MANAGEMENT OF STREET TREES: PLANNING

(Miller, Chapter 10)

Municipal Street Trees

Exactly what are street trees? Miller defines types of street trees by the site they occupy, as illustrated in Figure 10-1

Lawn Trees, can be either public or private if in the city easement

Strip Trees, in lawn or not, the strip often used for underground utilities or snow storage in some cold areas. Miller does not mention the common use of cut-outs, but in a way, they can be thought of as interrupted strips.

Median Trees are planted when a median separates traffic in opposing directions, but this is very common today. More often we see shrubs used to block lights of oncoming traffic for safety. Large tree trunks are also a danger when hit by a car.
We have already seen Urban Forestry programs vary greatly from city to city, and state to state in the US. Municipal street tree inventories illustrate the differences.

Street Tree Inventories

In a country-wide survey of 320 cities, Kielbaso and Cotrone, concluded there were 60 M Street Trees in US cities in 1989, along nearly 600,000 miles of roadside. Hence, they estimated a national average of about

102 trees per mile actual

In 1976, Barker estimated the miles of street trees in the US to be 620,000, a bit higher than the Kielbaso and Cotrone estimate of 600,000, but probably as close as we will get. From this, Barker estimated there was room for just over 100 M street trees.

He assumed that 58 feet is the proper spacing for street trees, this is 40 feet between trees plus 18 feet to account generally for intersections and other obstructions, i.e.

58 ft = 40 ft + 18 ft

AND, full stocking would be 182 trees per mile, that is

(5,280 x 2) / 58 = 182 trees per mile of street
So, \( 620,000 \text{ miles} \times 182 \text{ trees/mile} = 112,840,000 \)

.... At Full Stocking

And, the 60,000,000 trees reported by Kielbaso & Cotrone, divided by the Full Stocking Value of 112,840,000, suggested by Barker = .53

So, under these assumptions, nationally, we were just above 50% stocking (in about 1990).

However, there is considerable variability from city to city. In a 1993 studies, the following stocking rates were reported:

**Milwaukee (Ottman)..... 143 trees per mile** 79%

**Minneapolis (Hermann) .....150 trees per mile** 82%

I used Barker’s estimate that there are 182 spaces to estimate these %s.

However, each city did have it own estimate for spaces available, and,

**Milwaukee, claimed there was room for only 160 trees/mile,** giving 89%

**Minneapolis, claimed there was only room for 150 trees/mile,** giving 93%
Therefore, stocking level depends on ?????

And, Maco and McPherson estimated the stocking rate for Davis at 97%.

Furthermore, with densification and smart planning, we are being forced to use smaller and smaller trees meaning that trees will need to be spaced closer than 40 feet. They will also not reach the same height nor produce the same energy saving shade. Thus, we are conflicted with the need to save precious land but also precious energy.

In addition, surveys of 5 cities in 1979 also indicate that people prefer large to small trees. More on what people prefer in their trees later!

Budget

What are we Spending on these street trees

Tschantz and Sacamano surveyed cities in 1993 to see how much of the Urban Forest budget was being spent on various activities:

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Table 10-1

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I have summarized the totals over all cities, large and small, to estimates %s

<table>
<thead>
<tr>
<th>$K $</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street trees ...................... 226</td>
<td>57</td>
</tr>
<tr>
<td>Park trees ......................... 62</td>
<td>16</td>
</tr>
<tr>
<td>Public Grounds ................. 89</td>
<td>22</td>
</tr>
<tr>
<td>Cemeteries ......................... 6</td>
<td>2</td>
</tr>
<tr>
<td>Municipal Nurseries .............. 16</td>
<td>4</td>
</tr>
<tr>
<td>Total ........................................ 399</td>
<td></td>
</tr>
</tbody>
</table>

So, in general, street trees are 3.6 times as costly as park trees, but more on that a moment.

In California,

the total number of trees in cities and counties seems to be fairly constant but the number of people is increasing. Thus, the number of trees per person is declining.

From 1988 to 1992, increases were:

| Street trees ...... | +3-4 % |
| People ............ | +12 % |
| Street Trees / Person | - 6% |
But, the Good News .... **Park Trees** were up over + 20 % per person

In another study, the same pattern had been observed in California from 1979 to 1988, but the sampling was not as good

Now, if we combine street and park trees, we can compare regions of California

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Where we see that

Sacramento V > San Joaquin V

Coastal areas same and unchanged

N Coast and Sierra are low

Dramatic increase in 1992 in South Interior

Overall less than ½ tree per person

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So now let's ask, why are there fewer street trees per person? Trees per person and tree size may have been reduced over the last century for numerous reasons, in addition to smaller lot size in cities. Miller suggests the following possibilities:

A. Air conditioning
B. Automobile and ability to escape the city for the suburbs
C. Urban renewal
D. Street widening for increased traffic
E. Absentee ownership
F. Safety issues, old trees, vehicle maneuverability

**Long or short term planning**

Generally long term planning is used to schedule cycles and short term, or day to day plans, is used to respond to requests that may be a crisis. Some cities respond to a request for tree care or removal, make an inspection a place the case on a scale of relative importance, sometimes an A, B or C, where A is today if at all possible, and C may never get done.

When crisis management eats up the entire budget, you are in trouble because the frequency of tree care, including pruning, will go down and it just gets worse. This may result from too much work and too small a budget, or may result from imperfect management. Where is the work backing up? Can there be more delegation at that level? Is a perfectionist “clogging the drain?”
How much are we spending on the Urban Forest?

Greg has estimated some costs, app.

<table>
<thead>
<tr>
<th>City</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>$7,500,000</td>
</tr>
<tr>
<td>Berkeley</td>
<td>$2,372,000</td>
</tr>
<tr>
<td>Santa Monica</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Ft Collins</td>
<td>$998,000</td>
</tr>
<tr>
<td>Davis</td>
<td>$450,000</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>$328,000</td>
</tr>
<tr>
<td>Bismarck</td>
<td>$317,000</td>
</tr>
<tr>
<td>Glendale</td>
<td>$276,000</td>
</tr>
</tbody>
</table>

These values seem large until they are compared to the budget for the entire city. Again we can look at the Tschwantz and Sacamano survey for the US,

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Where we see that for whatever size of city the % in 1994 is less than one half of one percent.

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For California cities we spend annually about

$4.50 per resident

$18.00 per tree

Who does the work?

Historically, city Departments of Parks, or Parks and recreation, have planned, planted and maintained Public Trees, but in recent years more and more cities have contracted with private companies. These services can include:

A. Management Services, that include everything from writing ordinances to mapping and establishing tree inventories, that is taking responsibility for the entire Urban Forest.

B. Establishment Services, that plan the tree plantings, obtain the trees from nurseries, and plant them.

C. Maintenance Services, that prune trees and repair any damage, replace trees or stakes, dispose of tree waste and grind stumps.

The issue is often decided by the costs involved, and often private firms can perform tasks for less money than can city employees. In theory, companies compete with each other and become more efficient. They often do not hire union workers and do not
provide the same level of benefits, such as health insurance, retirement, etc, as do cities.

When private companies provide a service, it is the responsibility of the City Forester to inspect the work performed and be sure it is up to standard. Typically, the work will go out to bid and the City Forester is well advised to not accept the lowest bid. The reputation of the firm is important.

While costs often favor the private option, there are some advantages to doing the work in house. Cities may have some flexibility in shifting crews from one department to another. The entire city work force would usually be much larger than that of a private company. This can become important when a major storm causes so much damage that a smaller firm would take too long, and increase the level of post storm problems.

And, of course, the opposite is true for a very small city that would have difficulty providing expensive equipment needed to deal with major problems.

So, it all depends ??????

Lets conclude Chapter 10 with Miller’s Model for Urban Forest Planning

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How to plan?

Special Situations

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