

Municipal Forestry Budgets and Employee Compensation

By Richard Hauer and Ward Peterson

Editor's note: This is the fifth article in a year-long series we are 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.

If I had a dollar for every time I heard, “We don’t have enough money to fund everything we do,” I think there would be enough money to fund all these shortages.

Municipal forestry operations, like other things, require money and people to operate and to grow the urban forest. Just how much funding is needed to finance a municipal forestry program? How much do people earn as municipal forestry employees? Where do budgets come from and how are they allocated? What does it take to fund operations on a per tree or per capita basis? What percent of municipal budgets are spent on forestry operations? The following article analyzes these details.

Budgets and Funding

Municipal forestry operations represent one of several functions that a community must prioritize through funding allocations. The general fund continues to be the primary funding source used, on average, by 86% of communities to support tree care and management. This has not changed much from the mean 85% of communities using this fund from all studies since 1974. One significant change is in the percent of the municipal forestry budget that comes from a city’s general fund. The percent of the communities using general funds has remained relatively constant, but the percent of their tree care operating budgets today (71%) has declined 15% since 1980, when 86% of the municipal forestry budget was funded by the general fund. The remaining mean 29%, on average, includes fees, donations, grants, endowments, dedicated tax, and utility funds. Thus, urban forestry budgets still use general funds but now use more additional sources for funding.

Greater diversification of funding buffers a reduction from any one source. Forestry grants are common in over

30% of communities, similar to the 29% reported in 1993. These grants fund 2.6% of municipal budgets. Funding from federal jobs training programs has continued a decline since reaching a peak of 9% in 1980 to only 0.3% of communities today. Federal jobs programs were common in the 1970s and early 1980s. In contrast, the upward trend with community block grants continues in 9% of locations today. Funding sources such as a special frontage tax, road use tax, endowments, vehicle tax, and gas tax are similar to past usage. However, they represent less than 3% of the budget on average.

A municipality spends a mean USD \$801,595 (\$107,800 standard error of the mean; \$332,872 median value) to fund urban forestry activities and management. A total 1.5 billion dollars (0.7 confidence interval 95%) is spent on municipal forestry operations in communities with at least 2500 people. Compared to past surveys (adjusted for inflation), funding today is at its highest point, on average (Table 1). This is, potentially, the result of many urban greening activities, such as large-scale tree planting efforts and planting trees for stormwater management, aesthetics, shade, and for screening objectionable views, among many more reasons. Another explanation to consider is the cost required to respond to pest problems, such as emerald ash borer (EAB) (*Agrilus planipennis*). Forestry budgets accounted for 0.52% of municipal budgets (Figure 1). This is consistent with the 1974 (0.54%) and 1986 (0.49%) allocations, and greater than the numbers reported more recently in 1993 (0.31%). The highest percent recorded was in 1980 (0.81%), which coincided with then continued response to Dutch elm disease (*Ophiostoma ulmi*). The current response to emerald ash borer is having a similar effect on budgets.

Table 1. The total number of public employees involved with the municipal tree management program and the total municipal budget in 2014.

Classification	Population (n)	Full-time equivalents			Total	CI 95%	Annual tree activity budget			
		Sampled (n)	Mean	SEM			Sampled (n)	Mean	Median	SEM
Total, all cities	7,478	508	4.36	2.10	32,588	5,864	477	801,595	332,872	107,800
Population Group										
2,500–4,999	2,344	47	3.31	0.60	7,756	2,758	27	19,406	10,000	3,878
5,000–9,999	1,883	35	3.10	0.61	5,836	2,253	33	68,446	22,630	25,274
10,000–24,999	1,750	41	4.70	0.76	8,233	2,609	36	102,683	65,458	23,869
25,000–49,999	786	121	5.25	0.50	4,127	771	125	343,596	210,253	32,344
50,000–99,999	442	146	6.27	0.53	2,770	460	148	646,501	451,704	56,335
100,000–249,999	200	87	11.78	1.27	2,356	501	78	1,368,607	1,000,000	152,066
250,000–500,000	41	20	18.28	4.23	749	351	18	3,074,165	1,657,742	643,149
500,000–1,000,000	23	9	18.22	2.10	419	100	9	2,221,708	1,880,000	376,697
Over 1,000,000	9	2	38.00	17.0	342	353	3	18,389,353	5,338,060	13,725,759

Notes: SEM = standard error of the mean, CI = confidence interval at 95%.

There are several useful methods for understanding the level of funding (e.g., \$/capita, \$/tree, \$/inch stem diameter) used to maintain public trees. An average \$42.59 (4.49 SEM) per street tree was spent annually in 2014. This includes all costs associated with activities (e.g., planting, pruning, pest management, removal). When all the trees (public trees along streets, in parks, and other public locations) in the community are considered, \$37.50 (3.02 SEM) per tree was spent. No apparent difference was found by community population.

Expressing and determining the cost of the forestry budget per capita is straightforward and involves dividing the total forestry budget by the community population. A mean \$8.76 (0.45 SEM) per capita was spent on forestry budgets (Figure 1). Municipalities with 25,000 and 500,000 people spent approximately \$9.40. By comparison, the Tree City USA program has a \$2 per capita base requirement for communities as one of four requirements for achieving their designation. A threshold of \$1 per capita was initially set in 1976 (later raised to \$2 in the 1990s); adjusting this value by the consumer price index to 2014 dollars, however, produces an \$4.16 value.

The current \$8.76 per capita spending is double the \$4.08 real amount reported in 1993. (That is, the nominal \$2.49 from 1993, adjusted by a 1.64 CPI change, yielded \$4.08.) Other past reported real values are as follows: 1974 (\$7.82), 1980 (\$6.29), and 1986 (\$5.62). Thus, the downward trend, dating back to 1974, seems to have stopped and reversed course in this current study. However, this can be a reflection of more money spent to respond to negative consequences, such as EAB, rather than more positive outcomes, such as tree maintenance, tree planting, and public safety through tree risk management.

The impact of emerald ash borer is likely a factor with higher spending, especially in the Midwest region (Hauer

and Peterson 2016). After the initial 0 to 4 years following EAB confirmation in a state, the forestry budget as a percent of the total community budget will approximately triple to a peak year in a five- to eight-year period (Figure 2). Spending on tree and stump removal increased at the expense of tree pruning (Figure 3). Tree planting spending did not increase in locations in places with EAB compared to other places. Activities, such as public education, safety training, and tree watering, declined in places responding to EAB.

Allocation of Budgets

The greatest allocation of funding continues with street trees, at 62% of funding. Every time this question has been asked in the past, a consistent 61% or 62% of the

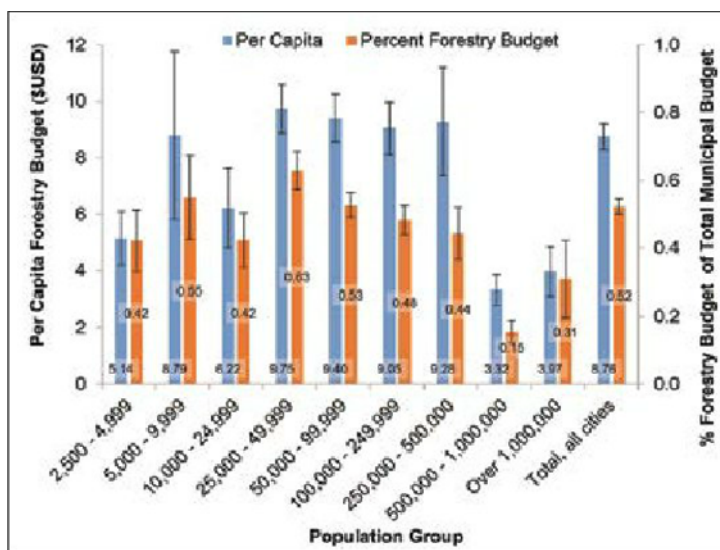


Figure 1. Municipal forestry budgets on a per capita basis (n = 477) and reflected as a percent of the forestry budget relative to the total municipal budget. (n = 463).

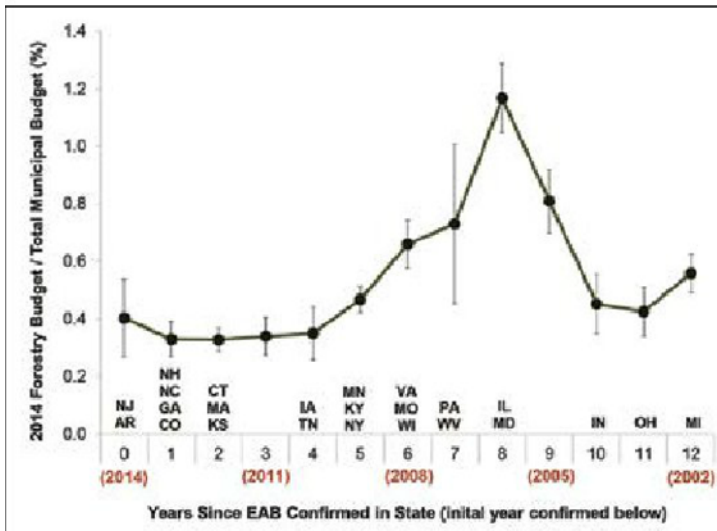


Figure 2. The effect of emerald ash borer (*Agrilus planipennis* Fairmaire) on municipal forestry budgets as a percentage of the total municipal budget (n = 366). Adapted from Hauer and Peterson (2017).

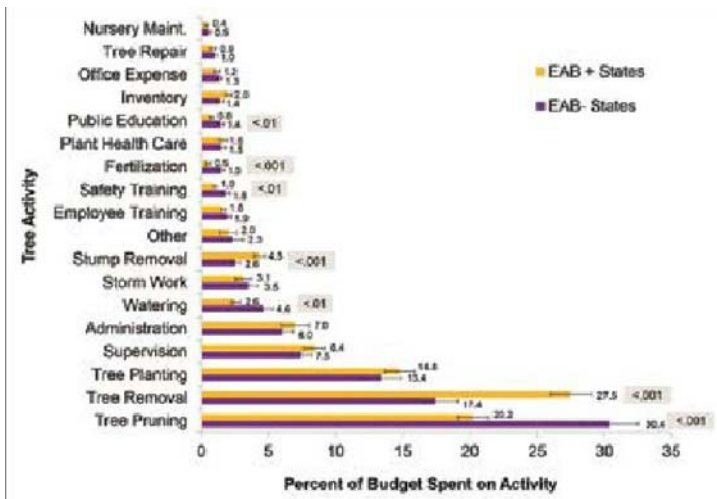


Figure 3. The percent of forestry budget spent on tree activities in states with a confirmed emerald ash borer (EAB) case (EAB+) and states without a confirmed EAB (EAB-) case (n = 268). Adapted from Hauer and Peterson (2017).

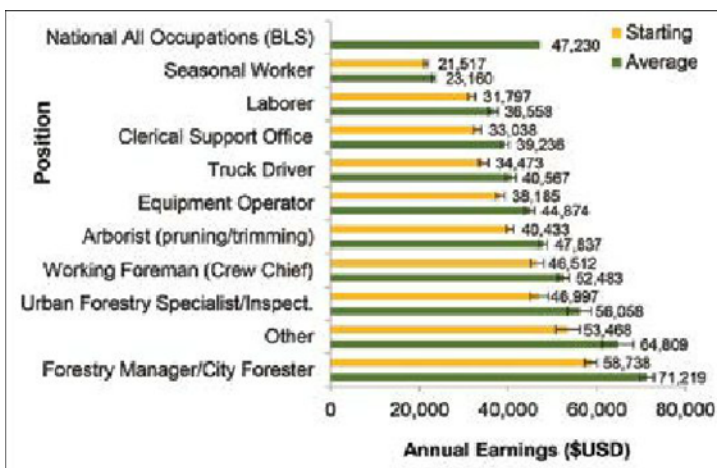


Figure 4. Starting and average annual pay for personnel compared to the national mean of all occupations in the United States (n = 47 to 178).

budget was for street trees on average. Park trees were the second greatest budget area, at 23% of total funding. This is followed by public grounds (8%), cemeteries (2%), nurseries maintenance (1%), and other offered uses (4%).

The big three (tree/stump removal, pruning, and planting) continue to require a majority two-thirds of funding (Figure 4). Tree and stump removal were greatest (27% of total budget) and were consistent with the long-term 27% mean value. Pruning used nearly a quarter of the budget (24%), which is below the long-term 29% mean from previous surveys. Budgets allocated 14% for planting, which is similar to the historical 15% of budget. Twice as much is spent on removals as planting. Could these expenses be reduced if we spent more on maintenance and tree care? Why pruning expenditures are lower today is unknown. Possible reasons are greater efficiency of dollars required to prune trees; trees are smaller in size today than in the past; trees are pruned less frequently; or other management areas are taking proportionally more resources today.

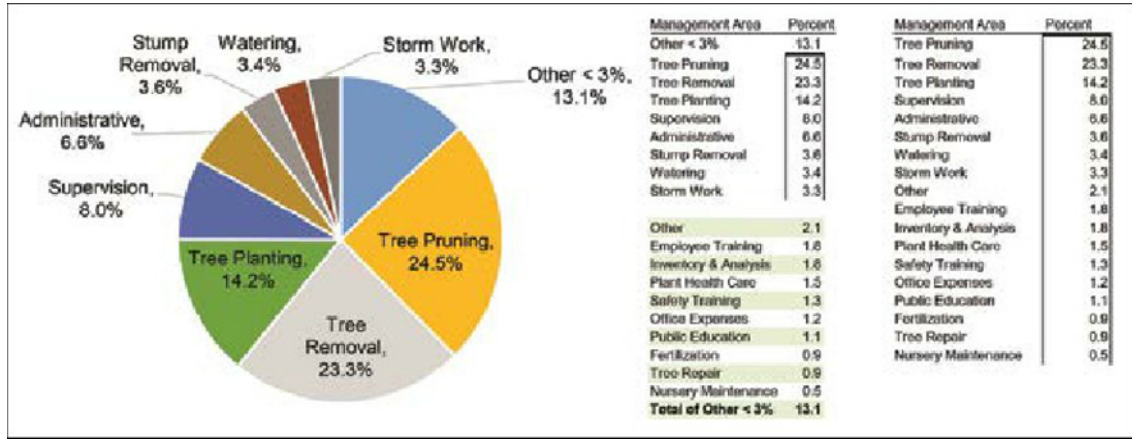
Employee Compensation

How does the pay of personnel associated with tree care activities compare to other jobs? The United States Bureau of Labor Statistics (BLS) collects data and regularly develops a mean of all occupations in the country. In 2014, this mean annual wage was \$47,230 (Figure 5). The mean salary of a municipal field arborist (e.g., climbing/pruning/trimming) is \$47,837 (870 SEM) which is slightly above the national BLS mean. As employees climb the career ladder to a working foreman (\$52,483; 1381 SEM), urban forestry specialist (\$56,058; 2634 SEM), or urban forest manager (\$71,219; 1635 SEM), position, their annual wage further exceeds the national average. Salary from entry level, seasonal employees, laborer, clerical, and truck driver jobs were lower. Salary was highest in the western and north-eastern states and lowest in the southern states for an urban forestry manager and forestry specialist. Overall, municipal employee pay was the least in the southern states.

The number of employees involved in public tree management was established (Table 1) and translated into full-time equivalents (FTEs, 2080-hour base year). An estimate 32,588 (±5,864) FTEs are associated with municipal tree care activities in communities with 2500 or more people. This comes from a total of 49,362 (±9675) people employed, who vary from part to full-time employment with municipal trees. There are also staff associated with municipal tree care in communities with fewer than 2500 people that are not accounted for in this estimation of the municipal forestry workforce.

The title of the person in charge varied by population. In 50% of places in the smallest population group, the responsibility is assigned to a staff member with varied responsibilities, such as a public works director or city administrator/manager. As population increased, a person

Figure 5. Percent allocation of tree care budget by activity area (n = 268).



with the title of arborist or forester became more common, and was reported by 46% of all respondents and in 60% places with 50,000 or more residents. The person responsible had 10.7 (0.4 SEM) years of time in their current position, and 20.0 (0.5 SEM) years' experience in tree care management.

Summary

Municipal Pay in urban forestry budgets are the highest ever and are the most diversified. Those funds are being used primarily for removals, pruning, and planting at similar percentages as in the past. In the United States, municipal tree care positions have better pay than many jobs. Urban forestry is healthy and growing in funding, efficiency, and staff compensation.

Literature Cited


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