

# COMPETITION FOR SPACE IN THE URBAN INFRASTRUCTURE<sup>1</sup>

by John D. Morell

What does the word *infrastructure* mean? Webster defines this as the underlying foundation or basic framework. In an urban area, the urban infrastructure refers to the underground water and waste water lines; gas, electrical and telephone lines; walks, curbs/gutters and roads that serve dwellings. Although my training and background is forestry, I am also the Assistant Director of Public Works for Park Ridge, Illinois. I prepared this article from the perspective of a public works director or city engineer. My day to day activities involve both forestry and public works projects, with trees and the infrastructure being an integral part of my daily routine.

I have heard about the environmental benefits that trees provide to a community, 1) through the photosynthesis process, the leaves absorb carbon dioxide and provide us with oxygen, 2) the shade of trees cools our homes, 3) trees provide shelter from winds, 4) the roots help prevent soil erosion, 5) trees add value to property, 6) trees provide wildlife with shelter, 7) they provide food and beauty for us all to enjoy, 8) trees absorb dust and help to cleanse the air of particles that we would otherwise breathe, and 9) trees absorb noises that frequent an urban community.

I am sure we would all agree that trees in an urban community are very beneficial. However, not everyone shares that viewpoint. Trees are often an obstruction to the infrastructure of a community. The roots of some trees buckle and crack sidewalks and driveways creating trip hazards to citizens of all ages, and liability exposure to municipalities. The roots of trees run along the soil surface occasionally sending up sucker sprouts in the middle of the resident's beautifully maintained yard. Surface roots also create trip hazards in yards. The roots that grow deep enter cracks or openings in the sewer lines both on city and

private property causing damage including water backup into the resident's home. The roots of trees crack house foundations creating entrance ways for ground water to seep in, curbs buckle, pavement raises and cracks develop from tree roots growing underneath in the soil.

Some trees drop leaves and small twigs throughout the growing season, a continuing nuisance to residents. Occasionally large limbs fall from trees without warning, causing property damage and personal injury. Trees obstruct roadways and the vision of motorists using the roadways. Low hanging branches interfere not only with vehicular travel but with pedestrian travel as well. Trees attract certain insects and pests that are a nuisance and problem for homeowners; for example, the boxelder bug, carpenter ants and termites. Large flock of starlings and other undesirable species of birds roost in trees creating a health hazard to our residents. Insect pests feeding on trees generate a sticky sap-like liquid that rains down and covers the sidewalk, homes, roads and vehicles. Trees disrupt electrical and telephone communications when their limbs come in contact with utility lines, a never ending maintenance problem.

Foresters have been and still are on a collision course with city engineers. As the infrastructure in communities continues to age, replacement is necessary. As population in the community grows, the road system also must be expanded to accommodate the increasing number of vehicles. Directors of public works and city engineers must meet the needs of the community and replace the aging infrastructure, build new roads, resurface and repair existing pavement in a financially responsible way. It is the property owners who are paying for these improvements through their property taxes. The repairs of the infrastructure

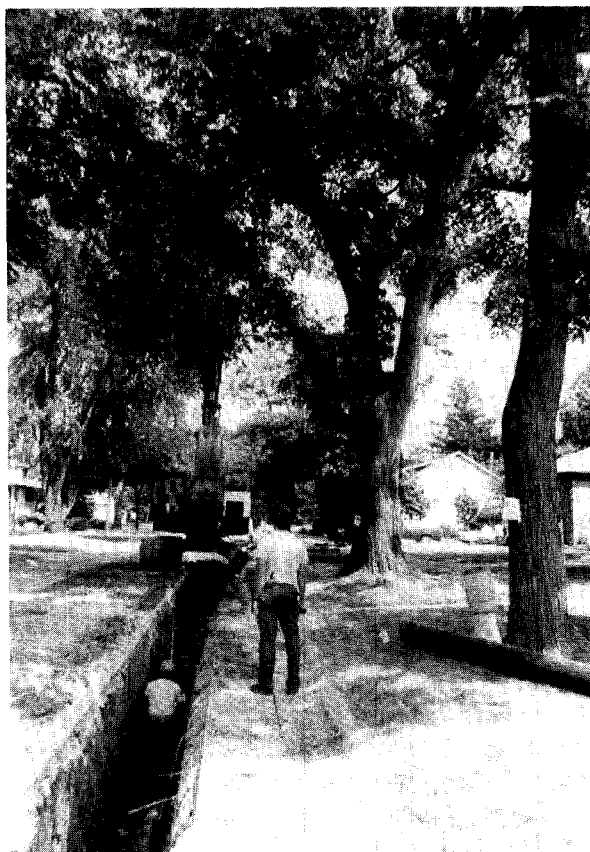
1. Presented at the annual conference of the International Society of Arboriculture in Philadelphia in August of 1991.



**Fig. 1. Removal of surface roots from a parkway elm underneath a public sidewalk that is being replaced. The sidewalk was raised and was hazardous to pedestrians.**

are also accomplished to eliminate safety hazards such as raised sidewalks, broken curbs and the widening of narrow streets for accessibility of emergency vehicles.

It has been my experience that public works directors and city engineers do not comprehend the damage the various phases of construction can cause to trees, i.e., root systems, trunks and branches. For example, to replace an old water main, it is economically more feasible to install the water main in the parkway by trenching down the block than by installing it in the street. Augering tree roots, drives and streets costs extra, and slows down the installation. Also, it is easier to make emergency repairs if the utility line is located in the parkway. Urban foresters need to develop guidelines or ordinances that address the concerns that public works directors or city engineers have regarding



**Fig. 2. Installation of a water main in the street area adjacent to a parkway elm. Root damage in the construction trench is evident.**

the placement of trees, the tree species and the growth characteristics of the tree as it relates to the surroundings in which it is planted.

Large overstory trees or evergreen trees should not be planted under power lines or in locations in which they will disrupt site visibility or traffic flow. The width of the parkway should determine what species of tree should be selected for planting. Foresters need to educate the public works directors, city engineers and the residents as to what effect construction damage has on trees. Replacing raised sidewalks at the existing grade by removing all of the surface roots can result in windthrow of the tree. The same is true for curb and gutter removal and replacement programs.

As the community's infrastructure has grown, so have the trees that were planted when the improvements were made. The root zone area of

these trees is covering a larger area, making it more difficult to make repairs or improvements to the infrastructure without causing damage to trees.

Recently, the EPA has recommended that the amount of lead in drinking water be changed from 50 ppb to 15 ppb and copper from 5,000 ppb to 1,300 ppb. What does this mean? Municipalities will be required to test drinking water and, if the new guidelines are not met, then the lead and copper service lines will need to be replaced in accordance with EPA standards.

In our community, we know that we have lead and copper service lines. However, we don't know how many, and we don't know, as yet, if we meet EPA standards. What we do know is that the replacement of these service lines will involve digging up the parkway and tree roots will certainly be affected.

As competition for space in the urban environment continues to place demands on everyone, public works directors, engineers, utility personnel and foresters will need to work together in order to achieve their various organizational goals. Developing new tree species to grow in the urban environment in confined space limitations will be an integral ingredient to resolving conflicts between trees and the urban infrastructure.

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