

Avoiding Tree and Utility Conflicts



Many factors should be considered prior to planting. Here are some helpful hints for tree planting around utilities.

Think about the balance between the benefits of trees with those provided by utilities. We need both for livable communities and it's possible to have both with proper planning.

For trees to thrive they need room. The ultimate mature height and spread of a tree must fit within the available growing space. This includes not only above ground, but also the soil area below, which must be large enough to accommodate the rooting habits of the species.

Preventing tree-utility conflicts is a serious matter. It not only potentially involves tree roots or branches growing into utility facilities, but also tree parts or whole trees that can fail and damage utilities, particularly in inclement weather.

The potential consequences of tree-utility conflicts include disruption of critical services, like electricity, water, or natural gas. These conflicts can also involve widespread property damage, personal injury, and loss of life.

Underground Utilities

Electric, gas, water, and sewer lines installed underground can be compromised by tree roots. Roots commonly spread many times the breadth of the tree crown and can extend out farther than the height of a tree.

Electric Utilities

Modern electric lines are resistant to root damage, particularly if installed at a depth below where tree roots commonly explore. However, the life of underground lines is limited, and they will eventually need to be repaired or replaced. Excavation for that work can damage tree roots, harming or even killing trees.

Water and Sewer Utilities

New water and sewer lines made of steel or PVC are also generally resistant to root damage. Older cement, clay, or cast-iron pipes that have degraded may develop leaks. Moisture from the leaks attracts tree roots, which can penetrate and expand the cracks, further damaging the pipes.

Natural Gas Utilities

Natural gas operators often keep the area directly over, and 10 feet each side, of pipelines free of trees to protect them from potential tree root damage and allow for pipeline inspection and maintenance activities. Species that are sensitive to natural gas are sometimes planted over the pipeline to help expose gas leaks. Many providers also have tree height and diameter restrictions out as far as 25 feet further than the clear tree zone.

Locating Underground Utilities

The greatest danger to underground utilities occurs during planting. Accidental digging into underground utilities can cause costly repairs to restore interrupted service or result in injury or loss of life. Before digging call your utility company or locator service to make sure you have located underground utilities. Never assume that utilities are buried deeper than you plan to dig. Locating underground utilities before digging is often required by law.

Overhead Utilities

There are several types of utilities located overhead on poles. In general, the higher the lines on poles and more robust the structure, the greater the voltage and more space required from trees.

There are four main types of lines: communication, secondary, primary, and transmission.

Communication Lines

The lowest lines on poles are often communication lines. They are not designed to carry electricity but can become energized.

Secondary Lines

Above communication lines are secondary lines. These carry household voltage of 120/240 volts in North America. Many of these lines are insulated.

Most operators do not try to prevent vegetation contact with communication and insulated secondary lines. However, many utility providers will prune trees to protect them from abrasion and deflection.

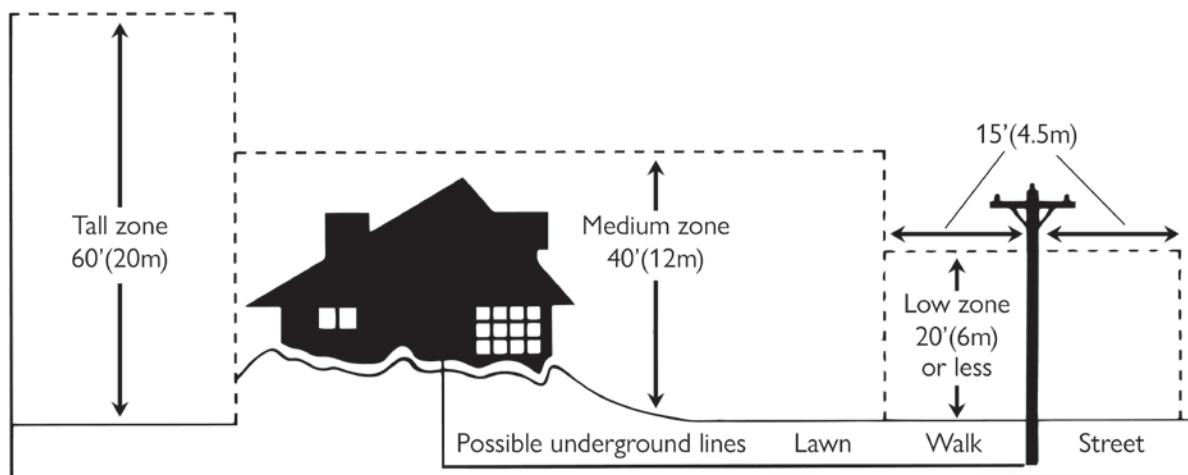
Some secondary lines are not insulated, and most electric utilities will systematically prune vegetation away from these types, but not enough to prevent contact before the next scheduled maintenance.

Primary Lines

Above secondary lines are primary lines. These are often located on top of single poles or on cross arms.

Transmission Lines

Transmission lines frequently carry hundreds of thousands of volts. It is best not to allow trees to develop with the potential to grow into them.



Tree Zones for Distribution Lines

Proper species selection and placement is important so trees have room to mature without having to be repeatedly pruned to keep them from interfering with utility lines. Species shape and size should fit into three zones relative to distribution lines: low, medium, and tall.

Tall Zones

The tall zone is at least 50 feet (15 meters) away from distribution lines. Trees with any potential mature height, including large species, may be selected for the tall zone. Make sure there is sufficient soil area to accommodate their expansive root systems. Planting sites greater than 8 feet (3 meters), including parks, meadows or other open spaces without below ground restrictions are appropriate.

Medium Zones

The medium zone extends between 15 and 50 feet (4.5 and 15 meters) from distribution lines. Species selected in this area should be medium sized, with a potential mature height of 40 feet (12 meters) or lower. Medium zone trees require wide planting areas or medians (4 to 8 feet – 1.3 to 3 meters wide), large planting squares (8 feet or 3 meters or greater), and other open areas of similar or larger size.

Low Zones

The low zone extends 15 feet (4.5 meters) on either side of distribution wires. Species selected for the low zone should have a mature height of 20 feet (6 meters) or lower. Low zone species may also be selected where soil volumes are too limited to support medium or tall zone trees.

Right Tree–Right Place

Planning before you plant ensures the right tree is planted in the right place. Proper tree selection and placement enhances your property value and prevents costly maintenance pruning and utility damage.

For further information on planting and helpful tips on street tree selection, refer to ISA's brochures on tree selection and new planting. If you have any more questions, please contact your local ISA Certified Arborist®, utility company, local nursery, or county extension office.

What Is a Certified Arborist?

ISA Certified Arborists® are individuals who have proven a level of knowledge in the art and science of tree care through experience and by passing a comprehensive examination developed by some of the nation's leading experts on tree care. ISA Certified Arborists must also continue their education to maintain their certification. Therefore, they are more likely to be up to date on the latest techniques in arboriculture.

Finding an Arborist

Visit [TreesAreGood.org](https://www.treesaregood.org) for free tools:

- The "Find an Arborist" tool can help you locate an arborist in your area.
- The "Verify a Credential" tool enables you to confirm whether an arborist has an ISA credential.

Be an Informed Consumer

One of the best methods to use in choosing an arborist is to educate yourself about some of the basic principles of tree care. Visit [TreesAreGood.org](https://www.treesaregood.org) to read and download all brochures in this series.



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