

# SACRAMENTO COUNTY

## Tree List and Parking Lot Shading Guidelines



July 25, 2024



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## I. INTRODUCTION

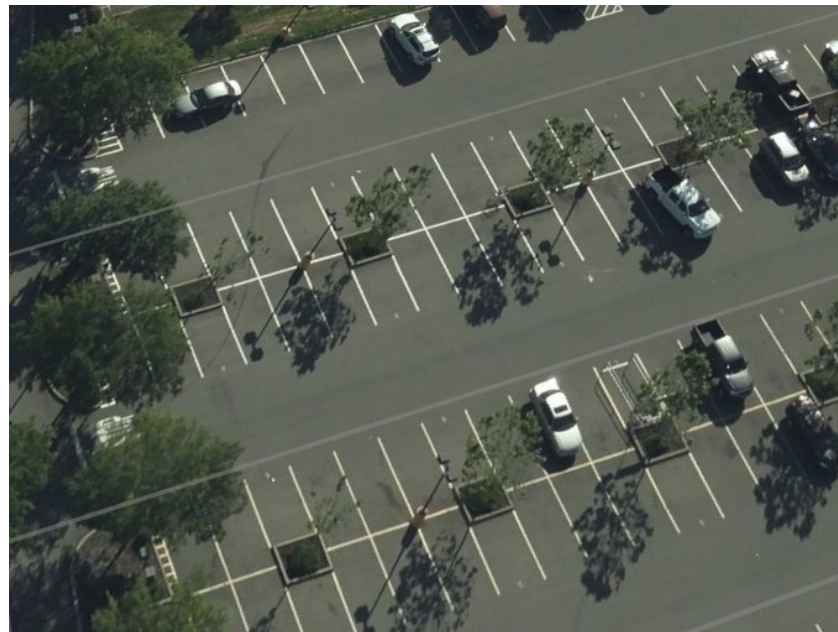
The following list of trees was compiled to aid Landscape Architects and Designers in the selection of trees for parking lot shading, street frontage, visual screening, and/or overhead utilities. Tree selection should be based on adaptability to site conditions. Tree information provided within this list is based on local observations as well as various nursery and University research. Trees are classified by shade credit diameters with individual species constraints and characteristics shown in columns on the tree list to help choose an appropriate tree based on the following information:

|                       |   |
|-----------------------|---|
| <b>Planter width:</b> | Recommended minimum planter width   |
| <b>Max. Height:</b>   | Approximate tree height near maturity   |
| <b>Growth:</b>        | Growth rate   |
| <b>Roots:</b>         | Root growth and depth   |
| <b>Soil:</b>          | Suggested soil type   |
| <b>Flowers/Fruit:</b> | Significant flowers and/or fruit  |
| <b>D/E Type:</b>      | <b>D</b> = Deciduous or <b>E</b> = Evergreen  |
| <b>Water Use:</b>     | <b>VL</b> = Very Low, <b>L</b> = Low, <b>M</b> = Medium (High water-use species are not allowed)          |
| <b>Suggested Use:</b> | <b>P</b> = parking lot shade, <b>Sc</b> = screening, <b>St</b> = street tree, <b>U</b> = under utilities* |
| <b>Remarks:</b>       | Characteristics such as fall color, diseases, and other miscellaneous information                         |

The species listed are not recommended for all situations; other species not listed may be appropriate and approved for use. Consultation with a Landscape Architect, Certified Arborist, and/or nursery person is strongly recommended before any selections are made to assure that the optimal species is chosen for each project. Proper planting procedures, adequate space, soil, water requirements, applicable County codes and ordinances, and maintenance programs should be ascertained at the start of the landscape project. It is important to note that proper planting procedures may include digging past any existing hardpan layer to assure deep rooting and proper growth. Refer to County Zoning Code and Design Guidelines for specific tree location and spacing requirements.

*Note: Parking lot shade is to be calculated based on a 15-year tree canopy. Slower growing trees may not be given shade credit based on mature canopy size, rather it's 15-year anticipated canopy.*

*\*Denotes that the tree is generally acceptable beneath power lines, however, additional confirmation with the specific utility company will be necessary.*



## II. TREE LIST

### A. 30-35 Foot Diameter Trees

**SHADE CREDIT:** 100% = 962 sq. ft. 75%=721 sq. ft. 50% = 481 sq. ft. 25% = 240 sq. ft.

| Botanical Name and Common Name   | Planter Width | Max. Height   | Growth           | Roots              | Soil              | Flowers/ Fruit       | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks   |
|--|---------------|---------------|------------------|--------------------|-------------------|----------------------|----------|------------------|-----------|---|
| <i>Acer platanoides</i><br><i>Norway Maple</i>   | 8 feet        | 50-60 feet    | Rapid            | Medium             | Moist Drained     | Winged Pod           | D        | M                | St        | Yellow fall color, aggressive root system, susceptible to aphids, mistletoe   |
| <i>Acer rubrum</i> 'October Glory', 'Franksred' or sim. size varieties<br><i>Red Maple</i> | 6 feet        | Up to 60 feet | Fast             | Medium             | Most Soils        | Red Fruit            | D        | M                | P, St     | Red fall color. Many acceptable varieties, sizes vary.  |
| <i>Celtis australis</i><br><i>European Hackberry</i>                                       | 6 feet        | 80 feet       | Moderate         | Medium to Deep     | Most Soils        | Small Purple Berries | D        | M                | P         | Susceptible to Asian Woolly Hackberry Aphid (infestation is messy around pavement)  |
| <i>Celtis occidentalis</i><br><i>Chinese Hackberry</i>                                     | 6 feet        | 60 feet       | Moderate         | Medium to Deep     | Most Soils        | Small Purple Berries | D        | L                | P, St     | Susceptible to Asian Woolly Hackberry Aphid (infestation can be messy around pavement)  |
| <i>Cinnamomum camphora</i><br><i>Camphor Tree</i>  | 10 feet       | 50 feet       | Slow             | Surface to Shallow | Most Soils        | -                    | E        | M                | Sc        | Surface root problems. Not recommended for parking lots or near paving. Turns yellow-green in winter. Prone to Verticillium wilt. Potentially invasive. |
| <i>Fraxinus</i> pen. 'Marshall'<br><i>Marshall Green Ash</i>                               | 6 feet        | 40 feet       | Fast             | Shallow            | Most Soils        | -                    | D        | M                | -         | Seedless variety. Prone to insect and disease damage.   |
| <i>Fraxinus uhdei</i><br><i>Evergreen Ash</i>  | 8 feet        | 70 feet       | Fast             | Medium             | Most Well Drained | -                    | E        | M                | St        | Prone to insect and disease damage. High root damage potential.   |
| <i>Gymnocladus dioicus</i><br>'Espresso'<br><i>Kentucky Coffeetree</i>                     | 8 feet        | 75 feet       | Moderate to Fast | Medium             | Most Soils        | Seedless variety     | D        | M                | P         | 'Espresso' is seedless variety. New leaves emerge pink, transition to green, and gold in fall. Leaves and seeds are toxic to horses.                    |
| <i>Liriodendron tulipifera</i><br><i>Tulip Tree</i>  | 8 feet        | 80 feet       | Moderate         | Deep Spreading     | Deep Moist        | Brown Cone           | D        | M                | P         | Yellow-brown fall color. Unusual lyre shaped leaf has scale, susceptible to aphids (infestation can be messy on pavement).                              |
| <i>Magnolia grandiflora</i><br><i>Southern Magnolia</i>                                    | 10 feet       | 60 feet       | Slow             | Deep               | Deep Moist        | White Flower         | E        | M                | P, Sc, St | Aggressive surface roots, requires plenty of space.   |
| <i>Pistache chinensis</i><br><i>Chinese Pistache</i>                                       | 6 feet        | 60 feet       | Slow             | Deep               | Most Soils        | -                    | D        | L                | P, St     | Orange/red fall color. Use male cultivars only, 'Keith Davey', 'Red Push', etc.   |

**30-35 Foot Diameter Trees (con't)**

100%= 962 SF 75%=721 SF 50%= 481 SF 25%= 240

| Botanical Name and Common Name                           | Planter Width | Max. Height | Growth           | Roots             | Soil                     | Flowers/ Fruit | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks  |
|--|---------------|-------------|------------------|-------------------|--------------------------|----------------|----------|------------------|-----------|--|
| <i>Platanus acerifolia</i><br><i>London Plane Tree</i>   | 8 feet        | 70 feet     | Rapid            | Shallow Spreading | Most Deep                | -              | D        | M                | P, St     | Brown fall color. Prone to red spider, powdery mildew, anthracnose. Use 'Bloodgood', 'Yarwood', or 'Columbia' varieties. Summer litter                             |
| <i>Quercus agrifolia</i><br><i>Coast Live Oak</i>        | 8 feet        | 70 feet     | Moderate         | Deep              | Most Soils               | Acorns         | E        | VL               | P, Sc, St | May have caterpillars in spring  |
| <i>Quercus buckleyi</i><br><i>Texas Red Oak</i>          | 8 feet        | 50 feet     | Fast             | Deep              | Most Soils               | Acorns         | D        | L                | P, St     | Low root damage potential. Susceptible to most oak diseases and pests. Resistant to Verticillium.  |
| <i>Quercus castaneifolia</i><br><i>Chestnut Leaf Oak</i> | 8 feet        | 80 feet     | Fast             | Deep              | Most Soils               | Acorns         | D        | L                | P, St     | Good street or shade tree. Susceptible to charcoal disease. Resistant to verticillium.   |
| <i>Quercus coccinea</i><br><i>Scarlet Oak</i>            | 8 feet        | 60 feet     | Rapid            | Deep Spreading    | Dry, Rocky Sandy         | Acorns         | D        | M                | P, St     | Scarlet fall color   |
| <i>Quercus emoryi</i><br><i>Emory Oak</i>                | 8 feet        | 60 feet     | Slow             | Medium            | Most Soils               | Acorns         | Semi-E   | L-M              | P         | Susceptible to Armillaria and root rot. Resistant to Verticillium.   |
| <i>Quercus gravesii</i><br><i>Chisos Red Oak</i>         | 8 feet        | 40 feet     | Fast             | Deep              | Most Soils, Well-drained | Acorns         | D        | L                | P, St     | Low root damage potential. Susceptible to anthracnose. Nuts and foliage attract local wildlife.  |
| <i>Quercus ilex</i><br><i>Holly Oak</i>                  | 6 feet        | 70 feet     | Moderate         | Deep              | Most Soils               | Acorns         | E        | L                | P, Sc, St | May have caterpillars  |
| <i>Quercus lobata</i><br><i>Valley Oak</i>               | 8 feet        | 70 feet     | Moderate         | Deep              | Most Soils               | Acorns         | D        | L                | P, St     | Native. May develop oak galls, litters   |
| <i>Quercus macrocarpa</i><br><i>Bur Oak</i>              | 8 feet        | 70 feet     | Moderate         | Deep              | Most Soils               | Acorns         | D        | M                | P, St     | Resistant to Verticillium. Susceptible to Armillaria, aphids, and spider mites   |
| <i>Quercus muehlenbergii</i><br><i>Chinkapin Oak</i>     | 8 feet        | 60 feet     | Moderate         | Deep              | Most Soils               | Acorns         | D        | M                | P         | Low root damage potential. Strong branches, no drooping. Resistant to Verticillium. Susceptible to Armillaria.   |
| <i>Quercus palustris</i><br><i>Pin Oak</i>               | 8 feet        | 50 feet     | Moderate to Fast | Shallow Fibrous   | Rich Most Soils Drained  | Acorns         | D        | M                | -         | Scarlet fall color, brown leaves hang on during winter, low branching. Susceptible to root rot, sooty mold, Verticillium, and aphids. Do not use in high pH soils. |
| <i>Quercus phellos</i><br><i>Willow Oak</i>              | 8 feet        | 65 feet     | Moderate to Fast | Deep              | Most Soils               | Acorns         | D        | L-M              | P, St     | Drought tolerant, can handle occasional flooding, or moist conditions. Produces less acorns than most oaks.  |

**30-35 Foot Diameter Trees (con't)**

100%= 962 SF    75%=721 SF    50%= 481 SF    25%= 240

| Botanical Name and Common Name                                    | Planter Width | Max. Height | Growth           | Roots   | Soil                        | Flowers/ Fruit | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks  |
|---|---------------|-------------|------------------|---------|-----------------------------|----------------|----------|------------------|-----------|--|
| <i>Quercus rubra</i><br>Red Oak                                   | 8 feet        | 80 feet     | Fast             | Deep    | Most Soils,<br>Deep Moist   | Acorns         | D        | M                | P, St     | Red/brown/orange fall color. Resistant to Verticillium. Susceptible to Armillaria, Anthracnose, Phytophthora, root rot, aphids, caterpillars, and insect galls |
| <i>Quercus suber</i><br>Cork Oak                                  | 8 feet        | 100 feet    | Moderate         | Deep    | Most Soils,<br>Well-Drained | Acorns         | E        | L                | P, St     | Cork bark. Resistant to Verticillium. Susceptible to Armillaria, Phytophthora, Root Rot, and invasive Shot Hole Borer.   |
| <i>Quercus virginiana</i><br>Southern Live Oak                    | 8 feet        | 60 feet     | Moderate to Fast | Deep    | Most soils,<br>Deep Moist   | Acorns         | E        | M                | P, Sc     | Strong branches and roots. Resistant to Verticillium. Susceptible to Armillaria, Phytophthora, Root Rot, and insect galls.                                     |
| <i>Quercus wislizeni</i><br>Interior Live Oak                     | 8 feet        | 60 feet     | Slow             | Deep    | Most Soils                  | Acorns         | E        | VL               | P, Sc, St | Native. Resistant to Verticillium. Susceptible to Armillaria, crown rot, mistletoe, powdery mildew, caterpillars, codling moths, insect galls, and white flies |
| <i>Schinus molle</i><br>Calif. Pepper Tree                        | 8 feet        | 40 feet     | Rapid Invasive   | Shallow | Most Soils<br>Berries       | Yellow Berries | E        | L                | Sc        | Broad tree at maturity needs space.  |
| <i>Ulmus parvifolia</i> var.<br>Chinese Elm                       | 6 feet        | 50 feet     | Rapid            | Medium  | Most Soils                  | -              | Semi-E   | M                | P, St     | Deciduous in colder winter areas, 'True Green', 'Drake', and 'Sempervirens' are common cultivars.  |
| <i>Zelkova serrata</i> 'Green Vase' or 'Village Green'<br>Zelkova | 8 feet        | 70 feet     | Rapid            | Medium  | Most Soils                  | -              | D        | M                | P, St     | Red/yellow fall color. Elm Leaf Beetle. Can be top heavy; requires thinning.   |

## B. 25-30 Foot Diameter Trees

SHADE CREDIT: 100% = 707 sq. ft. 75%=530 sq. ft. 50% = 354 sq. ft. 25% = 177 sq. ft.

| Botanical Name and Common Name  | Planter Width | Max. Height | Growth           | Roots              | Soil               | Flowers/ Fruit                 | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks  |
|---|---------------|-------------|------------------|--------------------|--------------------|--------------------------------|----------|------------------|-----------|--|
| <i>Cedrus atlantica</i> 'Glauca'<br><i>Blue Atlas Cedar</i>   | 8 feet        | 60 feet     | Slow to Moderate | Medium to Deep     | Loam               | Cones                          | E        | L-M              | Sc        | Susceptible to Phytophthora, root rot, sooty mold. Resistant to Verticillium.  |
| <i>Ceratonia siliqua</i><br><i>Carob Tree</i>   | 8 feet        | 40 feet     | Moderate         | Surface to Shallow | Most Soils         | Pods                           | E        | L                | Sc        | Messy pod drop, Specify male variety only.   |
| <i>Eucalyptus nicholii</i><br><i>Willow-leafed Peppermint</i>                                       | 6 feet        | 40 feet     | Fast             | Shallow Invasive   | Light Drained      | White Flower Capsules          | E        | L                | Sc        | Drought tolerant.  |
| <i>Fraxinus oxycarpa</i><br>'Raywood'<br><i>Raywood Ash</i>   | 6 feet        | 45 feet     | Fast             | Medium             | Most Soils         | -                              | D        | M                | P, St     | Purple-red fall color, prone to insect and disease damage.   |
| <i>Ginkgo biloba</i> 'Autumn Gold', 'Presidential Gold', 'Halka', or sim.<br><i>Maidenhair Tree</i> | 8 feet        | 45 feet     | Slow             | Deep               | Most Soils         | -                              | D        | M                | -         | Bright yellow fall color. Very slow growing.   |
| <i>Koelreuteria paniculata</i><br><i>Golden Rain Tree</i>   | 6 feet        | 35 feet     | Slow Moderate    | Deep               | Most Soils Drained | Yellow Flowers Capsules        | D        | M                | P         | Drought tolerant   |
| <i>Liquidambar styraciflua</i><br>'Hapdell' or other fruitless varieties<br><i>Sweet Gum</i>        | 8 feet        | 40 feet     | Moderate         | Shallow Surface    | Deep Moist         | -                              | D        | M                | -         | Crimson/yellow fall color, cork twigs, invasive roots, can break pavement, site clearance problem, avoid pedestrian traffic areas. Use only fruitless varieties. |
| <i>Nyssa sylvatica</i><br><i>Topelo or Sour Gum</i>   | 6 feet        | 60 feet     | Moderate         | Deep               | Most Soils Wet     | White Flowers Small Plum- like | D        | M                | P, St     | Scarlet/orange fall color  |
| <i>Pinus canariensis</i><br><i>Canary Island Pine</i>   | 6 feet        | 60 feet     | Rapid            | Deep               | Poor Sandy         | 8-inch Cones                   | E        | L                | Sc        | Conifer, blue green needles, drought, site clearance problem   |
| <i>Pinus densiflora</i><br><i>Japanese Red Pine</i>   | 6 feet        | 80 feet     | Rapid            | Deep               | Poor Sandy         | 2-inch Cones                   | E        | M                | Sc        | Conifer, mites, site clearance problem   |
| <i>Pinus halepensis</i><br><i>Allepo Pine</i>   | 8 feet        | 60 feet     | Rapid            | Deep               | Most Dry           | 4-inch Cones                   | E        | L                | Sc, St    | Conifer, wind break, erosion control, site clearance problem   |
| <i>Pinus ponderosa</i><br><i>Ponderosa Pine</i>   | 8 feet        | 80 feet     | Moderate         | Deep               | Most Soils         | 3 to 5 inch Cones              | E        | L                | Sc        | Conifer, drought tolerant, site clearance problem  |
| <i>Pinus sylvestris</i><br><i>Scotch Pine</i>   | 6 feet        | 50 feet     | Moderate         | Deep               | Poor Sandy         | 2-inch Cones                   | E        | M                | Sc        | Conifer, site clearance problem  |

**25-30 Foot Diameter Trees (con't)**

100%= 707 SF 75%=530 SF 50%= 354 SF 25%= 177 SF

| Botanical Name and Common Name                             | Planter Width | Max. Height | Growth    | Roots          | Soil             | Flowers/ Fruit                           | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks   |
|--|---------------|-------------|-----------|----------------|------------------|--|----------|------------------|-----------|---|
| Quercus canbyi<br><i>Canby's Oak, Sierra Oak</i>           | 8 feet        | 50 feet     | Moderate  | Deep           | Most Soils       | Acorns                                   | Semi-E   | L                | P, Sc, St | Susceptible to most oak diseases and pests. Resistant to Verticillium.  |
| Quercus chrysolepis<br><i>Canyon Live Oak</i>              | 8 feet        | 70 feet     | Moderate  | Medium to Deep | Most soils       | Acorns                                   | E        | L                | Sc        | Susceptible to most oak diseases and pests. Resistant to Verticillium.  |
| Robinia 'Purple Robe'<br><i>Purple Locust</i>              | 8 feet        | 40 feet     | Fast      | Shallow        | Most Soil        | Purple Flower                            | D        | L                | -         | Roots can be invasive, limbs susceptible to wind breakage, may spread by suckers. Susceptible to Fusarium, Armillaria, root rot, canker, aphids, borer, and leaf miner. |
| Tilia cordata 'Greenspire'<br><i>Little Leaf Linden</i>    | 6 feet        | 50 feet     | Moderate  | Deep           | Fertile Moist    | Yellow-white flowers, turning to nutlets | D        | M                | P, St     | Flowers attract bees. Susceptible to root rot, sooty mold, Verticillium, and aphids.  |
| Ulmus wilsoniana<br>'Prospector'<br><i>Prospector Elm</i>  | 6 feet        | 40 feet     | Fast      | Medium         | Most Soils       | -  | D        | L                | P, St     | Excellent resistance to Dutch elm disease and elm leaf beetle. Brilliant yellow fall color.   |
| Ulmus x 'Frontier'<br><i>Frontier Elm</i>                  | 6 feet        | 40 feet     | Fast      | Medium         | Most Soils       | -  | D        | M                | P, St     | Excellent resistance to Dutch elm disease and elm leaf beetle. Reddish purple fall color.   |
| Umbellularia californica<br><i>California Bay</i>          | 6 feet        | 40 feet     | Very Slow | Medium         | Most Soils Moist | Yellow Clusters Olive Fruit              | E        | M                | Sc, St    | Drought tolerant. Not recommended for parking lots due to its incredibly slow growth rate.  |
| Zelkova serrata<br>'Schmidtlow'<br><i>Wireless Zelkova</i> | 6 feet        | 25 feet     | Fast      | Medium         | Most Soils       | -  | D        | M                | P, U, St  | Vivid red fall color. Can be top heavy; requires thinning. Good choice for planting under utility lines.  |



## C. 20-25 Foot Diameter Trees

**SHADE CREDIT:** 100% = 491 sq. ft. 75%=368 sq. ft. 50% = 246 sq. ft. 25% = 123 sq. ft.

| Botanical Name and Common Name   | Planter Width | Max. Height | Growth    | Roots          | Soil               | Flowers/ Fruit                   | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks   |
|--|---------------|-------------|-----------|----------------|--------------------|----------------------------------|----------|------------------|-----------|---|
| <i>Acer buergeranum</i><br><i>Trident Maple</i>  | 4 feet        | 25 feet     | Fast      | Shallow        | Moist Drained      | Small Winged                     | D        | M                | -         | Red fall color. Susceptible to Armillaria, root rot, Verticillium, invasive shot hole borer, and aphids.  |
| <i>Arbutus 'Marina'</i><br><i>Marina Strawberry Tree</i>   | 6 feet        | 30 feet     | Slow      | Medium         | Well drained       | Pink flowers/ yellow & red fruit | E        | L                | Sc, U     | Specify standard form. Fruit may attract birds  |
| <i>Carpinus betulus</i><br><i>European Hornbeam</i>  | 6 feet        | 40 feet     | Slow      | Medium         | Most Soils         | Winged Seeds                     | D        | M                | -         | Yellow fall color. Susceptible to Armillaria, Root rot, and scales.   |
| <i>Cedrus deodora</i><br><i>Deodar Cedar</i>   | 8 feet        | 80 feet     | Fast      | Deep           | Most Soils         | Cones                            | E        | L                | Sc        | Needs adequate room, broad branching at base. Not recommended for parking lot planters.   |
| <i>Cercidium x 'Desert Museum'</i><br><i>Desert Museum Palo Verde</i>                            | 4 feet        | 25 feet     | Fast      | Deep           | Well drained       | Yellow, showy                    | D        | VL               | U         | Thornless variety. Low branching structure, keep back from walks. Prune after flowering to shape and provide structure. Be careful not to overwater.      |
| x <i>Chitalpa tashkentensis</i><br><i>Chitalpa</i>   | 6 feet        | 25 feet     | Fast      | Medium to Deep | Well drained       | Pink flowers                     | D        | L                | U         | Bell-shaped pink/white flowers bloom in summer. Flowers can be messy. Susceptible to root rot, Verticillium and Aphids.                                   |
| <i>Elaeocarpus decipiens</i><br><i>Japanese Blueberry Tree</i>                                   | 6 feet        | 40 feet     | Slow      | Medium         | Well drained       | White Fragrant                   | E        | M                | Sc        | Requires little pruning, heat tolerant. Bronze-colored leaves emerge in spring and mature to shiny dark green. Blueish/black fruits resemble blueberries. |
| <i>Geijera parvifolia</i><br><i>Australian Willow</i>  | 6 feet        | 30 feet     | Moderate  | Shallow        | Well drained       | Yellow Fragrant                  | E        | M                | Sc, P     | Drought tolerant, low branching. Dry fruit litter.  |
| <i>Laurus nobilis 'Saratoga'</i><br><i>Sweet Bay</i>   | 6 feet        | 30 feet     | Very Slow | Deep           | Moist, Sandy       | Yellow Flowers<br>Black Berry    | E        | L                | Sc        | Not recommended for parking lots due to its slow growth.  |
| <i>Olea Europaea 'Majestic Beauty'</i> or ' <i>Swan Hill</i><br><i>Fruitless Olive Varieties</i> | 8 feet        | 30 feet     | Slow      | Shallow        | Well drained       | Black                            | E        | VL               | U, St     | Grey-green foliage; use cultivars that generate little or no fruit; standard trunk and multi-trunk forms available  |
| <i>Pinus eldarica</i><br><i>Mondell Pine</i>   | 6 feet        | 80 feet     | Fast      | Deep           | Most Soils Dry     | 4-inch Cones                     | E        | L                | Sc        | Conifer, good for erosion control, site clearance problem   |
| <i>Prosopis glandulosa 'Maverick'</i><br><i>Thornless Honey mesquite</i>                         | 6 feet        | 35 feet     | Moderate  | Deep           | Most, Well drained | Yellow, legumes                  | D        | L                | -         | Thornless variety. Edible large brown legumes. Requires deep watering but tolerates drought thereafter.   |

**20-25 Foot Diameter Trees (con't)**

100%= 491 SF 75%=368 SF 50%= 246 SF 25%= 123 SF

| Botanical Name and Common Name                         | Planter Width | Max. Height | Growth   | Roots  | Soil          | Flowers/ Fruit    | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks   |
|--|---------------|-------------|----------|--------|---------------|-------------------|----------|------------------|-----------|---|
| <i>Quercus oblongifolia</i><br><i>Mexican Blue Oak</i> | 8 feet        | 30 feet     | Moderate | Medium | Most soils    | Acorns            | E        | L                | -         | Thrives in full sun, dry soil. Resistant to fires, aphids, and sudden oak death. Potential root damage and poison hazard. |
| <i>Rhus lancea</i><br><i>African Sumac</i>             | 4 feet        | 25 feet     | Slow     | Medium | Most Drained  | Small Red Berries | E        | L                | U         | Drought tolerant, messy berries   |
| <i>Tilia americana</i><br><i>American Linden</i>       | 6 feet        | 60 feet     | Fast     | Deep   | Fertile Moist | Small Nutlets     | D        | M                | P, St     | Susceptible to aphids- infestation can be messy around pavement   |

## D. 15-20 Foot Diameter Trees

SHADE CREDIT: 100% = 314 sq. ft. 75%=235 sq. ft. 50% = 157 sq. ft. 25% = 79 sq. ft.

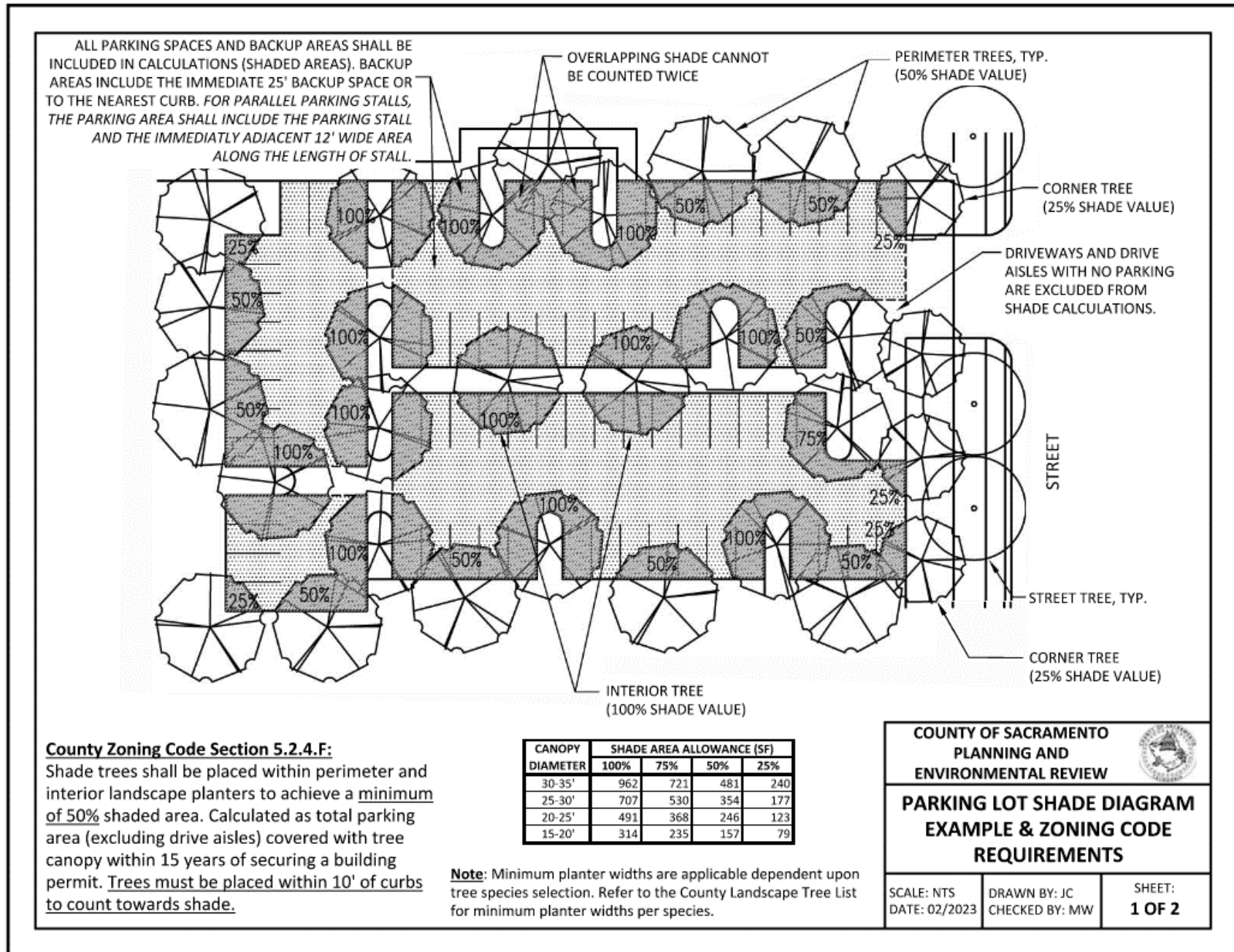
| Botanical Name and Common Name  | Planter Width | Max. Height   | Growth              | Roots           | Soil                  | Flowers/ Fruit                            | D/E Type | WUCOLS Water Use | Sugg. Use    | Remarks  |
|---|---------------|---------------|---------------------|-----------------|-----------------------|---|----------|------------------|--------------|--|
| <i>Acer palmatum</i><br><i>Japanese Maple</i>   | 4 feet        | 25 feet       | Slow                | Shallow         | Moist<br>Drained      | Small<br>Winged                           | D        | M                | -            | Red fall color, afternoon shade. Prefers moist soil. Susceptible to Armillaria, root rot, Verticillium, invasive shot hole borer, and aphids.                            |
| <i>Acer rubrum</i> 'Bowhall' or sim. columnar varieties<br><i>Bowhall Red Maple</i>   | 6 feet        | 40 feet       | Fast                | Medium          | Most Soils            | Red Fruit                                 | D        | M                | -            | Red/Orange fall color, Narrow columnar Form. Many acceptable varieties, sizes vary.  |
| <i>Arbutus unedo</i><br><i>Strawberry Tree</i>  | 5 feet        | 25 feet       | Slow                | Medium          | Well<br>drained       | White<br>flower/<br>yellow &<br>red fruit | E        | L                | Sc, U        | Specify standard form. Red-brown bark and limbs, fruit can be messy and may attract birds. Susceptible to Anthracnose, Phytophthora, root rot, rust, scales, and thrips. |
| <i>Calocedrus decurrens</i><br><i>Incense Cedar</i>                                   | 8 feet        | 50-90<br>feet | Moderate            | Deep<br>Lateral | Most Soils<br>Poor    | Small<br>Cones                            | E        | M                | Sc           | Drought tolerant. Foliage is aromatic.   |
| <i>Cercis canadensis</i><br><i>Eastern Redbud</i>                                     | 4 feet        | 25 feet       | Moderate            | Medium          | Most Soils            | Pink/Purp.<br>Spring                      | D        | M                | U            | Yellow/red fall color, drought tolerant, foliage can burn in summer winds.   |
| <i>Cercis occidentalis</i><br><i>Western Redbud</i>                                   | 4 feet        | 20 feet       | Moderate            | Medium          | Most Soils            | Pink<br>Spring                            | D        | VL               | U            | Native. Yellow to red fall color, usually a small tree, multiple trunk.  |
| <i>Chilopsis linearis</i> var.<br><i>Desert Willow varieties</i>                      | 4 feet        | 20 feet       | Moderate<br>to Fast | Deep            | Most Well-<br>Drained | White/Pink<br>Flowers                     | D        | VL               | U            | Drought tolerant tree known for fragrant flowers. Low maintenance, firescaping, specimen tree. Potential for root rot.   |
| <i>Chionanthus retusus</i><br><i>Chinese Fringe Tree</i>                              | 4 feet        | 20 feet       | Moderate            | Medium          | Well<br>drained       | Showy<br>flower/fruit                     | D        | M                | U            | Spring flowers with reddish berries in fall. Fruit can be messy  |
| <i>Fraxinus dipetala</i><br><i>California Ash</i>                                     | 6 feet        | 25 feet       | Moderate            | Deep            | Most Soils            | Showy<br>White<br>flower                  | D        | M                | -            | California native. Summer deciduous. Susceptible to root rot, sooty mold, Verticillium, and scales.  |
| <i>Ginkgo biloba</i> 'Princeton Sentry', 'Fairmont' or sim.<br><i>Maidenhair Tree</i> | 8 feet        | 40 feet       | Slow                | Deep            | Most<br>Soils         | -   | D        | M                | -            | Bright yellow fall color. Very slow growing.   |
| <i>Lagerstroemia indica</i> var.<br><i>Crape Myrtle</i>                               | 4 feet        | 25 feet       | Slow                | Shallow         | Most Soils            | Flower<br>Colors<br>Vary                  | D        | L                | U            | Red /gold fall color, needs full sun all day, mildew, aphids. Many cultivars.  |
| <i>Magnolia grandiflora</i><br>'Russet'<br><i>Russet Southern<br/>Magnolia</i>        | 8 feet        | 40 feet       | Moderate            | Shallow         | Well<br>drained       | White                                     | E        | M                | P, Sc,<br>St | Upright, narrow form. Susceptible to Armillaria, root rot, Verticillium, Invasive Shot Hole Borer, aphids, scales, and spider mites.                                     |

**15-20 Foot Diameter Trees (con't)**

100%= 314 SF 75%=235 SF 50%= 157 SF 25%= 79 SF

| Botanical Name and Common Name                                   | Planter Width | Max. Height | Growth           | Roots          | Soil                     | Flowers/ Fruit | D/E Type | WUCOLS Water Use | Sugg. Use | Remarks   |
|--|---------------|-------------|------------------|----------------|--------------------------|----------------|----------|------------------|-----------|---|
| Magnolia grandiflora<br>'St. Mary'<br>St. Mary Southern Magnolia | 6 feet        | 25 feet     | Moderate         | Shallow        | Well drained             | White          | E        | M                | P, Sc, St | Upright, narrow form. Susceptible to Armillaria, root rot, Verticillium, invasive shoot hole borer, aphids, scales, & spider mites.   |
| Maytenus boaria<br>Mayten Tree                                   | 4 feet        | 30 feet     | Slow to Moderate | Deep           | Most Soils, Moist        | -              | E        | M                | -         | Weeping habit, must have well drained soil. Considered invasive in some locations as it naturalizes easily.   |
| Pyrus calleryana<br>'Chanticleer'<br>Chanticleer Pear            | 5 feet        | 30 feet     | Moderate to Fast | Deep           | Most Soils, Moist        | White          | D        | M                | -         | Red fall color, narrow columnar form. Weak limbs break easily in windstorms. Considered invasive in some locations.   |
| Pyrus kawakami<br>Evergreen Pear                                 | 5 feet        | 30 feet     | Moderate         | Medium to Deep | Most Soils               | White Flowers  | Semi-E   | M                | -         | Not truly evergreen. Susceptible to fire blight, sooty mold, aphids, and white fly.   |
| Quercus robur 'Fastigiata'<br>English Oak                        | 6 feet        | 50 feet     | Moderate         | Medium to Deep | Well drained             | Acorns         | D        | M                | -         | Susceptible to most common oak diseases and pests.  |
| Phoenix sp.<br>Date Palm   | 4 feet        | 50+ feet    | Moderate         | Medium         | Most Well drained        | -              | E        | L                | -         | Not acceptable as a parking lot shade tree. Very low carbon sequestration.  |
| Prunus cerasifera var.<br>Purple Leaf Plum                       | 6 feet        | 25 feet     | Fast             | Medium         | Most Soils               | White to Pink  | D        | M                | U         | Top heavy, messy fruit drop dependent upon cultivar used. Susceptible to sooty mold, Armillaria, canker, leaf spot, beetle borers, caterpillars, scales, and aphids.              |
| Prunus c. 'Thundercloud'<br>Flowering Plum                       | 4 feet        | 20 feet     | Moderate         | Medium         | Most Soils               | Pink to White  | D        | M                | U         | Dark purple-coppery leaves. Susceptible to sooty mold, root rot, rust, and Verticillium.  |
| Prunus c. 'Krauter Vesuvius'<br>Flowering Plum                   | 4 feet        | 25 feet     | Moderate         | Medium         | Most Soils               | Pink           | E        | M                | U         | Dark purple leaves. Susceptible to sooty mold, root rot, rust, Verticillium, beetle borers, caterpillars, spider mites, & aphids.   |
| Prunus serrulata<br>'Kwanzan' Japanese Flowering Cherry          | 6 feet        | 25 feet     | Moderate         | Medium         | Well drained             | Double Pink    | D        | M                | -         | Upright form that spreads with age. Susceptible to canker, crown rot, Armillaria, Phytophthora, and caterpillars.   |
| Ulmus propinqua<br>'Emerald Sunshine'<br>Emerald Sunshine Elm    | 6 feet        | 35 feet     | Fast             | Medium         | Most Soils               | -              | D        | M                | -         | Columnar form. Resistant to Dutch Elm disease, Elm Leaf and Japanese beetles. Susceptible to Armillaria, Phytophthora, root rot, sooty mold, aphids, borers, beetles, and scales. |
| Washingtonia sp.<br>Fan Palm                                     | 4 feet        | 50+ feet    | Moderate         | Medium         | Most Soils, well drained | -              | D        | M                | -         | Not acceptable as a parking lot shade tree. Very low carbon sequestration.  |
| Zelkova serrata 'City Sprite'<br>City Sprite Zelkova             | 6 feet        | 25 feet     | Fast             | Medium         | Most Soils               | -              | D        | M                | U, P, St  | Red/yellow fall color.  |

### III. PARKING LOT SHADE DIAGRAM EXAMPLE



## IV. PARKING LOT SHADE CALCULATION EXAMPLE


| SACRAMENTO COUNTY PARKING LOT SHADE CALCULATION |                 |                                |                             |                                |                               |
|---|-----------------|--------------------------------|-----------------------------|--------------------------------|-------------------------------|
| TREE SPECIES                                    | CANOPY DIAMETER | FULL (100%)                    | THREE-QUARTER (75%)         | HALF (50%)                     | QUARTER (25%)                 |
| Platanus acerifolia                             | 30-35'          | 3 @ 962 SF<br>= <u>2886 SF</u> | 0 @ 721 SF<br>= <u>0 SF</u> | 5 @ 481 SF<br>= <u>2405 SF</u> | 4 @ 240 SF<br>= <u>960 SF</u> |
| Pistacia chinensis                              | 30-35'          | 1 @ 962 SF<br>= <u>962 SF</u>  | 0 @ 721 SF<br>= <u>0 SF</u> | 3 @ 481 SF<br>= <u>1443 SF</u> | 0 @ 240 SF<br>= <u>0 SF</u>   |
| Arbutus 'Marina'                                | 20-25'          | 0 @ 491 SF<br>= <u>0 SF</u>    | 0 @ 368 SF<br>= <u>0 SF</u> | 2 @ 246 SF<br>= <u>492 SF</u>  | 0 @ 123 SF<br>= <u>0 SF</u>   |
| <b>TOTALS:</b>                                  |                 | <b>3848 SF</b>                 | <b>0 SF</b>                 | <b>4340 SF</b>                 | <b>960 SF</b>                 |

### INSTRUCTIONS:

1. List out only the tree species that provide shade to parking lots.
2. Mark the shade trees on the planting plan to designate Full, Three-Quarter, Half, or Quarter shade (*Use the Sheet 1 Parking Lot Shade Diagram to assist in determining shade percentages*)
3. Count each tree species based on designated shade provided and list them out in a table similar to the above format.
4. Add up the Total Shaded Area.
5. Determine the Total Parking Area requiring shade (*Use Sheet 1 as a reference*)
6. Calculate the percent shaded area of the parking lot.
7. Place the complete Shade Calculation table on the plans.

|                            |                  |
|----------------------------|------------------|
| <b>TOTAL SHADED AREA:</b>  | <b>9,148 SF</b>  |
| <b>TOTAL PARKING AREA:</b> | <b>17,556 SF</b> |
| <b>PERCENT SHADED:</b>     | <b>52%</b>       |

| CANOPY DIAMETER | SHADE AREA ALLOWANCE (SF) |     |     |     |
|-----------------|---------------------------|-----|-----|-----|
|                 | 100%                      | 75% | 50% | 25% |
| 30-35'          | 962                       | 721 | 481 | 240 |
| 25-30'          | 707                       | 530 | 354 | 177 |
| 20-25'          | 491                       | 368 | 246 | 123 |
| 15-20'          | 314                       | 235 | 157 | 79  |

|  |                                |   |
|--|--------------------------------|---|
| COUNTY OF SACRAMENTO<br>PLANNING AND<br>ENVIRONMENTAL REVIEW |                                |  |
| <b>PARKING LOT SHADE<br/>CALCULATION EXAMPLE</b>             |                                |   |
| SCALE: NTS<br>DATE: 02/2023                                  | DRAWN BY: JC<br>CHECKED BY: MW | SHEET:<br><b>2 OF 2</b>   |