THE TRADITION CONTINUES...

Ordinances protecting trees date back 300 years in Newark, N.J. Under tree pioneer Carl Bannwart, more than 60,000 trees were planted in the city. Today that tradition lives on.

by Frank J. Sudol and Alvin L. Zach

One of the major areas of concern to residents of any municipality is the maintenance of street trees. In Newark, N.J., tree maintenance was once the largest area of citizen complaint. Over the past four years, however, the city has set a new standard for establishing a comprehensive urban tree management and implementation program.

The city today continues the tradition set by Carl Bannwart, its first urban forester. During the last three years, more than 20,000 trees have been pruned, all dead trees and all stumps removed, and more than 3000 new trees planted.

The tree management program was vigorously re-instituted late in 1984 when the city council contracted to provide a complete inventory of all street trees, park trees and to recommend planting sites.

Under the terms of the contract, the data collected was computerized and a comprehensive plan was developed for the city to use in caring for and replacing its trees.

The inventory included trees on public streets and in city parks. It contains information on location, number, size, species, condition, insect infestation, disease and other problems of the trees.

In addition, the location of each tree, by street address, block and lot,

census tract and ward, as well as its genus and species, size (diameter at breast height), height to the top of its crown, maintenance needs and loca-
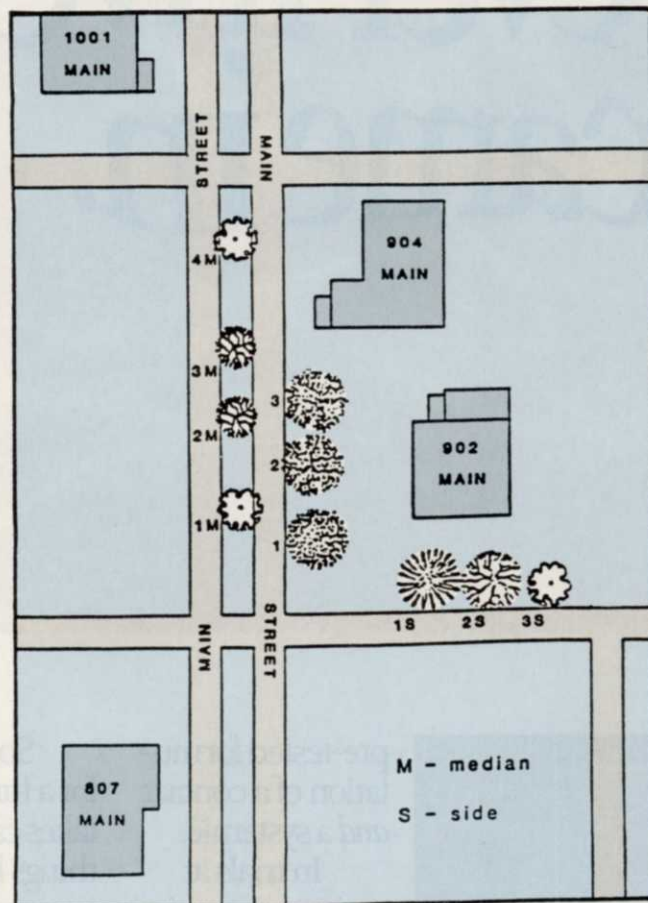

Newark's tree numbering system using an "S" to note side lot trees and "M" for roads with tree medians.

tion in relation to overhead wires was noted.

Future tree planting sites were identified for the optimum planting of new trees, detailing the best species for particular areas.

The contract provided $46,125 for the inventory and $6,170 to train Newark employees to use the system.

The remaining $3,470 was used to develop a "work data program" that allows the department to record work as it is done on trees to continuously update the initial inventory. This has provided a complete data base on Newark's trees. It also allows the city to compare costs between contractors, various tree species, tree locations and total expenditures on each tree care function such as removal and pruning. This work data program was recently revised by the city's computer consultant to make it more functional and to better meet the city forester's needs.

As data is accumulated, it is possible to evaluate the comparative cost of maintaining an American sycamore to that of a maple. Then it can be decided when it is no longer economically viable to maintain a mature tree. In addition, it can be determined the cost ratio for numerous smaller trees compared to the cost of a large over-mature tree.

Inventory updating is performed by the city's forester in order to sustain the value of the initial inventory.

While the trees in Newark County parks were not included in the city's inventory, it's important to note their significance. Newark is known as "Cherryblossomland" for the magnificent display of more than 3,000 cherryblossom trees in the 360-acre Branch Brook Park. It is one of the most famous in the world, exceeding even the Tidal Basin display in Washington, D.C.

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TABLE 1.
PLANTING SITE IDENTIFICATION

All planting sites for locations where trees should be planted were classified as marginal, small, medium or large and whether sidewalk or asphalt excavation is needed before tree planting. The following are minimum dimensions for planting sites:

Computer Code	Site Size	Sidewalk Excavation Required	Minimum Distance to any Tree	Minimum Distance to Building
MGPS	Marginal	No	30 feet	6 feet
SPS	Small	No	30 feet	10 feet
MPS	Medium	No	40 feet	15 feet
LPS	Large	No	50 feet	20 feet
MGPS/EX	Marginal	Yes	30 feet	6 feet
SPS/EX	Small	Yes	30 feet	10 feet
MPS/EX	Medium	Yes	40 feet	15 feet
LPS/EX	Large	Yes	50 feet	20 feet

The following are additional specifications used to determine the presence of planting sites:

* All planting sites were at least 35 feet away from the intersection of curbs.

* All planting sites were at least 10 feet away from fire hydrants.

* All planting sites were located at least five feet away from any visible or identifiable underground utilities, signs, light poles, driveways or other permanent structures.

* The largest possible size classification was recorded for each planting site.

Trees receiving a rating of "safety trim" are recommended for trimming to remove hazardous deadwood and/or broken branches.

Defining work

By visual inspection, work needs and priorities were determined. The maintenance need was assigned based on a thorough visual examination of the tree by trained and experienced tree care experts. Each tree needing work was put into one of five categories: tree removals, safety trim, routine prune, safety clearance trim and prune to shape.

This data provided a basis for prioritizing trimming and removal needs. It assisted in developing accurate trimming forecasts. Definition of the maintenance groups are:

1. Tree removals. Trees designated as "removal" had one or several defects that could not be cost-effectively or practically corrected. Such defects included severe trunk decay and severely decayed or weakened V-crotches that could not be effectively called or gauged. The majority of the trees in this category had a major percentage of their crown dead and consequently were potential safety hazards.

Smaller trees (0 to 6 inches diameter breast height) listed as "removals" are usually those that have died as a result of transplant shock, vandalism, poor cultural practices or other causes.

2. Safety trim. Trees receiving a rating of "safety trim" are recommended for trimming to remove hazardous deadwood and/or broken branches. Most of the trees in this category pose a potential safety hazard which could result in bodily injury or property damage. These were further classified into two priority categories based on the potential for injury or liability:

a. Immediate priority: any tree with broken or hanging limbs, hazardous deadwood and dead, dying or diseased limbs or leaders greater than four inches in diameter that are in immediate danger of falling.

b. High priority: any tree with dead, dying, diseased or weakened branches between two and four inches in diameter that are a potential safety hazard.

3. Routine prune. Trees receiving this rating often have problems that have the potential of becoming safety hazards if not corrected in the near future. This includes trees with deadwood which presently pose little threat of bodily injury or property damage, correctible structural problems and/or growth patterns that would eventually obstruct traffic or interfere with utility wires or buildings. Routine prune maintenance needs were classified into two priority categories:

TABLE 2
CONDITION CLASS RATING SYSTEM
Condition class uses the following rating scheme:

TRUNK CONDITION:	Sound & solid (5) Sectons of bark missing (3) Extensive decay & hollow (1)
GROWTH RATE:	More than 6-inch twig elongation (3) 2- to 6-inch twig elongation (2) Less than 2-inch twig elongation (1)
STRUCTURE:	Sound (5) One major or several minor limbs dead (3) Two or more major limbs dead (1)
INSECT & DISEASES:	No pests present (3) One pest present (2) Two or more pests present (1)
CROWN DEVELOPMENT:	Full & balanced (5) Full but unbalanced (3) Unbalanced and lacking a full crown (1)
LIFE EXPECTANCY:	Over 30 years (5) 15 to 20 years (3) Less than five years (1)

Total Points	Class
23 - 26	Excellent
19 - 22	Very good
14 - 18	Good
10 - 13	Fair
6 - 9	Poor
0	Dead

a. *High priority:* all trees with dead, dying or diseased wood between one and two inches in diameter and/or requiring removal of interefering or weak branches which need attention in the near future, but pose no current threat of bodily injury or property damage.

b. *Low priority:* all trees with dead, dying or diseased or other incipient problems that are judged not to need immediate maintenance attention and pose little threat of becoming serious problems until their next trim cycle.

4. Safety clearance trim. This category represents trimming needed to clear areas that obstruct pedestrian or vehicular traffic. All trees obstructing the view of traffic control signs were noted in this category.

5. Prune to shape. Indicates the need to prune small trees correctly or eliminate weak, interfering or objectionable branches in order to minimize future maintenance needs. This applies to trees that can be worked with a pole pruner by a person standing on the ground.

6. Clearance. All trees not cleared to a height of 13 feet 6 inches over roads and 8 feet over sidewalks were included in this category.

Accomplishments
As a result of the inventory and cost comparison with city-provided services, the city's Department of Engineering moved to contract all tree maintenance at substantial cost savings to the city. Without the inventory, much of the work would not have been performed. The organized record-keeping offered by the inventory has aided the city dramatically. Now, only one individual is needed to maintain the system and contract out all necessary work as computerized scheduling necessitates. The computerized inventory also has provided the city with better accountability on how it spends tree management funds.

In 1985 and 1986, more than 2,600 trees were removed at an approximate cost to the city of $350,000.

The Department of Engineering planted approximately 1000 street trees in 1986. Sites were determined by resident request and city prioritization. An emphasis for planting new trees was placed around urban garden sites, residential communities and areas where the likelihood of vandalism is less. The apporixmate cost for the 1987 planting of another 1,000 trees was $350,000.

The DES street tree inventory did not inventory tree stumps to be removed within city boundaries. The Department of Engineering, however, identified approximately 100 stumps from city resident requests, other requests and departmental field inspections. All stumps were removed with an approximate cost of $20,000.

By the end of 1987, two-thirds of Newark's tree population had been trimmed since 1985. The entire tree population was projected to be trimmed within another two years, with an estimated annual cost of $300,000.

Emergency tree work for fallen limbs, branches and trunks is another service the Department of Engineering now has under contract. The two emergency response times used are the one-hour notice and 72-hour notice. The estimated cost to the city is approximately $100,000. **LM**