Ranger	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>L. f.</i> 'White Cloud'	White Cloud Texas Ranger	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum langmaniae</i> 'Lynn's Legacy'	Lynn's Legacy Texas Ranger	●	5	5	20	E	S	L	H	N	Y	Y	F	
<i>L. l.</i> 'Rio Bravo'	Rio Bravo Texas Ranger	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum laevigatum</i>	Chihuahuan Sage	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum pruinosum</i> 'Sierra Bouquet'	Sierra Bouquet Texas Ranger	●	6	6	28	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum revolutum</i> 'Houdini'	Houdini Texas Ranger		4	4	13	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum zygophyllum</i> 'Cimarron'	Blue Texas Ranger, Cimarron Ranger	●	3	3	7	E	S	L	H	N	Y	Y	F	
<i>Leucophyllum</i> x 'Rain Cloud'	Rain Cloud Texas Ranger	●	5	4	13	E	S	L	H	N	Y	Y	F	
<i>Lycium andersonii</i>	Wolf Berry	●	6	4	13	D	M	VL	H	Y	N	Y	F	6
<i>Lycium cooperi</i>	Cooper's Wolfberry	●	5	6	28	E	F	L	H	Y	Y	Y	F,P	6
<i>Lycium pallidum</i> var. <i>oligospermum</i>	Pale Wolfberry	●	5	6	28	E	F	L	H	Y	Y	Y	F,P	6
<i>Malpighia glabra</i> 'Mariquita'	Barbados Cherry		3	3	7	S	M	L, M	L	N	N	N	P	1, 4
<i>Myrtus communis</i>	Classic Myrtle		6	6	28	E	S	L	H	N	Y	Y	F,P	1
<i>M. c. boetica</i>	Twisted Myrtle		10	10	79	E	S	L	H	N	N	Y	F,P	1, 8
<i>M. c.</i> 'Compacta'	Compact Myrtle		4	4	13	E	S	L	H	N	N	Y	F,P	1
<i>Nerium oleander</i>	Oleander		15	15	177	E	M	L	H	N	Y	Y	F	** 2, 7 (all parts), 8
<i>N. o.</i> 'Petite'	Dwarf Oleander		6	5	20	E	M	L	H	N	Y	Y	F	** 2, 7 (all parts)
<i>Phlomis fruticosa</i>	Shrubby Jerusalem Sage		3	3	7	E	M	L, M	M	N	N	N	F, P	1
<i>Phlomis lanata</i>	Jerusalem Sage		3	4	13	E	M	L, M	M	N	N	N	F, P	1
<i>Plumbago auriculata</i>	Cape Plumbago		6	8	50	E, S	M, F	L, M	M	N	N	N	F, P	
<i>Poliomintha maderensis</i>	Lavender Spice, Mexican Oregano		3	3	7	E, S	M	L, M	M	N	N	N	F, P	
<i>Prunus fasciculata</i>	Desert Almond	●	4	4	13	D	M	L	H	N	N	N	F	6
<i>Psoralea fremontii</i>	Indigo Bush	●	3	4	13	D	S	VL	H	N	N	N	F	6
<i>Psoralea polydenius</i>	Nevada Smokebush	●	5	4	13	D	S	VL	H	N	N	N	F	6
<i>Punica granatum</i> 'Nana'	Dwarf Pomegranate		3	3	7	D	M	M	M	Y	N	N	F, P	
<i>Purshia mexicana</i>	Mexican Cliffrose	●	7	4	13	E	S	L	M	N	N	N	F	6

**NOT ACCEPTED IN THE CITY OF HENDERSON

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BOTANICAL NAME		COMMON NAME	(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S	
SHRUBS (continued)														
<i>Purshia stansburiana</i> (=Cowania)	Cliff Rose	•	6	6	28	E	S	L	H	N	N	Y	F, P	6
<i>Pyracantha</i> sp.	Pyracantha, Firethorn	•	8	8	50	E	F	M	M	Y	Y	Y	F, P	1
<i>Rhus microphylla</i>	Littleleaf Sumac	•	8	12	113	D	M	L	H	Y	Y	Y	F, P	
<i>Rhus ovata</i>	Sugar Bush	•	12	12	113	E	S, M	L, M	H	N	Y	Y	F, P	
<i>Rhus trilobata</i>	Squaw Bush / Skunk Bush	•	5	8	50	D	M	L	H	N	Y	Y	F, P	
<i>Rhus virens</i>	Evergreen Sumac	•	10	15	177	E	M	L	H	N	Y	Y	F, P	8
<i>Romneya coulteri</i>	Matilija Poppy, Fried Egg Poppy		6	6	28	S	S	L, M	M	N	N	N	F, P	
<i>Rosa</i> sp.	Rose		4	3	7	D, E	F	M	M	Y	Y	Y	F, P	1, 2
<i>Rosa woodsii</i>	Woods' Rose		4	4	13	D	M	M	M	Y	Y	N	F, P	3, 6
<i>Rosmarinus officinalis</i>	Rosemary		4	6	28	E	M, F	L, M	M	N	Y	Y	F, P	
<i>Ruellia peninsularis</i>	Desert Ruellia	•	4	5	20	S	M	L	H	N	N	Y	F	
<i>Russelia equisetiformis</i>	Coral Fountain		4	6	28	E, S	M	M	H	N	N	N	F, P	4
<i>Salazaria mexicana</i>	Bladdersage	•	3	3	7	D	M	VL	H	N	N	N	F	6
<i>Salvia chamaedryoides</i>	Mexican Blue Sage	•	2	2	3	E, S	M	M	M	N	N	N	F, P	
<i>Salvia clevelandii</i>	Chaparral Sage	•	5	6	28	E	M	L	H	N	Y	N	F, P	
<i>Salvia coccinea</i>	Scarlet Sage		3	4	13	S	M	L, M	M	N	N	N	F, P	
<i>Salvia dorrii</i>	Purple Sage, Desert Sage	•	2	3	7	E, S	M	L	H	N	N	N	F, P	6
<i>Salvia greggii</i>	Autumn Sage		2	2	3	S	F	L, M	M	N	N	N	F, P	2
<i>Salvia leucantha</i>	Mexican Bush Sage		4	4	13	S	M, F	M	M	N	N	N	F, P	1
<i>Salvia microphylla</i> 'Sierra Madre'	Sierra Madre Sage		3	3	7	E	M	M	M	N	N	N	F, P	
<i>Salvia mohavensis</i>	Mojave Sage	•	3	3	7	E	M	VL	H	N	N	N	F, P, S	6
<i>Salvia</i> sp.	Sage		4	4	13	D, E	M, F	M	M	N	N	N	F, P	
<i>Sambucus mexicana</i>	Mexican Elderberry	•	15	15	177	D, S	M, F	L, M	H	N	Y	Y	F, P	6, 8
<i>Santolina chamaecyparissus</i>	Lavender Cotton, Gray Santolina		2	3	7	E	M	L, M	M	N	N	N	F, P	
<i>Santolina rosmarinifolia</i> (=S. virens)	Green Lavender Cotton, Green Santolina		2	3	7	E	M	L, M	M	N	N	N	F, P	
<i>Senegalia berlandieri</i> (=Acacia)	Berlandier Acacia, Guajillo		12	12	113	D	M	L, M	H	N	N	N	F, P	
<i>Senna armata</i> (=Cassia)	Spiny Senna	•	3	4	13	D	M	VL	H	Y	N	N	F	6
<i>Senna artemisioides</i> (=Cassia)	Feathery Senna, Feathery Cassia	•	6	6	28	E	M	VL, L	H	N	N	Y	F, P	
<i>Senna lindheimeriana</i> (=Cassia)	Velvet-leaf Senna	•	3	3	7	E	M	L	H	N	N	N	F, P	
<i>Senna nemophila</i> (=Cassia)	Desert Senna, Desert Cassia		6	6	28	E	M	L	H	N	N	N	F, P	4
<i>Senna phyllodinea</i> (=Cassia)	Silvery Senna, Silver Leaf Cassia		6	6	28	E	M	L	H	N	N	N	F, P	4
<i>Senna wislizenii</i> (=Cassia)	Shrubby Senna, Shrubby Cassia		8	6	28	D	M	L	H	N	N	N	F, P	
<i>Simmondsia chinensis</i>	Joboba	•	6	6	28	E	S, M	VL, L	H	N	Y	Y	F, P	
<i>S. c.</i> 'Vista'	Compact Joboba	•	4	4	13	E	S, M	VL, L	H	N	Y	N	F, P	
<i>Sophora arizonica</i>	Arizona Mescal Bean	•	10	8	50	E	S	L, M	M	N	N	N	F, P	8
<i>Tecoma stans</i>	Yellow Trumpet Flower, Yellow Bells		8	8	50	S	F	L, M	M	N	N	N	F, P	2, 8
<i>Tecoma</i> x 'Orange Jubilee'	'Orange Jubilee' Tecoma, Orange Bells		8	8	50	D, S	F	L, M	M	N	N	N	F, P	
<i>Tecoma</i> x 'Sunrise' TM	'Sunrise' Tecoma		8	8	50	D, S	F	L, M	M	N	N	N	F, P	
<i>Teucrium chamaedrys</i>	Germander		2	2	3	E	M	L, M	M	N	N	N	F, P	
<i>Thamnosma montana</i>	Turpentine Broom	•	2	2	3	D	S	VL	H	N	N	N	F	6
<i>Vauquelinia californica</i>	Arizona Rosewood	•	15	10	79	E	M	L	H	N	Y	Y	F, P	8
<i>Vauquelinia corymbosa</i> var. <i>heterodon</i>	Narrowleaf Rosewood	•	15	15	177	E	M	L, M	H	N	Y	Y	F, P	8
<i>Wedelia texana</i> 'Devil's River' (=Zexmenia hispida)	Devil's River, Orange Daisy		3	3	7	S, D	M	L, M	H	N	N	N	F, P	
<i>Xylosma congesta</i> 'Compacta'	Dwarf Xylosma		5	6	28	E	M	M	M	N	N	Y	F, P, S	
<i>Ziziphus obtusifolia</i>	Greythorn	•	6	8	50	D	S, M	L	H	Y	Y	Y	F, P	6
GROUNDCOVERS														
<i>Abronia villosa</i>	Desert Sand Verbena	•	1	2	3	D	M	L	H	N	N	N	F	6
<i>Acacia redolens</i> 'Desert Carpet'	Desert Carpet Creeping Acacia	•	2	12	113	E	S, M	VL	H	N	N	N	F	
<i>Acalypha monostachys</i>	Raspberry Fuzzies		1	1	1	S	M	M	M	N	N	N	F	
<i>Aptenia cordifolia</i>	Hearts and Flowers, Red Apple Ice Plant		1	3	7	E	M	L, M	L, M	N	N	N	F, P	
<i>Asteriscus maritimus</i>	Gold Coin Daisy		1	3	7	E	M	L, M	M	N	N	N	F	
<i>Baccharis pilularis</i> 'Pigeon Point'	Dwarf Coyote Brush		1	8	50	E	F	L	L	N	N	N	F	
<i>Berberis repens</i> (=Mahonia)	Creeping Oregon Grape		2	4	13	E	S	M	M	N	N	N	P, S	1
<i>Calylophus hartwegii</i>	Sierra Sundrop		1	2	3	D	F	L	H	N	N	N	F	
<i>Cephalophyllum speciosum</i> 'Red Spike'	Red Spike Iceplant		1	2	3	E	M	L	M	N	N	N	F, P	4
<i>Cerastium tomentosum</i>	Snow-in-Summer		1	1	1	D	F	L	L	N	N	N	F, P	
<i>Conoclinium greggii</i> 'Boothill' (=Eupatorium)	Boothill Eupatorium		2	2	3	E	F	M	M	N	N	N	P	
<i>Convolvulus cneorum</i>	Bush Morning Glory		2	4	13	E	F	L	M	N	N	N	F	
<i>Convolvulus mauritanicus</i>	Ground Morning Glory		1	3	7	P	F	L	M	N	N	N	F	
<i>Cotoneaster horizontalis</i>	Rock Cotoneaster		2	6	28	E	M	M	L	N	N	N	P	
<i>Dalea capitata</i> 'Sierra Gold'	Sierra Gold Dalea	•	1	3	7	D	F	L	H	N	N	N	F	1
<i>Dalea greggii</i>	Prostrate Indigo Bush	•	1	8	50	E	F	L	H	N	N	N	F	
<i>Dichondra argentea</i> 'Silver Falls'	Silver Dichondra, Kidneyweed		1	3	7	S	F	L	M	N	N	N	F, P	
<i>Dichondra micrantha</i>	Green Dichondra		1	3	7	E	M	M	L	N	N	N	P, S	1
<i>Drosanthemum cooperi</i>	Purple Iceplant		1	4	13	E	M, F	L	M	N	N	N	F, P	

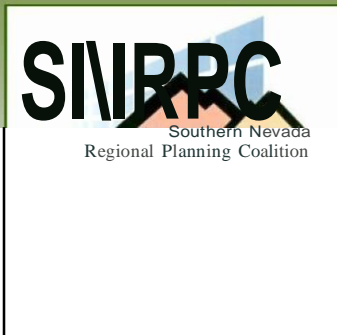
KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
BOTANICAL NAME		COMMON NAME												
GROUNDCOVERS (continued)														
<i>Euonymus fortunei</i> 'Coloratus'	Purple-leaf Wintercreeper		1	3	7	E	M	M	L	N	N	N	P	1
<i>Euphorbia rigida</i>	Spurge, Gopher Plant	•	2	3	7	E	F	L	H	N	N	N	F	
<i>Gazania rigens</i>	Gazania, Treasure Flower		1	1	1	E	F	L	M	N	N	N	F,P	2
<i>Glandularia gooddingii</i> (=Verbena)	Goodding Verbena	•	1	3	7	D	M	L	H	N	N	N	F	6
<i>Glandularia peruviana</i> (=Verbena)	Peruvian Verbena		1	2	3	D	F	L	L	N	N	N	P	
<i>Glandularia pulchella</i> (= Verbena)	Moss Verbena		1	3	7	E	M	L,M	L	N	N	N	F, P	
<i>Glandularia tenera</i> (=Verbena)	Rock Verbena		1	2	3	P	F	L	L	N	N	N	P	
<i>Juniperus chinensis procumbens</i>	Japanese Garden Juniper		2	8	50	E	S	M	L	N	N	N	P	1
<i>Juniperus conferta</i>	Shore Juniper		1	8	50	E	S	M	L	N	N	N	P	1
<i>Juniperus horizontalis</i> 'Prince of Wales'	Prince of Wales Juniper		1	4	13	E	S	M	L	N	N	N	P	1
<i>J. h. 'Wiltonii'</i>	Blue Carpet Juniper		1	6	28	E	S	M	L	N	N	N	P	1
<i>Juniperus sabina</i> 'Buffalo'	Buffalo Juniper		1	8	50	E	S	M	L	N	N	N	P	1
<i>Lantana montevidensis</i>	Trailing Lantana		1	6	28	D	F	L	M	N	N	N	F	7 (berries, leaves)
<i>Lippia nodiflora sterile hybrids</i> (=Phyla)	Kurapia		1	1	1	S	M	L,M	M	N	N	N	F,P	1
<i>Malephora crocea</i>	Gray Ice Plant, Coppery Mesemb		1	3	7	E	M	L,M	M	N	N	N	F, P	
<i>Malephora lutea</i>	Rocky Point Ice Plant		1	3	7	E	M	L,M	M	N	N	N	F, P	
<i>Mirabilis multiflora</i>	Four O'Clock	•	2	2	3	D	F	L	H	N	N	N	F,P,S	6
<i>Muehlenbeckia axillaris</i>	Creeping Wire Vine		1	3	7	E	F	M	M	N	N	N	P	
<i>Myoporum brevifolium</i> 'Emerald Gem'	Small Leaf Myoporum		1	4	13	D	M	L,M	H	N	N	N	F,P	
<i>Myoporum parvifolium</i>	Prostrate Myoporum		1	8	50	D	F	L	H	N	N	N	P	
<i>Pyracantha fortuneana</i> 'Santa Cruz'	Santa Cruz Pyracantha, Firethorn		2	5	20	E	M	M	M	Y	Y	Y	P	1
<i>Rosmarinus officinalis 'prostratus'</i>	Prostrate Rosemary		2	4	13	E	F	L	H	N	N	Y	F	
<i>Sedum spectabile</i>	Stonecrop		1	2	3	E	F	L	M	N	N	N	P	
<i>Sphaeralcea grossularifolia</i>	Goosefoot Mallow	•	2	4	13	E	F	VL	H	N	N	N	P	6
<i>Stachys coccinea</i>	Texas Betony, Scarlet Hedge Nettle		1	2	3	E, S	M	M	M	N	N	N	F, P	
<i>Tradescantia pallida</i> 'Purpurea'	Purple Heart, Wandering Jew		1	2	3	E	M	L,M	L	N	N	N	F, P	1
<i>Verbena rigida</i>	Sandpaper Verbena, Coarse Verbena		1	3	7	P	F	L	L	N	N	N	F	
<i>Vinca minor</i>	Dwarf Periwinkle		2	2	3	E	S,M	M, H	L	N	N	N	P, S	1
VINES														
<i>Antigonon leptopus</i>	Queen's Wreath, Coral Vine		15	10	79	D	M,F	L,M	M	N	N	N	F	
<i>Callaeum lilacaena</i> (=Mascagnia)	Orchid Vine		12	5	20	D	F	L	H	N	N	N	F	
<i>Campsis</i> sp.	Trumpet Creeper		10	10	79	D	F	M	L	N	N	N	P	2
<i>Cissus trifoliata</i> var. <i>incisa</i>	Grape Ivy, Arizona Grape Ivy		10	5	20	S	M	L,M	M	N	N	N	P, S	
<i>Clematis ligusticifolia</i>	Western Virgin's Bower	•	12	5	20	S	F	M	M	N	N	N	F,P,S	6
<i>Ficus pumila</i>	Creeping Fig		10	5	20	E	M	M	M	N	N	N	P,S	
<i>Gelsemium sempervirens</i>	Carolina Jasmine		10	5	20	E	M	H	L	N	N	N	P	1
<i>Hardenbergia violacea</i>	Happy Wanderer, Lilac Vine		10	5	20	E	M	H	L	N	N	N	P	
<i>Jasminum mesnyi</i>	Primrose Jasmine		10	5	20	E	M	M	L	N	N	N	P	1
<i>Lonicera japonica</i> 'Halliana'	Hall's / Japanese Honeysuckle		15	10	79	E	F	M	M	N	N	Y	F, P	
<i>Macfadyena unguis-cati</i>	Cat's Claw Vine		15	10	79	S	M	L	L	N	N	Y	F, P	3
<i>Maurandya antirrhiniflora</i>	Snapdragon Vine		8	5	20	D	M	L	M	N	N	N	F,P	6
<i>Parthenocissus</i> sp. 'Hacienda Creeper'	Hacienda Creeper		15	10	79	D	F	L,M	M	N	N	N	F, P	
<i>Polygonum aubertii</i>	Silver Lace Vine		15	5	20	E	M	L	M	N	N	N	F, P	
<i>Rosa banksiae</i>	Lady Bank's Rose		15	10	79	E	M	M	M	Y	N	N	P, F	3
<i>Solanum jasminoides</i>	Potato Vine		10	5	20	S, D	M,F	M	M	N	N	N	P, F	1, 4
<i>Tecoma capensis</i>	Cape Honeysuckle		8	5	20	E	M	L	L	N	N	Y	F, P	4
<i>Vitis arizonica</i>	Canyon Grape	•	10	10	79	D	M	L	M	N	N	N	F	6
<i>Vitis californica</i>	California Grape	•	10	10	79	D	M	L	M	N	N	N	F, P	
<i>V. c.</i> 'Roger's Red'	Rogers Red Grape	•	10	10	79	D	M	L	M	N	N	N	F, P	
<i>Vitis</i> sp.	Grape		10	10	79	D	M	L	M	N	N	Y	F, P	1
AGAVES, CACTI, SUCCULENTS, AND YUCCAS														
<i>Agave americana</i>	Century Plant		5	8	50	E	M	L	H	Y	Y	N	F	
<i>A. a.</i> var. <i>aura-marginata</i>	Yellow Margin Century Plant		4	5	20	E	S	L	H	Y	Y	N	F, P	
<i>A. a.</i> var. <i>medio-picta</i>	Medio Picta Century Plant		4	6	28	E	S	L	H	Y	Y	N	F	
<i>Agave angustifolia</i> var. <i>marginata</i>	Variegated Agave		3	3	7	E	S	L	H	Y	Y	N	F, P	
<i>Agave bovicornuta</i>	Cow's Horn Agave		4	4	13	E	F	L	H	Y	N	N	P	
<i>Agave bracteosa</i>	Green Spider Agave		1	1	1	E	S	L	H	N	N	N	F, P	
<i>Agave colorata</i>	Mescal Ceniza		3	3	7	E	M	L	H	Y	Y	N	F	
<i>Agave desmettiana</i>	Smooth Agave		3	3	7	E	F	L	H	Y	Y	N	F, P	
<i>Agave filifera</i>	Thread-leaf Agave, Dark Green Agave		2	2	3	E	M	L	H	Y	Y	N	F, P	
<i>Agave geminiflora</i>	Twin-Flowered Agave		3	4	13	E	M	L	H	Y	Y	N	F, P, S	
<i>Agave havardiana</i>	Havard Agave		3	4	13	E	M	L	H	Y	Y	N	F, P	
<i>Agave montana</i>	Mountain Agave		4	5	20	E	S	L	H	Y	Y	N	F, P	
<i>Agave multiflora</i>	Chahuiqui		3	4	13	E	S	L,M	M	Y	Y	N	F, P	
<i>Agave murpheyi</i>	Murphey's Agave		3	3	7	E	M	L	H	Y	N	N	F	
<i>Agave ocahui</i>	Agave Ocahui		2	3	7	E	S	VL	H	Y	Y	N	F	
<i>Agave ovatifolia</i>	Whale's Tongue Agave		3	4	13	E	S,M	L	H	Y	Y	N	F, P	

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established.		Comments:												
Height, Width, Coverage at mature growth.		1. Organic mulch recommended.												
Type: Deciduous, Evergreen, Semi-evergreen		2. Many cultivars.												
Growth Rate: Slow, Medium, Fast		3. Some species may form dense thickets.												
Water Use: Very Low, Low, Medium, High		4. Not cold hardy below 28°F.												
Drought Tolerance: Low, Medium, High		5. Invasive species.												
Exposure: Full sun, Partial shade, Shade		6. Mojave native.												
		7. Toxic (parts specified).												
		8. May be trained as a small tree.												
		9. Needs a protected site (north facing site or afternoon shade).												
BOTANICAL NAME	COMMON NAME													
AGAVES, CACTI, SUCCULENTS, AND YUCCAS (continued)														
<i>Agave palmeri</i>	Palmer's Agave		3	3	7	E	S	L	H	Y	N	F		
<i>Agave parrasana</i>	Cabbage Head Agave		2	2	3	E	S	L	H	Y	N	F, P		
<i>Agave parryi</i>	Parry's Agave		3	3	7	E	S	L	H	Y	N	F		
<i>A. p. var. huachuensis</i>	Huachuca Agave		2	3	7	E	S	L	H	Y	N	F, P		
<i>A. p. var. neomexicana</i>	New Mexico Agave		1	2	3	E	S	L, M	M	Y	N	F, P		
<i>A. p. var. truncata</i>	Artichoke Agave		3	3	7	E	S, M	VL	H	Y	N	F, P		
<i>Agave salmiana ssp. ferox</i>	Ferox Agave		6	8	50	E	S, M	L, M	M	Y	N	F, P		
<i>Agave scabra</i>	Rough-Leaved Agave		4	4	13	E	S	L	H	Y	N	F		
<i>Agave schidigera 'Durango Delight'™</i>	Durango Delight Agave		2	3	7	E	F	L	H	Y	N	F, P		
<i>Agave utahensis ssp. nevadensis</i>	Nevada Agave	•	1	1	1	E	S	VL	H	Y	N	F	6	
<i>Agave victoriae-reginae</i>	Queen Victoria Agave	•	2	2	3	E	S	L	H	Y	N	F		
<i>Agave vilmoriniana</i>	Octopus Agave		4	4	13	E	F	M	M	N	N	F, P		
<i>Agave weberi</i>	Weber Agave		5	8	50	E	M, F	L	H	Y	N	F, P		
<i>Aloe arborescens</i>	Tree Aloe		6	6	28	E	S	L	M	Y	N	F, P	4	
<i>Aloe barbadensis</i>	Aloe Vera		2	2	3	E	S, M	L	M	Y	N	F, P		
<i>Aloe ferox</i>	Tap Aloe, Cape Aloe		6	5	20	E	S	L	M	Y	N	F, P	4	
<i>Aloe nobiliss</i>	Gold Tooth Aloe		1	1	1	E	S, M	L	M	Y	N	F, P		
<i>Aloe saponaria</i>	African Aloe		2	1	1	E	M	L	M	Y	N	P		
<i>Aloe x 'Blue Elf'</i>	Blue Elf Aloe		2	2	3	E	S, M	M	M	Y	N	P, S		
<i>Aloe x spinosissima</i>	Spider Aloe		3	3	7	E	S	L	H	Y	N	P		
<i>Carnegiea gigantea</i>	Saguaro (spear)		12	2	3	E	S	L	H	Y	N	F		
<i>Carnegiea gigantea</i>	Saguaro (with arms)		20	6	28	E	S	L	H	Y	N	F		
<i>Cereus hildmannianus (= peruvianus)</i>	Peruvian Apple		8	3	7	E	M	L	H	Y	N	F	4	
<i>Cylindropuntia acanthocarpa (=Opuntia)</i>	Buckhorn Cholla	•	6	6	28	E	M	L	H	Y	N	F	6	
<i>Cylindropuntia arbuscula (=Opuntia)</i>	Pencil Cholla	•	8	3	7	E	M	L	H	Y	N	F		
<i>Cylindropuntia bigelovii (=Opuntia)</i>	Teddy Bear Cholla	•	6	4	13	E	M	L	H	Y	N	F	6	
<i>Cylindropuntia echinocarpa (=Opuntia)</i>	Silver Cholla	•	3	4	13	E	M	L	H	Y	N	F	6	
<i>Cylindropuntia fulgida (=Opuntia)</i>	Chain-Fruit Cholla, Jumping Cactus		8	5	20	E	M	L	H	Y	N	F		
<i>Cylindropuntia ramosissima (=Opuntia)</i>	Diamond Cholla	•	3	5	20	E	S, M	L	H	Y	N	F	6	
<i>Cylindropuntia versicolor (=Opuntia)</i>	Staghorn Cholla	•	6	5	20	E	M	L	H	Y	N	F		
<i>Dasyliiron acrotiche</i>	Green Desert Spoon	•	5	6	28	E	M	L	H	Y	N	F		
<i>Dasyliiron longissimum (=quadragulatum)</i>	Stick Palm, Mexican Grass Tree	•	8	6	28	E	M	L	H	Y	N	F		
<i>Dasyliiron wheeleri</i>	Desert Spoon	•	5	6	28	E	M	L	H	Y	N	F		
<i>Echinocactus grusonii</i>	Golden Barrel		2	3	7	E	M	L	H	Y	N	F		
<i>Echinocactus polycephalus</i>	Cottontop Cactus	•	2	3	7	E	S	VL	H	Y	N	F	6	
<i>Echinocereus engelmannii</i>	Strawberry Hedgehog	•	1	3	7	E	S	L	H	Y	N	F	6	
<i>Echinocereus triglochidiatus</i>	Claret Cup	•	1	2	3	E	S, M	L	H	Y	N	F	6	
<i>Escobaria vivipara (=Coryphantha)</i>	Common Pincushion	•	1	1	1	E	S, M	L	H	Y	N	F, P	6	
<i>E. v. var. bisbeana</i>	Beehive Cactus	•	1	1	1	E	S, M	L	H	Y	N	F, P	6	
<i>Ferocactus acanthodes (=Cylindraceus)</i>	Compass Barrel Cactus	•	6	2	3	E	S	L	H	Y	N	F	6	
<i>Ferocactus wislizenii</i>	Fishhook Barrel Cactus	•	6	2	3	E	S, M	L	H	Y	N	F		
<i>Fouquieria splendens</i>	Ocotillo	•	12	6	28	D	S	L	H	Y	N	F, P	6	
<i>Hesperaloe campanulata</i>	Bell-flowered Hesperaloe		3	3	7	E	M	L	H	N	Y	F, P		
<i>Hesperaloe funifera</i>	Giant Sword Flower	•	6	6	28	E	M	L	H	N	Y	F		
<i>Hesperaloe nocturna</i>	Night Blooming Yucca	•	5	6	28	E	M	L	H	N	Y	F		
<i>Hesperaloe parviflora</i>	Red Yucca	•	3	3	7	E	M	L	H	N	Y	F		
<i>H. p. 'Yellow'</i>	Yellow Yucca	•	3	3	7	E	M	L	H	N	Y	F		
<i>Mammillaria tetrancistra</i>	Pincushion / Fishhook Cactus	•	1	1	1	E	S, M	L	H	Y	N	F, P	6	
<i>Nolina bigelovii</i>	Bigelow's Nolina	•	6	4	13	E	M	L	H	N	Y	F	6	
<i>Nolina matapensis</i>	Treebear Grass	•	12	6	28	E	M	L	H	N	Y	F		
<i>Nolina microcarpa</i>	Bear Grass	•	4	5	20	E	M	L	H	N	Y	F		
<i>Nolina nelsoni</i>	Blue Nolina	•	5	5	20	E	M	L	H	N	Y	F		
<i>Nolina texana</i>	Texas Bear Grass, Devil's Shoestring	•	3	3	7	E	M	L	H	N	Y	F		
<i>Opuntia basilaris</i>	Beavertail Cactus	•	1	4	13	E	M	L	H	Y	N	F	6	
<i>Opuntia chlorotica</i>	Pancake Prickly Pear	•	4	5	20	E	M	L	H	Y	N	F	6	
<i>Opuntia engelmannii</i>	Engelmann's Prickly Pear	•	6	6	28	E	S, M	L	H	Y	N	F, P	6	
<i>O. e. acicularis</i>	Bristly Prickly Pear	•	8	10	79	E	M	L	H	Y	N	F, P		
<i>O. e. linguiformis</i>	Cow's Tongue, Angel's Wing Cactus	•	6	8	50	E	M	L	H	Y	N	F		
<i>Opuntia erinacea 'erinacea'</i>	Old Man Prickly Pear	•	2	3	7	E	S, M	L	H	Y	N	F	6	
<i>Opuntia ficus-indica</i>	Indian Fig Cactus	•	15	10	79	E	M, F	L	M	N, Y	Y	F		
<i>Opuntia macrocentra</i>	Black Spine Prickly Pear	•	4	3	8	E	M	L	H	N	Y	F		
<i>Opuntia microdasys</i>	Bunny Ears	•	3	5	20	E	M	L	H	Y	N	F		
<i>Opuntia phaeacantha</i>	Mojave Prickly Pear	•	3	6	28	E	S	L	H	Y	N	F	6	
<i>Opuntia paraguayensis</i>	Paraguay Cactus, Orange Tuna Cactus		6	4	13	E	M	L	M	Y	N	F, P		
<i>Opuntia riviereana</i>	Orange Tuna Cactus	•	5	8	50	E	M	L	H	Y	N	F		
<i>Opuntia robusta</i>	Silver Dollar Cactus, Giant Prickly Pear	•	18	10	79	E	M	L	H	Y	N	F		

KEY		"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
		(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	VL, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S		
AGAVES, CACTI, SUCCULENTS, AND YUCCAS (continued)														
<i>Opuntia santa rita</i> 'Tubac' (= <i>O. violacea</i> 'Santa Rita')	Purple Prickly Pear, Purple Pancake	●	4	6	28	E	M	L	H	Y	Y	N	F	
<i>Opuntia turpinii</i> (= <i>Tephrocactus</i>)	Pine Cone Prickly Pear, Paper Spine Cactus	●	1	2	3	E	M	L	H	N	N	N	P	
<i>Oreocereus celsianus</i>	Old Man Of the Andes		6	2	3	E	M	L	H	Y	N	N	F, P	
<i>Tephrocactus articulatus</i>	Paper Spine Cactus, Pine Cone Cactus		1	3	7	E	S	L	M	Y	Y	N	F, P	
<i>Trichocereus pachanoi</i> (= <i>Echinopsis</i>)	San Pedro Cactus		8	6	28	E	M	L	H	Y	N	N	F	
<i>Trichocereus spachianus</i> (= <i>Echinopsis</i>)	Golden Torch Cactus		6	3	7	E	S, M	L	H	Y	N	N	F, P	2
<i>Trichocereus</i> sp (= <i>Echinopsis</i>)	Cacti		15	3	7	E	M	L	H	Y	N	N	F	
<i>Yucca aloifolia</i>	Spanish Bayonet		8	8	50	E	S	L	H	Y	Y	N	F	
<i>Yucca australis</i>	Australis Yucca		30	10	79	E	S	L	H	Y	N	N	F	
<i>Yucca baccata</i>	Banana Yucca	●	4	6	28	E	S	L	H	Y	Y	N	F, P	6
<i>Yucca brevifolia</i>	Joshua Tree	●	15	10	79	E	S	L	H	Y	N	N	F	6
<i>Yucca constricta</i>	Constricta Yucca		4	3	7	E	S	L	H	Y	N	N	F	
<i>Yucca elata</i>	Soaptree Yucca	●	10	8	50	E	S	L	H	Y	N	N	F, P	
<i>Yucca faxoniana</i>	Palm Yucca	●	12	6	28	E	S	L	H	Y	N	N	F	
<i>Yucca filamentosa</i>	Adam's Needle		3	3	7	E	M	L	H	Y	Y	N	F, P	
<i>Yucca glauca</i>	Soapweed, Narrowleaf Yucca		3	4	13	E	S	L	H	Y	Y	N	F	
<i>Yucca gloriosa</i>	Spanish Dagger		10	8	50	E	S, M	L	H	N	N	N	F, P	
<i>Yucca harrimaniae</i>	Harriman's Yucca	●	1	1	1	E	S	L	H	Y	N	N	F	
<i>Yucca pallida</i>	Pale Leaf Yucca		1	2	3	E	S	L	H	Y	N	N	F	
<i>Yucca gloriosa</i> var. <i>tristis</i> (= <i>Y. recurvifolia</i>)	Weeping Yucca, Pendulous Yucca		6	6	28	E	S	L	H	Y	N	N	F, P	
<i>Yucca rigida</i>	Blue Yucca	●	12	3	7	E	M	L	H	Y	N	N	F	
<i>Yucca rostrata</i>	Beaked Yucca	●	10	3	7	E	S, M	L	H	Y	N	N	F	
<i>Yucca rupicola</i>	Twisted Yucca	●	2	3	7	E	S	L	H	N	N	N	F, P	
<i>Yucca schidigera</i>	Mojave Yucca	●	8	8	50	E	S	L	H	Y	N	N	F	6
<i>Yucca schottii</i>	Mountain Yucca		12	5	20	E	S, M	L	H	Y	N	N	F, P	
<i>Yucca thompsoniana</i>	Thompson's Yucca		10	8	50	E	S	L	H	Y	Y	N	F	
<i>Yucca torreyi</i>	Torrey Yucca		15	6	28	E	S	L	H	Y	Y	N	F	
<i>Yucca whipplei</i>	Our Lord's Candle, Chaparral Yucca	●	3	6	28	E	S	L	H	Y	Y	N	F	6
ORNAMENTAL GRASSES														
<i>Achnatherum hymenoides</i> (= <i>Oryzopsis</i>)	Indian Ricegrass	●	1	1	1	D	F	VL	H	N	N	N	F	6
<i>Achnatherum speciosum</i>	Desert Needlegrass	●	1	1	1	D	F	VL	H	N	N	N	F	6
<i>Aristida purpurea</i>	Purple Threeawn	●	2	2	3	E	F	L	H	N	N	N	F	5, 6
<i>Bouteloua curtipendula</i>	Side-Oats Grama	●	2	2	3	D	F	L	H	N	N	N	F, P	6
<i>Bouteloua gracilis</i>	Blue Grama Grass	●	2	2	3	E	F	VL	H	N	N	N	F	6
<i>Calamagrostis x acutifolia</i>	Feather Reed Grass		3	3	7	E	F	L	H	N	N	N	F, P	
<i>Cortaderia selloana</i>	Pampas Grass		8	15	177	E	F	L	H	N	Y	Y	F, P	5
<i>C. s. 'Pumila'</i>	Dwarf Pampas Grass		4	4	13	E	F	L	H	N	Y	Y	F, P	5
<i>Festuca ovina</i>	Blue Fescue		1	1	1	E	F	M	M	N	N	N	F	2
<i>F. o. var. brachyphylla</i>	Sheep Fescue		1	1	1	E	F	M	M	N	N	N	F	6
<i>Helictotrichon sempervirens</i>	Blue Oat Grass		2	2	3	E, S	M	M	M	N	N	N	F	
<i>Miscanthus sinensis</i>	Maiden Grass, Japanese Silver Grass		5	4	12	D	M	M	M	N	N	N	F, P	
<i>M. s. 'Variegata'</i>	Variegated Maiden Grass		5	4	12	D	M	M	M	N	N	N	F, P	
<i>Muhlenbergia capillaris</i> 'Regal Mist'	Regal Mist Muhly Grass	●	3	3	7	D	F	L	M	N	N	N	F, P	
<i>Muhlenbergia dumosa</i>	Bamboo Muhly, Fairy Bamboo		4	4	13	E, S	M, F	L, M	M	N	N	N	F, P	
<i>Muhlenbergia emersleyi</i> 'El Toro'	Bull Grass	●	3	3	7	E	F	VL	H	N	N	N	F, P	
<i>Muhlenbergia lindheimeri</i> 'Autumn Glow'	Autumn Glow	●	5	5	20	D	F	L	H	N	N	Y	F, P	
<i>Muhlenbergia rigens</i>	Deer Grass	●	4	4	13	D	M	M	H	N	N	N	F, P	6
<i>Muhlenbergia rigida</i> 'Nashville'	Nashville	●	2	2	3	E	M	M	H	N	N	N	F, P	
<i>Nasella tenuisima</i> (= <i>Stipa tenuisima</i>)	Mexican Feather Grass		2	2	3	D	M	M	M	N	N	N	F, P	5
<i>Ophiopogon japonicus</i>	Mondo Grass		1	1	1	E	M	M	L	N	N	N	P, S	2
<i>Pennisetum alopecuroides</i>	Black Moudry		5	5	20	S	F	M	L	N	N	Y	F, P	2
<i>Pennisetum x advena</i> 'Rubrum' 'Cupreum'	Purple Fountain Grass		4	3	7	S	F	M	L	N	N	Y	F	
<i>Phyllostachys aurea</i>	Golden Bamboo		15	10	79	D	F	M	L	N	Y	Y	F, P	3, 5
<i>Pleuraphis rigida</i> (= <i>Hilaria rigida</i>)	Big Galleta Grass	●	3	2	3	S	F	VL	H	N	N	N	F	6
<i>Sorghastrum nutans</i>	Indian Grass		4	2	3	S	F	M	M	N	N	N	F	
<i>Sporobolus airoides</i>	Alkali Sacaton Grass	●	4	2	3	D	M	L	M	N	N	N	F	6
<i>Stipa gigantea</i>	Giant Feather Grass, Golden Oats		3	2	3	S	M	M	L	N	N	N	F	
PERENNIALS (small accent areas only)														
<i>Achillea filipendulina</i>	Fern Leaf Yarrow		3	3	7	E	F	L	M	N	N	N	F	2
<i>Agapanthus africanus</i>	Lily of the Nile		3	3	7	E	M	M	L	N	N	N	P	1
<i>Amsonia tomentosa</i>	Desert Bluestar	●	1	1	1	D	M	VL	H	N	N	N	F	6
<i>Anemopsis californica</i>	Yerba Mansa		1	1	1	D	M	M	L	N	N	N	P, S	6, 7 (leaves)
<i>Artemisia ludoviciana</i>	Prairie Sage	●	3	3	7	D	F	L	M	N	N	N	F, P	6
<i>A. l. albula</i> 'Silver King'	Silver King Artemisia	●	3	3	7	D	F	L	M	N	N	N	F, P	
<i>Artemisia x 'Powis Castle'</i>	Powis Castle Wormwood	●	2	3	7	E	F	L	M	N	N	N	F, P	
<i>Artemisia schmidtiana</i> 'Silver Mound'	Angel's Hair, Silver Mound Artemisia		1	2	3	E	M	L	M	N	N	N	F, P	

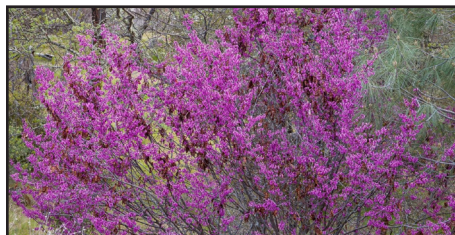
KEY		"Bulletproof"	Height (average) (feet)	Width (average) (feet)	Coverage (sq. feet)	Type D, E, S	Growth Rate S, M, F	Water Use VL, L, M, H	Drought Tolerance L, M, H	Spines or Thorns Yes or No	Physical Barrier Yes or No	Hedge or Screen Yes or No	Exposure F, P, S	COMMENTS
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established. Height, Width, Coverage at mature growth. Type: Deciduous, Evergreen, Semi-evergreen Growth Rate: Slow, Medium, Fast Water Use: Very Low, Low, Medium, High Drought Tolerance: Low, Medium, High Exposure: Full sun, Partial shade, Shade Comments: 1. Organic mulch recommended. 2. Many cultivars. 3. Some species may form dense thickets. 4. Not cold hardy below 28°F. 5. Invasive species. 6. Mojave native. 7. Toxic (parts specified). 8. May be trained as a small tree. 9. Needs a protected site (north facing site or afternoon shade).														
BOTANICAL NAME		COMMON NAME												
PERENNIALS (continued)														
<i>Astragalus preussii</i>	Preuss' Milkvetch	•	2	2	3	D	F	VL	H	N	N	N	F	6
<i>Baileya multiradiata</i>	Desert Marigold	•	1	2	3	D	M	L	H	N	N	N	F	6
<i>Berlandiera lyrata</i>	Chocolate Flower	•	1	2	3	E	F	L	H	N	N	N	F, P	
<i>Convolvulus tricolor</i>	Dwarf Morning Glory		1	2	3	D	F	L	L	N	N	N	F, P	
<i>Coreopsis lanceolata</i>	Sunray		1	1	1	S	F	M	L	N	N	N	F	
<i>Echinacea purpurea</i>	Purple Coneflower		3	2	3	S	M	M	L	N	N	N	F, P	1
<i>Enceliopsis argophylla</i>	Silverleaf Sunray	•	1	1	1	S	F	VL	H	N	N	N	F	6
<i>Epilobium canum</i> (=Zauschneria californica)	Hummingbird Flower		3	4	13	D	M	L	M	N	N	N	F, P	3
<i>Erigeron divergens</i>	Native Fleabane	•	1	3	7	E	F	VL	H	N	N	N	F, P	6
<i>Erigeron karvinskianus</i>	Santa Barbara Daisy, Mexican Daisy		1	3	7	E	F	L	H	N	N	N	F, P	
<i>Eschscholzia californica</i>	California Poppy, Golden Poppy		1	1	1	D	F	L	M	N	N	N	F	6
<i>Gaillardia aristata</i> (=grandiflora)	Blanket Flower		2	2	3	E	F	M	L	N	N	N	F	
<i>Gaura coccinea</i>	Scarlet Gaura	•	1	2	3	D	F	L	H	N	N	N	F, P	6
<i>Gaura lindheimeri</i>	Gaura		3	4	13	D	M	M	L	N	N	N	F, P	2
<i>Gazania rigida</i>	Gazania		1	1	1	E	M	L	M	N	N	N	F, P	
<i>Iberis sempervirens</i>	Evergreen Candytuft		1	2	3	E	M	L	L	N	N	N	F, P	
<i>Ipomopsis arizonica</i> (=Gilia aggregata)	Skyrocket	•	2	1	1	E	F	L	H	N	N	N	F, P, S	6
<i>Kallstroemia grandiflora</i>	Arizona Poppy, Orange Caltrop		1	1	1	S	F	L	M	N	N	N	F	
<i>Lavandula</i> sp.	Lavender		2	3	7	E	F	M	M	N	N	N	F	2
<i>Lepidium fremontii</i>	Desert Alyssium	•	2	2	3	D	F	VL	H	N	N	N	F	6
<i>Liatris spicata</i>	Gayfeather, Blazing Star		2	2	3	S	M	L, M	M	N	N	N	F, P	
<i>Linum lewisii</i>	Blue Flax		2	1	1	D	M	L	M	N	N	N	F	6
<i>Lippia repens</i>	Lippia		1	2	3	S	M	L	M	N	N	N	F, P	
<i>Liriope gigantea</i>	Giant Lily Turf		2	2	3	S	F	M	L	N	N	N	P, S	
<i>Liriope muscari</i>	Lily Turf		1	1	1	E	F	M	L	N	N	N	P, S	
<i>Lobularia maritima</i>	Sweet Alyssum		1	1	1	S	M	M	L	N	N	N	F, P	1
<i>Manfreda maculosa</i>	Texas Tuberose, Spice Lily		1	1	1	D	S, M	L, M	M	N	N	N	P, S	
<i>Melampodium leucanthum</i>	Blackfoot Daisy		1	2	3	S	M	L	M	N	N	N	F, P	
<i>Oenothera caespitosa</i>	Angel Wing/White Evening Primrose	•	1	2	3	E	F	M	L	N	N	N	F, P	6
<i>Oenothera elata</i> (=O. hookeri)	Hooker's Evening Primrose		3	1	1	D	F	M	M	N	N	N	F, P, S	5, 6
<i>Osteospermum fruticosum</i>	African Trailing Daisy, Freeway Daisy		1	4	13	E, S	M, F	M	M	N	N	N	F, P, S	
<i>Penstemon amphorellae</i>	Mexican Blue Penstemon		1	2	3	S	M	L, M	M	N	N	N	F, P	
<i>Penstemon baccharifolius</i> 'Del Rio'	Del Rio Penstemon		3	3	7	S	M	L	M	N	N	N	F, P	
<i>Penstemon barbatus</i>	Scarlet Bugler, Scarlet Beardtongue		4	2	3	E	M	L	M	N	N	N	F, P	
<i>Penstemon bicolor</i>	Pinto Beardtongue	•	2	2	3	E	F	VL	H	N	N	N	F	6
<i>P. b. ssp.roseus</i>	Rosy Two-tone Beardtongue	•	2	2	3	S	F	L	H	N	N	N	F, P, S	6
<i>Penstemon eatonii</i>	Firecracker Penstemon	•	3	2	3	E	M	L	H	N	N	N	F, P	6
<i>Penstemon palmeri</i>	Scented Penstemon	•	4	2	3	E	F	VL	H	N	N	N	F	6
<i>Penstemon parryi</i>	Parry's Penstemon	•	2	3	7	E	F	L	H	N	N	N	F, P	
<i>Penstemon pseudospectabilis</i>	Canyon Penstemon	•	2	4	13	E	F	L	H	N	N	N	F	
<i>Penstemon rostriflorus</i>	Bridge Penstemon		2	1	1	E	M	L	H	N	N	N	F, P	6
<i>Penstemon strictus</i>	Rocky Mountain Penstemon		2	2	3	E	F	L	M	N	N	N	F, P	
<i>Penstemon superbus</i>	Superb Penstemon, Coral Beardtongue		4	3	7	E	F	L, M	M	N	N	N	F, P	
<i>Penstemon</i> sp.	Penstemon		2	3	7	S	M, F	L	M	N	N	N	F	2
<i>Perovskia atriplicifolia</i>	Russian Sage	•	3	2	3	D	M	L	H	N	N	N	F, P	
<i>Psilostrophe cooperi</i>	Paper Flower	•	2	3	7	D	F	L	H	N	N	N	F, P	6
<i>Psilostrophe tagetina</i>	Wooly Paper Flower	•	2	3	7	D	F	L	H	N	N	N	F, P	
<i>Ratibida columnifera</i>	Mexican Hat		1	2	3	D	F	L	H	N	N	N	F, P	
<i>Rudbeckia hirta</i>	Black-eyed Susan		2	2	3	D	F	L	H	N	N	N	F, P	
<i>Ruellia brittoniana</i>	Wild Petunia		2	3	7	E	F	L	H	N	N	N	F, P, S	5
<i>R. b. vars. 'Katie', 'Rosa', 'Blanca'</i>	Dwarf Ruellia		1	2	3	E	M	M	M	N	N	N	F, P	
<i>Sphaeralcea ambigua</i>	Globe Mallow	•	3	3	7	S	F	L	H	N	N	N	F, P, S	2, 6
<i>Stanleya pinata</i>	Desert Prince's Plume	•	4	3	7	D	F	VL	H	N	N	N	F	6
<i>Tagetes lemmonii</i>	Mountain Marigold		4	4	13	S	F	M	M	N	N	N	F	
<i>Tagetes lucida</i>	Mexican Tarragon, Mexican Marigold		3	3	7	S	M, F	M	M	N	N	N	F, P	
<i>Tetranneuris acaulis</i> (=Hymenoxys)	Angelita Daisy	•	1	1	1	E	M	L, M	M	N	N	N	F, P	
<i>Thymophylla pentachaeta</i> (=Dyssodia)	Golden Dogbane, Golden Dyssodia	•	1	2	3	E	F	VL	H	N	N	N	F	6
<i>Thymophylla tenuiloba</i> (=Dyssodia)	Dahlberg Daisy	•	1	1	1	E	S	L	H	N	N	N	F	
<i>Tulbaghia violacea</i>	Society Garlic		1	1	1	S	M	M	M	N	N	N	F, P	
<i>Viguiera parishii</i> (=deltoidea)	Goldeneye	•	3	3	7	S	M	VL	H	N	N	N	F	6
<i>Xylorhiza tortifolia</i>	Mojave Aster	•	1	1	1	D	M	VL	H	N	N	N	F	6
<i>Zinnia acerosa</i>	Desert Zinnia	•	1	1	1	D	F	L	H	N	N	N	F, P	
<i>Zinnia grandiflora</i>	Prairie Zinnia		1	1	1	D	F	L	H	N	N	N	F, P	
PLANTS WITH SPECIAL NEEDS (NOT SUITABLE FOR ALL LOCATIONS)														
Shrub	<i>Asparagus densiflorus</i> 'Meyers'		2	3	7	E	M	M	L	N	N	N	P, S	1
Groundcover	<i>A. d.</i> 'Sprenger'		2	4	13	E	M	M	M	N	N	N	P, S	1, 4
Shrub	<i>Aspidistra elatior</i>		2	2	3	E	M	H	L	N	N	N	S	1
Shrub	<i>Aucuba japonica</i> 'Variegata'		8	8	50	E	S	M	M	N	N	N	S	1
Shrub	<i>Berberis aquifolium</i> (=Mahonia)		4	5	20	E, S	S	L	M	Y	Y	Y	P, S	1
Vine	<i>Bougainvillea</i> sp.		10	5	20	D	M	M	M	Y	Y	N	S	4

KEY			"Bulletproof"	Height (average)	Width (average)	Coverage	Type	Growth Rate	Water Use	Drought Tolerance	Spines or Thorns	Physical Barrier	Hedge or Screen	Exposure	COMMENTS
"Bulletproof": Extremely drought tolerant, cold hardy, and pest and disease resistant once established.				(feet)	(feet)	(sq. feet)	D, E, S	S, M, F	V, L, M, H	L, M, H	Yes or No	Yes or No	Yes or No	F, P, S	
Height, Width, Coverage at mature growth.															
Type: Deciduous, Evergreen, Semi-evergreen															
Growth Rate: Slow, Medium, Fast															
Water Use: Very Low, Low, Medium, High															
Drought Tolerance: Low, Medium, High															
Exposure: Full sun, Partial shade, Shade															
Comments:															
1. Organic mulch recommended.															
2. Many cultivars.															
3. Some species may form dense thickets.															
4. Not cold hardy below 28°F.															
5. Invasive species.															
6. Mojave native.															
7. Toxic (parts specified).															
8. May be trained as a small tree.															
9. Needs a protected site (north facing site or afternoon shade).															
BOTANICAL NAME	COMMON NAME														
PLANTS WITH SPECIAL NEEDS (continued)															
Perennial	<i>Canna hybrids</i>	Canna		6	3	7	D	F	M,H	L	N	N	N	P	1, 2
Agave, etc	<i>Cephalocereus senilis</i>	Old Man Cactus		6	4	13	E	S	L	M	Y	Y	N	P	4
Perennial	<i>Cuphea ilavea</i>	Bat-faced Cuphea		2	3	7	E	M	H	L	N	N	N	P	1
Perennial	<i>Dietes bicolor</i>	Fortnight Lily, Evergreen Iris		2	2	3	E	M	M	M	N	N	N	P, S	1
Perennial	<i>Dietes vegeta (=iridoides)</i>	Butterfly Iris, African Iris		2	2	3	E	M	M	M	N	N	N	P, S	1
Perennial	<i>Erysimum linifolium</i>	Wallflower		2	2	3	E	M	L, M	M	N	N	N	P	1
Shrub	<i>Euryops pectinatus</i>	Yellow Bush Daisy, Euryops Daisy		3	3	7	E	F	L	H	N	N	Y	F	1
Shrub	<i>E. p. 'Viridis'</i>	Green Bush Daisy		3	3	7	E	F	L	H	N	N	Y	F	1
Shrub	<i>Fatsia japonica</i>	Japanese Aralia		6	6	28	E	F	H	L	N	N	N	S	1
Shrub	<i>Genista racemosa</i>	Sweet Broom		6	6	28	E	F	M	M	N	N	N	F	1
Vine	<i>Hedera canariensis</i>	Algerian Ivy		10	5	20	E	F	M,H	L,M	N	N	N	P, S	1
Vine	<i>Hedera helix</i>	English Ivy		10	5	20	E	F	M,H	L,M	N	N	N	P, S	1, 7(all parts)
Perennial	<i>Hemerocallis hybrids</i>	Daylily Hybrids		2	2	3	E	M	M,H	L	N	N	N	P	1, 2
Shrub	<i>Hibiscus</i> sp.	Hibiscus		4	4	13	D,E,S	M	M,H	L	N	N	N	P	1, 2, some 4
Shrub	<i>Hyptis emoryi</i>	Desert Lavender		6	6	28	S	S,M	L	H	N	N	N	F, P	4, 6
Shrub	<i>Ilex cornuta</i>	Chinese Holly		8	8	50	E	M	M	M	Y	Y	Y	F,P	2
Shrub	<i>I. c. 'Burfordii Nana'</i>	Dwarf Burford Holly		6	6	28	E	M	M	M	N	Y	Y	F,P	
Shrub	<i>Ilex vomitoria 'Nana'</i>	Dwarf Yaupon Holly		3	3	7	E	M	M	M	N	Y	Y	F,P	
Shrub	<i>Ilex</i> sp.	Holly		20	10	79	D,E	S	M	M	Y	Y	Y	F,P	1, 2
Perennial	<i>Iris</i> sp.	Iris		3	2	3	D, S	M	M,H	L	N	N	N	P	1, 2, some 4
Vine	<i>Jasminum polyanthum</i>	Pink Jasmine		10	5	20	S	M,F	M	M	N	N	N	P	1
Shrub	<i>Lagerstroemia indica dwarf</i>	Dwarf Crape Myrtle		6	6	28	D	S	M	M	N	N	Y	F, P	1, 2
Shrub	<i>Ligustrum japonicum</i>	Waxleaf Privet, Japanese Privet		8	8	50	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>Nandina domestica</i>	Heavenly Bamboo		6	4	13	E,S	S	L	M	N	Y	Y	P, S	1
Shrub	<i>N. d. 'Nana'</i>	Dwarf Heavenly Bamboo		4	3	7	E,S	S	L	M	N	Y	Y	P, S	1
Vine	<i>Parthenocissus quinquefolia</i>	Virginia Creeper		10	5	20	D, S	F	M	L	N	N	N	P, S	1, 5
Vine	<i>Parthenocissus tricuspidata</i>	Boston Ivy, Japanese Creeper		10	5	20	D, S	F	M	L	N	N	N	P	1
Shrub	<i>Phormium</i> sp.	Flax		3	3	7	E	M	M	L	N	N	N	P	1, 2, some 4
Shrub	<i>Photinia x fraseri</i>	Redtip Photinia, Fraser's Photinia		8	6	28	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>Pittosporum tobira</i>	Japanese Mock Orange		8	8	50	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>P. t. 'Variegata'</i>	Variegated Mock Orange		8	8	50	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>P. t. 'Wheeler's Dwarf'</i>	Wheeler's Dwarf Mock Orange		2	4	13	E	S	M	M	N	N	N	P, S	1
Shrub	<i>Platycladus orientalis 'Aurea Nana'</i>	Golden Arborvitae		4	2	3	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>Podocarpus gracillor</i>	Fern Pine		10	3	7	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>Prunus caroliniana 'Compacta'</i>	Compact Carolina Cherry		8	6	28	E	S	M	M	N	Y	Y	P, S	1
Shrub	<i>Rhaphiolepis indica</i>	Indian Hawthorn		4	4	13	E	S	L	M	N	N	Y	P, S	1, 2
Groundcove	<i>Stachys byzantina</i>	Lamb's Ear		1	2	3	E	F	M	M	N	N	N	P	1
Agav'e, etc	<i>Stenocereus thurberi</i>	Organ Pipe Cactus		10	3	7	E	S	L	H	Y	Y	N	F, P	4
Vine	<i>Trachelospermum asiaticum</i>	Asiatic Jasmine		10	5	20	E	S	M	M	N	N	N	P, S	1
Vine	<i>Trachelospermum jasminoides</i>	Star Jasmine		10	5	20	E	S	M	M	N	N	N	P, S	1
Shrub	<i>Viburnum</i> sp.	Viburnum		8	8	50	E	S	M	M	N	Y	Y	P, S	1
Vine	<i>Wisteria sinensis</i>	Chinese Wisteria		10	8	20	D	F	M,H	L	N	N	N	P, F	1
Perennial	<i>Zephyranthes</i> sp.	Fairy Lily, Rain Lily		1	1	1	E, D	M	M	L	N	N	N	P	2
REFERENCES															
Florida Plant Profile List: http://www.floridata.com/lists/contents.cfm															
Lady Bird Johnson Wildflower Center Native Plant Database: http://www.wildflower.org/plants/															
Learn2Grow Plants Search: http://www.learn2grow.com/plants/															
Mountain States Wholesale Nursery: http://www.mswm.com															
Sunset Plant Finder: http://plantfinder.sunset.com/sunset/															
United States Department of Agriculture Plants Database: http://plants.usda.gov/															
University of Arizona Arid Plant List: http://ag.arizona.edu/pima/gardening/aridplants/aridplant_botindex.html															

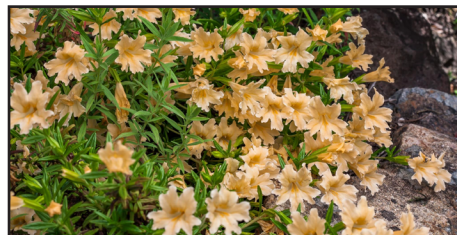


East Bay Municipal Utility District Recommended Plant List

Low-Water Use Plants



Cercis occidentalis



Diplacus (Mimulus) aurantiacus



Epilobium canum cvs.

Photos from WUCOLS, UC DAVIS

Trees

- | | |
|-------------------------------------|------------------------------|
| Aesculus californica | California Buckeye CA ☆ |
| Arbutus 'Marina' | Marina Madrone ☆ |
| Arbutus unedo | Strawberry Tree ☆ |
| Arctostaphylos manzanita 'Dr. Hurd' | Dr. Hurd Manzanita CA |
| Brahea armata | Mexican Blue Palm |
| Ceanothus 'Ray Hartman' | Ray Hartman Ceanothus CA ☆ |
| Cercis occidentalis | Western Redbud CA ☆ |
| Heteromeles arbutifolia | Toyon CA ☆ |
| Lagerstroemia indica | Crape Myrtle |
| Laurus nobilis 'Saratoga' | Saratoga Sweet Bay |
| Olea europaea | Olive ☆ |
| Pistacia chinensis 'Keith Davey' | Keith Davey Chinese Pistache |
| Quercus agrifolia | Coast Live Oak CA ☆ |
| Quercus douglasii | Blue Oak CA ☆ |
| Quercus englemannii | Mesa Oak CA ☆ |
| Quercus lobata | Valley Oak CA ☆ |
| Quercus rugosa | Netleaf Oak ☆ |
| Quercus suber | Cork Oak ☆ |
| Quercus tomentella | Island Oak CA ☆ |

Grasses

- | | |
|--------------------------------------|-----------------------------------|
| Bouteloua gracilis 'Blonde Ambition' | Blonde Ambition Mosquito Grass CA |
| Carex tumulicola | Foothill Fescue CA |
| Festuca californica | California Fescue CA ☆ |
| Festuca mairei | Atlas Fescue ☆ |
| Muhlenbergia dubia | Pine Muhly ☆ |
| Muhlenbergia rigens | Deer Grass CA ☆ |

Shrubs

- | | |
|---|-----------------------------------|
| Acacia cognata 'Cousin Itt' | Little River Wattle |
| Alyogyne huegelii | Blue Hibiscus ☆ |
| Arctostaphylos densiflora 'Howard McMinn' | Howard McMinn Manzanita CA ☆ |
| Artemisia californica | California Sagebrush CA ☆ |
| Baccharis pilularis | Dwarf Coyote Bush CA ☆ |
| Callistemon 'Little John' | Little John Bottlebrush ☆ |
| Ceanothus 'Dark Star' | Dark Star Ceanothus CA ☆ |
| Ceanothus maritimus 'Valley Violet' | Valley Violet Mountain Lilac CA ☆ |
| Cistus salvifolius 'Prostratus' | Sageleaf Rockrose |
| Cistus spp. | Rockrose |
| Cotinus coggygria cvs. | Smoke Tree ☆ |
| Dasyliirion wheeleri | Desert Spoon |
| Dodonaea viscosa | Hopseed Bush |
| Encelia californica | Coast Sunflower CA ☆ |
| Encelia farinosa | Brittlebush CA ☆ |
| Eriogonum fasciculatum | California Buckwheat CA ☆ |
| Frangula 'Mound San Bruno' | San Bruno Coffeeberry CA ☆ |
| Frangula californica 'Leatherleaf' | Leatherleaf Coffeeberry CA ☆ |
| Fremontodendron 'Ken Taylor' | Ken Taylor Flannel Bush CA ☆ |
| Grevillea spp. | Grevillea ☆ |
| Peritoma arborea | Bladderpod CA ☆ |
| Phlomis fruticosa | Jerusalem Sage ☆ |
| Ribes aureum var. gracillimum | Golden Currant CA ☆ |
| Ribes sanguineum var. glutinosum | Pink Flowering Currant CA ☆ |
| Ribes viburnifolium | Evergreen Currant CA |
| Salvia clevelandii cvs. | Cleveland Sage CA ☆ |
| Salvia greggii/microphylla | Autumn Sage |
| Sphaeralcea ambigua | Apricot Mallow ☆ |
| Teucrium fruticans | Bush Germander |
| Westringia fruticosa | Coast Rosemary ☆ |



Follow the QR code for plant descriptions and pictures. Visit www.ebmud.com/plants for more resources!



Water Conservation

Low-Water Use Plants

Perennials

Anigozanthos cvs.	Kangaroo Paw
Asclepias fascicularis	Narrow-Leaf Milkweed CA ☆
Asclepias speciosa	Showy Milkweed CA
Clinopodium douglasii	Yerba Buena CA
Cordyline australis cvs.	New Zealand Cabbage Tree
Diplacus (Mimulus) aurantiacus	Sticky Monkey Flower CA ☆
Epilobium canum cvs.	California Fuchsia CA ☆
Epilobium canum 'Everett's Choice'	Everett's Choice California Fuchsia CA
Glandularia (Verbena) lilacina 'De La Mina'	Cedros Island Verbena CA
Heuchera maxima	Island Alum Root CA
Juncus patens	California Grey Rush CA ☆
Lavandula x allardii 'Meerlo'	Lavander Meerlo
Lavandula stoechas	Spanish Lavender
Libertia peregrinans	Orange Libertia
Lomandra longifolia 'LM300'	Breeze Dwarf Mat Rush
Lomandra longifolia 'Roma13'	Variiegated Dwarf Mat Rush
Lychnis coronaria	Rose Campion
Monardella villosa	Coyote Mint CA ☆
Nepeta x faassenii	Catmint
Penstemon centranthifolius	Scarlet Bugler CA ☆
Penstemon heterophyllus	Foothill Penstemon CA ☆
Perovskia atriplicifolia	Russian Sage
Phormium hybrids	Flax
Romneya coulteri	Matilija Poppy CA ☆
Salvia 'Dara's Choice'	Sonoma Sage CA
Salvia spathacea	Hummingbird Sage CA ☆
Sisyrinchium bellum	Blue-Eyed Grass CA ☆
Symphoricarpos albus	Common Snowberry CA
Teucrium chamaedrys	Wall Germander

Groundcovers

Achillea millefolium cvs.	Common Yarrow CA ☆
Arctostaphylos uva-ursi cvs.	Bearberry CA
Berberis aquifolium var. repens	Creeping Mahonia CA ☆
Ceanothus 'Centennial'	Centennial Ceanothus CA
Ceanothus 'Yankee Point'	Yankee Point Ceanothus CA
Dymondia margaretae	Dymondia, Rock Ditty ☆
Lantana montevidensis cvs.	Trailing Lantana
Lessingia filaginifolia	California Aster CA
Lessingia filaginifolia 'Silver Carpet'	Silver Carpet Corethrogyne CA
Rosmarinus officinalis cvs.	Rosemary ☆
Thymus serpyllum 'Elfin'	Elfin Thyme
Verbena rigida	Sandpaper Verbena

Succulents

Agave attenuata cvs.	Fox Tail Agave
Aeonium haworthii	Pinwheel
Aloe 'Blue Elf'	Blue Elf Aloe
Dudleya spp.	Dudleya CA ☆
Hesperaloe parviflora cvs.	Red Yucca
Yucca cvs.	Yucca

Symbol Key

The plants on this list are low-water species and thrive with minimal supplemental irrigation.

CA = California Native: California native plants are adapted to wet winters and dry summers and may only need supplemental irrigation during abnormal dry seasons.

☆ = Summer Dry: Plants from areas in the world with little to no summer rain require minimal summer watering once established. Many California natives are considered summer dry. Observe how these plants do in your garden and provide supplemental irrigation to support plant health as needed.

cvs. = Cultivars

spp. = Species

Note: Check with your local fire department to determine landscape and maintenance requirements. Good maintenance and healthy plants may help to reduce fires.



Salvia clevelandii cvs.



Achillea millefolium cvs.



Denver Water Recommended Plant List

Denver Water does not publish a single recommended plant list. They use the Plant Select® program for native plant recommendations including water efficient and xeriscape options. Further information can be found here: <https://plantselect.org/>

City of Celina

Ordinance Review for Water Conservation

June 18, 2026



Life Connected.

AGENDA

1. Project Overview
2. Water Conservation Analysis of Current Ordinances
3. Benchmarking Analysis
4. Draft Recommendations
5. Next Steps

PROJECT SCOPE

1

Review current Celina ordinances and compare against 6 benchmark entities

2

Prepare Technical Memo with benchmarking results and recommendations

3

Present study findings to City Council

Review of Existing Ordinances

(water conservation relevance)

Water Conservation and Drought Management

- Water Conservation and Drought Contingency Plan is codified in Article 13.04
- Twice per week outdoor watering (baseline)

Last Digit of Address	Allowed Landscape Watering Days
1, 3, 5, 7, 9	Saturday and Wednesday
0, 2, 4, 6, 8	Sunday and Thursday
Commercial and industrial	Tuesday and Friday

- No automatic irrigation from 10am-6pm
- Water waste prohibition language
- Enforcement, City can...
 - Issue citations
 - Impose fines
 - Suspend water service

Water Conservation and Drought Management

- Stage 1 – Water Watch
- Stage 2 – Water Warning
- Stage 3 – Water Emergency

Category	Stage 1	Stage 2	Stage 3
Triggers	UTRWD Stage 1 or 80% for 3 days	UTRWD Stage 2 or 85% for 3 days	UTRWD Stage 3 or 90% for 3 days
Automatic Irrigation	2 days/week	1 day/week	Prohibited
Drip Irrigation/Hand Watering	Unlimited	2 hrs/day	1 day/week (2 hrs max)
Non-Essential Uses	Limited	Restricted	Severely Restricted

Subdivision and Zoning

Subdivision Ordinance (§10.03)

- Irrigation required for open space not left in riparian condition (§10.03.078(h))
- 500+ lot subdivisions must irrigate common areas from wells or detention/retention devices (§10.03.078(h))
- HOA cannot restrict water-conserving landscapes (§10.03.079(h)(1))

Zoning Ordinance (Chapter 14)

- 20% open space required in residential districts (§14.02.201(c)(1))
- Residential landscape requirements (§14.04.206(a))
 - *Smart irrigation controllers required for front yards*
 - *Tree bubblers required*
 - *No more than 30% of yard can be made of non-plant materials*
- Landscape buffers and tree density standards (§14.04.207(c); §14.04.208)
- Approved plant list (§14.04.205)

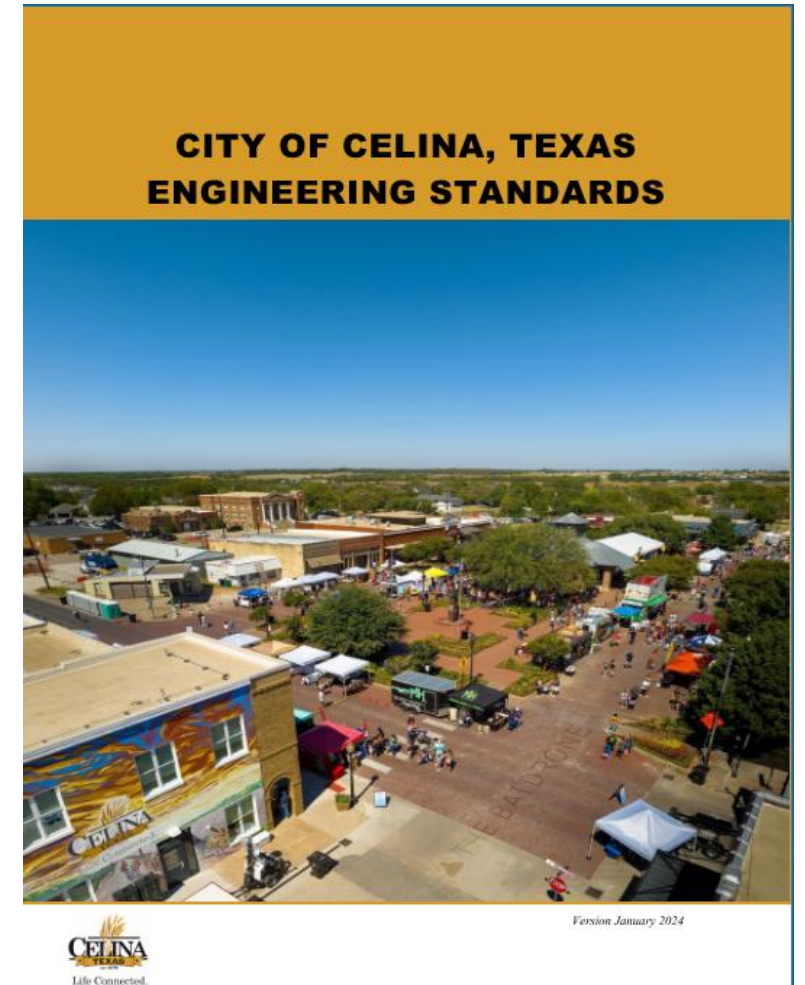
Engineering Standards (2024)

Median landscaping and irrigation requirements (§6.02; §7.02)

- Only mowed grass within 6 ft of curb (§6.02 (D))
- Minimum sod and placement requirements (§6.02 (L))
- Unclear irrigation language “Irrigation shall be provided...” ((§6.02 (E))
- Separate meters for irrigation (§7.02 (E))
- Technical standards for irrigation design within roadway (§7.02)

Reclaimed Water System section (§2.04)

- Currently marked as “Reserved”



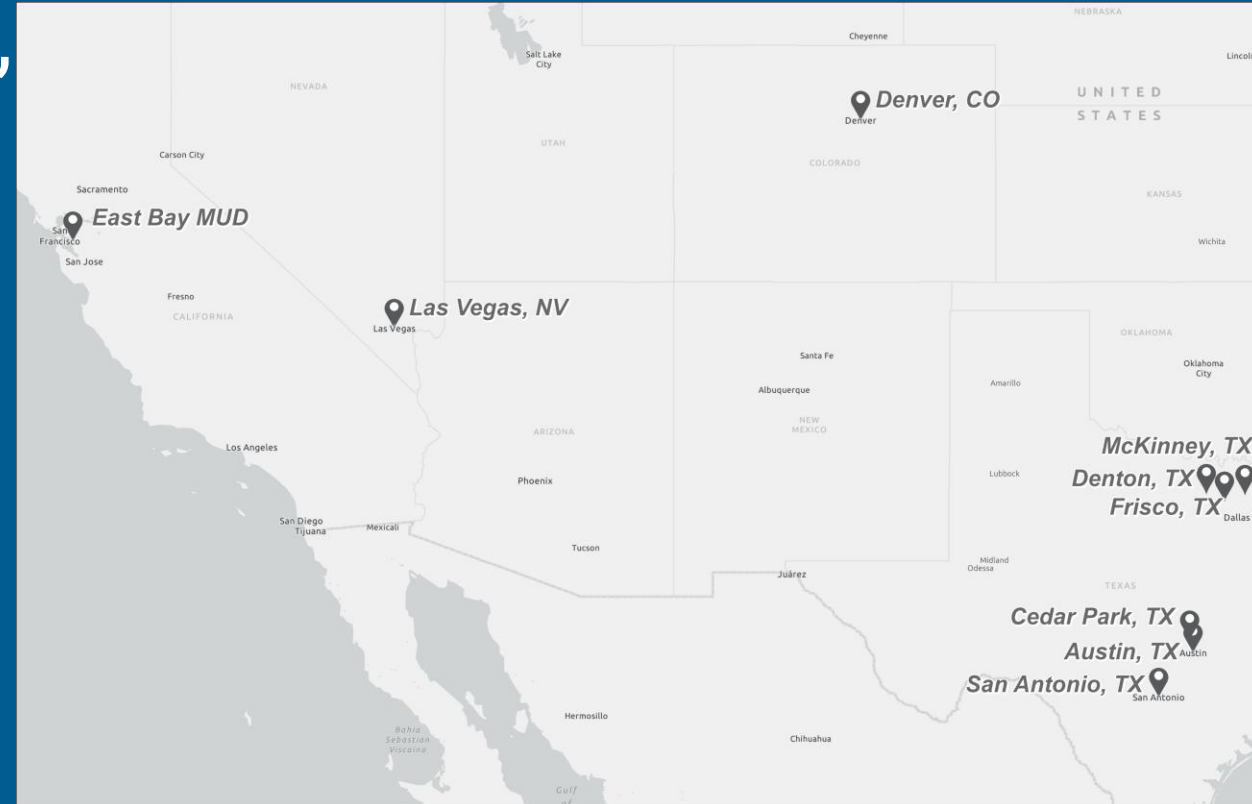
Potential Water Demand Drivers for Development

- Mandatory irrigation of certain open space areas
- Required landscape buffers and tree density
- Required turf in medians and parkways
- Amenity/open space requirements in residential districts
- No turf percentage caps in zoning



Benchmarking Analysis

- Texas
 - DFW Area (Denton, Frisco, McKinney)
 - Austin
 - Cedar Park
 - San Antonio
- Other States
 - Denver
 - East Bay MUD (Bay Area California)
 - Las Vegas































Benchmarking Analysis

 Most Stringent

 Stringent

 Least Stringent

Category	Austin	Cedar Park	Denver	EBMUD	Las Vegas	San Antonio	DFW Area
Development							
Landscape							
Irrigation							
Reuse							

Benchmarking Analysis – DFW Cities

Category	Denton	Frisco	McKinney
Development	Landscape plan review	Landscape and irrigation plan review	Landscape plans must include irrigation affidavit
Landscape	No major turf or drought-tolerant landscaping mandates identified	Strong corridor landscaping and tree preservation requirements	Artificial turf restrictions; approved plant list includes drought-tolerant species, hydrozoning required for irrigation approval
Irrigation	20% drought surcharge during severe drought; reuse water exempt from irrigation restrictions	Dedicated irrigation ordinance; rain/freeze sensors required on new systems	Year-round watering restrictions; narrow-area spray irrigation restrictions; detailed irrigation standards
Reuse	Active purple pipe system; discounted reuse water rates;	Dedicated reclaimed water ordinance and engineering standards; active purple pipe system	Reclaimed water authorized for irrigation with operational and cross-connection requirements

Benchmarking Analysis – Texas

Category	Austin	Cedar Park	San Antonio
Development	Allows for some natural landscape	Requires plan approval	Limits on HOA turf and irrigation mandates
Landscape	Non-functional turf irrigation prohibited in higher drought stages, hydro mulching	Requires plan approval	Required plant list, hydro mulching
Irrigation	Limited in certain areas and not allowed or not required in others	Requires plan approval	Limited in certain areas and not allowed or not required in others. Audits for large users
Reuse	On-site including (Gray, SW etc.)	Not addressed	On-site and Purple Pipe

Benchmarking Analysis – Other States

Category	Denver	EBMUD	Las Vegas
Development	Use System Development Charges to incentivize smaller lots	Requires indoor fixture efficiency standards at development	Prohibits turf in most new development
Landscape	Do not directly limit	Requires landscape water budgets. Limits turf to 25% and requires hydrozoning	Prohibits nonfunctional turf (existing + new development). Water budgets for large users
Irrigation	Prohibits spray irrigation in narrow landscape strips	Enforces strict water waste prohibitions (year-round). Uses volumetric water use limits during drought	Prohibits spray irrigation for non-turf areas and permanent irrigation restrictions
Reuse	Allows different treatment of potable vs non-potable water use	Can require recycled water use and dual plumbing	Requires use of non-potable water where available

Draft Recommendations

Draft Recommendations – Single Family

Less Stringent



More Stringent

- Minimum soil depth
- Only plants from approved list
- Ban non-functional turf in areas <6' wide
- Ban on Spray Irrigation in small areas <6' wide

- Limit turf to 25% of land area
- Ban on Spray Irrigation in small areas <10' wide
- Incentivize rainwater harvesting

- Ban on non-functional turf
- Ban on Spray Irrigation for non-functional turf
- Allow and incentivize dual plumbing for irrigation with graywater and rainwater harvesting

Functional Turf Definition (from Las Vegas)

An irrigated grass area that provides a recreational benefit to the community and is: Active/programmed recreation turf, athletic fields, designated-use-area turf, golf course play areas, some pet relief turf, playground turf

Draft Recommendations – Commercial/Multi-Family

Less Stringent



More Stringent

- Minimum soil depth
- Only plants from approved list
- Ban non-functional turf in areas <10' wide
- Ban on Spray Irrigation in small areas <10' wide
- Establish purple pipe connection where available

- Required irrigation audits
- Ban on non-functional turf
- Ban on Spray Irrigation for non-functional turf
- Incentivize rainwater harvesting

- Water budgets for certain customer types
- Ban on non-functional turf
- Ban on Spray Irrigation for non-functional turf
- Allow and incentivize on-site reuse

Draft Recommendations – HOAs

Less Stringent



More Stringent

- Minimum soil depth
- Only plants from approved list
- Ban non-functional turf in areas <10' wide, in entrances, parkways, and medians
- Ban on Spray Irrigation in small areas <10' wide in entrances, parkways, and medians
- Establish purple pipe connection where available

- Required irrigation audits
- Ban on non-functional turf
- Ban on Spray Irrigation for non-functional turf
- Incentivize rainwater harvesting

- Water budgets
- Ban on non-functional turf
- Ban on Spray Irrigation for non-functional turf
- Allow and incentivize on-site reuse

Conservation and Drought Stages

- Add year-round mandatory “Conservation” stage to align with other Texas benchmarks
 - Current Celina drought Stage 1 restrictions
 - Mandatory twice-per-week watering schedule (est. 2% savings)
- Shift Stage 1 to once-per-week watering schedule (est. 10% savings)
- Stage 2 = either once every other week (est. 20% savings) or more restrictive time of day window
- Stage 3 = no irrigation or non-essential outdoor water use (est 30% savings)
- Consider drought surcharges for high volumes (SA, EBMUD)

- Stage 1 – Water Watch
- Stage 2 – Water Warning
- Stage 3 – Water Emergency



Next Steps

- Present at P&Z
- FNI to finalize Draft Technical Memo
- Present recommendations to City Council

Schedule

- Draft Technical Memo:
- City Council Presentation- tentative **July 14, 2026**



Life Connected.

MINUTES
PLANNING & ZONING COMMISSION REGULAR
MEETING
CELINA COUNCIL CHAMBERS
112 N. COLORADO ST.
THURSDAY, MAY 21, 2026
5:00 PM

I. CALL TO ORDER AND ANNOUNCE A QUORUM PRESENT:

Chair Bain called the meeting to order at 5:00 PM, and led those present in a salute to the United States and Texas flags.

Members Present:

Chair Shawn Bain
Vice Chair Bryan Poche
Commissioner Daniel Trigo
Commissioner Jason Laumer
Commissioner Ryan Samuelson

Members Absent:

Commissioner Alan Upchurch

Staff Present:

Director of Development Services, Dusty McAfee
Assistant Director of Development Services, Madhuri Mohan
Senior Civil Engineer, Scott Harper
Long Range Planning Manager, Melissa Kleineck
Principal Planner, Victoria Kiker Simpson
Senior Planner, Haley Yansky
Planning Technician, Jamie Whisenhunt

II. OPEN FORUM:

No one wished to speak during Open Forum.

III. WORKSESSION:

No items were presented.

IV. PRESENTATIONS:

A. Discussion regarding the Lighting Ordinance – Text Amendment.

Melissa Kleineck, Long Range Planning Manager, presented the Lighting Ordinance - Text Amendment.

V. CONSENT AGENDA:

A. Minutes Approval:
1. Minutes from the April 16th, 2026, Planning & Zoning Commission meeting.

Upon a motion by Vice Chair Poche and a second by Commissioner Laumer, the Commission voted five (5) for and none (0) opposed to approve the minutes of the April 16th Planning & Zoning Commission meeting. The motion carried 5-0.

VI. PUBLIC HEARING/ACTION:

- A. Conduct a public hearing to consider and act upon a request to amend an approximately 25 acre portion of Planned Development (PD) No. 80 with modified development standards; generally located at the northeast corner of Dallas Parkway and Frontier Parkway, within the City Limits. (Mac Haik Celina – PD Amendment)

*Haley Yansky, Senior Planner, presented the staff report.
 Applicant Matt Moore introduced himself and provided the commission with background information on the project history, highlighting Mac Haik Chevrolet's presence in Celina.*

*Chair Bain opened the Public Hearing at 5:33 PM.
 No one wished to speak.
 Chair Bain closed the Public Hearing at 5:33 PM.*

Upon a motion by Vice Chair Poche and a second by Commissioner Laumer, the Commission voted five (5) for and none (0) opposed to approve the item without a color variance. The motion carried 5-0.

- B. Conduct a public hearing to consider and act upon a request to amend the City’s Code of Ordinances, by amending Chapter 14: Zoning, Article 14.04: Site Development Standards, Part Three: Screening Walls and Fences, and related sections of the Zoning Ordinance. (Text Amendment)

Mrs. Kleineck presented the staff report.

*Chair Bain opened the Public Hearing at 5:40 PM.
 No one wished to speak.
 Chair Bain closed the Public Hearing at 5:40 PM.*

Upon a motion by Vice Chair Poche and a second by Commissioner Samuelson, the Commission voted five (5) for and none (0) opposed to approve the item. The motion carried 5-0.

VII. ADJOURNMENT:

Chair Bain adjourned the meeting at 5:40 PM.

Approved on the 18th day of June 2026.

 Chair

 Staff Liaison



Life Connected.

Planning
City of Celina, Texas

Memorandum

To: Planning and Zoning Commission
From: Sandra Green, Principal Planner
CC: Madhuri Mohan, Assistant Director of Development Services
Date: June 18, 2026
Re: Conduct a public hearing to consider and act upon a request for a Specific Use Permit (SUP) to allow for a Child Care Center, Primary use on approximately 2 acres; generally located 580 feet west of Legacy Dr and approximately 1,000 feet north of Frontier Parkway, within the City Limits. (Lightbridge Academy Daycare – Specific Use Permit)

Action Requested:

Conduct a public hearing to consider and act upon a request for a Specific Use Permit (SUP) to allow for a Child Care Center, Primary use on approximately 2 acres; generally located 580 feet west of Legacy Dr and approximately 1,000 feet north of Frontier Parkway, within the City Limits. (Lightbridge Academy Daycare – Specific Use Permit)

Background Information:

The subject property is approximately 2 acres and is generally located 580 feet west of Legacy Drive and approximately 1,000 feet north of Frontier Parkway. The property is currently within City Limits and is entitled with existing zoning from 2020 that allows for Mixed Use (MU) zoning district. The applicant desires to operate a daycare. The Zoning Ordinance requires a Child Care Center, Primary Use, to first obtain a Specific Use Permit (SUP) from the City Council to legally operate in a Mixed Use (MU) district. Please refer to the attachments for additional information.

Legal Review:

N/A

Supporting Documents:

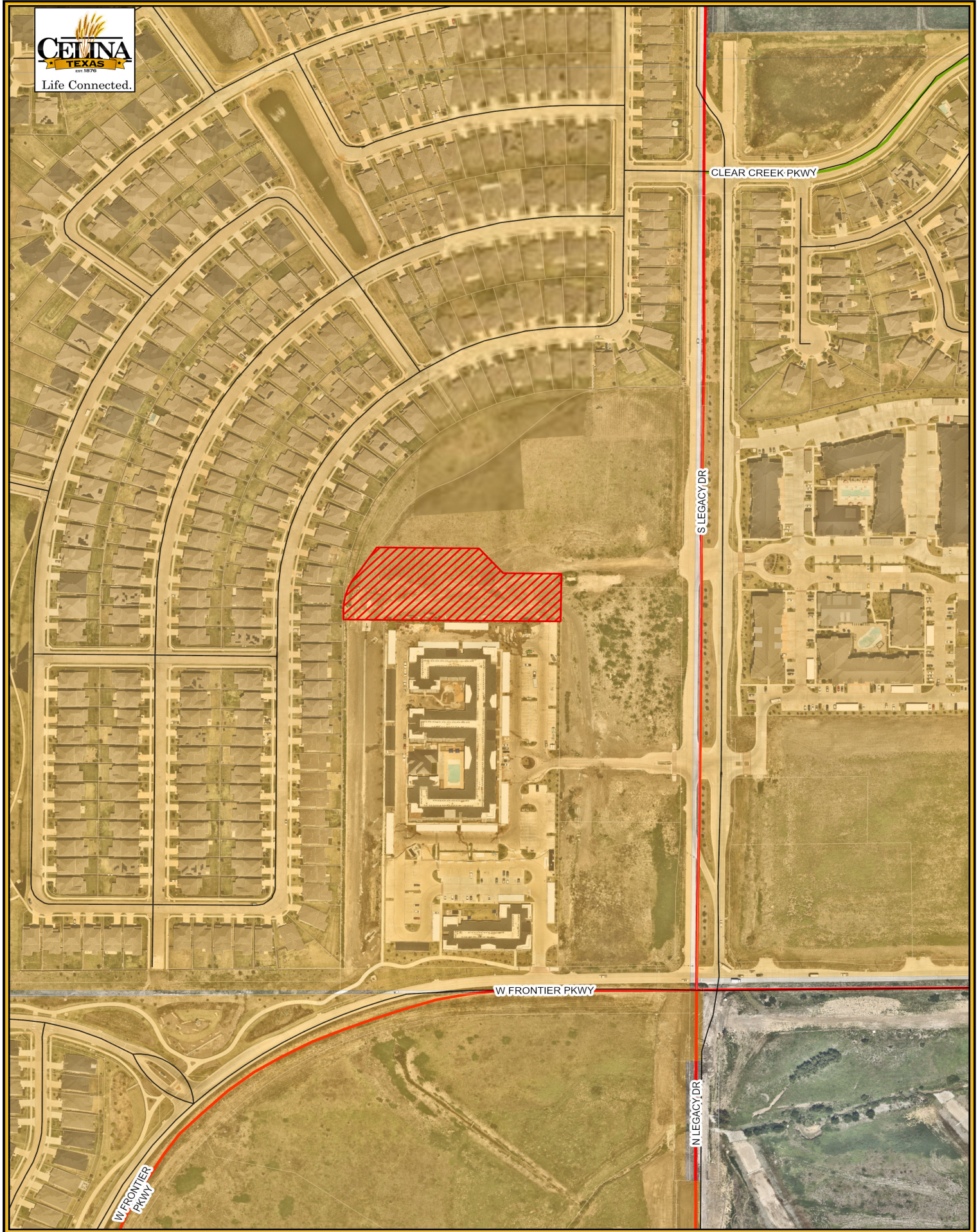
1. Location Map
2. Staff Presentation

Financial Consideration:





N/A

Staff Recommendation:

Staff recommends approval as presented

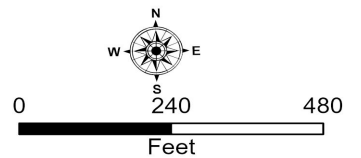


Legend

-  Subject Property
-  City Limits
-  Roads
-  Parcels

**26-SUP-04 Lightbridge
Academy Daycare
Location Map**

5/26/2026



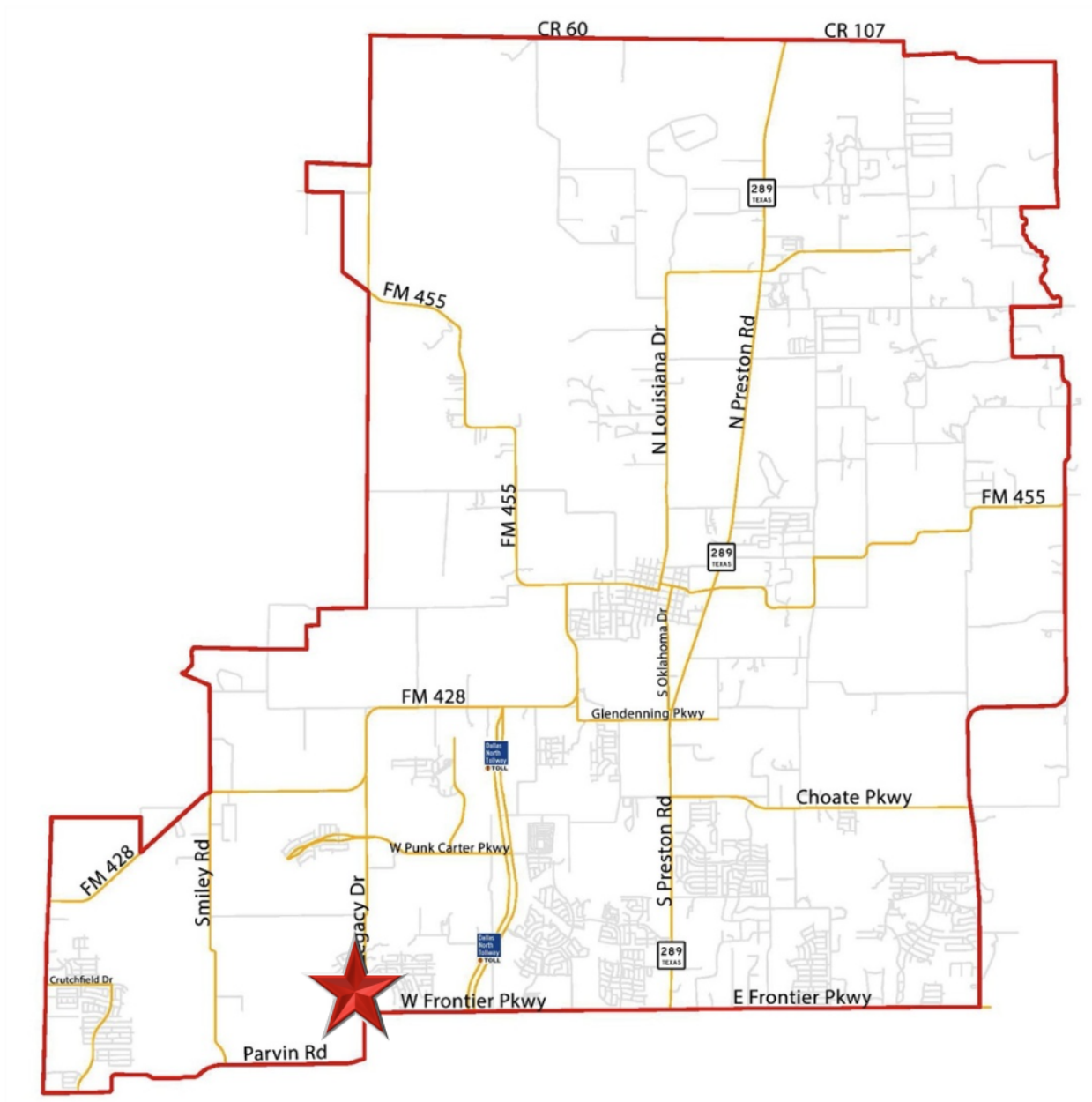


Lightbridge Academy

Specific Use Permit

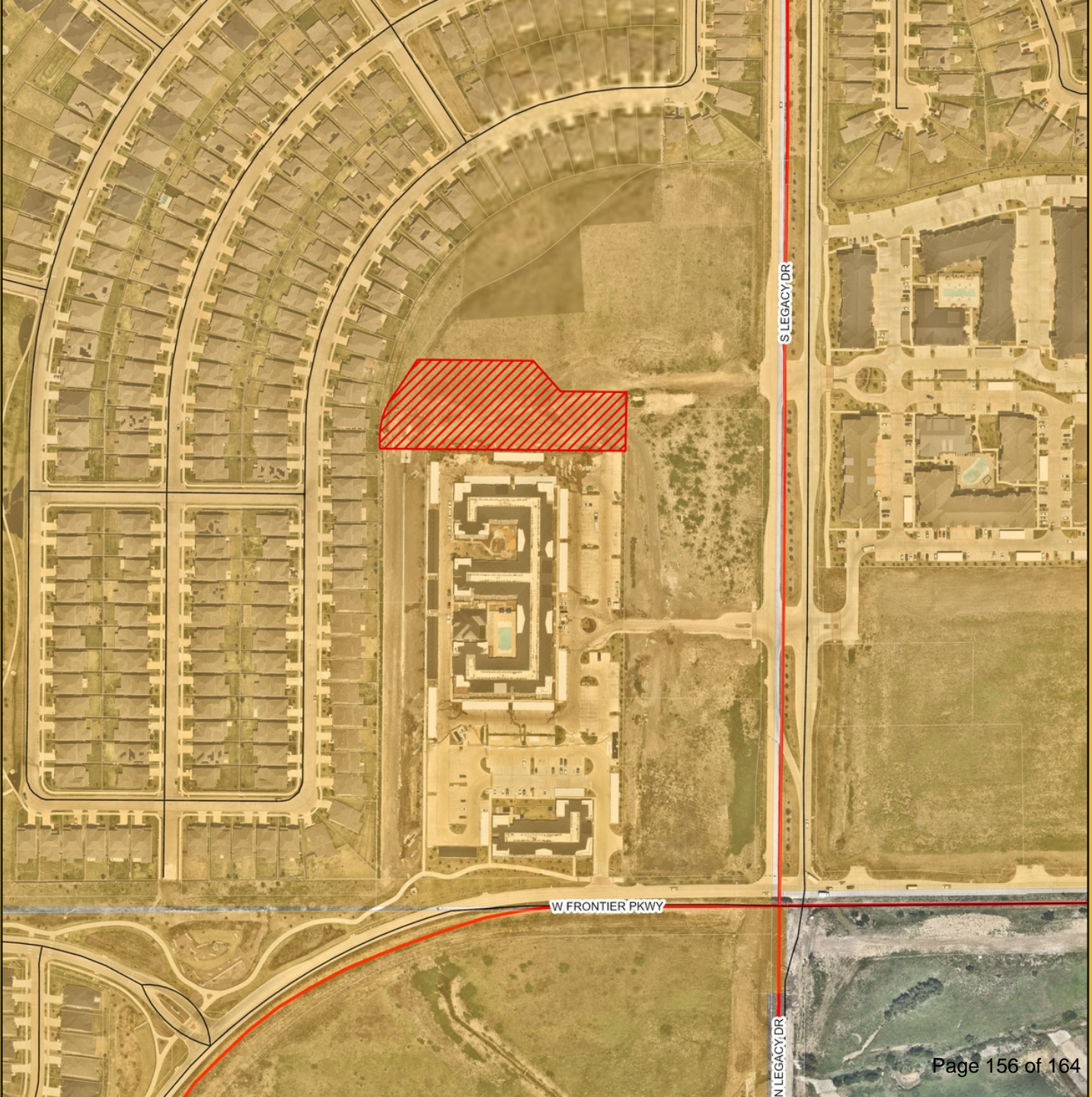
Planning & Zoning Commission

June 18, 2026



Location Map

The subject property is generally located 580 feet west of Legacy Dr and approximately 1,000 feet north of Frontier Parkway



BACKGROUND

- The subject property is approximately 2 acres
- The property is currently within City Limits and has existing zoning from 2020 that allows for Mixed Use (MU)
- The applicant desires to operate a daycare

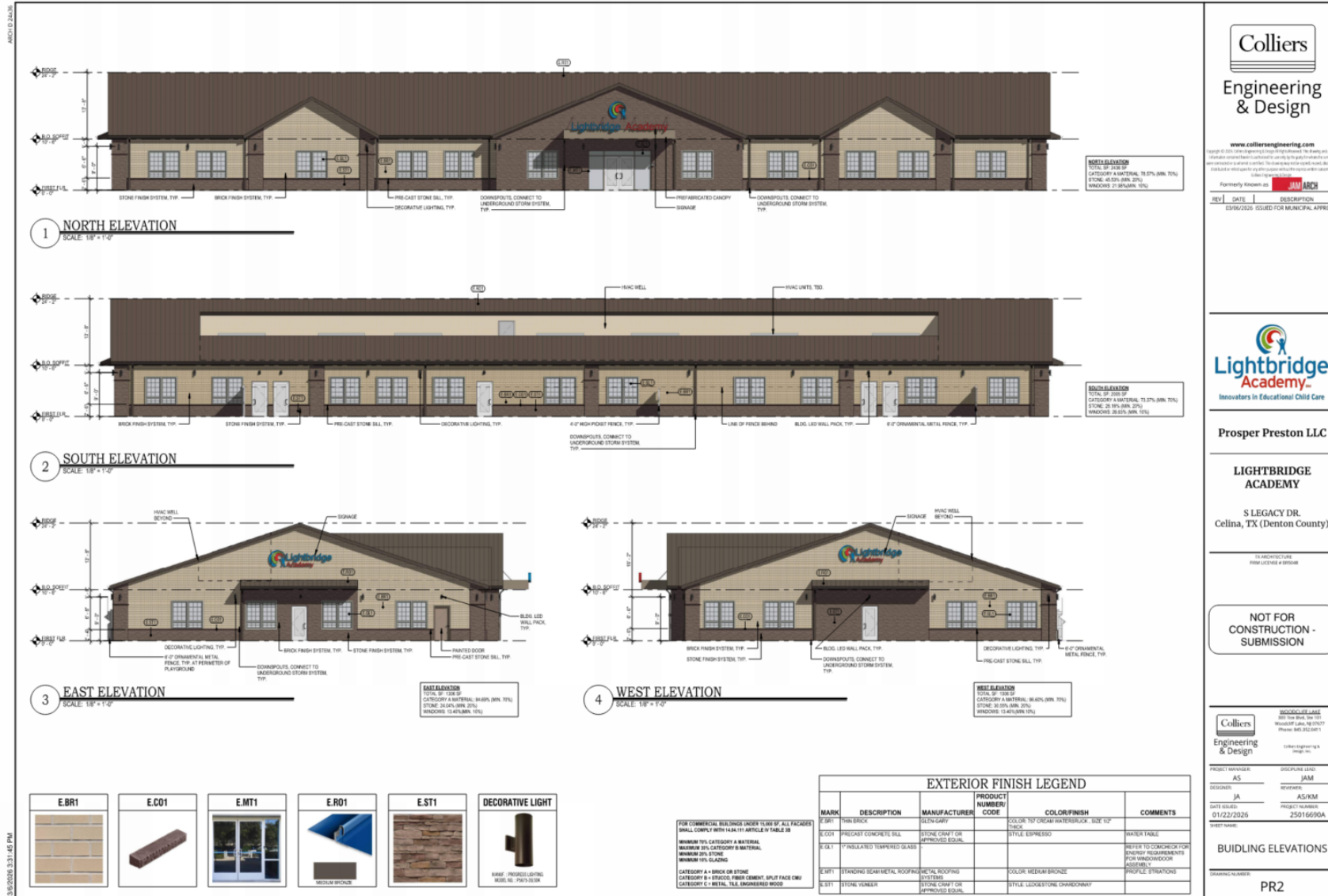
ENTITLEMENT OVERVIEW

- The Zoning Ordinance requires a Child Care Center, Primary Use, to first obtain a Specific Use Permit (SUP) from the City Council to legally operate in a Mixed Use (MU) area
- The Zoning Ordinance does not require an SUP for childcare centers in the Commercial zoning district

SUP OVERVIEW

- A SUP is required of land uses that the Zoning Ordinance may allow, but uses that are also screened and specially approved for situational suitability
- The purpose of the SUP requirement is to determine the appropriateness of a proposal
- The City has broad discretionary approval of the requested SUP

CONCEPTUAL RENDERINGS



Colliers
Engineering & Design

www.colliersengineering.com
Formerly known as JAM ARCH



Prosper Preston LLC
LIGHTBRIDGE ACADEMY
S LEGACY DR.
Celina, TX (Denton County)

NOT FOR CONSTRUCTION - SUBMISSION

Colliers Engineering & Design

POLICY CONSIDERATIONS

- The subject property's base zoning is Mixed Use
- The zoning request is in conformance with the Future Land Use Plan (FLUP)
- Modern design standards ensure an attractive project
- The proposed location is an interior pad site and not on a frontage pad site

RECOMMENDATION

- The recommendation of the Planning & Zoning Commission will be considered by the City Council at its regular meeting in July
- Staff recommends approval as presented



Thank You!