ESTIMATING COSTS OF TREE PRESERVATION ON RESIDENTIAL LOTS

by Andrew F. Seila and Linda M. Anderson[1]

Each time a developer prepares to construct a new house on a wooded lot, he must make decisions, either explicitly or implicitly, concerning how many trees should be removed from the lot. These decisions have immediate and direct financial consequences for the builder in terms of the cost of tree removal, any income that may be derived from selling the trees that are removed, cost of construction, and the salability of the house. More importantly, however, these decisions have long-term consequences for residents of the area because they collectively determine the nature of much of the urban forest.

A healthy and mature urban forest is generally considered desirable by today's society. In addition to the pleasing esthetic value that trees have, they are perceived to increase privacy, reduce noise, and enhance the value and salability of residential lots. It is generally agreed that the value of forested residential property is higher than that of unforested property, and this knowledge certainly influences developers' decisions concerning tree removal. However, since developers are businessmen, their tree preservation decisions must be based upon anticipated overall economic consequences.

Currently, little is known about the economic environment in which tree removal or preservation decisions are made. In this article, we report on two surveys conducted to examine builders' perceptions of the costs associated with tree preservation on home construction sites. The first study was conducted in 1977 in Amherst, Massachusetts, by John Lash and Brian Payne of the USDA Forest Service. We conducted the second survey in 1980 in Athens, Georgia.

The Amherst, Massachusetts study[2]

Lash and Payne surveyed nine homebuilders, asking them what it cost on average a) to remove all trees from a homesite; b) to try to preserve selected trees on the lot through construction; and c) to remove all trees and replace some of them with nursery stock. In each case, a heavily-wooded lot was assumed.

The Amherst builders reported an average cost of about $1,000 (range $250 to $1,900) to clear a heavily-wooded lot of all trees. If trees were to be preserved, the costs were higher, averaging about $1,700 (range $650 to $3,250). This increase in costs was in part due to the need to hire professional experts to advise on which trees to preserve, to build barricades to protect trees during construction, and to pay for increases in time and trouble in working around trees on the lot. Six of the builders had had the experience of clearing all trees and replanting nursery stock. They reported the average cost for this practice was $1,500 (range $1,000 to $1,750).

So in Amherst, clearing trees from the lot cost an average of $1,000. Preserving some trees cost an average of $1,700. Clearing all trees and replanting with nursery stock cost an average of $1,500. The Amherst builders sometimes encountered building codes requiring that trees be found in yards around new homes. In such cases, the advantage is with preserving trees — for an average of $200 more, they can preserve much better and older trees than could be planted as new stock.

The extra cost of $700 to preserve trees, as opposed to clearing the lot, would be more than recovered if trees add even 3 percent to the value

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[2]Our thanks to John Lash who provided us with background information and unpublished documents describing the Amherst study. We also wish to thank Linda L. Johnson for conducting the interviews in Athens.

of a home. Earlier work by Payne[3] in the same area indicated that trees added 5 to 7 percent to the value of homes. The nine builders reported that they were always able to recover their extra costs for preserving trees in the sales of their houses. They also all agreed that public demand was for homes landscaped with trees.

The Athens, Georgia study

We decided to address the same issues, with a slightly different procedure, in Athens, Georgia. Rather than ask builders for their estimate of the average costs of various tree removal or preservation practices, we asked about their costs for tree removal or preservation for specific houses they had built in the previous few years. We chose a sample of 106 houses in Athens and the surrounding area. The nine builders of these houses were asked about the tree preservation or removal practices they followed for each house.[4] Analysis of the survey data revealed that the costs incurred by Athens builders for tree removal increased

—as the density of trees in the original stand increased;
—if the proportion of hardwoods in the original stand was either very high or very low;
—if more than a minimum number of trees was removed;
—as the size of the lot increased.

The total sales price of the house and lot, and the size of the house, showed no relationship with tree removal costs. Table 1 shows the average costs of different tree removal practices reported by the Athens builders.

The relative differences in costs for various tree removal or preservation practices were the same from year to year, with selective thinning and clear-cutting about equally costly, and preserving all possible trees much less expensive. The Athens results show that builders' tree policies which call for removing more than the minimum number of trees cost three to eight times more than those involving little or no tree removal. However, in Athens, almost all tree removal or preservation practices cost less than $500, and therefore are a very small portion of the total sales price of the houses. Again, the builders reported that public demand is for houses landscaped with trees, and any extra costs they incurred in preserving trees on the lot were recovered in the final sales price.

Comparing the two studies

The results of the studies in Amherst and in Athens seem to differ radically. In Athens, it costs $250 to clear a lot; in Amherst, $1,000. In Athens, it costs $280 to preserve selected trees on a lot; in Amherst, $1,700. A closer examination of the studies will help explain why the responses from the two regions are so different.

First, there were some procedural differences. For instance, in Amherst, Lash and Payne deliberately set out to sample nine builders of different sizes of houses, many of them custom builders, and who followed different tree presrvation or removal practices. They asked each builder for an estimate of his average cost following several different hypothetical tree treatments, but always for heavily-wooded lots. In the Athens study, we seleced over 100 houses, most of them not custom-built, and asked the builders of these houses for their impression of the specific cost of treatment for each particular unit. In both cases we are relying on the builder's ability to estimate this particular cost out of the whole gamut of costs he encounters in building each home. Lash and Payne's builders also had to average the cost over a large number of conditions which can strongly affect the total cost. Also, the Amherst builders were only asked about high density stands, while stand density varied for the Athens sample. However, even the densest stands in Athens did not produce costs nearly as high as the costs reported for dense stands in Amherst.

More important than these procedural differences were differences in what builders in the two areas meant by "selective thinning," and "preservation" of trees. For instance, Athens builders did not report hiring forestry or horticultural consultants to advise them on which

[3]Payne, Brian. 1973. The twenty-nine tree home improvement plan. *Natural History*, 82(9): 74-75.

[4]Details of the procedure and analyses of the Athens study can be obtained from the authors.

Table 1. Costs incurred by Athens, Georgia, builders for various tree removal and preservation practices.

Practice	Number of cases	Average cost	Lowest cost	Highest cost
Clearing all or part of lot	5	$255	$150	$ 375
Selective thinning of all or part of lot	44	284	50	1250
Preserving all possible trees on lot	27	39	0	350
No policy (few trees originally on lot)	30	17	0	250

trees should be removed and which retained. Nor did the Athens builders report frequent use of tree barricades or other protection measures. Trees were rarely thinned selectively in a forestry sense of choosing the best or more valuable trees to preserve. Rather, trees were often removed only from the foundation, drive, and septic tank areas, with added "selective thinning" of pines only from the rest of the lot.

In Athens we rarely encountered construction of speculation houses on choicely wooded lots. Rather construction was occurring on old fields abandoned at different times past. Some of the more recently tilled fields had only scattered young pine, while older fields had mature pine with a dense hardwood understory. The Amherst builders were asked about a heavily-wooded lot, and probably responded with a choice wooded lot in mind — one with some old oaks or birch copses to preserve. By asking Athens builders only about houses that were actually constructed, we forced them to consider all qualities of wooded lots, most less than ideal, so that our estimates of costs were much reduced. The studies illustrate several points worth emphasizing to the arborist and to the developer.

First, there are many ways of treating trees on lots during construction. Between Amherst and Athens, a large number of these alternativs were surveyed for several different kinds of conditions. Widely varying costs and differences in the initial and final appearance of the lots are the rule, not the exception. It would be unwise to take the reported estimate of one builder, for one house, and expect that other builders and other sites should encounter the same costs. Sometimes it is expensive to preserve trees — when tree experts are paid for advice, when barriers are constructed to preserve particular specimens, when supervision is intensified to protect trees from careless equipment operators, etc. On the other hand, if the builder feels no need to be selective in which trees are preserved, and simply builds the house without clearing more than the minimum essential space, costs can be much reduced.

Secondly, just as costs vary from site to site, so does the "best" policy with regard to tree preservation and removal. If tree survival can be predicted to be good, the preservation of existing trees is clearly a better choice than clearcutting, with or without replacement of trees with nursery stock. By preserving existing trees, the benefits of more mature trees can be enjoyed by the new homeowners that much sooner, and there will be much less disruption of the local environment. However, if desirable trees are left on the lot but are not protected against changes in grade, heavy equipment damage, burning, etc., they can become liabilities, especially when they are close to the eaves. If such trees die, they can cost a considerable amount to remove. Selective thinning of trees is a good general policy, provided the selection is based upon both the desirability of the selected individual trees, and their chances of sur-

viving the construction process. Professionals with experience in tree care can advise builders on how the selected trees should be chosen, thinned, and protected. County extension agents and state foresters are sources for documents describing tree protection practices and considerations that should be taken when choosing trees on construction sites.

Finally, it is important to note that in Amherst, where reported costs were high for the type of tree preservation done there, and in Athens, where reported costs were lower for different types of construction in different kinds of woods, builders reported that they recovered their tree-protection expenses in selling their finished products. The public demand is for houses landscaped with trees; environmental quality is protected when trees are preserved; builders will recover their costs for protecting trees; and as in Athens, builders may find that construction costs are lower when only the minimum number of trees are removed.

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ABSTRACTS

Chapman, Douglas J. 1981. **Late flowering trees provide mid-summer color, interest.** Weeds, Trees & Turf 20(9): 26-27.

Trees which flower early to mid-summer can be particularly important in the landscape. When looking for diversity with excitement, yet low maintenance, yellowwood, goldenrain tree, Kousa dogwood, and goldenchain tree should be high on the list. These trees integrate well into mass plantings. They all seem relatively drought tolerant, having few or no insect and disease problems. Although their fall color varies, the uniqueness of early to mid-sumer blooms makes these truly exciting additions to the landscape. Although borderline hardy in central and northern Michigan, they should be considered somewhat commonplace from Detroit all the way south to the Washington, D.C. area.

Lambe, Robert C. and G.H. Lacy. 1982. **Crown gall.** Am. Nurseryman 155(3): 113-114.

Crown gall is a serious disease that can severely affect ornamentals. Numerous woody ornamentals are affected, including cypress, euonymus, forsythia, hibiscus, lilac, flowering peach, privet, roses, viburnum, and willow. Galls range from a fraction of an inch to several inches in diameter. Crown gall was first associated with the bacterium *Agrobacterium tumefaciens* in 1907. Only in the past decade was it discovered that the gall or tumor-inducing principle is part of a separate genetic entity, a plasmid, that is itself parasitic within the bacterium. The "pathogenic" bacterium, then, is just a vehicle for transmitting the disease-causing organism to the plants. After the bacterium attaches to plant wounds and multiplies briefly among parenchymatous cells, the tumor-inducing principle moves into the plant and is maintained with the host's genetic material. Because the bacterium is not necessary for tumor development, many galls become "aseptic" or free of *A. tumefaciens*. Strict sanitation is necessary to prevent spreading pathogenic bacteria.