

# Street Trees

## *for Home and Municipal Landscapes*

by GARY L. KOLLER and MICHAEL A. DIRR

Worldwide, cities and most towns have one element in common: the seemingly endless ribbon of highways that cut through the countryside like great scars, often reflecting a reckless insensitivity to the natural landscape. It is in cities, however, where they make their greatest visual and physical impact. Streets lie flush with sidewalks and these, in turn, give way to great buildings. Grass and other vegetation is little in evidence. Beyond, in suburbia, the scene is less stark as the ribbon winds through residential areas with their ubiquitous 50- by 50-foot lots; but still the sidewalks, driveways and roadways are the dominant features of a society on the move.

Into this landscape, the eyesores of service stations, fast-food establishments and mushrooming shopping centers must be included. Neon signs and billboards compete for the consumer's attention, manufacturing plants spew black and acrid smoke across the skies, and dumps, junkyards and salvage shops display the detritus of a "throwaway" society. Interspersed, of course, are majestic churches, historical structures with delicate and handsome details, and buildings both modest and monumental that are architectural treasures. All of these disparate features blend in a confusing montage with little to separate, frame, or soften the overall impact and bring it into human scale and human terms.

Plants have a great deal to contribute to the city landscape, but often have been overlooked because urban space is at a premium and their maintenance is an additional expense that most businesses and city agencies do not choose to assume. Because of budget limitations, the landscaping of a building is often the first item to be sacrificed when money runs out. As a result, many spaces that would be enhanced by greenery are paved instead.

Nonetheless, we notice those city areas where plants have been used effectively and have seen people stop to admire or pause to enjoy the attractive visual environment in which they have suddenly found themselves. Street trees, more than shrubs, have the greatest capacity to make a visual impact, and require the least amount of horizontal ground space. They develop into green walls or buffers that soften the lines and angles of manmade structures; create canopies under which people can walk; cast shade to reduce reflected heat and light; and trap airborne dust particles, filtering the air we breathe. Equally important, they stand as silent

sentinels, providing us with a direct link to the green world we have so often sacrificed in our attempt to “progress.”

The term ‘street tree’ can be interpreted in several ways. Most commonly it refers to those trees planted in a narrow tree lawn (illustrated) running between street and sidewalk and evident in urban, suburban and some rural locations. It also includes those trees planted in islands within parking lots or between roadways, in small spaces cut out of the sidewalk, plants in above-ground streetside containers and trees planted along expressways and superhighways.

Street trees reside in situations that vary from high impact areas such as midtown Manhattan, to placid hamlets in Vermont where a street tree is essentially in open countryside. While each of these uses and locations presents different landscape design opportunities, each imposes trials and tribulations that affect the health, well-being and life span of trees.

Consider the stresses to which the average urban and suburban street trees are subjected. In the confined growing space, soil is not only limited, but is often dry, rocky, infertile and compacted. In summer, desiccating winds, reflected heat, and sunlight increase transpiration, resulting in wilting and scorched leaves. Drainage water and pollution (specifically, ozone and sulfur dioxide) often disrupt metabolic activities.



*In this situation, Bradford pear is successfully used as a suburban street tree. Note the wide planting area between the street and sidewalk: such space seldom occurs along urban streets.*

Winter hazards include cold, drying winds intensified by the tunnel effect caused by buildings. Salt spray from deicing operations bathes stems, buds and the leaves of evergreens, while salt-laden water drenches the soil around the roots.

Along with the pressures of the physical environment, the plant must survive neglect, vandalism, trenching and building operations, vehicular damage, and the public's widespread insensitivity to the tree as a living organism.

Because of these limiting factors, the ideal street tree remains undiscovered. No one plant is perfect, and the same plant may not be ideal under two different situations; further, each plant is asked to serve a multitude of different landscape purposes.

In view of the vicissitudes that street trees must withstand, what would constitute the ideal street tree? It should be a vigorous grower, yet one that does not create a maintenance problem because of rapid growth and weak wood. Annual care such as pruning, spraying and leaf removal should not be needed. A desirable feature is the capacity to grow in a limited volume of dry, sterile, rocky soil. The tree should tolerate drought, drying winds, and intense reflected sunlight without becoming brown or scorched. Dust, smoke, soot and noxious fumes should have little or no effect. Tolerance to the winter hazards of salt spray, salt-laden drainage water, and oil and gasoline is necessary, as is the ability to recover quickly from mechanical injuries caused by vandalism and snow removal equipment. The plant should be resistant to damage from ice and windstorms.

Leaves of our ideal tree should appear as soon as the danger of frost has passed and, thereafter, maintain a healthy green color. They should remain on the tree until late in autumn, then drop very quickly. Leaves should be small and not need collecting. Our ideal tree should have attractive flowers that are not messy, showy fruit that presents no maintenance problems, good autumn color, and interesting winter structure. It also should have the desired size, shape and texture to fill our design needs. Such a plant should re-establish itself quickly upon transplanting. Its roots should not lift sidewalks or clog utility pipes, and the plant should not be adversely affected by extended illumination. Above all, it should be resistant to insects and diseases and have a long life span.

How is a tree selected for a growing site? First, the user — landscape architect, street tree commissioner or homeowner — should evaluate the site. What are the major environmental constraints that will influence the optimum growth of the tree? Are they shade, limited soil volume, severe cold or perhaps major applications of winter deicing salts? Difficult conditions imposed upon a tree bordering a street in Boston, Massachusetts are usually more complex and intense than those the same tree would face on a street in rural New England. In effect, it should be easier to grow a wider array of plants along rural streets than along city streets; however, few sites are without major limitations.

Next, what are the physical limitations or design needs? An example might be utility wires running above the planting site. For this situation,



*Trees planted within paved areas suffer from limited volumes of infertile, compacted, and droughty soil. They usually are too close to the curb and are subject to injuries from cars being parked.*



*This honeylocust, which is in need of pruning from dieback, attests to the inadequate tree care provided by many municipalities.*

one may want to select a tree that has an ultimate size less than the height of the electric lines to eliminate the expensive periodic pruning needed to keep the tree growth from interfering with the wires. Also, trees in the public domain are more often butchered than skillfully pruned when their growth conflicts with the public utilities. If there is adequate money, equipment and trained personnel to provide high-level maintenance, one might select a large tree and utilize corrective pruning to enable the tree to grow through and above the height of the wires.

Other physical considerations are tree branching that is high enough to allow unobstructed vision or vehicular traffic, tree size that will fill but not overwhelm the scale and proportion of the landscape space, and size and growth form to fulfill a specific design requirement.

Selecting a tree for flowers, fruit or autumn color should have low priority and not even be considered until cultural and physical restrictions have been met. If one selects a beautiful flowering tree that languishes because of site difficulties, it will not be satisfactory as an ornamental or as a street tree.

A word needs to be said about maintenance, for most municipalities select trees on the basis of minimum upkeep. Generally, municipal budgets allow money only for tree installation and little is appropriated for routine care such as corrective pruning, watering during drought, fertilization, or spraying for plant pests. Most urban street trees receive little consideration until a broken limb damages an automobile or severs utility wires, or until a tree dies and needs to be removed. Consequently, the trees installed by municipalities need to be thoroughly tested and evaluated for performance under different environmental conditions. Homeowners have an advantage in that they often can afford to provide the extra maintenance a more ornamental tree might demand.

The following information is intended to provide readers with an accurate assessment of the plants described. By stressing both a plant's assets and limitations we hope to provide data that, when coupled with details about planting sites, will allow one to select the plant that will be best for an individual location. Since no tree will be perfect, it is important to seek the species, variety, or cultivar offering the greatest adaptability and conformance to landscape architectural needs, while posing the fewest maintenance problems.

To assist users in finding plants most appropriate for their sites, quick-reference lists have been provided beginning on page 223. Trees are arranged alphabetically according to cultural adaptability and major landscape attributes such as flower, fruit or autumn color.

The authors invite comments from interested readers who may have additional information relative to a particular plant's performance under street or urban conditions. This information will be collated and added to our reference file on street trees.



*Trees play an important aesthetic role in the planting of this well-designed parking lot.*

## CLARIFICATION OF CONTENTS

*Nomenclature*: In general, plant names used in this publication conform to *Hortus Third*, L. H. Bailey Hortorium, Macmillan Publishing Co., Inc., New York, 1976.

*Hardiness Zones*: The zones of hardiness listed here are based on the Arnold Arboretum Zone Map which attempts to define the cold tolerance of north temperate woody plants. While we indicate northern limits, most plants will grow over a broad southern range.

## Average Annual Minimum Temperature

Zone 1	-50°F or lower
Zone 2	-50° to -35°F
Zone 3	-35° to -20°F
Zone 4	-20° to -10°F
Zone 5	-10° to -5°F
Zone 6	-5° to 5°F
Zone 7	5° to 10°F
Zone 8	10° to 20°F
Zone 9	20° to 30°F
Zone 10	30° to 40°F

*Plant Size*: An attempt has been made to list average landscape sizes. Many authors have listed size as it applies to native or wild plants. These heights do not accurately reflect the size that may occur under landscape conditions.



*The harsh effect of asphalt and concrete buildings is softened by the trees that frame this Boston street.*





*Basal suckering is a problem on several tree species, as this linden illustrates.*

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*Ailanthus altissima* is among the most stress-tolerant trees. The broken branch on this specimen should be pruned flush with the trunk to effect good wound healing.