TREE INFORMATION: A SPLIT SCREEN SYSTEM

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Abstract. A split-screen, main frame computerized tree information system has been developed in Windsor, Ontario, to integrate a manual tree inventory and work record system with a manual current work order system. The computer system provides tree information such as diameter, height, tree condition, location, origin year and survey year, for individual municipal addresses. This information is shown on a tree inventory file which is linked to the current work order and work history file. Simplified parameters were utilized for easy updating and information retrieval by municipal staff. A tree code was developed using a genus/species four-letter code from common tree name abbreviations. Tree locations were indicated by a floating tree ordering system in relation to the curb and position on the property, rather than using coordinates for each tree. The parameters provided on the tree inventory file allows the sorting of data to produce tree profiles by planning districts. Management of the tree population is thusly upgraded, enhanced, and systematized.

Managing street trees through a computerized inventory sytem (7) has become an important activity in developing an urban forestry program. An urban forestry program (8) usually develops from a basic street tree program (6). The integration of a tree inventory card index with a manual work request system and transforming these into a computerized system is part of this development. Such a system is well suited to a city such as Windsor with some 60,000 street trees and 3,000 or more citizen requests for tree work annually.

Basic inventory design considerations. It is essential to determine beforehand the form and purpose of your system (11). Some of the purposes of such systems were outlined (1) as follows: a) identify diseased or damage-prone tree species, b) determine which trees should be preserved and protected during development of building and facility construction sites, c) appraise the monetary value of trees that have been or might be injured or destroyed, d) develop a resource inventory for planning, budgetary, and maintenance operations, and e) support legal testimony of municipal representatives in the event of litigation resulting from damage by trees to people or property.

One example of a computerized system (3) involves a basic tree inventory combined with an elaborate tree health reporting system. Other approaches (9) provide for a random sampling procedure to establish species composition and structure of street tree populations. Three important attributes of a tree information system were outlined (4) as follows: a) What is the site, condition, and location of the tree? b) What work and/or inspections have been carried out? c) Are there any complaints and/or investigation records?

The tree card system. The basic tree card index system in Windsor, dating back from 1965, provided entries for size, condition, location, etc. Work completed for a municipal address was entered on the same card, whereas current work requests were handled through a separate manual system. In redesigning our system, the tree inventory data, current work requests, and work completed entries were integrated into one combined system. In addition, inventory parameters were selected to provide us with the opportunity to present species composition and age class profiles and other management considerations in order to produce working plans for 19 planning districts.

Choosing our computer system. The choice was between a microcomputer system (2) or choosing a main frame computer. Microcomputers are extremely useful where a relatively small data base is involved, such as in arboreta, small towns, or park tree inventories as outlined (5) and (10). A large data base of more than 10,000 trees makes the choice of a main frame computer a necessity. Our main frame computer is a 11-71, El Sperry operated by the Data Processing Section, Finance Department, of the City of Windsor, N9A 6W5. This main frame computer provides for a municipal data base for all physical and service functions on the municipal rights-of-way. Our tree inventory has become part of this data base and can be accessed through the municipal address listed on the tax rolls. This main frame data base system allows us to add our park tree inventory as well, and the park trees can be accessed through a park's name.

A split screen layout. The basic design of our system is a double or split screen. This design provides us with the basic inventory situation at a municipal address, as well as allowing us to compile and sort data to produce working plans. The first screen is accessed through the municipal address and shows the layout in Table 1.

The second screen is the tree work order history file which is linked to the inventory file for a specific municipal address. This second file is accessed from the tree inventory file through a function key and shows the layout in Table 2.

The tree work order history file exhibits the combination of current work requests (WR) on the top entry line as well as past work performed. In this way, we are able to combine the manual work order requests system with work completed system into one system, which is linked directly to the physical tree situation at the municipal address. One screen display allows for nine vertical entries, but additional panels of nine items can be obtained by rolling the screen.

Parameters Of The Tree Inventory File

Survey order of trees. Trees are surveyed on municipal properties always from low to high numbers on the street. Where more than one tree is located on one property, the tree order is established in relative order, in the survey direction of low to high street number. On our example of a tree inventory file, the MANO (Norway maple) is the first tree encountered followed by the POCO (cottonwood poplar). If a young tree is placed in between, the MANO is still the first item, the new tree becomes the second entry and the POCO becomes the third entry. No actual number is assigned for ease in future updating, rather a relative floating positioning of trees on a property is maintained.

Species codes. The four letter species codes MANO and POCO consist of a common tree name combination of genus and species, e.g. MA = maple, PO = poplar, MANO = maple Norway, POCO is poplar cottonwood. TREE indicates a private tree near the rights-of-way, while BUSH indicates a landscaping or private conifer. POST indicates a physical limitation to the presence of a tree because of pavement, hydrants, or other physical obstacles.

Diameter. Is the value in centimeters taken at breast height (1.60 m above ground). It is used to sort trees for maintenance purposes and the

TABLE 1.

TREE INVENTORY FILE

PROP ADDRESS ON TAX FILES IS: 01642 ADANAC

SPECIES NAME	ORIGIN YEAR	DIAMETER (CM)	HEIGHT (M)	DISTANCE FROM CURB	CONDITION OF TREE	SURVEY YEAR
MANO	1983	043	17	01	G	1983
POCO	1931	090	22	02	F	1983

preparation of tendering lists.

Height. Is the value to the nearest meter, and is used to sort for tree maintenance crew size/ equipment organization and long term tree profile projections.

Distance from curb. Is the distance from tree to curb, which is used to establish ownership.

Condition of trees. Is either good, fair, or poor, to indicate for a certain survey year whether health problems exist.

Survey year. Is the year of the initial survey in 1982 and 1983 and later update years. The original base line inventory of 1982-1983 is stored separately, so that the tree inventory file can be continuously updated, without losing the base line survey.

Origin year. Is determined for older trees from preliminary diameter/height/age relationships or from current information on newly planted trees. This allows us to estimate life expectancy for various tree species.

The work order history file. All types of work requests or inquiries by citizens, as well as work completed for trees listed on the municipal property addresses can be entered and maintained on the tree work order history file. They are flagged with WR or work request. Citizen work requests are entered on a daily basis on the work history display screen. A print-out is produced of each work request showing the tree work inventory display and beneath the tree work order history display and the print-outs are forwarded for investigation and/or completion to the Forestry field staff. The purpose of this file is to provide the current status of citizen work requests and also relate these to past work completed.

Data collection, input & output. Field data were collected by survey teams consisting of 3 biology students during the summer of 1982 and 1983. The street tree data were transferred to the tree inventory files by grant project personnel, as well as the old manual work history entries. Updating of data is carried out continuously for both files, as work is carried out. Our Data Processing Department has provided us with programs which sort our tree inventory data for age, diameter, and height classes and other parameters, used in establishing working plans. Sort programs have also been created to sort for outstanding work requests to tabulate potential planting sites and to draw up our basic tree listing for tender work.

Discussion

Many variations in the design of a computerized tree inventory are possible (1, 2, 3, 4, 5, 7, 9, 10, 11), depending on one's objectives. The municipal tree inventory in Windsor is relatively simple to establish, operate, and update with limited staff and resources.

Secondly, the system is accessible for manipulation by our office and field staff and for this reason, a common name genus/species code rather than using scientific names was established. Also, tree locations are oriented to the street curb, rather than using a coordinate system. In addition, relative floating positioning order of trees for specific addresses is readily updated by field staff. Our tree condition is simple in

Table 2.

PROP ADDRESS ON FILE IS: 01642 ADANAC

DATE PERFORMED	SPECIES NAME	WORK PERFORMED
AUG 31/84	POCO	WR REMOVE MRS WOOD 735-5910 SEWER PROBS.
FEB 17/75	MANO	TRIMMED
MAY 06/69	MANO	SPRAYED (APHIDS)

comparison to elaborate tree health documentation (3), which requires higher skill level inputs.

Most importantly, by creating a split-screen design we were able to separate the tree inventory data from the work history data. By adding the current work requests to the work history records, a current system of tree information is provided which is directly linked to the tree inventory data. In summary, the split screen computer information system provides: a) instant information of the actual tree situation at each municipal address (tree inventory file), b) a record of arboricultural work performed at each address (tree work order history file), c) a record of current tree work requests, investigations, and outstanding work records (tree work order history file), d) computer printouts for arboricultural tenders (from tree inventory file), e) base-line data on the municipal trees that can be sorted by species, age, height, diameter for compilation of working plans by planning districts or larger working units (tree inventory file), and f) a faster and improved tree call response system.

The information items a, b, c are printed to provide the field staff with a work order sheet listing the tree situation and work performed as well as the actual current work request. The split-screen tree information system allows for work requests to be sorted immediately for their priority in investigation during the growing season work overload.

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Abstract

OSSENBRUGGEN, SHARON. 1985. **A properly placed cut is crucial to healthy pruning.** Am. Nurseryman 161(6): 132-136.

For protection, trees wall off dying branches. Every branch has internal tissues that separate it from the trunk. As this tissue forms, the bark is forced upward to form a raised ridge on the trunk that separates the branch from the trunk. This is the branch bark ridge. It is the guide to proper pruning. Proper pruning means removing dead, dying, or living branches so that the branch collar is not injured or removed. The recommended pruning is called natural target pruning. It is natural because the cut lines are made along those that the tree forms for natural shedding. It is target pruning because the tree provides target points as guides for the cut. These target points are obvious on most trees, even more so on dying and dead branches.