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

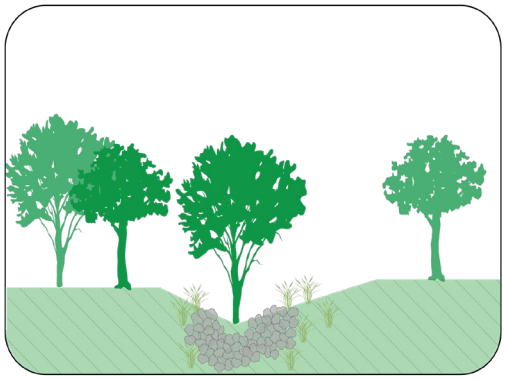
Location Type 6 - Restricted Growing Area

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

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

The Nature Conservancy

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 gray 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.

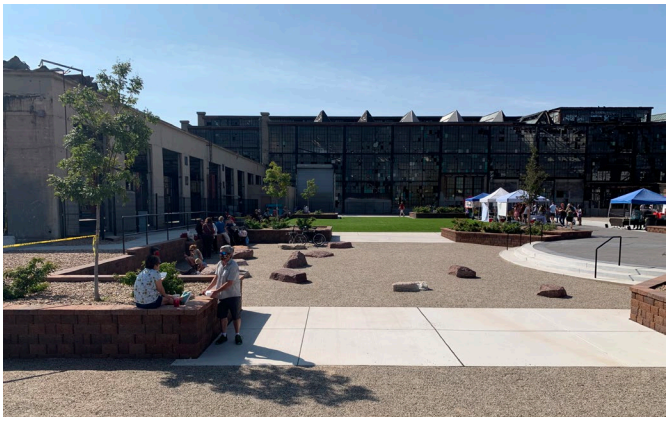


Photo Credit: MRWM Landscape Architects

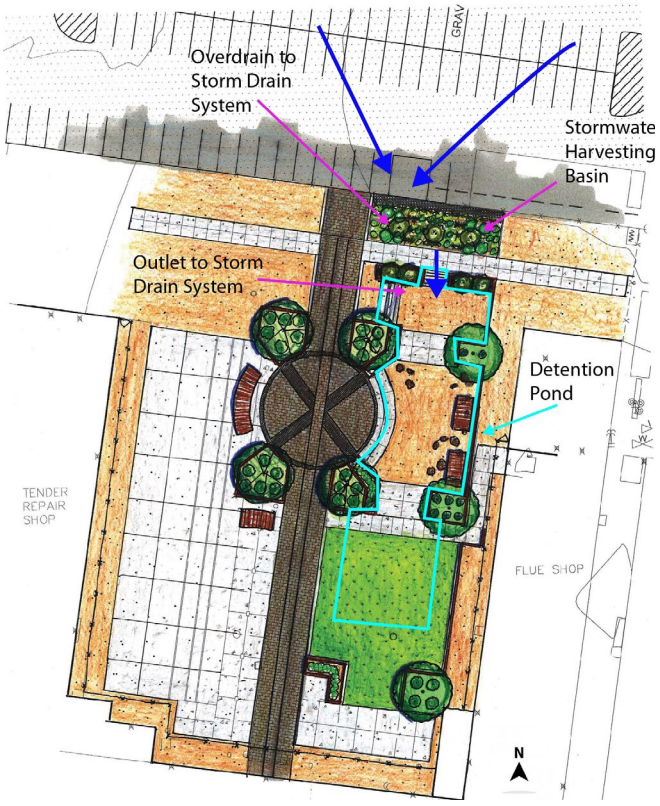
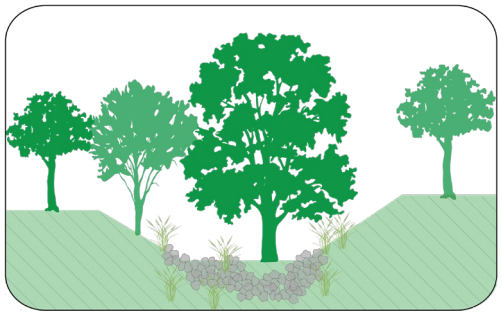


Image Credit: MRWM Landscape Architects

Climate-Ready Trees for Albuquerque

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 ≥ 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

RECOMMENDED TREES

Celtis reticulata	Netleaf Hackberry
Cercis canadensis var. *mexicana* *	Mexican Redbud*
Cercis occidentalis *	Western Redbud*
Cercis reniformis *	Oklahoma Redbud*
Cercis canadensis var. *texensis* *	Texas Redbud*
Crataegus ambigua *	Russian Hawthorn*
Forestiera neomexicana	New Mexico Privet
Fraxinus cuspidata	Fragrant Ash
Gymnocladus dioica *	Kentucky Coffeetree*
Platanus mexicana	Mexican Sycamore
Lagerstroemia indica *	Crape Myrtle*
Maclura pomifera *	Osage Orange*
Pistacia chinensis	Chinese Pistache
Populus deltoides	Eastern Cottonwood
Populus deltoides var. *wislizeni*	Rio Grande Cottonwood
Prosopis glandulosa *	Honey Mesquite*
Prosopis pubescens	Screwbean Mesquite
Quercus arizonica	Arizona White Oak
Quercus ilex *	Holly Oak*
Quercus muehlenbergii	Chinkapin Oak
Quercus suber *	Cork Oak*
Quercus virginiana *	Southern Live Oak*
Salix gooddingii	Goodding's Willow
Sapindus saponaria var. *drummondii* *	Western Soapberry*
Ulmus x 'Morton' *Accolade™*	Accolade Elm
Ulmus x 'Frontier'	Frontier Elm
Ulmus parvifolia *	Lacebark Elm*
Taxodium mucronatum *	Montezuma Cypress*
Zelkova serrata	Japanese Zelkova

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

Photo Credit: MRWM Landscape Architects

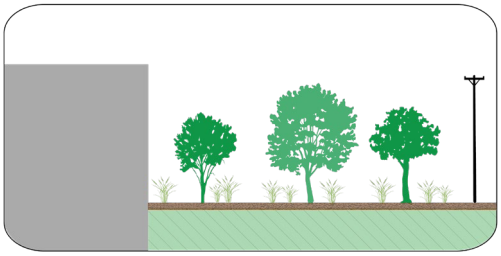
Right Tree, Right Place

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.

The Nature Conservancy

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

RECOMMENDED TREES

Arbutus xalapensis	Texas Madrone
Celtis reticulata	Netleaf Hackberry
Cercis canadensis var. *mexicana*	Mexican Redbud
Cercis reniformis	Oklahoma Redbud
Cercis canadensis var. *texensis*	Texas Redbud
Cercis occidentalis	Western Redbud
Cedrus atlantica	Atlas Cedar
Chilopsis linearis	Desert Willow
Cotinus obovatus	American Smoketree
Forestiera neomexicana	New Mexico Privet
Gymnocladus dioica	Kentucky Coffeetree
Fraxinus cuspidata *	Fragrant Ash*
Juniperus deppeana *	Alligator Juniper*
Juniperus monosperma *	One Seed Juniper*
Juniperus virginiana *	Eastern Red Cedar*
Lagerstroemia indica	Crape Myrtle
Leucaena retusa *	Goldenball Leadtree*
Maclura pomifera	Osage Orange
Parkinsonia x Cercidium *	Palo Verde Hybrids*
Pinus eldarica	Afghan Pine*
Pinus pinea *	Italian Stone Pine
Pistacia chinensis *	Chinese Pistache*
Prosopis glandulosa *	Honey Mesquite*
Prosopis velutina *	Velvet Mesquite*
Quercus arizonica	Arizona White Oak
Quercus fusiformis	Escarpment Live Oak
Quercus gravesii	Chisos Red Oak
Quercus ilex	Holly Oak
Quercus muehlenbergii	Chinquapin Oak
Quercus oblongifolia	Blue Oak
Quercus suber *	Cork Oak*
Sapindus saponaria var.*drummondii**	Western Soapberry*
Sophora secundiflora *	Texas Mountain Laurel*
Rhus lanceolata	Prairie Flameleaf Sumac
Ulmus x 'Morton' *Accolade™*	Accolade Elm
Ulmus x 'Frontier'	Frontier Elm
Ulmus parvifolia *	Lacebark Elm*
Vitex agnus-castus	Chaste Tree

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

Photo Credit: ABCWUA

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.

The Nature Conservancy

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.

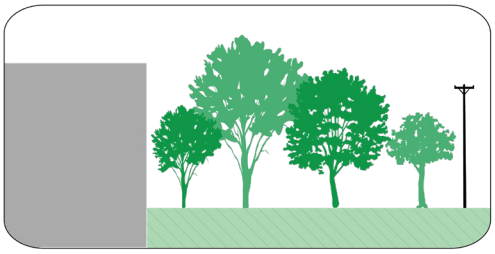
In contrast, xeriscaping incorporates low water use plants with a focus on native and arid adapted species, careful organic mulching, water catchment, and water redirection systems to support a lush landscape that is both visually enjoyable and wildlife-friendly. Trees are an important part of the "xeric"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

Photo Credit: Hunter Ten Broeck

Climate-Ready Trees for Albuquerque

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	Netleaf Hackberry
Cercis canadensis var. *mexicana*	Mexican Redbud
Cercis reniformis	Oklahoma Redbud
Cercis canadensis var. *texensis*	Texas Redbud
Cercis occidentalis	Western Redbud
Cedrus atlantica	Atlas Cedar
Cedrus deodara	Deodar Cedar
Forestiera neomexicana *	New Mexico Privet*
Gymnocladus dioica	Kentucky Coffeetree
Fraxinus cuspidata *	Fragrant Ash*
Juniperus deppeana *	Alligator Juniper*
Juniperus virginiana *	Eastern Red Cedar*
Lagerstroemia indica	Crape Myrtle
Maclura pomifera *	Osage Orange*
Pinus eldarica	Afghan Pine
Pinus pinea	Italian Stone Pine
Pistacia chinensis	Chinese Pistache
Platanus mexicana	Mexican Sycamore
Populus deltoides	Eastern Cottonwood
Populus deltoides var. *wislizeni*	Rio Grande Cottonwood
Prosopis pubescens *	Screwbean Mesquite*
Prunus mexicana	Mexican Plum
Quercus arizonica	Arizona White Oak
Quercus fusiformis	Escarpment Live Oak
Quercus gravesii	Chisos Red Oak
Quercus ilex	Holly Oak
Quercus muehlenbergii	Chinkapin Oak
Quercus suber *	Cork Oak*
Quercus buckleyi	Texas Red Oak
Quercus virginiana	Southern Live Oak
Sapindus saponaria var. *drummondii* *	Western Soapberry*
Sophora secundiflora	Texas Mountain Laurel
Rhus lanceolata	Prairie Flameleaf Sumac
Taxodium mucronatum *	Montezuma Cypress*
Ulmus x 'Morton' *Accolade™*	Accolade Elm
Ulmus x 'Frontier'	Frontier Elm
Ulmus parvifolia	Lacebark Elm
Vitex agnus-castus	Chaste Tree
Zelkova serrata	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.

The Nature Conservancy

LOCATION TYPE 4 - HIGHLY IRRIGATED ARES

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, xersicaping 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.

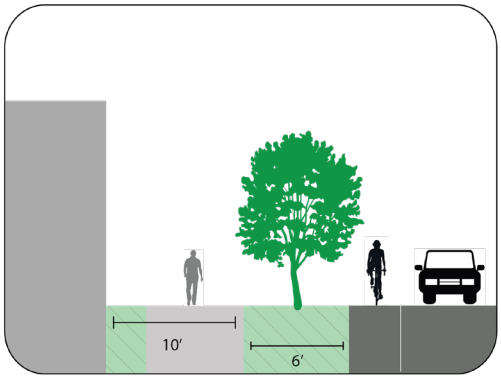
Trees planted in this location type should be trees that thrive with frequent, shallow irrigation and are heat tolerant. By surrounding turf spaces, large or small, xeriscaping, can reduce water use and capture any runoff from the turf irrigation.

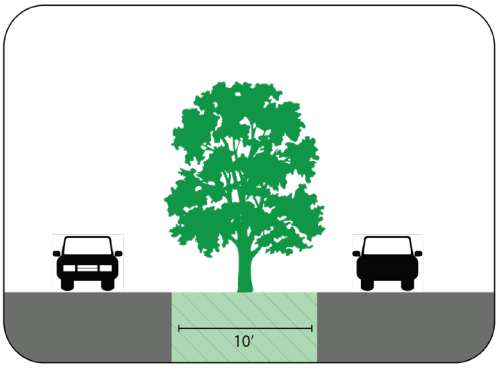
IMPORTANT NOTE: Typical spray irrigation of turfgrasses is often insufficient to meet the slow, deep watering requirements of large shade tree roots. Additional, deep watering is likely needed to supplement spray irrigation.

Photo Credit: Albuquerque Water Authority

Climate-Ready Trees for Albuquerque

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	Texas Madrone
Celtis reticulata	Netleaf Hackberry
Cercis canadensis var. *mexicana*	Mexican Redbud
Cercis reniformis	Oklahoma Redbud
Cercis canadensis var. *texensis*	Texas Redbud
Cercis occidentalis	Western Redbud
Cedrus deodara	Deodar Cedar
Chilopsis linearis	Desert Willow
Cotinus obovatus	American Smoketree
Crataegus ambigua	Russian Hawthorn
Forestiera neomexicana	New Mexico Privet
Gymnocladus dioica	Kentucky Coffeetree
Fraxinus cuspidata *	Fragrant Ash*
Lagerstroemia indica	Crape Myrtle
Leucaena retusa *	Golden-ball Lead-tree*
Maclura pomifera	Osage Orange
Parkinsonia x 'Desert Museum' *	Palo Verde hybrids*
Pistacia chinensis *	Chinese Pistache*
Prosopis glandulosa *	Honey Mesquite*
Quercus arizonica	Arizona White Oak
Quercus fusiformis	Escarpment Live Oak
Quercus gravesii	Chisos Red Oak
Quercus ilex	Holly Oak
Quercus muehlenbergii	Chinkapin Oak
Quercus oblongifolia	Blue Oak
Quercus suber *	Cork Oak*
Quercus buckleyi	Texas Red Oak
Sapindus saponaria var.drummondii *	Western Soapberry*
Sophora secundiflora *	Texas Mountain Laurel*
Rhus lanceolata	Prairie Flameleaf Sumac
Ulmus x 'Morton' *Accolade™*	Accolade Elm
Ulmus x 'Frontier'	Frontier Elm
Ulmus parvifolia *	Lacebark Elm*
Vitex agnus-castus	Chaste Tree
Zelkova serrata	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.

The Nature Conservancy

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

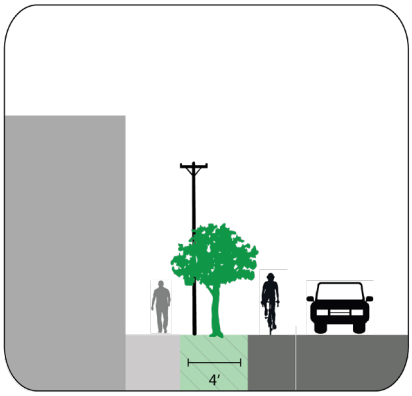
Celtis reticulata	Netleaf Hackberry
Cercis canadensis var. *mexicana*	Mexican Redbud
Cercis occidentalis	Western Redbud
Cercis reniformis	Oklahoma Redbud
Cercis canadensis var. *texensis*	Texas Redbud
Fraxinus cuspidata	Fragrant Ash
Lagerstroemia indica	Crape Myrtle
Prosopis glandulosa	Honey Mesquite
Quercus oblongifolia	Blue Oak

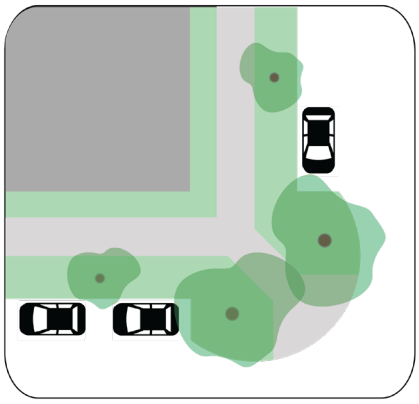
RECOMMENDATIONS

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 ≤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.

The Nature Conservancy

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.

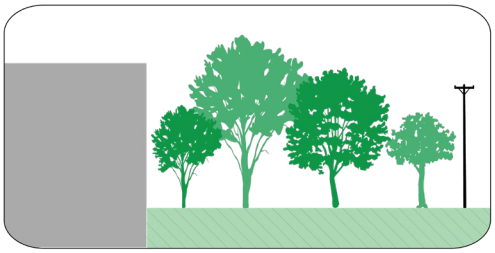
Smaller understory plants like bunch grasses and wildflowers are better suited for these areas. Only small stature trees should be selected for planting, and only if the space has a minimum width of 4 feet and/or continuous soil strips, tree trenches, or suspended soils. If the area is less than 4 feet 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

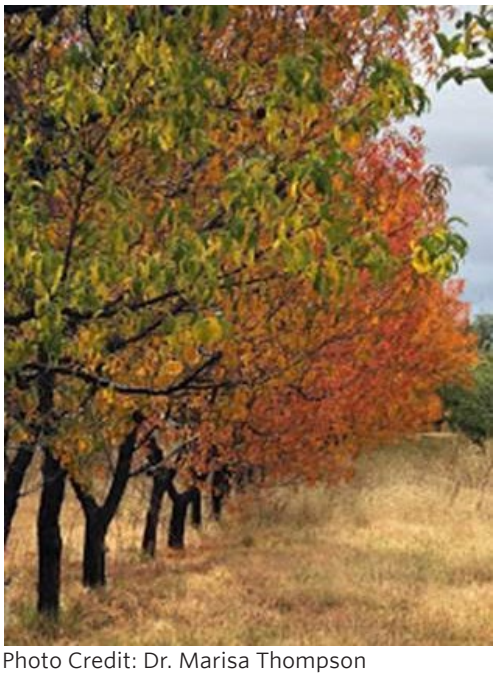


Photo Credit: Dr. Marisa Thompson

RECOMMENDED TREES

Diospyros texana	Texas Persimmon
Ficus carica 'Mission'	Black Mission Fig
*Morus microphylaa**	Little Leaf Mulberry*
Pistacia vera	Pistachio
Punica granatum	Pomegranate
Ziziphus jujuba	Jujube
Cydonia oblonga	Quince
Diospyros kaki	Japanese Persimmon
Juglans microcarpa	Little Walnut
Carya illinoinensis	Pecan
Prunus armeniaca	Apricot
*Eriobotrya japonica**	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.

The Nature Conservancy