CHAPTER 3
STREETSCAPE DESIGN AND TREE PROTECTION

TABLE OF CONTENTS

Section **Page**

3.01 GENERAL 1
(A) INTENT 1
(B) SCOPE 1
(C) REFERENCE STANDARDS 1
(D) CITY APPROVAL REQUIRED 1
3.02 LANDSCAPING PLAN 1
(A) LANDSCAPING PLAN REQUIRED 1
(B) TREE PROTECTION 1
(C) LANDSCAPING PLAN REQUIREMENTS 2
3.03 STREET TREES AND PLANTS 2
(A) TREE SELECTION 2
(B) TREE PLACEMENT IN NON-PAVED MEDIANS AND LANDSCAPE PLANTING STRIPS 5
(C) TREE PLACEMENT IN PAVED AREAS USING TREE GRATES AND PLANTING PITS 6
3.04 TREE REMOVAL AND RELOCATION 9
(A) PERMIT REQUIRED FOR TREE REMOVAL OR RELOCATION 9
(B) UNDESIRABLE TREES FOR PUBLIC RIGHTS OF WAY 9
(C) TREE REMOVAL 9
(D) TREE RELOCATION (TRANSPLANTING) 10
3.05 TREE PROTECTION FOR CONSTRUCTION SITES 10
(A) TREE PROTECTION REQUIRED 10
(B) TREE PROTECTION PROCEDURES 11
3.06 GENERAL LANDSCAPING AND MAINTENANCE REQUIREMENTS 14
(A) PROTECTING EXISTING IMPROVEMENTS 14
(B) MAINTENANCE 14

LIST OF TABLES

Number **Page**

Table 3-1: Limitations on Individual Tree Species.....5
Table 3-2: Tree Grates and Planting Pits Standards 6

3.01 General

(A) Intent

The Streetscape Design and Tree Protection Standards are intended to improve public safety by preventing sight distance and facility obstructions and sidewalk and street damage, ~~to promote~~promoting suitable landscape species selection for streetscapes, ~~to minimize~~minimizing tree and landscape maintenance costs.

(B) Scope

These Standards apply to public and private streetscapes and ~~private construction sites where specified~~~~containing existing trees proposed for preservation~~, ~~and~~ include the planting, maintenance, pruning and spraying, protection and removal of trees and landscaping materials located, standing, or growing within or upon any City of Boulder public right- of- way. Tree Protection standards also apply to ~~private construction sites containing~~ ~~to~~ any existing private trees proposed for preservation as a part of a development approval under Title 9 pf the B.R.C. 1981. The requirements of this chapter are in addition to and ~~compliment~~ complement those set forth in Chapter 10, "~~Streetscaping~~ Landscape Standards," and applicable streetscape drawings in Chapter 11, "Technical Drawings," of these Standards and the B.R.C. 1981.

(C) Reference Standards

Where not specified in these Standards or the B.R.C. 1981, in order to protect the public health, safety, and welfare, the Director of Public Works in consultation with the Director of Parks and Recreation will specify the standards to be applied to the design and construction of ~~streetscapes~~ public landscapes and the planting of trees, and may refer to one or more of the references listed in the References Section of these Standards.

(D) City Approval Required

All work associated with the planting, maintenance, and removal of trees and landscaping materials located, standing, or growing within or upon any City of Boulder public right- of- way is subject to City of Boulder approval or permit issuance as set forth in Chapter 8-5, "Work in the Public Right- of- Way and Public Easements," and Chapter 6--6, "Protection of Trees and Plants," B.R.C. 1981.

3.02 Landscaping Plan

(A) Landscaping Plan Required

An applicant for construction approval involving ~~a project or~~ development where streetscaping improvements are to be provided or potentially impacted by the installation or construction of public improvements, or where prescribed by a City adopted subcommunity, area, or special improvement plan, shall submit a Landscaping Plan in compliance with these Standards and those set forth in Chapter 6--6, "Protection of Trees and Plants," Chapter 9-~~3.3~~9, "~~Site~~ Development Standards," ~~and~~and Chapter 9-12~~5~~, "Subdivisions," B.R.C. 1981. Coordination to meet any applicable requirements of ~~Chapter~~Title 9 shall be the responsibility of the developer/owner.

(B) Tree Protection

The Landscaping Plan shall include design details and notes, construction activity controls and measures, and any necessary provisions or restrictions to ensure the protection of existing trees as required in Chapter 6-6, "Protection of Trees and Plants," B.R.C. 1981, and Section 3.05, "Tree Protection for

Construction Sites," of these Standards. For large or complicated sitesprojects larger than one single family dwelling, a separate Tree Protection Plan in addition to the required Landscaping Plan shall be required. The city may require tree protectionAll tree protection shall to be installed and monitored by a certified arborist.

(C) Landscaping Plan Requirements

The Landscaping Plan shall be prepared in compliance with the requirements in Section 1.03, "Submittal Requirements for Construction Approval," of these Standards, Section 9-9-12 B.R.C. 1981 and shall include but are not limited to the following elements:

(1) Location, typespecies, and size of all existing trees and landscaping materials, and identification of any required tree protection measures as outlined in Section 3.02(B), "Tree Protection." of these Standards.

(2) Design location, typespecies, and size of all trees and landscaping materials proposed to be planted, removed, or relocated.

(3) Location of existing and proposed public utilities and transportation improvements and public rights- of- way boundaries.

(4) When a drainage report is required in accordance with Chapter 7 of these standards, the landscape plan shall display drainage flow arrows and the location of open channels, storm inlets, and stormwater control measures to indicate the interaction between plantings and drainage."Indication of how site grading and consequent drainage flow interacts with location of plantings. And existing trees?

(45) Specifications and construction notes for proposed trees and landscaping materials, including without limitation, plant variety types, number and size of plants to be installed, location, sizing, and design details for irrigation systems, planting and maintenance requirements for specific species, tree protection systems and measures, and tree grate type and installation details. Specifications and construction notes for proposed tree

3.03 Street Trees and Plants

(A) Tree Selection

(1) Trees proposed to be planted in non-paved public rights- of- way shall be selected from Table 31, "Approved Street- Tree List List for Non-paved Medians and Landscape Planting Strips," unless an alternative tree selection has been reviewed and approved by a Cityadopted subcommunity, area or special improvement planthe City of BoulderCity Manager. The City Manager is authorized to update Table 31 as adopted annually and published on or about August 15 of each calendar year. Other species and varieties of trees may be used, subject to City approval. Alternative species and varieties should be thornless, cottonless, minimally fruiting, minimally seeding, and single-stem, tree-form varieties.

(2) Tree species that are not to be placed in public rights- of- way include: Ash, Box Elder, Cottonwood, Chinese and Siberian Elm, Poplar, Russian Olive, Silver and Norway Maples, Tree of Heaven, Willow, evergreens that create sight obstructions, and clump forms or multistem trees.

(3) Trees to be planted in non-paved medians or landscape planting strips shall be selected using the minimum planting strip width requirements for the tree species listed in the Forestry aApproved Tree List table Table 31 for the available planting strip width.

(4) Trees selected for narrow (4' 5') planting strips must be upright forms of tree

species under the small tree category. Upright varieties of tree species such as crabapple ('Centurion' and 'Red Barron') and pear ('Chanticleer') are recommended for a 4'-5' planting strip along arterial streets where a high volume of traffic is a concern. Other crabapple varieties can be planted in a 4'-5' planting strip along non-arterial streets or in a 6'-7' planting strip.

(5) Trees shall not be planted in planting strips that are less than 4 feet in width wide or where the planting strip is narrower than the required minimum planting strip width for specific tree species.

NOTE: For detached sidewalk landscaped planting strips, the planting strip width is measured from the back edge of curb to the front edge of the sidewalk.

(6) Evergreen trees shall not be selected for placement in public rights- of- way medians or landscaping strips, due to the potential for overcrowding, and sight obstructions and icing, unless these concerns can be mitigated and adequate planting strips at least 20 feet wide are provided. Deciduous conifers such as baldcypress or dawn redwood are allowed in 8' + planting strips.

(7) Whenever possible, trees should be selected from species noted as having "drought tolerant" xeric or minimum moisture level requirements as noted in the Approved Tree List in consultation with the city forester in Table 31.

(8) A variety of trees, as required in Table 3-21, "Limitations on Individual Tree Species," shall be selected for planting within any given site or street corridor, including street medians and curbside landscape strips, to prevent uniform insect or disease susceptibility associated with planting a single genus or species. A maximum of 3 plantings of the same tree species type are allowed planted in a row.

(9) Trees proposed for the public rights- of- way in the Downtown Area shall follow the guidelines outlined in the Downtown Urban Design Guidelines, 19992002 2016.

Table 3-1: Approved Street Tree List for Non-paved Medians and Landscape Planting Strips

Trees on the following list will do well in our local environment provided the appropriate species is selected for a particular site. (see Table 3-6, "Tree Characteristics") The trees on this list offer a wide range of varieties and cultivars which fit into local landscapes. Tree names are followed by examples of acceptable tree varieties that may be used in streetscapes. Other available varieties of each tree type may be used, subject to City approval, if they are thornless, cottonless, minimally fruiting, minimally seeding, and tree form varieties. Trees are listed in alphabetical order and are not prioritized according to their suggested use.

Small Maturing Trees (Under 25' Mature Height) **Required Planting Strip Width** 4' 5' Minimum **Spacing Between Trees** 15' Minimum, 20' Recommended	**Medium Maturing Trees** (30' 45' Mature Height) **Required Planting Strip Width** 6' 7' Minimum **Spacing Between Trees** 25' Minimum, 30' Recommended	**Large Maturing Trees** (Over 45' Mature Height) **Required Planting Strip Width** 8' Minimum **Spacing Between Trees** 30' Minimum, 40' Recommended
Crabapple *Malus spp.* (Fireblight resistant varieties, inc. 'Centurion,' 'Red Barron')	Cherry *Prunus sargentii* (Sargent)	Ash, Green[1,2] *Fraxinus pennsylvanica* ('Marshall's Seedless,' 'Newport,' 'Patmore,')
Goldenraintree[1] *Koelreuteria paniculata*	Crabapple *Malus spp.* (Fireblight resistant varieties, inc. 'Indian Magic', 'Indian Summer', 'Radiant', 'Spring Snow')	Ash, White[2] *Fraxinus americana* ('Autumn Applause,' 'Autumn Purple,' 'Rosehill')
Hawthorn *Crataegus spp.* (thornless cockspur, 'Ohio Pioneer') Tree Form	Hackberry, Common[1] *Celtis occidentalis* ('Prairie Pride')	Baldcypress *Taxodium distichum*
Lilac, Japanese tree *Syringa reticulata* Tree Form	Honeylocust[1] *Gleditsia triacanthos var. inermis* ('Imperial,' 'Sunburst')	Catalpa, Western[1] *Catalpa speciosa*
Maple, Amur[1] *Acer ginnala* Tree Form	Hop Hornbeam *Ostrya virginiana*	Coffeetree, Kentucky[1] *Gymnocladus dioicus*
Maple, Norway *Acer platanoides* ('Crimson Sentry')	Hornbeam, European *Carpinus betulus*	Elm, American *Ulmus americana* ('Brandon,' 'Valley Forge')
Maple, Tatarian *Acer tataricum* Tree Form	Linden, Littleleaf *Tilia cordata* ('Corinthian')	Hackberry, Common[1] *Celtis occidentalis*
Oak, Gambel *Quercus gambelii* Tree Form	Maple, Norway *Acer platanoides* ('Cavalier,' 'Drummondi')	Honeylocust[1] *Gleditsia triacanthos var. inermis* ('Shademaster,' 'Majestic')
Pear *Pyrus calleryana 'Chanticleer'*	Maple, Hedge *Acer campestre*	Horsechestnut, Common *Aesculus hippocastanum*
Prunus *Prunus spp.* (Cherries, Plums, Almonds, Apricot[1]) Tree Form	Maple, Wasatch[1] *Acer grandidentatum* Tree Form	Linden, American *Tilia americana* ('Legend', 'Redmond')
Redbud *Cercis canadensis* Tree Form	Ohio Buckeye[1] *Aesculus glabra*	Linden, Littleleaf *Tilia cordata* ('Chancellor,' 'Greenspire')
Serviceberry *Amelanchier spp.* Tree Form	Pear *Pyrus spp.* (Ussurian, Callery avoid 'Bradford' variety)	Maple, Norway *Acer platanoides* ('Deborah,' 'Emerald Queen')
	Turkish Filbert *Corylus colurna*	Maple, Red *Acer rubrum* ('Northwood', 'Red Sunset')
		Maple, Sugar *Acer saccharum* ('Green Mountain', 'Legacy')
		Oak *Quercus spp.* (Bur[1], English, Red, Shumard, Swamp White[1])

1 Indicates **drought tolerant** species.

2 Green/White ash should be used sparingly and not in large rows or groupings because of major problems with brownheaded ash sawfly and lilac/ash borer.

Table 3-1: Limitations on Individual Tree Species

(The following table applies to all genus and species unless otherwise approved by the City Forester)

Number of Trees in the Site or Corridor	Maximum Percentage of Any Genus or Species
≤3	100% Genus
4 to 8	50% Genus
9 to 15	33% Genus
16 to 50	20% Species, 30% Genus
≥51	10% Species, 20% Genus
Note: Any exceptions to the above diversity percentages must be approved by the City Manager. Tree availability at the time of construction may impact tree diversity requirements. Genus and species substitutes, as well as revisions to tree diversity requirements will be reviewed on a project by project basis by the City Manager.	

~~Table 3-21: Limitations on Individual Tree Species~~

~~*(The following table applies to trees in both Table 3-1 and Table 3-4all genus and species unless otherwise approved by the City Foresterstaff.)*~~

~~Number of Trees in the Site or Corridor~~	~~Maximum Percentage of Any OneGenus or Species~~
~~10-19~~	~~5033%~~
~~20-39~~	~~2533%~~
~~40 and Over~~	~~1525%~~

(B) Tree Placement in Non-paved Medians and Landscape Planting Strips

(1) Tree placement of deciduous and evergreen trees shall be designed and based on the expected mature height and canopy spread for the selected species, to prevent unnecessary competition or overcrowding of trees.

(2) Trees shall not be placed where the expected mature height and canopy spread could obstruct sight distance of any public sign, driveway, alley, or intersection, as set forth in Section 9-~~3.3-5~~9-7, "Sight ~~Distance~~Triangles," B.R.C. 1981, or where the physical obstruction of any sidewalk, trail, alley, or street lane could occur.

(3) New or transplanted trees shall not be placed within 10 feet of existing underground utility lines. New underground utilities should not be placed within 10 feet of existing trees without the prior review and approval of the Director.

(4) Trees shall not be placed within ~~20~~ 10 feet of any utility pole, streetlight or pedestal. When tree placement is allowed under overhead ~~power~~ utility lines, only those tree species listed as "Small Maturing Trees" ~~on Table 31, "Approved Street Tree List,"~~ shall be planted.

(5) Trees ~~should~~ shall be located at least 10 feet away from buildings and offset from building entrances. When available space is limited, only species with ~~columnshaped~~ columnar or ~~pyramidshaped~~ fastigiate forms shall be planted. Any other proposed solution requires City review and approval.

(6) ~~Trees may shall be planted in right-of-way landscape planting strips adjacent to existing trees on private property only when all trees have enough space to grow to their expected mature size. Trees with narrow forms should be used in the right-of-way when there is~~

~~the potential for overcrowding with existing trees.~~

(7) Trees shall be planted in the center of right- of- way planting strips, or appropriately placed for mature height and spread, to ensure tree health, prevent root damage to sidewalks and street facilities and to avoid a sight distance obstruction.

(8) ~~Trees shall not be placed in medians or landscape planting strips less than 4 feet wide or where the planting strip is narrower than the required minimum planting strip width for specific tree species as listed in Table 3-1, "Approved Street Tree List for Non-paved Medians and Landscape Planting Strips."~~

~~**NOTE**: For detached sidewalk landscaped planting strips, the planting strip width is measured from the back edge of curb to the front edge of the sidewalk.~~

(9) ~~Evergreen trees shall be placed at least 10 feet behind the edge of pavement, curbs or sidewalks, or far enough to permit clearance of the tree's mature canopy spread if previously approved by the City.~~

(10) ~~Evergreens shall not be placed on the south sides of east-west running streets.~~

(11) Deciduous trees shall not be placed in the right- of- way where the planting strip behind an attached sidewalk, edge of pavement, or curb along roadways without sidewalks extends less than 4 feet from the back edge of the sidewalk, pavement, or curb to the property line. In such cases, street trees shall be planted on adjacent private property.

(12) Tree spacing for trees placed in landscaped planting strips shall comply with the "Spacing Between Trees" requirements listed in the species headings in ~~Table 3-2~~1, "Approved Street Tree List ~~for Non-paved Medians and Landscape Planting Strips~~." Tree placement should meet the recommended tree spacing and shall not be less than the minimum tree spacing requirements unless previously approved by the ~~City~~Director.

~~(13)~~

(C) Tree Placement in Paved Areas Using Tree Grates and Planting Pits

(1) Trees using tree grates and planting pits shall be placed in compliance with the design standards for tree spacing and shall ~~generally~~ be planted in a 4 ft. x 10 ft. two piece Neenah Foundry, or approved equal, grate ~~unless otherwise approved through a variance request~~. Tree spacing for tree grates shall comply with the "Spacing Between Trees" requirements listed in the ~~species headings in Table 3-2,~~ "Approved Street Tree List."

Table 3-~~3~~2: Tree Grates and Planting Pits Standards

Tree Species Size	Tree Spacing	Minimum Tree Grate Area (Width x Length)	Minimum Soil~~Tree Pit~~ Volume* ~~(Width x Length x Depth)~~
Small Tree	15~~0~~ Ft. minimum, ~~15 Ft. recommended~~	20 Sq. Ft. minimum, 4 Ft. min. width (Ex. 4 ft. x 5 ft.)	600 Cu. Ft. minimum, 3 Ft. min. depth ~~(Ex. 4 ft. x 5 ft. x 3 ft.)~~
Medium Tree	25~~15~~ Ft. minimum, ~~20 Ft. recommended~~	32 Sq. Ft. minimum, 4 Ft. min. width (Ex. 4 ft. x 8 ft.)	900~~6~~ Cu. Ft. minimum, 3 Ft. min. depth ~~(Ex. 4 ft. x 8 ft. x 3 ft.)~~
Large Tree	30~~20~~ Ft. minimum, ~~25 Ft. recommended~~	40 Sq. Ft. minimum, 4 Ft. min. width (Ex. 4 ft. x 10 ft.)	1200 Cu. Ft. minimum, 3 Ft. min. depth ~~(Ex. 4 ft. x 10 ft. x 3 ft.)~~

*–Where soil volumes between trees overlap, up to 25% of the required soil volume per tree may be

shared.

(2) Tree grates, tree guards and planting pits shall be provided in locations where a hard surface or paved area is required to adequately accommodate pedestrians, including without limitation downtown or commercial sidewalks, malls, and plazas. The tree grate allows air and moisture to reach tree roots and limits compaction of the soil around the tree to maintain healthy growth.

(3) Trees using tree grates shall not be placed where the expected mature height and canopy spread ~~could~~ obstructs sight distance of any public sign, driveway, alley, or intersection, as set forth in Section 9-~~3.35~~9-7, "Sight ~~Distance~~Triangle," B.R.C. 1981, or where the physical obstruction of any sidewalk, trail, alley, or street lane could occur.

(4) Trees using tree grates shall not be placed within 10 feet of any existing underground utility line or within ~~20~~ 10 feet of any utility poles or pedestal. When tree placement is allowed under overhead ~~power~~ utility lines, only those tree species listed as "Small Maturing Trees" ~~i~~in Table 3-~~4~~2, "Approved Street Tree List ~~for Paved Areas Using Tree Grates and Planting Pits~~," shall be planted.

(5) Trees using tree grates should be located at least 10 feet away from buildings and offset from building entrances. ~~When available space is limited, only species with column-shaped or pyramid-shaped forms shall be planted~~.

NOTE: ~~that~~ below grade parking structures are considered buildings and must meet this requirement.

(6) Adequate growing space between the tree trunk and first ring of the tree grate shall be provided to allow the tree to grow properly without girdling. The opening in the center of the tree grate through which the tree grows shall provide 4-6 inches of clearance from the tree trunk and be at least 1~~8~~2 inches in diameter. The tree shall be centered within the tree grate opening.

~~(7) If large area tree grates are not available or cannot be used, the required permeable surface area may be provided by using multiple tree grates that are at least 4 feet wide, or by providing a single tree grate around the tree trunk that is at least 4 feet wide in conjunction with natural permeable materials, such as landscaping pavers, over the remainder of the planting pit surface. Any non-standard tree grate frame installation shall have adequate structural support and be approved by the Director.~~

~~(8)~~(7) The soil surface within a planting pit and beneath a tree grate shall be level with the bottom of the sidewalk slab. This is to avoid problems with root flares lifting grates as the tree grows and allows the roots to find air and water. Trees are then to be planted so that the top of the root ball is 2" above the finished grade of the soil.

~~(9)~~(8) Planting pits shall be 3 feet deep and have the same surface area as the required tree grate area, and may not be deepened unless warranted by the depth of the root ball of the tree to be planted. A planting pit shall not be deepened to increase pit volume as an alternative to providing the minimum tree grate surface area.

~~(10) The growth of trees using tree grates shall be monitored to ensure that inner grate rings or the entire tree grate is removed as necessary to prevent girdling the tree.~~

~~(11)~~(9) Tree grates shall be flush with the finish grade of adjacent pavement ~~final surface grades~~.

~~(12)~~(10) All tree grates shall be installed per the manufacturer's specifications. Grates shall be supported by a frame which has anchors embedded in the surrounding concrete. Final frame dimensions shall be 1/16 to 1/8-inch larger than the grate dimension on all sides to allow the grate to drop into the frame seat. Frame sections are to be bolted together and cast into the surrounding concrete. Frames must be level and the seat for the

grate must be in a true, flat, plane to prevent rocking of the grate. The seat for the grate shall be cleaned prior to setting the grate. To ensure proper fit, the grate or a template ~~should~~ shall be placed in the frame before concrete is poured so that the final installation will be square and level.

~~(13)~~(11) Tree grates are to be of the pedestrian safe style with slot openings 3/8-inch in width or less and designed to accommodate a tree guard~~.~~

~~Any grate installed flush to the curb shall be truck rated to avoid breakage or shall be installed a minimum of 182 inches from back of curb.~~

(12) Tree guards shall have ~~5' with either an~~ 18" opening to match the tree grate and shall be installed per the manufacturer's specifications.

~~(D) Plant Selection and Placement for Landscaping in Medians~~

~~(1) Plants proposed to be planted in medians in the public right-of-way shall be selected from Table 3-1, "Approved Street Tree List for Non-paved Medians and Landscape Planting Strips, or Table 3-4, "Approved Street Tree List for Paved Areas Using Tree Grates and Planting Pits," or Table 3-5, "Approved Median Shrub List," unless an alternative plant selection has been approved by a City-adopted subcommunity, area or special improvement plan.~~the City

~~(2) Median plants selection and placement shall be designed and based on the expected mature height and spread of the selected species, to prevent unnecessary competition or overcrowding of plants and to ensure that the selected mature plants remain within the median width without requiring excessive or frequent pruning.~~

~~(3) Median plants shall not be placed where the expected mature height and spread could obstruct sight distance of any public sign, intersection, or crosswalk as set forth in Section 9-3.3-59-7, "Sight Distance~~Triangles," B.R.C. 1981.

~~(4) Plant species that are not well-suited for median environments and should not be placed in medians in the public right-of-way include: Junipers (select species including `Blue Pfitzer', `Blue Rug', `Calgary Carpet', `Pfitzers', `Sea Green', and `Tam') Bridal Wreath Spirea, Flowering Crabs, Forsythia, Ginnala Maple, Honeysuckle, Pyracantha, and Redtwig Dogwood.~~

~~Table 3-5: Approved Median Shrub List~~

~~*Amorpha, var.* ('Leadplant,' 'Indigo Bush,' etc.)*~~	~~Mountain Mohagany*~~
~~Apache Plume - *Fallugia paradoxa**~~	~~Potentilla - *Potentilla fruticosa*~~
~~*Artemisia* ('Powis Castle')*~~	~~*Prunus besseyi, tenella**~~
~~Barberry~~	~~Rabbitbrush* - *Chrysothamnus nauseosus*~~
~~Cliffrose, Mexican - *Cowania mexicana**~~	~~Sage, Russian - *Perovskia atriplicifolia**~~
~~Cotoneaster (various)~~	~~Sagebrush* - *Artemisia sp.* ('Big,' 'Sand')~~
~~Cranberrybush - *Virburnum opulus* ('Compactum')~~	~~Serviceberry - *Amelanchier alnifolia**~~
~~Fernbush - *Chamaebatiaria millefolium*~~	~~Shrub Rose (various)~~
~~Juniper ('Arcadia,' 'Blue Chip,' 'Broadmoor,' 'Buffalo,' 'Hughes,' 'Scandia')~~	~~Snakeweed - *Gutierrezia sarothrae**~~
	~~Spirea ('Bluemist*,' *bulmalda*, 'Mongolian')~~
~~Lilac* - ('Dwarf,' 'Littleleaf')~~	~~Sumac* - *Rhus aromatica* ('Grolow')~~

~~* Indicates **drought-tolerant** species.~~

3.04 Tree Removal and Relocation

(A) Permit Required for Tree Removal or Relocation

(1) An applicant for construction approval shall not remove or relocate any tree existing within any public right- of- way without first having a landscaping plan approved, ~~and~~ obtaining a right- of- way permit per Chapter 8-5 "Work in the Public Right-of-way and Public Easements," B.R.C. 1981and ~~authorization from the City Forester per~~preapprovals required in Chapter 6-6, "Protection of Trees and Plants," B.R.C. 1981.~~.~~

(2) An applicant for construction approval may not request City approval nor propose as part of a landscaping plan for a project or development the removal or relocation of a tree in the public right- of- way unless:

(a) The site cannot feasibly be developed, through design or construction alternatives, without removing or relocating the tree, and the applicant mitigates the loss of the tree,

(b) The tree is determined by the City to be undesirable as outlined in Section 3.04(B), "Undesirable Trees for Public Rights-of-Way,' below, or

(c) The City is requiring the removal of a tree as part of construction approval.

(3) Where tree mitigation is required for tree removal per Chapter 6-6, "Protection of Trees and Plants," B.R.C. 1981., trees required to be planted as part of standard project or development approval will not be counted towards the required mitigation.

(4) Mitigation shall be satisfied when all fees are paid and replacement trees are planted. Mitigation fees are determined by the City ~~Forester~~Manager ~~Forestry Department~~ and due prior to issuance of building permits. If replacement is appropriate, a landscape plan showing the location, species and size of all plant material shall be required.

(B) Undesirable Trees for Public Rights- of- Way

The City may determine that certain trees located within the public right- of- way are undesirable and may recommend or require removal of these trees if:

(1) The trees are less than 1 inch in caliper, usually representing volunteer trees or suckers that seldom conform to selection and placement standards, and are smaller than would be required for new plantings.

(2) The trees are smaller than 12 inches in diameter and are ~~listed as trees not to be placed in the public right- of- way in Section 3.03(A)(2)~~. Cottonwood (any Poplar species), Siberian Elm, Russian Olive, Silver Maple, Tree-of-Heaven, Willow, evergreens that create sight obstructions, and clump forms or multi-stem trees.

(3) Trees that have been severely damaged or are in poor general health, as determined by the City under generally accepted forestry standards. This determination will not apply if the damage or poor general health is the result of action~~s~~ or inaction of the adjacent property owner or the applicant for construction approval.

(4) Trees that, due to their species, location, or density would not conform to the existing streetscape standards for tree placement or spacing as outlined in these Standards.

(C) Tree Removal

(1) Trees shall only be removed in compliance with a landscaping plan, approved by the City as set forth in these Standards. Trees shall be deemed removed if greater than 40% of the canopy or root system is damaged or removed during construction as determined by the

City Manager under generally accepted forestry standards. Mitigation will then be required.~~...~~

(2) All trees to be removed shall be marked with an "X" in blue permanent marking and approved by the City prior to removal.

(3) All tree removal shall include stump grinding to a minimum depth of 12 inches.

~~(4) Trees shall be deemed removed and require mitigation if greater than 40% of the canopy or root system is damaged or removed during construction as determined by the City under generally accepted forestry standards.~~

(D) Tree Relocation (Transplanting)

(1) Trees with a "transplanting ease" rating of 1 or a 2, as defined in the *Tree and Shrub Transplanting Manual*, are considered eligible for transplanting, subject to City approval. All transplanting shall be in a location approved by the City.

(2) Trees eligible for transplanting shall meet the following requirements:

(a) Be 8 inches or less in caliper, unless approved by the City, and

(b) Have a root ball size of 1 foot per 1 inch of trunk caliper, evenly distributed on all sides from the center line of the trunk. For example, a tree with a 4-inch caliper shall have a root ball with a 4-foot diameter, evenly distributed with 2 feet on all sides from the centerline of the trunk.

(3) Transplanting shall be done only by ~~an experienced tree professional~~a licensed arborist or ~~tree contractor~~ per Chapter 4-28 B.R.C. 1981 and according to a landscaping plan approved by the City.

(4) The applicant for construction approval shall ensure that the transplanted tree survives without significant loss of tree value in compliance with the tree protection standards set forth in Chapter 6-6, "Protection of Trees and Plants," B.R.C. 1981.

(5) Transplanting periods:

(a) Transplanting shall be done between ~~February 15~~December 1 and April 30 for all trees, except for trees identified in the *Tree and Shrub Transplanting Manual* as unsuitable for early spring transplanting.

(b) Trees identified as unsuitable for early spring transplanting shall be transplanted only between September 15 and October 30.

3.05 Tree Protection For Construction Sites

(A) Tree Protection Required

(1) An applicant for construction approval shall protect trees and plants in the public right- of- way and on any project or construction site where public improvements are proposed.

(2) An applicant for construction approval shall submit a landscaping plan incorporating proposed tree protection measures for any existing trees located in the public right- of- way and on site at any project or construction site where public improvements are proposed in compliance with these Standards. For projects larger than one single family dwelling~~For large or complicated sites~~, a separate Tree Protection Plan in addition to the required Landscaping Plan shall be required.

(3) The landscaping plan shall identify any potential detrimental effects to existing trees that might result from proposed construction activities within 20 feet of the dripline of any existing trees located on site or in the adjacent public right- of- way. The plan shall include the species, size, and location of all existing trees that are ~~1~~2-inch or larger caliper size. If no existing trees are present that require protection, this shall be noted on the Landscape ~~p~~Plan. Existing trees approved to be removed or relocated shall be clearly identified on the ~~landscaping~~ L~~l~~andscape/Tree ~~p~~Protection P~~p~~lan.

(4) The applicant for construction approval shall notify the City within 24-hours of any suspected damage to trees resulting from construction activities. If damage occurs during construction, the applicant shall have the damaged tree ~~restored~~ evaluated immediately by a City of Boulder licensed certified ~~qualifie~~d arborist.

(5) If greater than 425~~0~~% of the canopy or root system is damaged or removed during construction, the tree shall be evaluated for safety and future health by a City of Boulder licensed certified ~~the qualified~~ arborist. A complete copy of the evaluation shall be submitted to the City. Mitigation shall be required if the tree is unsafe and subsequently removed.

(B) Tree Protection Procedures

(1) **Protective Maintenance:** An applicant for construction approval shall provide maintenance and care for existing trees required to be protected on site and in the public right- of- way adjacent to any project or construction site during construction activities and the public improvement warranty period to ensure that existing trees survive and are not damaged.

(2) **Soil Compaction Prevention**

(a) To prevent soil compaction, designated routes for equipment and foot traffic by work crews shall be determined prior to commencing construction activities and indicated in the L~~l~~andscap~~eing~~/-T~~t~~ree P~~p~~rotection P~~p~~lan.

(b) These planned routes shall be marked at the site before construction commences with durable fencing material that is at least 4 feet high. Flagging tape or any other material that may be torn down, moved, or evaded is not acceptable.

(c) The contractor shall inform all construction crew members on the site of access routes and will ensure that only these routes are used.

(d) To prevent tree root smothering, no soil stockpiles, supplies, equipment, portable toilets, or any other material shall be placed or stored within a tree dripline or within 15 feet of the tree trunk ~~for columnshaped and evergreen trees~~, whichever distance is greater.

(e) Soil around a tree dripline may be required to be aerated during and after construction activities. This is necessary even when compaction results from heavy foot traffic. A City of Boulder licensed certified ~~professional~~ arborist shall perform ~~do~~ the vertical aeration or soil fracturing. ~~SO~~o~~il fracturing techniques comparable to using a "growgun" with Isolite material are acceptable~~. Conventional turf aeration is not acceptable.

(f) When foot traffic or equipment use is unavoidable within the dripline, the area within the dripline shall be mulched with wood chips to a depth of 6 inches before construction activity begins. A ~~6inch~~6-inch mulch depth shall be maintained for the duration of the project, then removed when construction activities are completed.

(3) **Root Protection**

(a) Tree roots shall not be cut unless cutting is unavoidable.

(b) When root cutting is unavoidable, a clean, sharp cut shall be made to avoid shredding or smashing. Root cuts should be made back to a lateral root.

(c) Whenever possible, tree roots should be cut between late fall and bud opening, when root energy supplies are high and conditions are least favorable for disease causing agents.

(d) The City ~~Forester~~Manager shall be notified of any cutting of the following roots:

(i) Two roots having a diameter of more than 3 inches, or

(ii) Four roots having diameters between 2 and 3 inches.

(e) Trenches shall be hand dug within the dripline in areas where roots 2 inches and larger in diameter are present, and when low branches which may be damaged by equipment are present.

(f) Whenever possible, roots 2 inches or larger in diameter shall be tunneled or bored under and shall be covered to prevent dehydration. Exposed roots shall be covered immediately with soil or burlap and kept moist.

(g) Power tools shall not be used to prune roots, with the exception of arboriculturally approved rootcutting- equipment used under the supervision of the City. Only the following approved tools shall be acceptable: scissorstype hand pruners and loppers, except -anviltypes, and -arboristtype- pruning saws.

(h) ~~When more than one root 2 inches or larger in diameter on any public tree is cut, s~~Supplemental watering shall be provided if the tree lacks an operational sprinkler system. The applicant or abutting landowner shall provide the watering. Watering shall commence immediately after roots have been cut or damaged at the following rates:

i. 1"-3" diameter water weekly at a rate of 10 gallons/inch of diameter;

ii. 4"-9" diameter water 3x per month at a rate of 10 gallons /inch of diameter;

iii. 10" diameter or larger apply water 2x per month at the rate of 15 gallons / inch of diameter.

The above schedule should be followed April – September; for Oct – March apply water once per month following above amounts.

(i) Sidewalk and paving surfaces shall be sufficiently contoured to avoid cutting surface tree roots. Whenever possible, tree roots should be bridg~~ed~~ or float~~ed~~ over with walks.

(j) To allow maximum aeration and water penetration to roots, walk materials other than concrete may be selected (e.g., brick, flagstone, honeycomb block, chips, gravel) subject to City approval. Under no circumstances shall impervious material make contact with or completely encircle a tree trunk.

(k) Auger tunneling, not trenching, shall be used ~~where possible~~ for utility placement within the dripline of ~~a mature tree~~s ~~(~~tree~~s~~ measuring over 6 inches in DBH).

(l) If roots are cut ~~between March and August~~, trees may need supplemental deep root watering at the discretion of the City ~~Forester~~Manager. ~~once per week for at least 2 months after the roots are cut. When roots are cut between September 1 and October 15, trees may need supplemental watering once per week until at least October 31~~.

(m) Trees impacted by construction activities ~~roots~~ shall not be fertilized for a period of 1 year following the cessation of construction activities. Thereafter, for the next 2 years, a light annual fertilization using a slow release nitrogen source is acceptable.

(4) **Tree Fencing**

(a) Fencing material shall encircle any tree, including those on adjacent properties, whose outer dripline edge is within 20 feet of any construction activities.

(b) Fencing material shall be a bright, contrasting color, durable, and at least 4 feet high. Fence posts shall be comparable to metal Tposts or heavier posts and placed at least 1.5~~2~~ feet below ground.

(c) Fencing material shall be placed at the dripline or at least 15 feet from any tree trunk, whichever distance is greater, and maintained in an upright position throughout the duration of construction activities.

(d) The applicant for construction approval shall indicate fencing locations on the landscaping tree protection plan.

(e) ~~Heavy~~ Oobjects, such as wood pallets or metal railings, shall not lean against or come into contact with any tree trunk.

(5) **Grade Changes:** Grade changes, such as removing topsoil or adding fill material, shall not occur within the dripline of any existing tree. If necessary as part of project or site development and if approved by the City, retaining walls and tree wells may be used to maintain the existing grade within the dripline of any tree ~~may be acceptable~~ when constructed prior to site grading changes near the tree. A landscaping plan containing an illustrated design scheme of the tree protection improvement shall be approved by the City prior to initiating any grade changes near existing trees.

(6) **Transplanting:** Any proposed or required transplanting shall conform with the requirements in Section 3.04(D), "Tree Relocation (Transplanting)."

(7) **Chemical/Foreign Material Disposal**

(a) Disposing of chemicals or foreign material anywhere on site or in the public right- of- way is prohibited. This shall include, but is not limited to: paint, stain, solvents, concrete or any construction material onsite, and rinse water from any cans or tools containing chemicals.

(b) Soil samples may be taken to determine the presence of chemicals or foreign materials for any planter containing proposed or existing plant material.

(8) **Pruning:** Pruning shall not occur during construction activities or the public improvement warranty period, except to remove dead or damaged branches or to prevent branch damage that could occur during construction, without the prior approval of the City Forester. Any approved pruning must be completed by a ~~cCity of Boulder~~ licensed certified arborist. ~~Pruning of healthy branches shall be delayed for a period of 2 years after construction activities are completed.~~

(9) **Watering**: For trees 1"-3" diameter water weekly at a rate of 10 gallons/inch of diameter; for trees 4"-9" diameter water 3x per month at a rate of 10 gallons /inch of diameter; for trees 10" diameter or larger apply water 2x per month at the rate of 15 gallons / inch of diameter. The above schedule should be followed April – September; for Oct – March apply water once per month.

3.06 General Landscaping and Maintenance Requirements

(A) Protecting Existing Improvements

An applicant for construction approval shall preserve and protect all trees, plants, monuments, structures, and public improvements from damage due to construction activities.

(1) **Utilities:** The applicant shall ask the appropriate utility company to stake exact locations and depths of all water, sewer, electric, gas, or telephone lines prior to excavation, and shall take the necessary precautions to protect underground lines from damage. If damage occurs, the applicant shall pay all repair costs.

(2) **Existing Trees:** Protection shall comply with Section 3.05, "Tree Protection for Construction Sites."

(3) **Responsibility for Damages:** The applicant shall be responsible for any damage to trees, plants, fences, buildings, roadways, sidewalks, and public and private property resulting from the applicant's activities. The City may require an applicant to provide, at no cost to the City, devices to prevent damage to fragile plant materials or structures.

(4) **Omissions and Discrepancies:** Omissions from any approved landscaping plan or specifications that affect the intent of the plans or specifications, or that are customarily performed, shall be performed as if fully and clearly set forth and described in the plans and specifications.

(B) Maintenance ~~of Landscaping~~

(1) ~~Landscaping~~ Landscape maintenance shall begin immediately after each area is planted and shall continue following City acceptance through the applicable warranty period as set forth in Section 9~~3.34~~-9-12(d)(2)~~,~~ "Landscape and Screening Maintenance and Replacement," Section 9~~4~~9-12-13 "Subdivider Financial Guarantees~~-19-2-14, "Required Improvements and Financial Guarantees~~," or Section ~~9511~~9-12-14~~,~~ "Public Improvement Warranty~~,~~" B.R.C. 1981.

(2) ~~Landscaping~~ Landscape maintenance shall include, without limitation, watering, weeding, cultivating, mulching, tightening and repairing of guys, removal of guy wires and tree stakes after the first full growing season, removal of tree wrap prior to April 1, removing dead branches, resetting plants to proper grade or upright position, replacing dead plants and protecting the site from damage or vandalism. ~~Landscape maintenance also includes the removal of tree wrap and guy wires and tree stakes from all trees after the first full growing season.~~

(3) If required by the City, the applicant for construction approval shall furnish written maintenance instructions to the City for the care and maintenance of all newly planted areas for the applicable warranty period. These instructions shall include, but are not limited to: irrigation staking, pruning, insect and disease control, and fertilizing.

Table 3-6: Tree Characteristics

The following table describes the typical characteristics of trees on the Approved Street Tree List when planted in non-paved landscape planting strips. Trees growing in tree grates or planting pits will have an overall mature height of approximately 1/3 less than that of trees in non-paved areas.

Small Maturing Trees
(Under 25' Mature Height)

COMMON & SCIENTIFIC NAME	SIZE AND FORM	CHARACTERISTICS
Crabapple (*Malus 'Red Barron' or Malus 'Centurion'*	15-25' ht., 7-15' spread, broad upright	Adaptable water requirements once established, adapts well, attractive blossoms in early spring, very little to no fruit, resistant to fireblight, requires full sun
Goldenraintree (*Koelreuteria paniculata*)	20-25' ht., 15-20' spread, broadly globe-shaped	Drought tolerant once established, tolerates wide range of soil types, attractive yellow flowers in mid-summer, yellow fall color, grows in full sun or partial shade
Hawthorn (*Crataegus spp.* - thornless cockspur or 'Ohio Pioneer')	15-25' ht., 15-25' spread, broadly globe-shaped, plant tree form only	Adaptable water requirements once established, tolerates salt and alkaline soils, attractive blossoms in spring, thornless, resistant to fireblight but susceptible to rust, requires full sun
Lilac, Japanese tree (*Syringa reticulata*)	15-25' ht., 15-20' spread, moderately globe-shaped, plant tree form only	Adaptable water requirements, attractive white blossoms in late spring, golden fall color, grows in full sun or partial shade
Maple, Amur (*Acer ginnala*)	15-20' ht., 15-20' spread, broadly globe-shaped to irregular, plant tree form only	Drought tolerant once established, can become chlorotic in alkaline soils, brilliant red to orange or yellow fall color, requires full sun
Maple, Norway (*Acer platanoides* 'Crimson Sentry')	25' ht., 15' spread, dense and columnar	Adaptable water requirements once established, dark purple foliage in spring and summer, susceptible to sunscald, requires full sun
Maple, Tatarian (*Acer tataricum*)	20-25' ht., 15-20' spread, moderately globe-shaped, plant tree form only	Adaptable water requirements once established, seeds are a rosy red color, yellow to orange red fall color, grows in full sun or partial shade
Oak, Gambel (*Quercus gambelii*)	10-25' ht., 10-15' spread, broadly globe-shaped, plant tree form only	Tolerant of dry and alkaline soils, Colorado native, yellow to red fall color, requires full sun
Pear (*Pyrus calleryana* 'Chanticleer')	20-30' ht., 15-20' spread, narrow pyramidal shape	Adaptable water requirements once established, tolerates salt and alkaline soils, attractive white blossoms in spring, maroon fall color, resistant to fireblight, requires full sun
Prunus (*Prunus spp.*) Ex. Cherries, plums, almonds, apricot	20-25' ht., 20-30' spread, moderately globe-shaped, plant tree form only	Adaptable water requirements, most have attractive spring blossoms, bears fruit, grows in full sun or partial shade
Redbud (*Cercis canadensis*)	20-25' ht., 20-30' spread, moderately globe-shaped, plant tree form only	Moist to adaptable water requirements, needs protected location, pink to lavender blossoms in early spring, yellow fall color, prefers filtered shade to shade
Serviceberry (*Amelanchier spp.*)	25' ht., 10-20' spread, moderately	Adaptable water requirements once established, prefers acidic soils, attractive flowers in early

	ovate-shaped, plant tree form only	spring, yellow to orange red fall color, plant varieties resistant to fireblight, grows in sun or shade

Medium Maturing Trees
(30-45' Mature Height)

COMMON & SCIENTIFIC NAME	SIZE AND FORM	CHARACTERISTICS
Cherry, Sargent (*Prunus sargentii*)	30-45' ht., 20-30' spread, moderately globe-shaped	Adaptable water requirements, attractive blossoms in spring, bears fruit, grows in full sun or partial shade
Crabapple (*Malus 'Indian Magic', 'Indian Summer', 'Radiant', 'Spring Snow'*)	15-30' ht., 15-30' spread, broad globe-shaped to rounded	Adaptable water requirements once established, adapts well, attractive blossoms in early spring, very little to no fruit, resistant to fireblight, requires full sun
Hackberry (*Celtis occidentalis* 'Prairie Pride')	45' ht., 30-40' spread, moderately pyramidal-shaped	Drought tolerant once established, tolerates a wide range of soil conditions, yellow fall color, does not develop witches broom, grows in full sun to partial shade
Hawthorn (*Crataegus spp.* - thornless cockspur or 'Ohio Pioneer')	15-25' ht., 15-20' spread, broadly globe-shaped	Adaptable water requirements once established, tolerates salt and alkaline soils, attractive blossoms in spring, thornless, resistant to fireblight but susceptible to rust, requires full sun
Honeylocust (*Gleditsia triacanthos* var. *inermis* 'Imperial' or 'Sunburst')	30-45' ht., 30-35' spread, moderately globe-shaped	Drought tolerant once established, tolerant of salt and alkaline soils, transplants easily, fruitless, thornless, yellow fall color, susceptible to many insect and disease problems, requires full sun
Hop Hornbeam (*Ostrya virginiana*)	30-45' ht., 20-35' spread, moderately ovate-shaped	Requires moist to moderately dry soils once established, prefers acidic soils, salt sensitive, grows in full sun or partial shade
Hornbeam, European (*Carpinus betulus*)	30-45' ht., 15-30' spread, dense, narrow pyramidal to oval-shaped	Adaptable water requirements once established, grows well in clay and alkaline soils, salt sensitive, yellow fall color, grows in full sun or partial shade
Linden, Littleleaf (*Tilia cordata* 'Greenspire' or 'Glenleven')	40-45' ht., 25-35' spread, broadly to moderately pyramidal-shaped	Tolerates alkaline soil, withstands compaction, salt sensitive, yellow fall color, young trees susceptible to sunscald, grows in full sun or partial shade
Maple, Norway (*Acer platanoides* 'Cavalier' or 'Drummondi')	35-45' ht., 30-40' spread, broadly globe-shaped	Adaptable water requirements, deep maroon leaf color, susceptible to sunscald, requires full sun
Maple, Hedge (*Acer campestre*)	25-45' ht., 25-35' spread, dense, moderately globe-shaped	Adaptable water requirements once established, tolerates compaction and alkaline soils, easily transplanted, yellow fall color, grows in full sun or partial shade
Maple, Wasatch (*Acer grandidentatum*)	20-30' ht., 20-25' spread, broadly globe-shaped	Drought tolerant once established, tolerant of alkaline soils, very slow to establish, Colorado native, yellow to red orange fall color, grows in full sun or partial shade
Ohio Buckeye (*Aesculus glabra*)	30-45' ht., 25-35' spread, broadly ovate to globe-shaped	Drought tolerant once established, large fruit, purple to red fall color, requires full sun
Pear (*Pyrus spp.* - Ussurian or Callery - avoid 'Bradford' variety)	30-40' ht., 25-35' spread, moderately columnar-shaped	Adaptable water requirements once established, tolerates salt and alkaline soils, attractive white blossoms in spring, maroon fall color, resistant to fireblight, requires full sun

Turkish Filbert (*Corylus colurna*)	45' ht., 25-30' spread, moderately pyramidal-shaped	Adaptable water requirements once established, tolerates alkaline soil, difficult to transplant, free from insect and disease problems, requires full sun

Large Maturing Trees
(Over 45' Mature Height)

COMMON & SCIENTIFIC NAME	SIZE AND FORM	CHARACTERISTICS
Ash, Green (*Fraxinus pennsylvanica* 'Patmore' or 'Marshall's Seedless' or 'Newport')	50-60' ht., 35-45' spread, moderately to broadly ovate-shaped	Drought tolerant once established, tolerates salt and alkaline soils, transplants easily, yellow fall color, susceptible to both brownheaded ash sawfly and lilac/ash borer, requires full sun
Ash, White (*Fraxinus americana* 'Autumn Applause' or 'Autumn Purple' or 'Rosehill')	40-60' ht., 40-50' spread, moderately globe-shaped	Adaptable water requirements, purple to red fall color, susceptible to both brownheaded ash sawfly and lilac/ash borer, requires full sun
Baldcypress (*Taxodium distichum*)	50-60' ht., 20-40' spread, moderately pyramidal-shaped	Tolerates wet soils and moderate drought once established, deciduous conifer, golden yellow fall color, free from insect and disease problems, requires full sun
Catalpa, Western (*Catalpa speciosa*)	40-60' ht., 30-50' spread, moderately ovate-shaped	Drought tolerant once established, large attractive white blossoms in summer, produces pod fruit, requires full sun
Coffeetree, Kentucky (*Gymnocladus dioicus*)	50-70' ht., 40-50' spread, moderately globe-shaped	Drought tolerant once established, tolerant of alkaline soils, free from insect and disease problems, requires full sun
Elm, American (*Ulmus americana* 'Brandon' or 'Valley Forge')	45-55' ht., 40-50' spread, broadly vase-shaped	Adaptable water requirements once established, tolerant of salt and alkaline soils, fast growth rate, easily transplanted, yellow fall color, requires full sun
Hackberry, Common (*Celtis occidentalis*)	50-60' ht., 40-50' spread, moderately globe-shaped	Drought tolerant once established, tolerant of salt and a wide range of soil conditions, requires full sun
Honeylocust (*Gleditsia triacanthos* var. *inermis* 'Shademaster' or 'Majestic')	50-60' ht., 30-40' spread, moderately globe-shaped	Drought tolerant once established, tolerant of salt and alkaline soils, transplants easily, fruitless, thornless, yellow fall color, susceptible to many insect and disease problems, requires full sun
Horsechestnut, Common (*Aesculus hippocastanum*)	50-60' ht., 50-60' spread, broadly globe-shaped	Adaptable water requirements, has attractive large white blossoms in early summer, large fruit, requires full sun
Linden, American (*Tilia americana* 'Legend' or 'Redmond')	50-60' ht., 30-40' spread, moderately pyramidal-shaped	Adaptable water requirements once established, tolerant of alkaline soils, easily transplanted, young trees susceptible to sunscald, grows in full sun or partial shade
Linden, Littleleaf (*Tilia cordata*	45-60' ht., 40-50' spread, broadly	Adaptable water requirements, tolerant of

'Greenspire' or 'Chancellor')	pyramidal shaped	alkaline soils and pollution, easily transplanted, yellow fall color, young trees susceptible to sunscald, requires full sun
Maple, Norway (*Acer platanoides* 'Deborah' or 'Emerald Queen')	45-60' ht., 40-50' spread, broadly globe shaped	Adaptable water requirements, deep maroon leaf color for 'Deborah', yellow fall color for 'Emerald Queen', susceptible to sunscald, requires full sun
Maple, Red (*Acer rubrum* 'Northwood' or 'Red Sunset')	45-55' ht., 25-40' spread, moderately globe shaped to upright	Adaptable water requirements once established, can become chlorotic in alkaline soils, salt sensitive, orange red to brilliant red fall color, requires full sun
Maple, Sugar (*Acer saccharum* 'Green Mountain' or 'Legacy')	50-60' ht., 30-40' spread, moderately ovate shaped	Adaptable water requirements once established, prefers acidic soils, salt sensitive, red to orange fall color, can grow in full sun or shade
Oak, Bur (*Quercus macrocarpa*)	50-80' ht., 50-80' spread, broadly ovate to broadly globe shaped	Drought and wind tolerant once established, tolerant of a wide range of soil types, yellow to brown fall color, requires full sun
Oak, English (*Quercus robur*)	50-80' ht., 50-80' spread, broadly ovate to broadly globe shaped	Tolerant of a wide range of soil types, yellow to yellow-brown fall color, requires full sun
Oak, Shumard (*Quercus shumardii*)	50-80' ht., 50-80' spread, broadly ovate to broadly globe shaped	Adaptable water requirements once established, tolerates compaction and salt, does better in alkaline soils than red oak, russet red to red fall color, requires full sun
Oak, Red (*Quercus rubra*)	50-80' ht., 50-80' spread, broadly ovate to broadly globe shaped	Prefers acidic soils, can become chlorotic in alkaline soils, russet red to bright red fall color, requires full sun
Oak, Swamp White (*Quercus bicolor*)	50-80' ht., 50-80' spread, broadly ovate to broadly globe shaped	Drought tolerant once established but can also withstand wet conditions, can become chlorotic in alkaline soils, yellow fall color, requires full sun