

CHAPTER 3 - CLIMATE-READY TREES FOR ALBUQUERQUE

How to Use These Lists

The following tree species selection lists should only be used as a starting point when determining the right tree for the right place. They should always be used in conjunction with the Master List found in Appendix A of this report, planting site characteristics, local expert knowledge, and applicable local or municipal tree ordinances.

Finally, it is important that trees be planted correctly and all trees need additional irrigation during an establishment period, usually the first three years after planting. Please consult local resources for proper planting techniques and specific watering guidance.



Photo Credit: Roberto Rosales

LOCATION TYPE 1 - SMALL GREEN STORMWATER INFRASTRUCTURE (GSI) FEATURES

LOCATION TYPE 2 - LARGE GREEN STORMWATER INFRASTRUCTURE (GSI) FEATURES

LOCATION TYPE 3 - XERISCAPED PUBLIC RECREATION, RESIDENTIAL, OR COMMERCIAL PLACES

LOCATION TYPE 4 - PUBLIC RECREATION, RESIDENTIAL, OR COMMERCIAL PLACES

LOCATION TYPE 5 - STREETSCAPES WITH AVERAGE GROWING AREA

LOCATION TYPE 6 - RESTRICTED GROWING AREA

LOCATION TYPE 7 - CLIMATE-READY FRUIT TREES

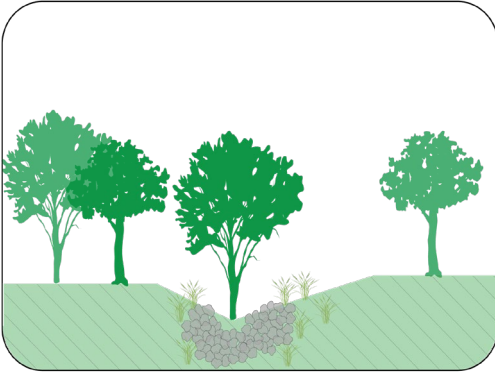


Photo Credit: Roberto Rosales

Climate-Ready Trees for Albuquerque

LOCATION TYPE 1

SMALL GREEN STORMWATER INFRASTRUCTURE (GSI) FEATURES



LOCATION CHARACTERISTICS

Follows “Right Tree in the Right Place”

Low Points Collect Stormwater Runoff

Soil Decompacted to a Depth ≥ 18 ”

May Have Tree Trenches, Curb Cuts, or Scuppers

Similar Restrictions to Location Type 5

Examples: Anthea Building, Southern Sandoval County Arroyo Flood Control Authority Main Office, and South 2nd St.

TREE CHARACTERISTICS

Mature Tree Height: Site Specific

Inundation Compatible up to 96 Hours.

Pollution Tolerant



Photo Credit: MRWM Landscape Architects

RECOMMENDED TREES SPECIES

<i>Celtis reticulata</i>	Netleaf Hackberry
<i>Cercis canadensis</i> var. <i>mexicana</i> *	Mexican Redbud*
<i>Cercis occidentalis</i> *	Western Redbud*
<i>Cercis reniformis</i> *	Oklahoma Redbud*
<i>Cercis canadensis</i> var. <i>texensis</i> *	Texas Redbud*
<i>Crataegus ambigua</i> *	Russian Hawthorn*
<i>Forestiera neomexicana</i>	New Mexico Privet
<i>Fraxinus cuspidata</i> *	Fragrant Ash*
<i>Lagerstroemia indica</i> *	Crape Myrtle*
<i>Pistacia chinensis</i>	Chinese Pistache
<i>Prosopis glandulosa</i> *	Honey Mesquite*
<i>Prosopis pubescens</i> *	Screwbean Mesquite*
<i>Salix gooddingii</i>	Goodding’s Willow
<i>Sapindus saponaria</i> var. <i>drummondii</i> *	Western Soapberry*

* These species have further site specific needs outlined in Appendix A - Master List

Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

LOCATION TYPES 1 & 2 - GREEN STORMWATER INFRASTRUCTURE (GSI) FEATURES

Cities are predominantly full of hard, impervious surface that rainwater runs off into designated stormwater collection systems. These networks of pipes and concrete spillways, known as grey stormwater infrastructure, are designed to redirect stormwater runoff away from vulnerable areas to reduce risk of urban flooding. Though efficient in decreasing high flow risks on streets, grey infrastructure concentrates pollution in stormwater and increases stream and river degradation by causing unnaturally high flows in riparian areas.

Green Stormwater Infrastructure (GSI) features use vegetation, soils, and other natural elements and practices to manage stormwater as a companion to grey stormwater infrastructure. GSI features slow down incoming stormwater and remove contaminants through soil infiltration, tree canopy water interception, and plant root absorption. GSI features allow stormwater to filter back into the groundwater system, replenishing the aquifer and creating a more sustainable desert water management system while decreasing the risk of urban flooding and protecting water quality and riparian habitat. GSI features also support beneficial plant habitat and increase green spaces in the city, benefitting residents in multiple ways. These features can be used alongside grey infrastructure, directing water to areas

with permeable surfaces and vegetation first, using gray infrastructure pipes and spillways as overflow.

Trees are important components of a GSI feature. They are efficient at intercepting rainwater via canopy and bark, increasing soil permeability via root structures, and facilitating absorption of pollutants via leaves, bark, and roots. GSI features also benefit trees by providing de-compacted, healthy soil and increasing water collection. Trees that can survive short term water inundation in their roots are best for the bottom of GSI features. Stormwater systems regulated by the Environmental Protection Agency and the New Mexico Environment Department may only retain stormwater onsite for up to 96 hours; trees in GSI features should be able to survive up to 96 hours of water inundation and should also have tolerance to water pollution. Trees that do not do well with inundation, can be considered for placement on higher elevations of larger GSI features.



Photo Credit: MRWM Landscape Architects

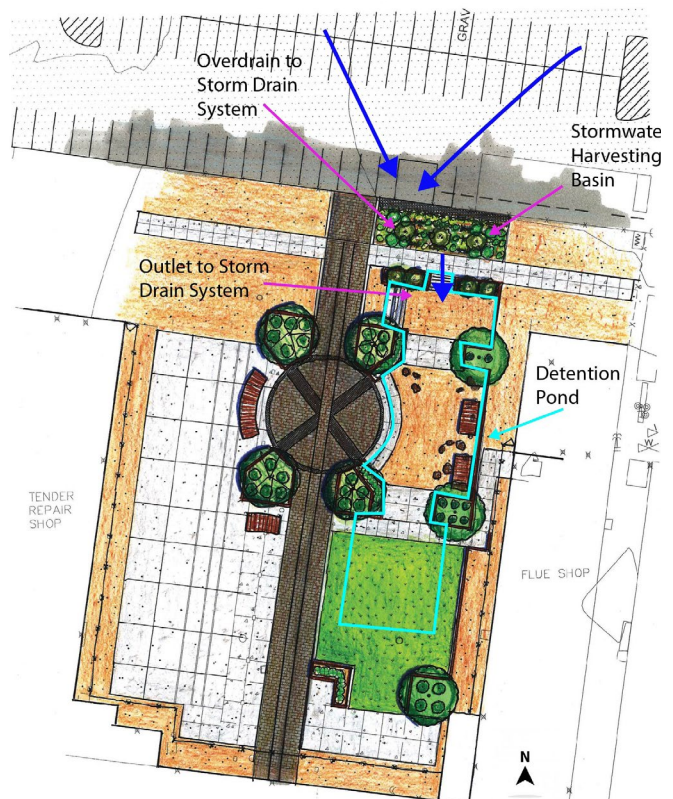


Image Credit: MRWM Landscape Architects

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LOCATION TYPE 2

LARGE GREEN STORMWATER INFRASTRUCTURE (GSI) FEATURES



LOCATION CHARACTERISTICS

Follows "Right Tree in the Right Place"

Low Points Collect Stormwater Runoff

Soil Decompacted to a Depth $\geq 18"$

May Have Basins, Swales, or Infiltration Trenches

Examples: Southern Sandoval County Arroyo Flood Control Authority Main Office landscaping, Pete Domenici Courthouse, and Smith Brasher Hall

TREE CHARACTERISTICS

Mature Tree Height: Site Specific

Inundation Compatible ≤ 96 Hours

Pollution Tolerant



Photo Credit: MRWM Landscape Architects

RECOMMENDED TREES

Celtis reticulata
Cercis canadensis var. *mexicana**
*Cercis occidentalis**
*Cercis reniformis**
Cercis canadensis var. *texensis**
*Crataegus ambigua**
Forestiera neomexicana
Fraxinus cuspidata
*Gymnocladus dioica**
Platanus mexicana
*Lagerstroemia indica**
*Maclura pomifera**
Pistacia chinensis
Populus deltoides
Populus deltoides var. *wislizeni*
*Prosopis glandulosa**
Prosopis pubescens
Quercus arizonica
*Quercus ilex**
Quercus muehlenbergii
*Quercus suber**
*Quercus virginiana**
Salix gooddingii
Sapindus saponaria var. *drummondii**
Ulmus x 'Morton' *Accolade*TM
Ulmus x 'Frontier'
*Ulmus parvifolia**
*Taxodium mucronatum**
Zelkova serrata

Netleaf Hackberry
Mexican Redbud*
Western Redbud*
Oklahoma Redbud*
Texas Redbud*
Russian Hawthorn*
New Mexico Privet
Fragrant Ash
Kentucky Coffeetree*
Mexican Sycamore
Crape Myrtle*
Osage Orange*
Chinese Pistache
Eastern Cottonwood
Rio Grande Cottonwood
Honey Mesquite*
Screwbean Mesquite
Arizona White Oak
Holly Oak*
Chinkapin Oak
Cork Oak*
Southern Live Oak*
Goodding's Willow
Western Soapberry*
Accolade Elm
Frontier Elm
Lacebark Elm*
Montezuma Cypress*
Japanese Zelkova

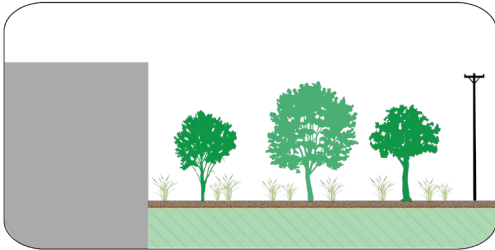
* These species have further site specific needs outlined in Appendix A - Master List

Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

Climate-Ready Trees for Albuquerque

LOCATION TYPE 3 XERISCAPED AREAS



LOCATION CHARACTERISTICS

- Follows "Right Tree in the Right Place"
- Consider Existing Utilities
- Building Setback: Varies
- Consider Users
- Xeriscaped or Low-Medium Irrigation
- Examples: Plants of the Southwest, Explora, High Desert Neighborhood

TREE CHARACTERISTICS

- Mature Tree Height: Site Specific
- Water Needs: Low to Very Low
- Ornamental and Large Trees
- Wildlife or Pollinator Benefit Desired



Photo Credit: ABCWUA

RECOMMENDED TREES

Arbutus xalapensis
Celtis reticulata
Cercis canadensis var. *mexicana*
Cercis reniformis
Cercis canadensis var. *texensis*
Cercis occidentalis
Cedrus atlantica
Chilopsis linearis
Cotinus obovatus
Forestiera neomexicana
Gymnocladus dioica
*Fraxinus cuspidata**
*Juniperus deppeana**
*Juniperus monosperma**
*Juniperus virginiana**
Lagerstroemia indica
*Leucaena retusa**
Maclura pomifera
*Parkinsonia x Cercidium**
Pinus eldarica
*Pinus pinea**
*Pistacia chinensis**
*Prosopis glandulosa**
*Prosopis velutina**
Quercus arizonica
Quercus fusiformis
Quercus gravesii
Quercus ilex
Quercus muehlenbergii
Quercus oblongifolia
*Quercus suber**
Sapindus saponaria var. *drummondii**
*Sophora secundiflora**
Rhus lanceolata
Ulmus x 'Morton' Accolade™
Ulmus x 'Frontier'
*Ulmus parvifolia**
Vitex agnus-castus

Texas Madrone
 Netleaf Hackberry
 Mexican Redbud
 Oklahoma Redbud
 Texas Redbud
 Western Redbud
 Atlas Cedar
 Desert Willow
 American Smoketree
 New Mexico Privet
 Kentucky Coffeetree
 Fragrant Ash*
 Alligator Juniper*
 One Seed Juniper*
 Eastern Red Cedar*
 Crape Myrtle
 Goldenball Leadtree*
 Osage Orange
 Palo Verde Hybrids*
 Afghan Pine*
 Italian Stone Pine
 Chinese Pistache*
 Honey Mesquite*
 Velvet Mesquite*
 Arizona White Oak
 Escarpment Live Oak
 Chisos Red Oak
 Holly Oak
 Chinquapin Oak
 Blue Oak
 Cork Oak*
 Western Soapberry*
 Texas Mountain Laurel*
 Prairie Flameleaf Sumac
 Accolade Elm
 Frontier Elm
 Lacebark Elm*
 Chaste Tree

* These species have further site specific needs outlined in Appendix A - Master List

Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

LOCATION TYPE 3 - XERISCAPED AREAS

Xeriscaping is the concept of transforming a high-water use landscape to a “xeric” or low water use landscape, one that thrives on rainfall and careful supplemental irrigation. The concept of xeriscaping is often misconstrued with the landscaping technique of removing most organic material and replacing with inorganic material like rock that requires no water. While inorganic material landscapes need no water, they increase the ambient temperature (often driving energy usage higher in surrounding buildings), increase stormwater runoff, and create an unsuitable habitat for plants, wildlife, and often people.

In contrast, xeriscaping incorporates low water use plants with a focus on native and arid adapted species, careful organic mulching, water catchment, and water redirection systems to support a lush landscape that is both visually enjoyable and wildlife-friendly. Trees are an important part of the “xeric” landscape but are often overlooked because of

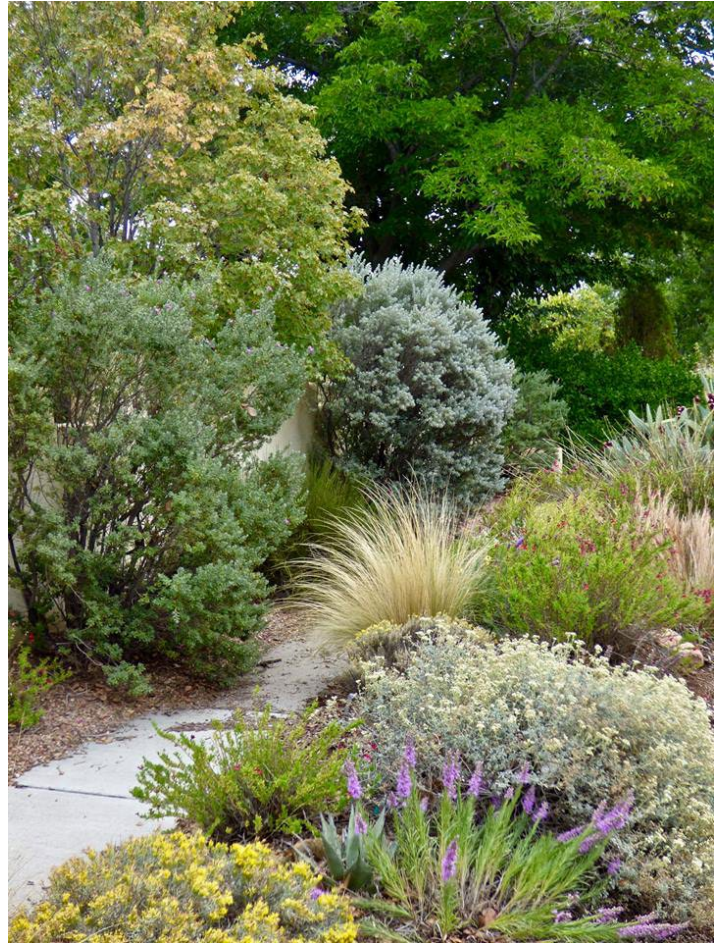


Photo Credit: Hunter Ten Broeck

the perception that they require too much water. Trees selected for a xeric landscape should be native or well adapted to xeric conditions. Supplemental irrigation will be required for all trees during establishment. Most trees will need supplemental irrigation throughout their life, but especially during drought or extended periods of heat. Xeriscaping can be combined with rain gardens, rain barrels, and other GSI features for a low impact landscape design.



Photo Credit: Hunter Ten Broeck

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LOCATION TYPE 4 HIGHLY IRRIGATED AREAS



LOCATION CHARACTERISTICS

Follows “Right Tree in the Right Place”

Consider Existing Utilities

Consider Users

Building Setback: >10’

Examples: UNM Golf Course, Mountain View Community Center, Ridgecrest Neighborhood, and Tiguex Park

TREE CHARACTERISTICS

Mature Tree Height: Site Specific

Water Needs: High Irrigation Tolerant

Ornamental and Large Trees

Wildlife or Pollinator Benefit Desired



Photo Credit: ABCWUA

RECOMMENDED TREES

Celtis reticulata
Cercis canadensis var. *mexicana*
Cercis reniformis
Cercis canadensis var. *texensis*
Cercis occidentalis
Cedrus atlantica
Cedrus deodara
*Forestiera neomexicana**
Gymnocladus dioica
*Fraxinus cuspidata**
*Juniperus deppeana**
*Juniperus virginiana**
Lagerstroemia indica
*Maclura pomifera**
Pinus eldarica
Pinus pinea
Pistacia chinensis
Platanus mexicana
Populus deltoides
Populus deltoides var. *wislizeni*
*Prosopis pubescens**
Prunus mexicana
Quercus arizonica
Quercus fusiformis
Quercus gravesii
Quercus ilex
Quercus muehlenbergii
*Quercus suber**
Quercus buckleyi
Quercus virginiana
Sapindus saponaria var. *drummondii**
Sophora secundiflora
Rhus lanceolata
*Taxodium mucronatum**
Ulmus x ‘Morton’ *Accolade*™
Ulmus x ‘Frontier’
Ulmus parvifolia
Vitex agnus-castus
Zelkova serrata

Netleaf Hackberry
 Mexican Redbud
 Oklahoma Redbud
 Texas Redbud
 Western Redbud
 Atlas Cedar
 Deodar Cedar
 New Mexico Privet*
 Kentucky Coffeetree
 Fragrant Ash*
 Alligator Juniper*
 Eastern Red Cedar*
 Crape Myrtle
 Osage Orange*
 Afghan Pine
 Italian Stone Pine
 Chinese Pistache
 Mexican Sycamore
 Eastern Cottonwood
 Rio Grande Cottonwood
 Screwbean Mesquite*
 Mexican Plum
 Arizona White Oak
 Escarpment Live Oak
 Chisos Red Oak
 Holly Oak
 Chinkapin Oak
 Cork Oak*
 Texas Red Oak
 Southern Live Oak
 Western Soapberry*
 Texas Mountain Laurel
 Prairie Flameleaf Sumac
 Montezuma Cypress*
 Accolade Elm
 Frontier Elm
 Lacebark Elm
 Chaste Tree
 Japanese Zelkova

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Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

LOCATION TYPE 4 - HIGHLY IRRIGATED AREAS

This site location type encompasses all areas that have high irrigation potential, such as areas with lawn or turfgrass. As described above for location types 1-3, xeriscaping and GSI features are the preferred methods of sustainable, low-impact landscape design. Turfgrass can often be described as “habitat deserts” because the uniformity of the landscape does not promote ecosystem diversity. From a water conservation stand point, these areas can be a strain on limited resources, especially in the summer. However, many public recreation places such as parks, soccer fields, and golf courses necessitate turf, and can be a good use of water because they provide an alternative to individual people having private lawns. Within residential or small commercial settings, planting and irrigating larger trees can provide dense shade and refugia for people from summer heat.

Trees planted in this location type should be trees that thrive with frequent, shallow irrigation and are heat tolerant. By surrounding turf spaces, large or small, xeriscaping, can reduce water use and capture any runoff from the turf irrigation.

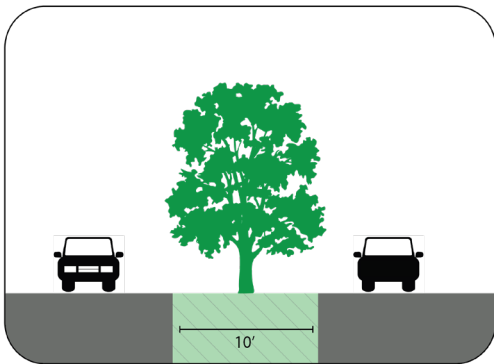
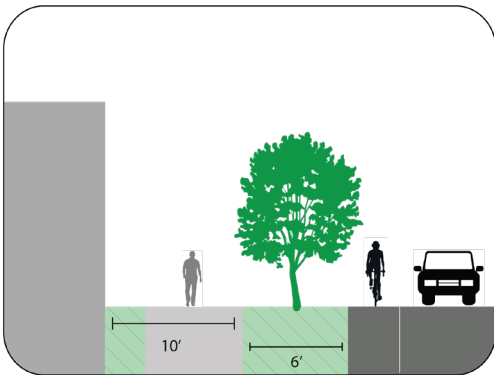
IMPORTANT NOTE: Typical spray irrigation of turfgrasses is often insufficient to meet the slow, deep watering requirements of large shade tree roots. Additional, deep watering is likely needed to supplement spray irrigation.



Photo Credit: Albuquerque Water Authority

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LOCATION TYPE 5 STREETSCAPES



LOCATION CHARACTERISTICS

Follows "Right Tree in the Right Place"

Soil Volume: Sufficient

No Utility Conflicts

Building Setback: >10'

Consider Sidewalks, On-Street Parking, Bike Paths

Median or Parkway Width: ≥ 6'

Examples: Menaul Blvd, Big I Medians, 12th and 4th St., Ridgecrest Neighborhood

TREE CHARACTERISTICS

Mature Tree Height: Any

Low Litter Potential

Compacted Soil and Pollution Tolerant

Will Require Structural Pruning

RECOMMENDED TREES

Arbutus xalapensis
Celtis reticulata
Cercis canadensis var. *mexicana*
Cercis reniformis
Cercis canadensis var. *texensis*
Cercis occidentalis
Cedrus deodara
Chilopsis linearis
Cotinus obovatus
Crataegus ambigua
Forestiera neomexicana
Gymnocladus dioica
*Fraxinus cuspidata**
Lagerstroemia indica
*Leucaena retusa**
Maclura pomifera
Parkinsonia x 'Desert Museum' *
*Pistacia chinensis**
*Prosopis glandulosa**
Quercus arizonica
Quercus fusiformis
Quercus gravesii
Quercus ilex
Quercus muehlenbergii
Quercus oblongifolia
*Quercus suber**
Quercus buckleyi
Sapindus saponaria var. *drummondii**
*Sophora secundiflora**
Rhus lanceolata
Ulmus x 'Morton' *Accolade*™
Ulmus x 'Frontier'
*Ulmus parvifolia**
Vitex agnus-castus
Zelkova serrata

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 Texas Redbud
 Western Redbud
 Deodar Cedar
 Desert Willow
 American Smoketree
 Russian Hawthorn
 New Mexico Privet
 Kentucky Coffeetree
 Fragrant Ash*
 Crape Myrtle
 Golden-ball Lead-tree*
 Osage Orange
 Palo Verde hybrids*
 Chinese Pistache*
 Honey Mesquite*
 Arizona White Oak
 Escarpment Live Oak
 Chisos Red Oak
 Holly Oak
 Chinkapin Oak
 Blue Oak
 Cork Oak*
 Texas Red Oak
 Western Soapberry*
 Texas Mountain Laurel*
 Prairie Flameleaf Sumac
 Accolade Elm
 Frontier Elm
 Lacebark Elm*
 Chaste Tree
 Japanese Zelkova

* These species have further site specific needs outlined in Appendix A - Master List

Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

LOCATION TYPE 5 - STREETSCAPES

Medians and street rights-of-way are common urban planting locations. With sufficient soil volume and above-ground space, appropriate tree species can be a cost-effective method to reduce particulate matter pollution in high traffic areas. These location types are harsh environments for trees. The soil in these areas is almost always highly compacted, preventing proper root development and therefore, tree development. Irrigation is often insufficient and infrequent, and UHI effects are intense. Mechanical damage and high pollution exposure also contribute to tree decline. Trees that are too big for the space at maturity are often planted, causing problems at a later date often ending in tree removal. Streetscape trees are often not a positive return on investment because many

of them die from some combination of those factors before the benefits of a mature tree are gained.

Ideally, traditional raised and/or curbed streetscapes will transition to GSI features with water catchment and healthy soils—both for the health of the trees and our water. In the meantime, only plant trees in areas that have sufficient soil volume to support healthy tree growth. This amount will vary depending on mature tree size but should be at minimum 6 feet wide.

Any tree in this location type will require structural pruning to maintain requisite clearance and sightlines.



Photo Credit: ABCWUA

Climate-Ready Trees for Albuquerque

LOCATION TYPE 6 RESTRICTED GROWING AREA

LOCATION CHARACTERISTICS

Follows "Right Tree in the Right Place"

Soil Volume: Limited

Consider Existing Utilities

Building Setback: <10'

Sidewalks, on-street parking, bike paths

Median or Parkway Width: 4-6'

Examples: Downtown Central Avenue and Silver Street

TREE CHARACTERISTICS

Mature Tree Height: <25'

Low Root Damage Potential

Low Litter Potential

Compacted Soil and Pollution Tolerant

Will Require Structural Pruning



Photo Credit: MRWM Landscape Architects

SUGGESTED TREES

Celtis reticulata
Cercis canadensis var. *mexicana*
Cercis occidentalis
Cercis reniformis
Cercis canadensis var. *texensis*
Fraxinus cuspidata
Lagerstroemia indica
Prosopis glandulosa
Quercus oblongifolia

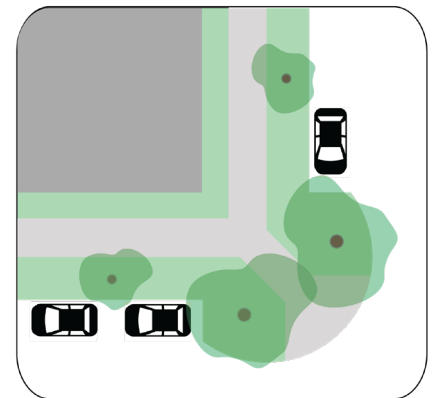
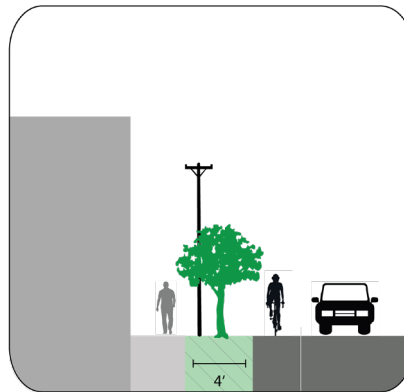
Netleaf Hackberry
Mexican Redbud
Western Redbud
Oklahoma Redbud
Texas Redbud
Fragrant Ash
Crape Myrtle
Honey Mesquite
Blue Oak

RECOMMENDATIONS

The practice of planting trees in medians or parkways should be limited to Location Type 5 for sufficient soil volume to support the full size of a mature tree.

Medians or parkways 4-6' wide can only provide sufficient soil volume to support health trees if there are continuous, uncompacted strips of soil like soil vaults or suspended pavement.

If the width is $\leq 4'$, only plants that are $< 3'$ wide at maturity should be planted.



Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.

LOCATION TYPE 6 - RESTRICTED GROWING AREA

Restricted growing areas are those with widths of 6 feet or less. The most common examples in an urban environment are spaces between streets and sidewalks, between sidewalks/streets and buildings, or in between parking lot spaces. These spaces rarely provide adequate soil volume for trees unless special infrastructure is included. They are known as “hell strips” because they are very hot, not well irrigated, and overall not conducive to tree survival. However, they are often underutilized spaces in a city that if planted can significantly contribute to beautification and cooling. They are also often well-suited spaces for flow-through GSI features and other low impact design techniques.

Smaller understory plants like bunch grasses and wildflowers are better suited for these

areas. Only small stature trees should be selected for planting, and only if the space has a minimum width of 4 feet and/or continuous soil strips, tree trenches, or suspended soils. If the area is less than 4 feet wide, do not plant any trees or large shrubs. Instead consider small understory plants and vegetation that will not only thrive in the smaller space, but will also still provide beneficial habitat, capture and clean stormwater, and create green spaces. Pair these small understory green spaces with light colored shade structures to reflect solar radiation and cool any nearby pedestrian areas.



Photo Credit: The Nature Conservancy

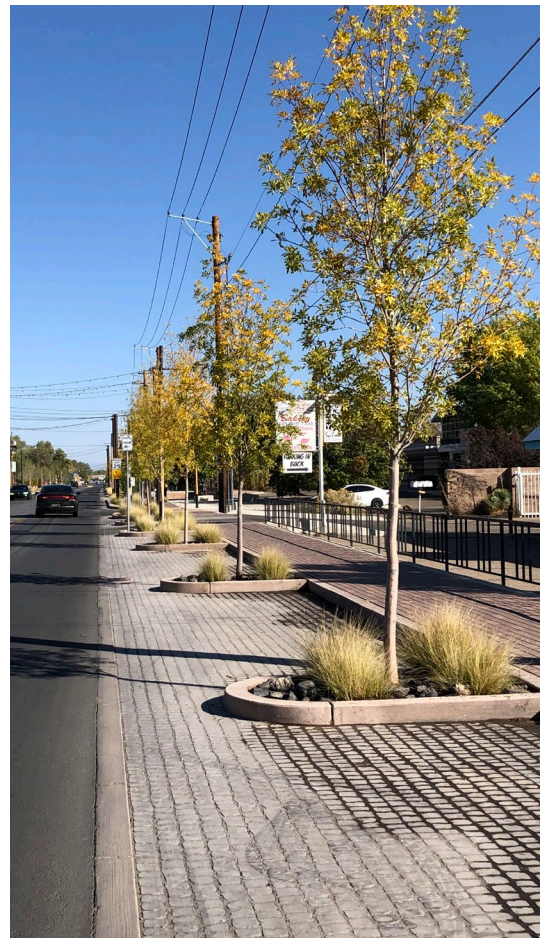
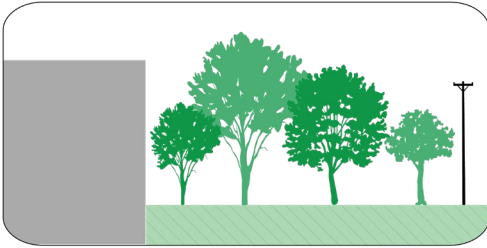


Photo Credit: The Nature Conservancy

Climate-Ready Trees for Albuquerque

LOCATION TYPE 7 FRUIT TREES



LOCATION CHARACTERISTICS

Follows "Right Tree in the Right Place"

Soil Volume: Sufficient

No Utility Conflicts

TREE CHARACTERISTICS

Mature Tree Height: Any

High Litter Potential

Fruit Producing

Requires Irrigation to Ensure Fruit Production



Photo Credit: Dr. Marisa Thompson

RECOMMENDED TREES

Diospyros texana
Ficus carica 'Mission'
*Morus microphylla**
Pistacia vera
Punica granatum
Ziziphus jujuba
Cydonia oblonga
Diospyros kaki
Juglans microcarpa
Carya illinoensis
Prunus armeniaca
*Eriobotrya japonica**

Texas Persimmon
Black Mission Fig
Little Leaf Mulberry*
Pistachio
Pomegranate
Jujube
Quince
Japanese Persimmon
Little Walnut
Pecan
Apricot
Loquat*

* These species have further site specific needs outlined in Appendix A - Master List



Photo Credit: Dr. Marisa Thompson

Right Tree, Right Place

Keeping mature size and other species characteristics in mind, consider overhead and underground utilities, proximity to buildings and traffic, the users of the space and maintenance and upkeep.