



# Save Your Trees from Subtle Death

**TREE CITY USA®  
BULLETIN**

July/August 2021 • Editor: Dr. James R. Fazio



*Landscape trees are a beloved part of most homes, institutions, and even some businesses. No one would intentionally inflict harm on these beautiful and beneficial attributes to the property. But harm comes in many ways, especially if trees are forgotten when building or landscaping projects come along.*

Many years ago we asked arborists and urban foresters in locations throughout the country to tell us what they found that results in the most premature deaths of urban trees. Almost unanimously the finger of infamy pointed to construction damage. This probably has not changed over the years, and the sad part is that it is preventable.

The challenge to saving trees during construction can be divided into two categories. One is large-scale construction. For example, when a new housing development is slated, the land is often stripped of its vegetation (and even its top soil), and the site is cleared for work to begin on utilities, streets,

Trees deserve respect and special care during construction projects of all kinds around homes, businesses, and on institutional property such as college campuses or government buildings.

---

and buildings. Some say, tongue-in-cheek, this is the nuclear option! There are better ways, and this will be the topic of a future Tree City USA Bulletin.

The other category is what happens around individual residences, on campuses, or next to businesses. It may be a new house planned on a single lot or, more often, an improvement project of some kind where trees have long been part of the landscape. In most cases, the damage to trees is as subtle as it is unintentional, and tree health declines slowly. In the following pages, suggestions are offered that show ways to do improvement work while at the same time keeping trees safe and healthy.

# Planning First Can Prevent Problems Later

*In many small-scale projects, trees may seem like the least of one's worries. However, consideration of existing trees can add value to the finished project and prevent expensive problems in the years ahead.*

## FOUR STEPS TO PLANNING

### 1. MAP YOUR TREES

Before any work begins, sketch out the location of trees on your property relative to the building, driveway, and any new features that are part of the project.



Careful planning that includes trees and clear communication with contractors is the best way to start projects.

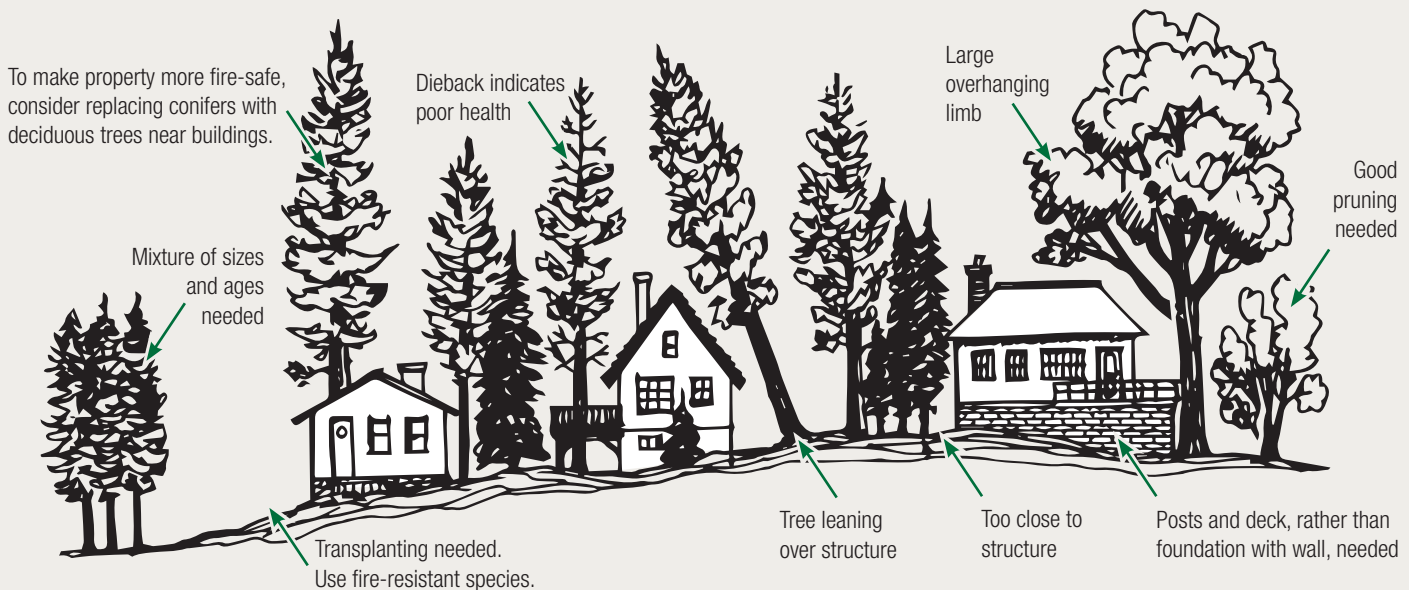
### 2. MAKE OBJECTIVE DECISIONS

Now is the time to decide which trees should stay, which can or should be removed, and which ones need some work such as pruning. It is best to set aside sentimentality and get the advice of a certified arborist about species, tree health, and the prospects for safe, productive longevity. An arborist will be knowledgeable in matters such as what trees may be susceptible to insects or diseases in your area, or what shaded trees may do poorly if exposed to more sunlight after the project.

Ideally, have the removal and pruning work done before construction begins. This allows you to improve your landscape while at the same time focusing on the trees you want to save.

- Consider removing trees that lean over the site of the project or existing buildings.
- It is usually best to remove trees that are within 5 feet of a new structure.
- If trees are within the construction zone, consider transplanting if they are less than 2 inches in diameter and 10 feet tall. Tree spades can be used to move larger trees.

(Below) A building project is a good time to consider landscape improvement by concentrating protective efforts on the best and safest trees.

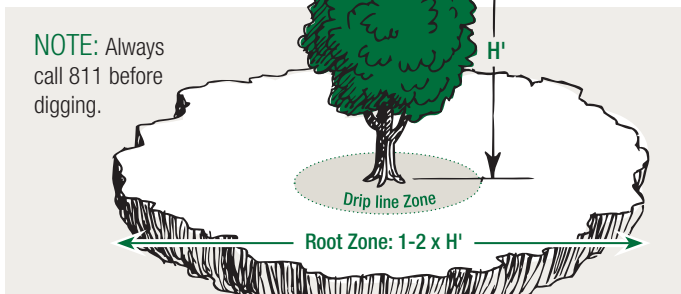




- Selectively prune trees that will remain. Some may need branches removed that conflict with the project or need remediation to prevent a hazardous condition. Unnecessary or excessive pruning should be avoided because leaves provide nourishment to the roots and tissues of the tree. The more live crown after a project, the more self-help the tree will have in recovering from project impacts.
- If existing trees make it possible, try to have a good mix of ages and sizes remaining after construction. This is more visually pleasing and reduces the impact when a tree does die.

### 3. ADD TO YOUR MAP

For those trees to be saved, add circles on your map delineating each tree's dripline zone and root zone. Avoid these areas when determining the locations for trucks to enter and exit, any on-site parking, and storage for excavated soil and/or building materials. Fence off protected root zones from construction activities.



A tree's future health depends largely on safeguarding its roots from cutting and compaction.

### WHAT MAKES DAMAGE 'SUBTLE?'

One definition of "subtle" is "delicate or faint and mysterious." This nicely portrays what happens to otherwise healthy trees after construction projects if care is not taken. Tree owners are often dismayed to see a favorite tree slowly decline over the years. It is disappointing and expensive. And it all begins with truck traffic over root zones, equipment damage to the bark, or a jagged branch stub — easy entrances for decay fungi. Or, unnoticed paint or other chemicals that slowly leach into the soil and poison feeder roots. The crushed and broken roots may be covered up, but their vital support and transmission tissues are gone. In myriad ways, minor damage can subtly result in deadly effects on trees over time.



### 4. DISCUSS WITH CONTRACTORS

With your map in hand, you should have a candid discussion with any contractors you are considering to work on the project. They will know you have given careful thought to the project and are serious about preventing injury to your trees. It will help them decide whether or not to bid on the job, and possibly the price to charge. Nothing beats clear and upfront communication to prevent later misunderstandings.

# Saving Trees — Tips for Above Ground Work

*It is usually easy to predict what damage to trees may occur when construction work begins. It is just as easy to prevent such damage. Here are some methods that have been used successfully.*

## A SIGN IS A REMINDER

Signs are usually part of larger projects, but they can be helpful even on a residential lot. The neater and friendlier the sign, the clearer it is to workers that you are serious about protecting your trees and need their cooperation.

## PROTECT THE TRUNK AND BRANCHES

The best way to prevent tree damage is to erect a barrier around the tree or group of trees to be saved. When space and circumstances allow, the fence should extend beyond the tree's drip line and protect as much of the root zone as possible.

Another way trees are sometimes damaged is when signs are nailed to the trunk or the tree is used to fasten a cable. Barriers should help prevent these kind of injuries, but prohibiting them should be made clear to the construction manager and crew.

Where space constraints make it impossible to use fencing, other methods can at least protect the trunk from gouges. Slats of wood secured with packing bands, hay bales, or other protective or cushioning material can be used.

## DESIGNATE STORAGE AREAS

It is only natural for some contractors to select a convenient area to store soil or other materials. It is up to you to designate sites that spare trees from trunk or root damage.

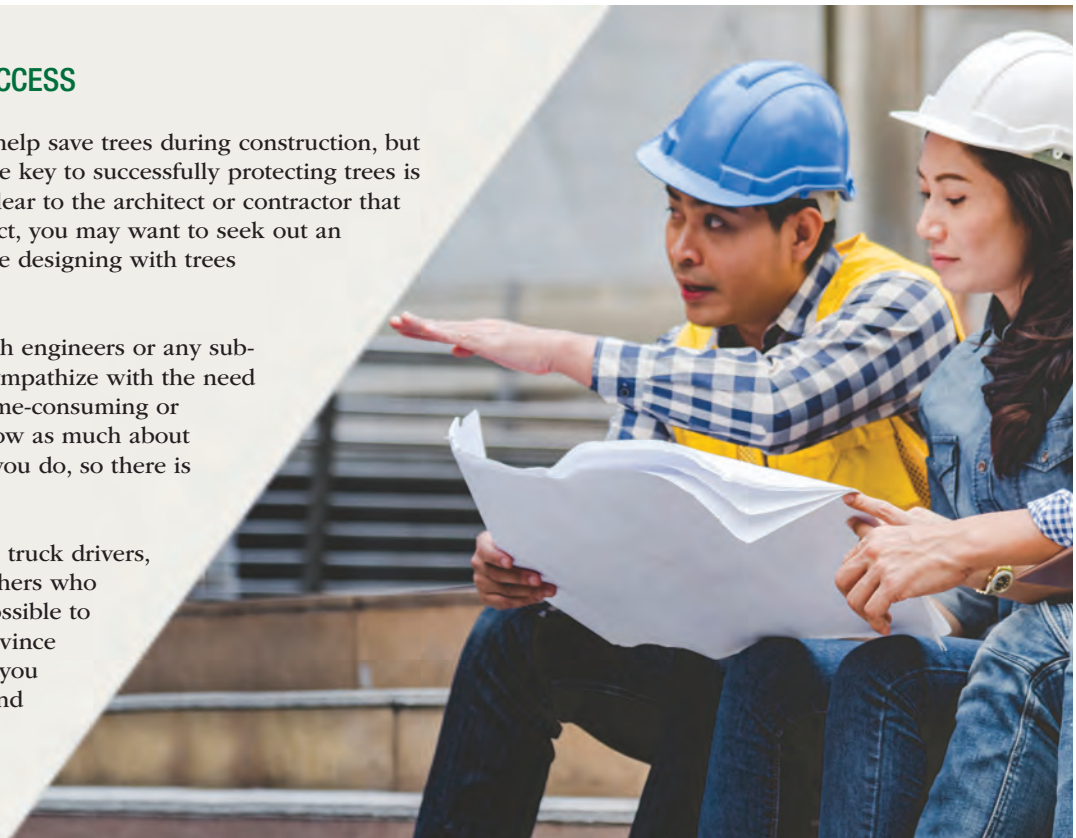


## COMMUNICATION IS THE KEY TO SUCCESS

There are many techniques that will help save trees during construction, but this is only one part of the challenge. The key to successfully protecting trees is communication. It begins by making it clear to the architect or contractor that existing trees are important to you. In fact, you may want to seek out an architect who has interest and experience designing with trees in mind.

Just as important, communication with engineers or any sub-contractors is essential. Many builders sympathize with the need to save trees, but others view it as too time-consuming or otherwise costly. Still others may not know as much about tree health or tree-saving techniques as you do, so there is an education challenge.

Finally, there are the dozer operators, truck drivers, painters, masons, and a small army of others who may be on-site. While it is usually not possible to work with each one, it is possible to convince the general contractor and foremen that you are serious in your desire to save trees and that they need to relay this concern to their workers.







High-visibility plastic mesh fence is inexpensive and easy to install. However, it is easily violated. A wooden fence or even a chain link fence conveys an even more serious intent to protect vegetation and the soil around it.





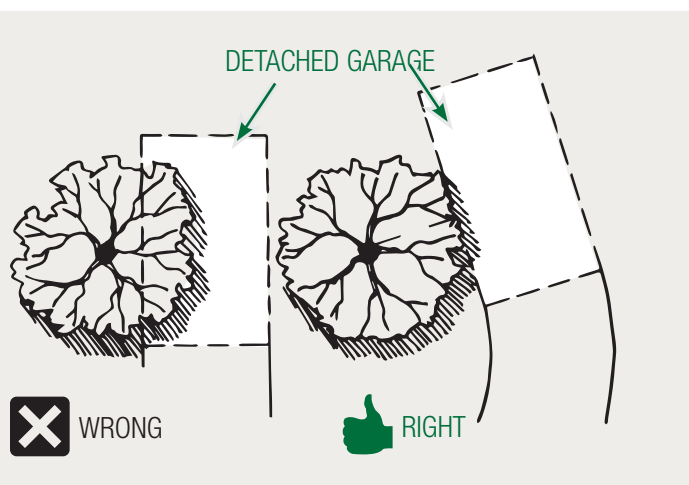
# Saving Trees Means Protecting Roots

*Roots are a tree's lifeline. They absorb water and minerals from the soil and provide stability. To survive and function, they need room to expand and uncompacted soil that allows sufficient aeration and tiny spaces for water.*

Some techniques, such as fencing and safe soil storage, serve not only to protect the trunk and branches of a tree but also preserve healthy roots. Here are some other methods that protect that essential space below the surface.

## CONSIDER A DESIGN CHANGE

Sometimes a small change in building design can make a big difference to trees. It may mean moving the foundation of a new house to a slightly different angle, curving a driveway or moving a ditch for utilities. As someone has said, "There is nothing sacred about straight lines!"



An example of how a slightly different angle for a new detached garage preserves nearly one-fourth of a tree's life-giving root zone. This principle can apply to driveways, walks, patios, and utility trenches.

## STAKE IT OUT

Work with the builder to locate and mark with stakes and flagging the exact location of parking areas for workers, trench locations, storage areas, edges of new construction, and other areas you have delineated in order to prevent tree damage.



## PRESERVE PERMEABLE SURFACES

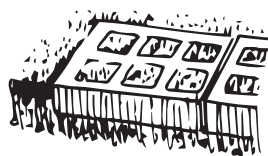
When concrete or asphalt is laid over soil, water runoff is increased and air penetration to roots is decreased. Consider other surface materials that can handle vehicle or foot traffic while at the same time protecting root functions. In some cities, fees that are based on impervious surface area may be reduced by using pavement materials that allow infiltration of water. This saves not only the health of tree roots but also money for the property owner.



BRICK



FLAGSTONE



HONEYCOMB BLOCK

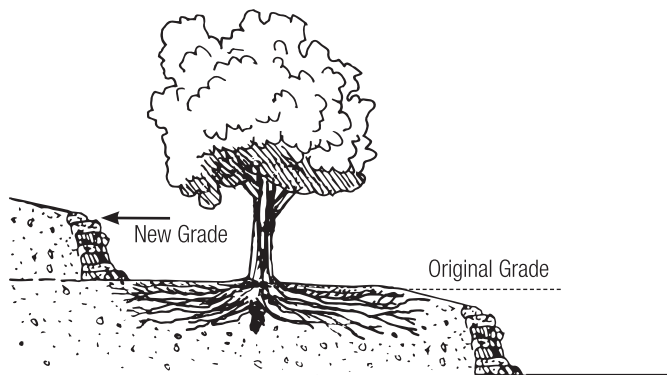


CHIPS/GRAVEL

## BE AWARE OF SOIL CHEMISTRY

A tree that is vigorous and otherwise healthy is obviously growing in soil conditions that are right for that tree. Construction activities can upset that happy balance if care is not taken. For example, cutting large quantities of plasterboard or washing out a cement mixer can raise the soil pH to an alkaline level not suitable to a tree that needs a slightly acidic or neutral pH. Here are some ideas to prevent altering soil chemistry:

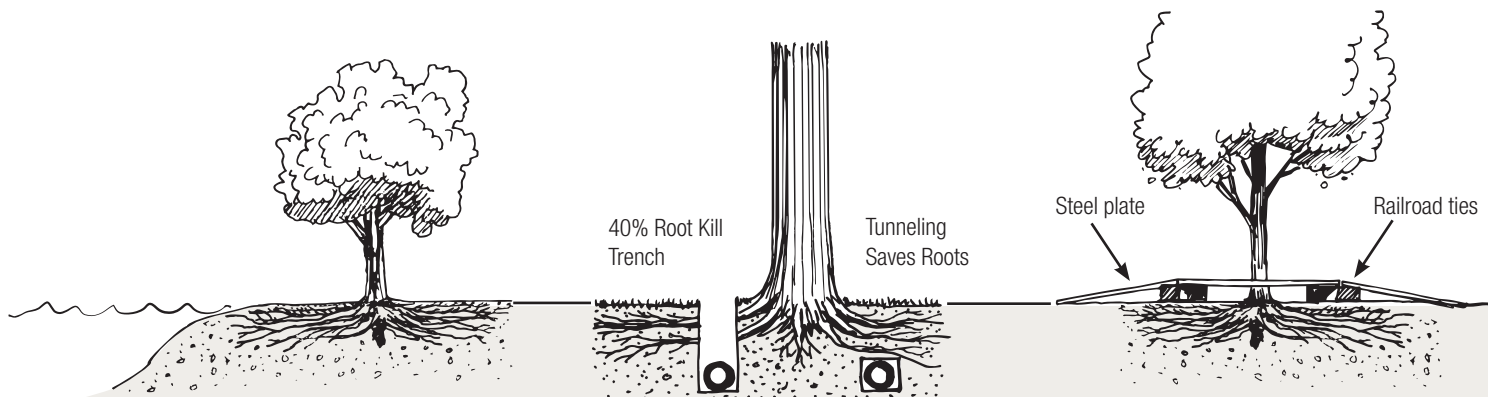
- Require washouts to be off-site.
- Select an area where washouts cannot cause damage.
- Spread a heavy tarp where concrete will be mixed, paint brushes cleaned, plasterboard cut, etc.
- Avoid the use of pentachlorophenol (PCP), creosote, or similar toxins near tree roots. Ask your county extension agent for suggestions to alternative wood preservatives when necessary.
- Insist that paint thinners, used oil, and other chemical wastes are properly discarded at a recycle center.



## GRADE CHANGES

Another detrimental but subtle process that can cause the slow death of a tree is a change in soil level over the root zone. Adding even a few inches of soil over a large extent of the root zone can result in a smothering effect. Reducing the soil level results in severing roots. Where the natural grade around a tree must be changed, consider ways to keep the original grade over as much of the root zone as possible. A terrace with walls, as shown in the illustration, is one method. A very wide tree well can also sometimes help.

## DRAINAGE CHANGES, SEVERING ROOTS, AND SOIL COMPACTION



**DRAINAGE CHANGES** If terrain is altered, there will be a change in how water drains from the land. If flows are created that add too much moisture to a wooded site, a drainage system may be needed to maintain the previous amount of moisture (which provided the natural growing conditions for the existing trees.) Similarly, existing trees along the edge of a new pond may eventually die from their roots suffocating. On sites deprived of water, irrigation may be needed to maintain existing trees.

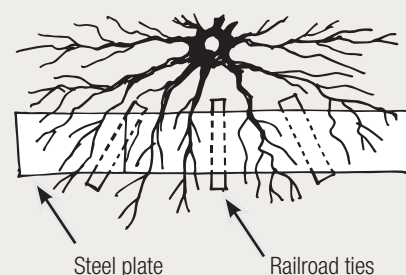
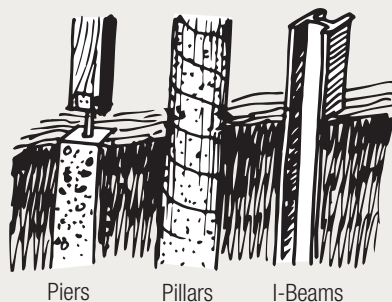
**SEVERING ROOTS** Some cutting of roots near construction is inevitable, but much *is* avoidable. For example, the routing of underground utilities does not have to follow a straight line from street to house. Careful route selection can often avoid important trees. When that is not possible, tunneling is a good way to reduce damage. To reduce trenching for foundations, posts and pillars can be substituted for footers and walls.

**SOIL COMPACTION** The key to tree survival in the years following construction is protection of the roots during construction. This is probably the most insidious problem because the results of compaction cutting off air and water passages in the soil show up slowly. When barriers are not possible to keep away vehicles and foot traffic, other protective methods used include spreading several inches of wood chips, pumping concrete from the truck through conveyor pipes instead of driving over root systems, and bridging root areas with plates of steel.



*Promoting building practices that save trees can help a Tree City USA community attain the Growth Award.*

## PIT AND POST CONSTRUCTION





# Vulnerability to Construction Impacts



Some species of trees can withstand environmental change better than can others. Construction often changes a tree's environment, so it can be helpful to consider how adaptable a tree will be to some of the impacts that result from construction activities. Below is a chart from Colorado State University showing adaptability by species. To view a more extensive list, please visit the supplemental resources for this bulletin at [arborday.org/bulletins](http://arborday.org/bulletins).

## DEGREE OF ADAPTABILITY TO CHANGE

### HIGH

American elm	Honeylocust
Common hackberry	London planetree
Cottonwoods	Siberian elm
Ginkgo	Silver maple
Green ash	White ash
	Willows

### MODERATE

Aspen  
Black walnut  
Boxelder  
Bur oak  
Linden  
Norway maple  
Pines  
White oak

### LOW

Bolleana white poplar  
Black locust  
Colorado blue spruce  
English oak  
Lombardy poplar  
Northern red oak  
Norway spruce

The northern red oak that graces this lawn is an example of a species with low tolerance to environmental change from construction.

## FOR MORE INFORMATION

For direct links to more information about saving trees during construction, please visit [arborday.org/bulletins](http://arborday.org/bulletins).

Tree City USA Bulletin © 2021 Arbor Day Foundation. Published by the Arbor Day Foundation; James R. Fazio, editor; Karina Helm, graphic designer.  
PHOTOS COURTESY: John Hartman, University of Kentucky (Page 5). TECHNICAL REVIEWER FOR THIS ISSUE: Michael Beaudoin, Idaho Community Forestry Program Manager, Coeur d'Alene, Idaho.