



CITY OF TURLOCK STREET TREE PLANTING, WATERING, AND MAINTENANCE GUIDELINES

SUMMARY

Overview

This document provides comprehensive guidelines for establishing and maintaining healthy street trees in Turlock, balancing best arboricultural practices with urban infrastructure constraints.

Key Sections

Street Tree Planting – see page 3

- Tree Placement (pg. 3): Trees planted in parkways, behind sidewalks/curbs, or in tree wells, with specific spacing requirements
- Tree Selection (pg. 4): Choose species based on parkway width using the City's approved tree list; match existing streetscape patterns; verify exact cultivar names when purchasing
- Tree Planting (pg. 5): Use 24" deep root barriers within 10' of paved surfaces; install both surface and deep root irrigation; use proper staking with two 8' lodgepole stakes; apply mulch and slow-release fertilizer

Street Tree Irrigation – see page 6

- Irrigation Methods & Equipment (pg. 6): Combine surface irrigation with deep root bubblers (18" deep root watering tubes with 0.25 gpm bubblers)
- Irrigation Schedule (pg. 7): New trees need approximately 15 gallons three times weekly through combined irrigation methods, established trees need to be watered deeply and infrequently (typically once weekly)
- Monitoring (pg. 8): Watch for signs of under-watering (wilting, leaf curl, dry soil) and over-watering (yellowing leaves, standing water, algae)

Street Tree Maintenance – see page 8

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- Tree Litter (pg. 8): Regular sweeping, raking
- Tree Pruning (pg. 9):
 - Only prune for structural development, clearance, safety, or health—never to limit size
 - Consult certified arborists; winter is best for structural pruning
 - Never top trees, make heading cuts, or remove more than 25% of canopy
 - Avoid root pruning; if necessary beyond 5' from trunk, use clean cuts and consult arborists for roots over 2" diameter

Critical Success Factors

1. Proper species selection matching available space
2. Installation of root barriers at all paved surfaces
3. Dual irrigation system (surface + deep root)
4. Appropriate watering schedules that evolve as trees mature
5. Minimal, informed pruning that respects natural tree form

Goal

Reduce infrastructure conflicts, minimize long-term costs, and extend the functional lifespan of Turlock's street tree inventory through consistent application of these practices.

INTRODUCTION

Street trees are a vital part of the urban landscape, providing shade, improving air quality, enhancing neighborhood character, and contributing to the overall health and livability of a city. When properly selected, planted, watered, and maintained, street trees can thrive for decades with relatively modest inputs. When these steps are poorly executed, however, trees can become a source of ongoing maintenance challenges, infrastructure damage, and premature decline.

These guidelines are intended to provide practical, easy-to-understand direction for the successful establishment and long-term care of street trees. The guidelines are designed for use by a wide audience, including City staff, residents, contractors, and design professionals, and reflect a balance between current arboricultural best practices and the real-world constraints of urban environments.

The goal of this document is not only to support healthy tree growth, but also to reduce common conflicts between trees and sidewalks, curbs, utilities, and adjacent properties. By promoting appropriate tree selection, thoughtful planting practices, realistic irrigation strategies, and proper maintenance, these guidelines aim to improve tree performance, reduce long-term costs, and extend the functional lifespan of the city's street tree inventory.

STREET TREE PLANTING

Street trees provide shade, improve air quality, and enhance the public realm, but their long term success depends on proper placement, species selection, and planting practices.

Tree Placement

Proper street tree placement is critical to ensuring healthy growth while minimizing conflicts with sidewalks, utilities, and adjacent infrastructure. Street trees are planted in one of three locations:

1. Parkway – If a parkway is present, this is the location of the street tree(s).
2. Back of Sidewalk or Curb – If a parkway is not present, the street tree(s) are planted behind the sidewalk or curb.
3. Tree Well – Certain downtown locations or other urban locations (such as Geer Road) require tree wells (a cut-out in a sidewalk for a tree) within an enlarged sidewalk.

Most single family homes will have one street tree if they are on a standard lot, and three street trees if they are on a corner lot. Multi-family residential developments, commercial

projects, and streetscapes in general, have a regular street tree pattern of one tree every 30' to 40' of a single species. This ensures a continuous canopy over sidewalks and street edges at maturity.

When locating street trees, first identify obstructions and observe distance minimums. Street trees should be placed:

1. At least 15' from street lights
2. At least 5' from fire hydrants
3. At least 5' from water and sewer lines
4. At least 8' from driveways
5. At least 10' from curb return (the curb connecting two streets at a corner)
6. For street trees without a parkway, place 3' from the back of curb or sidewalk
7. In a continuous pattern with street trees on adjacent properties
8. Centered between obstructions (such as paved surfaces and utilities) to the extent possible

*Exceptions to the above standards may be approved at the discretion of the Municipal Services Director or his/her designee.

If the site is new, there is opportunity to design for street tree success. Design the site with the following considerations:

1. Always plan for street tree locations in the earliest stages of project planning. Street trees need unobstructed space, and generally speaking, the more space they are given the less likelihood of future problems with sidewalk lifting and other harm.
2. Locate utilities as closely together as possible, leaving the most space possible for tree canopies and roots.
3. In single family home developments, consider locating street lights and fire hydrants in the small parkway space between driveways rather than the parkway space centered on the home.

Tree Selection

Selecting appropriate trees species for street environments is another key decision to ensure long term success. When an existing tree needs removal and replacement, contact the City for a free removal permit and replacement guidance. When selecting a tree, the three most important decisions are:

1. The planting space available (usually parkway width)
2. The existing streetscape, if any
3. Individual tree characteristics

With these criteria, first evaluate the space available, and check it against the City of Turlock Street Tree List, which lists trees by parkway width. Second, check the street tree species of neighboring properties and down the street in both directions. If street trees exist (even if they are not on neighboring properties), use matching street trees. If the species is unknown to you, an online key, such as <https://urbantreekey.calpoly.edu>, may be helpful. If neighboring street trees do not exist, or there is currently a large variety of trees where a single species does not predominate, choose a tree from the City of Turlock Street Tree List that corresponds with the parkway space you have to work with.

When purchasing a tree from a nursery, carefully check the tag to be sure that it matches the chosen street tree exactly. A common mis-step is purchasing a tree whose tag is mostly, but not completely, correct. For example, a *Pistacia chinensis* 'Keith Davey' is on the City of Turlock Approved Street Tree List. The nursery may only have *Pistacia chinensis*, missing the 'Keith Davey' cultivar designation. There are critical differences that will affect the tree's long term performance. The 'Keith Davey' cultivar is guaranteed to be male, which produces minimal flower litter. The plain species (without the cultivar designation) has a 50% chance of being female, which after 5-6 years produces large quantities of clustered red berries annually that produce a heavy load of litter and stain concrete.

Tree Planting

Once the tree has been selected and the location(s) have been decided, it is time to plant the tree. First, the site must be prepared. The tree planting process is as follows:

1. Install the irrigation laterals first (see Tree Irrigation section, below). If there will be deep root barriers, ensure the laterals are deep enough to clear the panels. Position the laterals for upcoming bubbler connections.
2. Second, install root barriers for all trees planted within 10' of a paved surface. Root barriers are rigid, thick plastic panels that are installed directly next to the paved surface, such as a curb, sidewalk, or driveway. Use 12' lengths of 24" deep panels, DeepRoot UB Root Barrier, <https://www.deeproot.com/products/barriers/tree-root-barrier> at every tree and along every paved surface, installed per manufacturer's specifications. The tree will be planted at the midpoint of the root barrier. See details L-1 and L-2 of the City of Turlock Standard Specifications and Drawings.
3. Next, dig the planting pit. The planting pit should be the same, or slightly shallower, than the soil height in the tree container, so that the tree will sit at the same level, or slightly higher, when it is in the ground. The planting pit should be at least twice the diameter of the tree container. Mix the removed soil with compost (available at nurseries and hardware stores) at a rate of 4 parts native soil to 1 part compost. Scarify the bottom and sides of the planting pit.

4. Install the deep root bubblers (see Tree Irrigation section, below) and connect them to the laterals placed in step 1, above.
5. Place slow release fertilizer tabs, such as Agriform planting tabs (or equal) at the bottom of the planting pit. Use 3 planting tabs for 15 gal. trees and 5 planting tabs for 24" box trees, evenly spaced in the planting pit.
6. Remove the tree from the container and evaluate the roots. Circling or girdling roots lead to poor tree development and they need to be dealt with at this point. Untangle by hand to the degree possible. A few roots may be cut without harm to the tree, but most need to be left intact. If the circling is thick and severe, and they are unable to be pried into a looser position, contact the nursery for a remedy or replacement tree.
7. Place the tree in the planting pit and rotate as needed to direct roots in the most advantageous direction possible away from paved surfaces and other obstructions. Make sure the tree is at the same level, or slightly higher, than the surrounding soil surface. Backfill the tree planting pit with the native soil and compost mix and tamp lightly around the sides of the tree. Create a shallow soil saucer for water retention around the tree, keeping it 12" away from the trunk. Water thoroughly to wet the entire root ball.
8. Remove the thin nursery stake that was tied to the tree. It will prevent the tree from developing a strong root system and trunk. Install two lodgepole stakes, 8' long and 2" diameter. Place one on each side of the tree, 3" away from the rootball, oriented perpendicular to the prevailing wind. The stakes should be driven 36" into the ground, making sure that the irrigation bubblers and pipes will not be hit. Tie the tree to the pole in at least 3 locations with "Super Tree" nylon reinforced vinyl tree ties as shown on City of Turlock Standard Specifications and Drawings L-1 and L-2.
9. Apply a 3" minimum layer of mulch to the area, keeping the mulch 6" away from the trunk.

STREET TREE IRRIGATION

Proper irrigation is one of the most important factors influencing street tree survival and long-term health. Proper irrigation also significantly reduces the risk of lifted and damaged pavement. A combination of surface and deep root irrigation is recommended. As a general rule, watering should be done deeply and often when young, and deeply and infrequently when mature.

Irrigation Methods & Equipment

There are three primary types of irrigation equipment used to water trees: spray, drip, and bubblers. As stated above, trees perform best when provided with both surface AND deep

root irrigation. All newly planted trees should be provided with both, unless existing conditions do not allow.

There are different approaches to tree irrigation depending on the street tree's situation. Common scenarios with irrigation solutions are as follows:

1. If there is an existing street tree with existing irrigation, see the Irrigation Schedule section, below.
2. If a new street tree is being planted and there IS NOT existing irrigation present:
 - a. Irrigation must be added to provide both surface irrigation and deep root irrigation.
 - b. Two deep root bubblers are used for deep root irrigation. Use 18" deep root watering tubes, such as Rain Bird RWS-M or Hunter RZWS-18, with .25 gpm (gallons per minute) bubblers. See City of Turlock Standard Drawing L-4 for reference.
 - c. If there will be shrub or turf planting in conjunction with the tree, the drip or spray irrigation for this planting will provide surface irrigation for the tree.
 - d. If there will NOT be shrub or turf planting (such as in a tree well), surface irrigation for the tree is still needed. In that case, one of the two bubblers should instead be a surface bubbler. See City of Turlock Standard Drawing L-4 for reference.
3. If a new street tree is being planted and there IS existing drip or spray irrigation present:
 - a. Aim to provide the street tree with both surface irrigation and deep root irrigation.
 - b. If it is possible to add another irrigation line on a separate valve for deep root bubblers, do so.
 - c. If it is impossible or impractical to add bubblers, adjust the drip and spray as needed to provide adequate root zone coverage and longer run times to water the tree deeply. See the Irrigation Schedule section, below.
 - d. In the first 2 years of planting, if deep root bubblers are not added, deeply hand water in addition to the existing drip or spray irrigation. To deeply hand water, slowly apply 10 gallons of water per tree, twice per week in warm months and once per week in cool months.

Irrigation Schedule

The irrigation schedule is a critical component of tree irrigation. In the first two years of planting, trees need to be watered frequently and deeply, both at the surface and in the root zone.

1. For NEW TREES in their first two years:
 - a. Provide approximately 15 gallons of water, three times per week, including all forms of irrigation.
 - b. When a tree uses 2 deep root bubblers plus drip at the surface, that could be accomplished with a 20 minute run time for the bubblers (2 bubblers, .25 gpm each) PLUS a 90 minute run time for drip (assuming 6 drip emitters at .06 gph each for the tree only, additional drip emitters for shrubs).
 - c. When a tree uses 2 deep root bubblers plus spray at the surface, that could be accomplished with a 20 minute run time for the bubblers (2 bubblers, .25 gpm each) PLUS a 35 minute run time for high efficiency spray heads. This will typically give tree enough surface water while still giving the lawn what it needs.
 - d. When a tree in a tree well is irrigated with one deep root bubbler and one surface bubbler, that could be accomplished with a 30 minute run time (2 bubblers, .25 gpm each).
 - e. The time for drip or spray may be reduced or eliminated based on rain. In the first two years, decrease the bubbler irrigation by 50% if there are typical, periodic storms. If it is a wet winter, with extensive rain, shut off the bubblers. If it is a dry winter, decrease the bubbler irrigation by only 25%.
2. For ESTABLISHED TREES from 2 years through maturity:
 - a. Mature street trees should be irrigated deeply, infrequently, and independently of turf whenever possible. Relying on turf irrigation alone, watering lightly and frequently, or skipping water altogether create conditions that lead to shallow roots and sidewalk damage.
 - b. Mature tree watering needs vary more than newly planted trees. Their canopies are larger, making more leaf surface area for transpiration loss, but their roots reach farther, making more water sources available to them. The irrigation on your property, the irrigation on neighboring properties, the landscape density, wind patterns, the amount of shade cast by nearby buildings, and more, all factor into the amount of water the tree will need.
 - c. As a starting point for irrigation scheduling for trees with 2 deep root bubblers and drip, use a 20 minute run time for the bubblers, once per week, PLUS a 90-120 minute run time for drip. Observe the tree regularly and adjust watering times accordingly.
 - d. As a starting point for trees planted in lawn with spray irrigation (and no drip), continue with 20 minute run time for the bubblers, once a week and a time the spray for the lawn needs only. Observe the tree regularly and adjust watering times accordingly.

- e. As a starting point for trees in a tree well irrigated with one deep root bubbler and one surface bubbler, use a 30 minute run time once a week. Again, observe the tree regularly and adjust watering times accordingly.
- f. Shut off irrigation in winter, but if trees show signs of under-watering in winter, water very infrequently, such as once per month, at the watering times shown above.

Monitoring

Regularly evaluate the tree for signs of over-watering and under-watering, and adjust or shut off irrigation as needed to remedy. The symptoms of over-watering and under-watering can appear similar, so it is important to factor in soil moisture, recent weather, and irrigation history.

1. Signs of under-watering include:
 - a. Wilting or drooping leaves, especially mid-day
 - b. Leaf curl or dry, brittle leaves
 - c. Premature leaf drop
 - d. Dieback at branch tips
 - e. Dry soil
 - f. Soil pulling away from the tree root ball
2. Signs of over-watering include:
 - a. Leaves yellowing (chlorosis)
 - b. Soft, limp leaves
 - c. Leaf drop without scorching
 - d. Muddy soil or standing water
 - e. Sour soil odor
 - f. Algae on the soil surface

STREET TREE MAINTENANCE

Routine maintenance is necessary to preserve tree health, maintain public safety, and protect surrounding infrastructure over the life of the tree.

Tree Litter

Leaf drop, flowers, and fruit are natural characteristics of trees and should be anticipated and managed as part of routine street tree maintenance. Most of the year, infrequent sweeping is all that is needed to manage tree litter on paved surfaces. Deciduous leaf litter in fall and winter should be cleared from paved surfaces and private property and disposed of in the green bin. See the City's website for any leaf pick-up program details.

Tree Pruning

Street tree pruning may require a no-cost permit pursuant to Turlock Municipal Code Chapter 7-7 Article 3, available online or upon request.

Street tree pruning should focus on developing a strong, well-spaced branch structure that supports long-term health, clearance, and public safety.

1. Street trees should only be pruned for the following reasons:
 - a. To develop strong structure and a central leader
 - b. Facilitating clearance underneath for pedestrians, vehicles, and sightlines
 - c. Removing dead, dying, or hazardous branches
 - d. To maintain tree health and natural form
2. Street trees should not be pruned to limit overall size or reduce leaf or debris clean-up.
3. The overall natural form of the tree must be respected when pruning. Identify the street tree before starting, to understand how the tree should look as it matures. If you don't know what the tree is, a key, such as <https://urbantreekey.calpoly.edu>, should be useful.

What TO DO when pruning street trees:

1. First consider if the tree actually requires pruning due to structural or safety reasons. A minimal pruning is better than over-pruning the tree.
2. It is highly recommended that a certified arborist be consulted prior to pruning any tree, as improper pruning can cause irreparable harm to the form and structure of the tree.
3. In general, structural pruning is best done in winter, when canopy growth is slowest and for deciduous trees, the branching structure is easiest to see. Pruning to correct a hazard, such as a broken branch, should be done immediately.
4. When the tree is young (in the first 2 years) make sure there is a central leader, and that branches aren't crossing or rubbing. If these conditions are present, prune to correct them.
5. A helpful document on pruning young trees is found on the Arbor Day Foundation website. Click on the "Download Bulletin" link on this webpage <https://www.arborday.org/tree-resources/how-prune-young-shade-trees> to see tips with graphics regarding tree pruning. Techniques are shown on pages 5-7.
6. The Arbor Day Foundation has three short "Ask an Arborist" videos that show a good overview of pruning decisions and priorities. They are at the bottom of this webpage: <https://www.arborday.org/tree-care-maintenance/pruning>.

What NOT TO DO when pruning street trees:

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1. Never top a tree as this ruins the form forever, stresses the tree, and triggers dense, weakly attached shoots.
2. Never randomly shorten branches without regard to growth habit. This practice, called "heading cuts" damages the tree both structurally and aesthetically. A heading cut chops off the end of a branch at an indiscriminate point, which produces a cluster of weak, fast-growing small branches and destroys the natural branch structure of the tree. It also increases future pruning needs.
3. Avoid cutting branches flush to the trunk, as the branch collar (the swollen area at the base of the branch where it joins a larger branch or trunk) protects the tree.
4. Avoid lion-tailing, which is removing the interior branches, leaving foliage only at the branch tips. This weakens the tree by concentrating weight at the branch tips, increasing the risk of branch breakage. This practice also exposes the limbs to sunburn.
5. Never remove more than 25% of the canopy in a single pruning cycle. A standard pruning cycle for young trees (first 5 years) is every 1-3 years and every 3-5 years for mature trees.
6. Avoid pruning for clearance too aggressively. This raises the center of gravity and leads to unstable, top-heavy trees.
7. Avoid removing large limbs on mature trees unless necessary for safety.

Many residents, concerned with sidewalk lifting, want to cut tree roots. Roots provide the tree with stability and water uptake, and are vital for the tree. When considering root cutting, the following principles should be followed:

1. Avoid root pruning if at all possible. Root pruning should be considered a last resort, and ideally should never happen.
2. Root pruning within 5' of a trunk must be done under the supervision of a certified arborist.
3. Beyond 5', a limited amount of root pruning may be acceptable.
4. If a root is over 2" in diameter, an arborist must evaluate and approve the cut.
5. Cutting tools must be clean and sharp. The cuts must be clean, not tearing or jagged.

CONCLUSION

Healthy street trees are the result of thoughtful decisions made over time, beginning with appropriate species selection and continuing through planting, irrigation, and ongoing maintenance. No single practice ensures success on its own; rather, long-term tree performance depends on the cumulative effect of many small, informed actions carried out consistently and with care.

These guidelines are intended to support a common understanding among City staff, residents, contractors, and designers regarding best practices for street tree management. By following these recommendations, stakeholders can help reduce avoidable conflicts with infrastructure, minimize maintenance costs, and promote the long-term health, safety, and appearance of the urban forest. When applied consistently, these practices will contribute to a more resilient, attractive, and sustainable streetscape for the community as a whole.