TREES — ASSETS OR LIABILITIES?

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Highway administrators concerned with roadside trees ask several questions: Why do we need trees on our roadsides? How do they benefit the highway? What percentage of highway funds can justifiably be spent to maintain them? It is our purpose to try to furnish answers for these and other pertinent questions.

Since ancient times trees have been planted along public roads to provide shade. The Greeks are credited with being the first nation to have done this. Greece was, at one time, well wooded. What a contrast its tree-denuded landscape presents today!

The older states and cities of our nation are examples of the love and respect which our forefathers accorded trees on public ways and in public squares. Some states have even gone so far as to enact laws to safeguard and protect them. In fact, the shade-tree laws of Massachusetts, in effect today, date back to the earliest colonial days, but, of course, have been modernized by amendments.

These heritages of our forefathers are fast leaving us. What are we doing to protect or replace them for the enjoyment of future generations? Some would sacrifice our noble trees for economic reasons - to reduce maintenance costs, to facilitate mowing operations, or to let in sunlight and air to dry the roadbed. These people evidently have not been refreshed by the cooling shade, or had the blasts of wintry winds subdued to their benefit. In many ways, we are two or more decades behind in the perpetuation of tree planting and protection. This may be due, in a large measure, to the great strides made in modernizing our highway system. Highway safety, paramount to the needs of everyone, requires shoulders suitable for safe and rapid retreat from approaching danger and adequate drainageways. The combined area should be entirely free of trees, utility poles, bridge and culvert headwalls, and anything else that would endanger traffic. Widening roadbeds, changing alignments, grades, or curvatures necessitate drastic changes in the cross section of the highway and, in many cases, cause the removal of trees that have been protected for many years. We must take prompt measures to replace these necessary losses.

Let us, for a minute, consider the elements that make up the highway cross section. If we assume a 160 to 200-ft. right-of-way, 20 to 30 ft. at the center, are allowed for the median. This is flanked by two 12 ft. traffic lanes on each side, bordered by a 10-ft. shoulder and a normal 5 ft. drainageway. All of these consume 98 ft., leaving 62 ft. on a 160-ft. right-of-way, or 102 ft. on a 200-ft. right-of-way for the roadsides, with 31 to 51 ft. on each side of the highway. In some states, 16 ft. lanes are provided on the borders of the right-of-way for utility lines and service drives to reduce points of ingress and egress from the main traveled way. This leaves only 15 to 36 ft. for a planting zone.

On a 110-ft. right-of-way without a median, 24 ft. are allowed for pavement, 20 ft. for shoulders, and 10 ft. for drainageways, totaling 54 ft. and leaving 56

ft., or 28 ft. for the roadsides proper. Should a 16 ft. service area be required, this will reduce the planting area, or roadside proper, to 12 ft. on each side.

An 80 ft. right-of-way allows for hardly more than the required pavement, shoulders, drainageways, and sidewalks, with possibly a 5 to 7 ft. tree zone between the shoulder and the sidewalk for tree planting.

The above shows consideration for a utility strip for overhead wires, underground conduits, and pipe lines. Trees are affected more by the overhead installations than the underground. Many trees have been lost because of the vast extension of utility pole lines into rural areas. In most states, these power and communication lines are located on or along the highways. Trees and utility wires cannot live together on narrow rights-of-way. Modern highways, as indicated above, present more opportunity for trees and pole lines to live together. There are exceptions, however. High-voltage lines require more lateral clearance than communication and low-voltage lines, while cable can be threaded through trees with a minimum amount of clearance. Rural power is helping to spread out our fast-growing population. Every thought must be given to expanding this program, but it should be done with equal consideration given to trees and pole lines.

A half century ago, radio and television were practically unknown, while the automobile, electric power and light, telephone, and telegraph were being given only causal consideration. What vast strides these have made in such a short period! Who knows what changes will take place in the next 25 or 50 years? Atomic energy, now in its infancy, may take the place of some of these utility lines. There may come a time when the pole line will be a thing of the past. Should we continue to cut, slash, and disfigure shade trees merely to make way for pole lines? If we do, the time may come when there will be no pole lines and no trees of any value on the highways. This may be real exaggeration, but, in my opinion, it is worthy of consideration. We can have both utility lines and trees on the same highway once we make adequate plans for them. Wires alone are not particularly noticeable. It is the poles and the crossarms that disfigure the landscape. Judicious planting helps to screen these poles and crossarms. Selection of trees which best suit different pole and wire conditions is most essential.

In fact to evaluate trees as assets or liabilities, consideration must be given to several factors: for example, the species or type of tree - whether it is evergreen, half-deciduous, deciduous, coniferous, or palm; the habit of growth of tree - whether spreading, spherical, pyramidal, slender, compact, or sparse; the rapidity of the growth of the tree - slow, moderate, fast or very fast; the length of useful life - short, average, prolonged, or in the posterity class. To some, the type of foliage, the color of the foliage in the spring and fall, and the color of the flowers may be important factors; but, for the highway, those I have enumerated, together with consideration of the stature of the tree -- whether its normal height is 10 to 20 ft; 20 to 40, 40 to 60, or over 60 ft. in height -- are important. In other words, the characteristics of the tree with respect to location or the service it is going to perform must be carefully considered. (These factors could be graded numerically for use in an equation.) Is the tree now located, or will it be located, in a place where it might be considered definitely permanent, or is it temporary? If it is an old tree, what is the physical condition of its roots, trunk, and top? These points should be graded according to the

susceptibility of the tree's recovery under treatment. What is the apparent age of the tree with respect to its ultimate life-cycle? For example, a poplar, 20 years old is nearing the end of its usefulness, while an oak of the same age is approaching the prime of life. Age, threfore, should be graded according to the average life-expectancy.

The cost of maintaining different types of trees is also important. Some species require no maintanance, practically no spraying, only occasional feeding, and have very little dead wood, owing to the sturdy structure of the branches, while others are brittle and break under minor storms. Susceptibility to annual insect infestation and defoliation, and susceptibility to disease are also factors to be considered.

The character of the leaves - whether they fall all in one short period or over a prolonged time - should be considered. What are the fruiting bodies, and what effect does the dropping of the fruit on the pavement have on traffic? All of these factors require experienced study and constant attention.

Every state should set up its own classification for native trees, based on such factors as they consider essential for the above equations. Locations are important - whether the tree will have range room to spread or whether it must be a low, spreading tree to be kept always under the pole lines and wires, or whether it is of the columnar or fastigiate type, like the Lombardy poplars and palms. Trees should also be calssified according to their susceptibility to light or heavy trimming and shaping, such as sycamores and locusts; from a line clearance standpoint, trees located near poles require less lateral trimming than those in the middle of the spans, where wires have to be cleared for windage. In designing combined utility lines and tree planting, consideration must be given to location of the poles with respect to long spans for highway crossings.

Science is developing inhibitors for grass which may eventually serve to retard the growth of entire trees or parts of trees. In the future, this may be the means of saving many trees. It is a factor that should be given consideration until such time as it has proved its value.

In brief, we can set up parallel columns for trees - listing assets on one side and liabilities on the other. We can check or discount the equalities and note what is left. The human equation, however, enters into this in a large way. The highway engineer who places no value on aesthetics may object to trees and shrubs in medians, even though they are planted to counteract the crossglare of headlights, because they increase maintenance operations. Which is more important - the elimination of crossglare of lights from a safety standpoint, or the reduction of maintenance costs? Trees can and have been used to define the curvature of roads, serve as warnings and as guides, and, at times, eliminate the necessity for guard rail. These also increase some maintenance operations. Trees serve as windbreaks to prevent snow from drifting onto the highway. These require constant attention, but does the cost of maintaining them offset what it would otherwise cost to remove drifting snow over a period of years? To the utility company, any trees that require trimming every two or three years are a liability. Their lines must be kept cleared at all times. These same trees, however, help to screen many eyesores, including the pole lines, billboards, automobile graveyards, dumps, etc. These trees also help to

frame vistas. They furnish shade for the casual picnic table or turnout. They are serving the public constantly, as are the utility lines, and as such must be made to work in unison.

Roadside-tree programs need:

1. Skilled designers to locate and select the proper trees for the soil, climate, and environment; to plan with respect to location of poles, primarily with regard to the future growth of the trees and necessary maintenance of both.

2. Trained technicians who thoroughly understand the future effects of trimming and who can distinguish and combat the various insects and tree diseases. It is essential for men who are working in the tops of trees to convey this information to the engineer in charge.

3. Maintenance forces who know how to recognize weaknesses in trees - when it is necessary to spray, to feed, to trim, to shape - and the most modern techniques for handling these different operations.

4. An engineer who is capable of evaluating trees with respect to:

   (a) Changing alignment or constructing tree wells or tree walls to protect and save a tree, or knowing whether it is better to remove a tree and plant another that will serve the particular location better and more permanently.

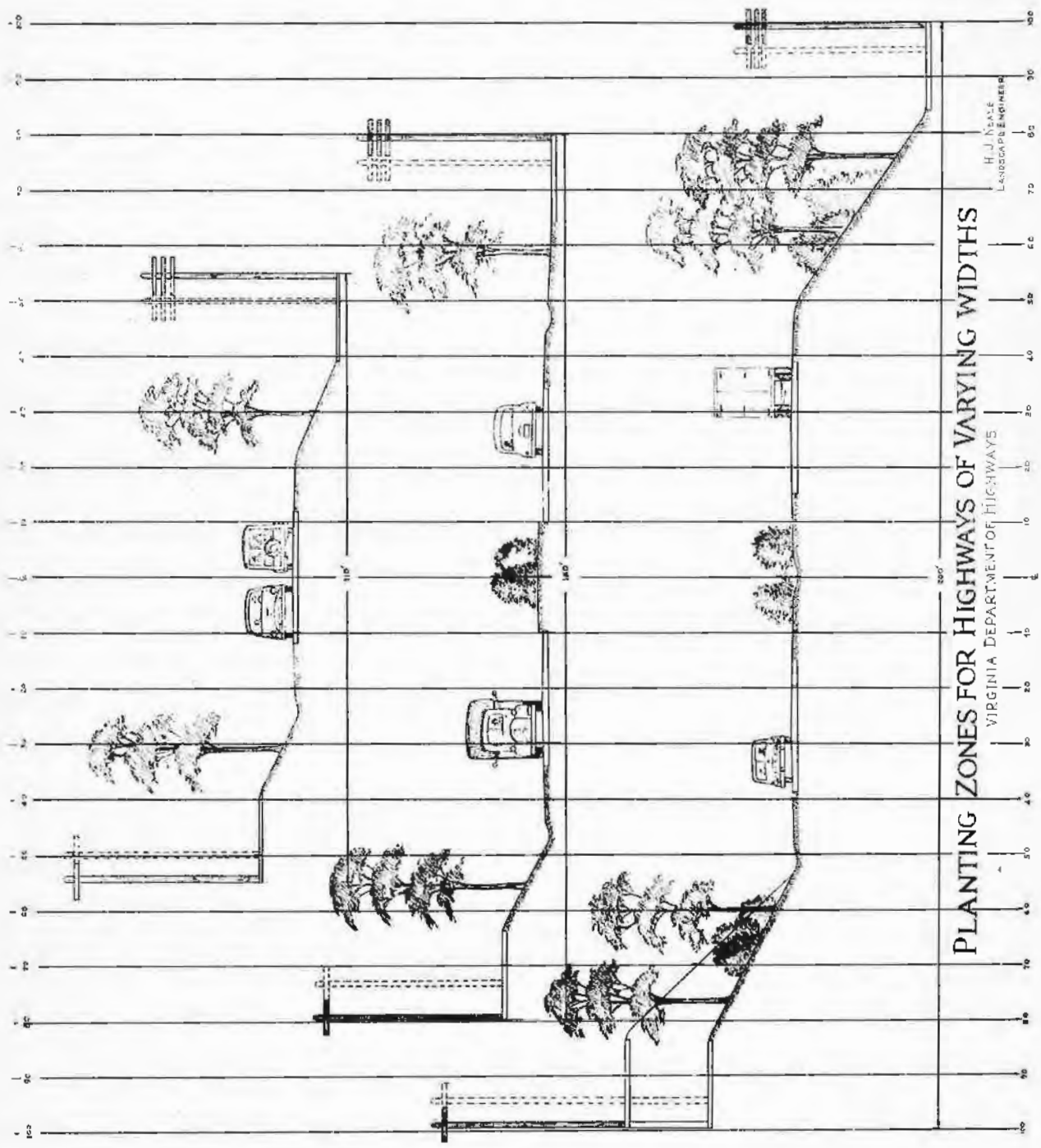
   (b) Selecting permanent trees in wooded areas and then realigning pole lines to avoid cutting these trees; in other words, locating poles with respect to the permanent trees.

   (c) Demanding change in pole-line layout or design to reduce the amount of trimming and removals necessary adequately to maintain the line.

It has been my purpose to present this subject in the hope that it may be introductory to intensive research.

This is a project that deserves our best thoughts and efforts in order to contribute to the safety and comfort of those who travel our highways, to cooperate with the growing and expanding utility interests whose problem is to maintain good public relations in furnishing power and lights to rural areas, and, at the same time to protect our highway trees. Research should reveal existing practices, laws, and techniques that will be helpful to the highway administrator and the utility official for the best interests of the people of today and tomorrow.

> No place is complete without trees — a home without trees is charmless, a road without trees is shadeless, a park without trees is purposeless, a country without trees is hopeless.


PLANTING ZONES FOR HIGHWAYS OF VARYING WIDTHS
VIRGINIA DEPARTMENT OF HIGHWAYS
H. J. HEALE
LANDSCAPE ENGINEER
110'
140'
200'