

Systematic Management of the Urban Forest

By Paul Ries, Rich Hauer, and Ward Peterson

Editor's note: This is the third in a series of articles we'll be publishing that focuses on trends and best practices in municipal arboriculture and urban forest management, based on findings from the research project, Municipal Tree Care and Management in the United States.

A goal of many municipal urban forestry programs is to become more proactive and less reactive in managing their urban forest resources. This approach can be described as *systematic*, and ideally lead to more efficient and effective management. One definition of systematic concerns deliberate actions that are pre-planned in a coordinated way. In such a case, the terms *orderly*, *logical*, *methodical*, and *structured* would be synonymous with *systematic*. Opposites of systematic might be *disorganized*, *reactive*, or *unplanned*.

As applied to the field of urban forestry, systematic management refers to pre-planned actions designed to take place in an orderly and sequential fashion leading to an end result—such as when a park or neighborhood is planted with trees, an Arbor Day event is productively executed, or a preventative tree maintenance contract is completed.

A recent survey report (Hauer and Peterson 2016) explored how cities approach urban forest management, and whether said approach was more often in a reactive and crisis management mode, or systematically. This article,

one of a series of features based on this report and appearing in *Arborist News* this year, describes how many cities engage in systematic management of their urban forest resource.

Defining Systematic Management

An administrative goal for a municipal urban forestry program is often stated as “being systematic in our approach to managing the urban forest resource.” However, in reality, this goal could never be totally achieved. There will always be a certain amount of uncertainty in running an urban forestry program, regardless of whether the uncertainty is caused by weather events, political change, administrative reorganization, or any other event or situation that can't be predicted. So, while a municipal urban forestry program must by nature be reactive at times, it should strive to be proactive (or systematic) whenever possible. Inherent in the idea of systematic management of the urban forest is the concept of planning.

Systematic management of the urban forest is an approach that focuses on tree care planned well in advance. In contrast, reactive management occurs on-demand as the result of a crisis, an unplanned event, or even the lack of an urban forestry program. In some cities, a reactive approach is the only approach, primarily due to funding or staffing limitations or the lack of a coordinated program.

Regarding what constitutes a systematic approach, there is no agreed-upon ratio of active:reactive management activity. Kielbaso (1988) deemed a community to have a systematic program if 40% or more of their work was scheduled. Any percentage less than 100% is based on the reality that some reactive management will always be necessary. Even so, a reactive response can still be partially pre-planned, such as with storm response plans that are formulated in advance of severe weather events (Koeser et al. 2016). Consequently, in order to be efficient managers of taxpayer dollars, most cities would logically try to

Advantages of a Systematic Approach

- Safety: Taking care of tree problems before the trees fail.
- Efficiency: Having the right equipment and properly trained crews for the work, and getting the most done with the resources available.
- Productivity: Reducing travel, clean up, and organization time.
- Predictable, justified budgets: Working based on known work requirements.
- Community confidence and satisfaction: Support is based on performance.
- Quality of the urban forest: Result is a healthier, longer-lived tree population.

increase their amount of systematic response and decrease their amount of reactive response.

Elements of Systematic Management of the Urban Forest

Municipal Tree Management in the United States is a report based on a 2014 Municipal Tree Survey that asked city representatives a series of questions regarding the extent of their urban forest resource and their efforts to manage it. The survey included a series of questions meant to determine the degree to which representatives use a systematic approach to management.

Survey results reveal that 55% of respondents reported having a systematic program (Figure 1). Approximately 60% of communities with populations between 10,000 and 100,000 residents reported using a systematic approach. This decreased as populations increased—with 29% of locations above 500,000 ranked as systematic.

In further exploring the nuances of a systematic management approach, city representatives were asked to describe their overall schedule for tree maintenance. A majority (63%) of responding communities reported tree maintenance was a continuous activity (Table 1). Only the smallest communities were more likely to operate primarily on/under an emergency/as needed basis.

Tree pruning (including young tree structural pruning and pruning of mature trees) is the most common type of planned maintenance activity. Most respondents (99%) stated they prune trees to some extent (Figure 2). Those who reported pruning on an as needed/emergency basis, or reported using a regular pruning cycle, each comprised 46%. A response of pruning on an as needed/emergency basis was most common in smaller communities and

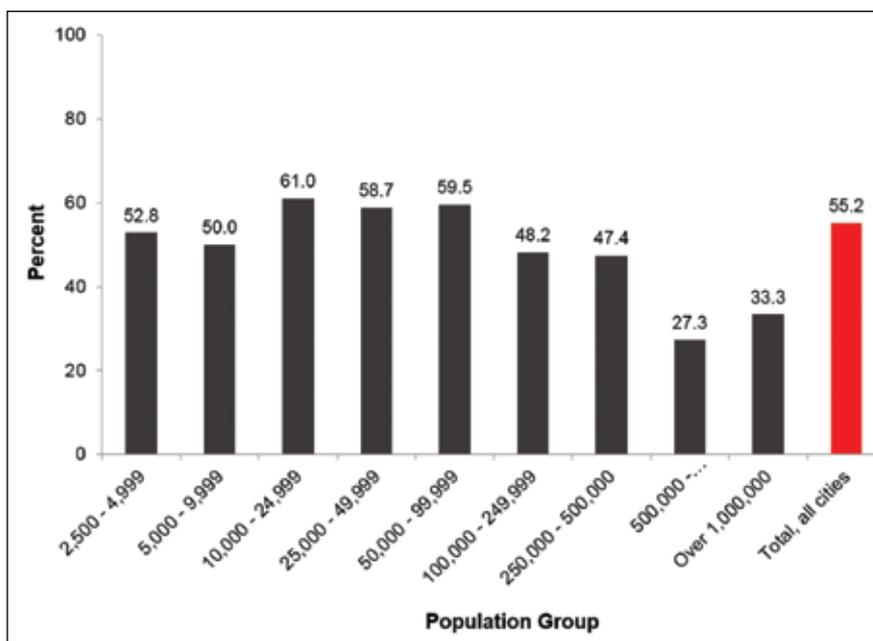


Figure 1. The percent of tree care (e.g., pruning, pest control) conducted on a systematic (regularly scheduled) cycle, as opposed to conducted on demand as reactive (e.g., complaints, hazardous situations, crisis, storm response)? Results shown: (n = 560).

declined as communities increased in size. As community size increased, tree pruning on a cyclical basis increased, with nearly half of the communities performing such activities.

Representatives of cities that use a regular pruning cycle were asked to describe their current and desired pruning cycle. A mean 6.6-year current pruning cycle was reported (Figure 3). A desired 4.8-year cycle leaves respondents 1.8 years off their desired pruning cycle. The cycle increased as community size increased. The reported pruning cycles were for communities using a cycle, and the mean actual pruning cycle for all locations is likely higher considering the number of respondents indicating they prune on an emergency basis only. ▶

Table 1. How would you best describe your tree management program's overall schedule for all types of tree maintenance?

Population group	n	Continuous throughout year	Seasonal during a specific time/period	Emergency/as needed only	Primarily at request of property owner	Other
2,500–4,999	47	38.3	21.3	31.9	4.3	38.3
5,000–9,999	25	36.0	20.0	32.0	0.0	36.0
10,000–24,999	30	76.7	13.3	0.0	6.7	76.7
25,000–49,999	130	61.5	18.5	9.2	7.7	61.5
50,000–99,999	145	66.9	16.6	5.5	5.5	66.9
100,000–249,999	81	75.3	6.2	4.9	6.2	75.3
250,000–500,000	18	61.1	22.2	16.7	0.0	61.1
500,000–1,000,000	8	75.0	0.0	12.5	12.5	75.0
Over 1,000,000	3	66.7	0.0	33.3	0.0	66.7
Total (all cities)	487	63.0	15.6	10.7	5.7	4.9

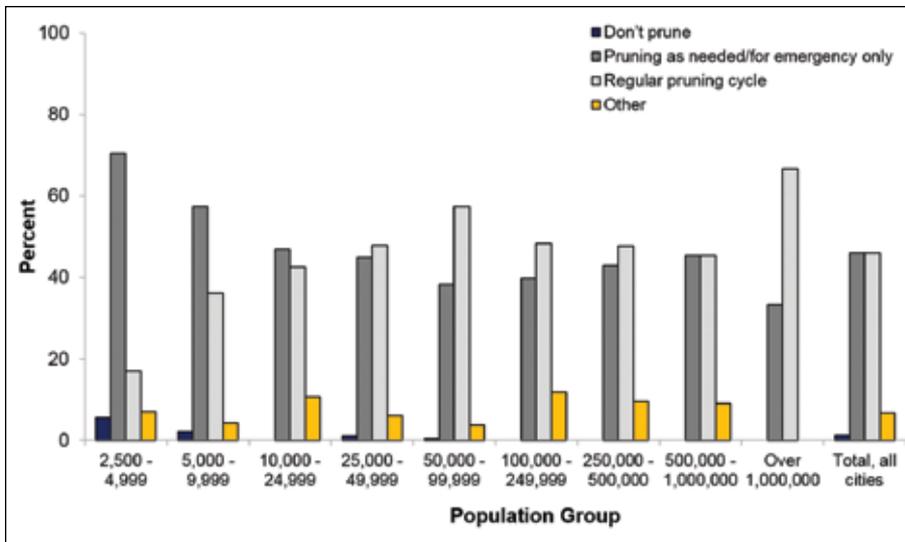


Figure 2. How would you best describe your tree management program's approach to pruning? Results shown: (n = 641).

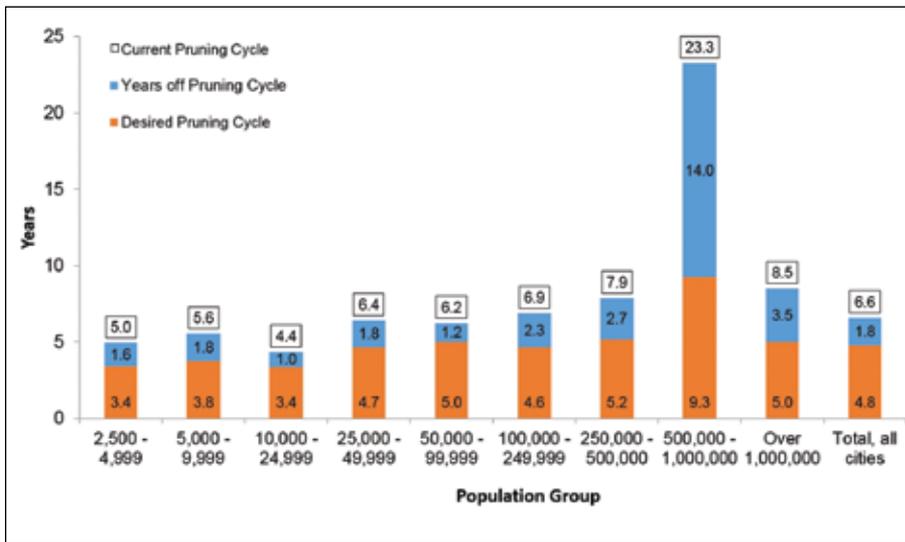


Figure 3. What is your current pruning cycle, your desired cycle, and years of the current pruning cycle? Current cycle: n = 227; desired cycle: n = 146.

Integrated Pest Management

Respondents were asked about the management of urban tree pests, which is another activity that can be either planned or reactive. No method of control was reported by 32% of respondents. This was more common in smaller communities, with 56% of places with populations of less than 10,000 residents indicating no control of tree pests occurred. Treating outbreaks as they occur was common to 34% of respondents. An integrated pest management approach was common to 19% of responding municipalities. Spraying at regular intervals (once a much more common practice of tree care work) has become uncommon, with only 4% performing such activities now. Thus, the “spot and spray” approach of the

past has given way to “identify and respond.” (See the recent ANSI A300 Part 10, which details the latest industry standards for integrated pest management.)

Another important component of a systematic urban forestry program is record keeping. Records form a collection of information to identify what was done and how various management options work toward an established goal. Records can be used to document the work that certain crews have done, and can determine if said work is meeting the needs of the city. For example, collecting data on the response time required to abate high-risk trees and comparing this data to an internal policy concerning how many days are stated to correct such a high-risk situation allows a decision-maker to determine whether the terms of the policy are being met. The resulting analysis will not only minimize a risk of injury or property damage but will also document, ideally, if a community has been responding prudently to situations of unacceptable risk.

Conclusion

It is generally accepted that the management of the urban forest is optimally directed by a long-term strategy or plan, which is an inherently systematic process (Clark et al. 1997). Achieving this standard is far more difficult. Using a 40% threshold (Kielbaso et al. 1988), this survey reveals that only 55% of U.S. cities meet this systematic management goal. A similar survey in New Zealand found that only 33% of cities met the same threshold (Stobbart and Johnston 2012). Nonetheless, the benefits of systematic management of the urban forest remain a compelling reason for

communities to continue striving to adopt such an approach.

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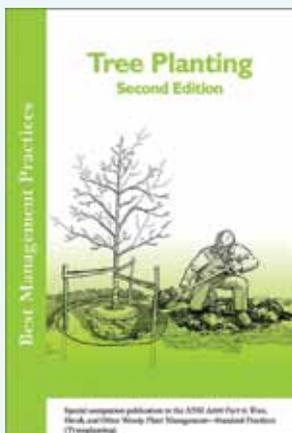
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Figure 4. To be efficient managers of taxpayer dollars, most cities would logically try to increase their amount of systematic response and decrease their amount of reactive response.