EDUCATIONAL AND COOPERATIVE PROGRAMS

The Forestry Division prepares various educational items as well as participates in cooperative programs with other organizations as a way to share knowledge and reach the common goal, quality urban trees.

Downers Grove Park District

The Village and the Downers Grove Park District have an excellent working relationship. Both co-own and lease several properties to one another throughout Downers Grove, including Lyman Woods. The Park District generally assumes the overall maintenance of these areas, which in some locations also includes the unimproved right-of-ways adjacent to these parcels. The Forestry Division assists with tree planting, any maintenance activities, and tree removals as needed. In recent years, various capital projects have also addressed drainage issues on multiple properties.

School Districts

The Forestry Division has been involved with schools and education about trees. Programs include teaching the value of trees to the community, general tree care, and tree planting instructions. These programs have been combined with tree plantings on the school properties for a variety of occasions including Earth Day, Arbor Day or Teacher Appreciation Week. Individual teachers have also arranged specific programs with the Forestry Division such as a tour through the Forest Preserve on Gilbert, or creating a design plan for the school's arboretum.

Public Works Departments of Surrounding Cities/Villages

Municipal foresters of the Chicagoland area meet almost every month and discuss forestry topics. This has allowed the exchange of ideas and methods, specifications, and ordinances. This interaction has lead to cooperation in other areas, as well as provides an insight to the overall trends in community actions.

Throughout the year, neighboring communities that do not have forestry staff have requested forestry-related information. These communities have realized that any forestry related functions must be performed properly. Any pertinent information is distributed and courtesy inspections made as time allows.

Cooperative tree pruning arrangements have been made with Darien in the Knottingham subdivision. Because Darien and Downers Grove intertwine in that area, all parkway trees west of Williams (including those on the both sides of Williams) up to the northern portion of Florence are included in the Downers Grove pruning program for uniformity throughout the subdivision.

See also Suburban Tree Consortium in Chapter 4.

The Conservation Foundation

Founded in 1972, The Conservation Foundation is one of the region's oldest and largest not-for-profit land and watershed conservation organizations dedicated to preserving and restoring open space, protecting rivers and watersheds and promoting stewardship of the environment in northeastern Illinois. Their website includes more information at http://www.theconservationfoundation.org/page.php?PageID=73

Starting in 2016, The Conservation Foundation has annually offered a native tree and shrub sale to residents. Downers Grove advertised the program on the Village website along with the plant options. Over 190 plants were purchased in the first year of 2016, and well over 100 plants have been annually purchased in 2017, 2018, and 2019.

Content Navigation

Native Tree and Shrub Sale

Last updated: Public Relations Specialist | Friday, May 10, 2019

Add some native trees to your home landscape for **$30- $35 each** through the 2019 Downers Grove Native Tree & Shrub Sale. Planting native trees and shrubs in your home landscape adds beauty and shade to your yard, and turns it into a water conserving haven for wildlife and your family.

Orders must be received by JUNE 7 and may be picked up **on Saturday, June 15, 2019, from 9:00 a.m. to 11:00 a.m.**, at Public Works, 5101 Walnut Ave., Downers Grove.

Here's how it works:

- Learn about the **types of trees and shrubs (http://www.downers.us/public/docs/top_stories/2019 Tree Sale Description-Downers Grove.pdf)** available.
- View/download the **Tree and Shrub List Order Form (http://www.downers.us/public/docs/top_stories/2019 Downers Grove order form-fillable.pdf)**. This is a fillable pdf form, so you can either print it out, or fill it out and save it to your computer for ordering by mail or email.
- Email or mail your completed order form to :
  Jan Roehll (mailto:jroehll@theconservationfoundation.org)
  The Conservation Foundation
  10S404 Knoch Knolls Road
  Naperville, IL 60565
- Purchase a Rain Barrel (http://upcycle-products.com/downersgroveil.html)

Downers Grove Public Works Tree Sale

Thursday, June 8, 2017 2:00 p.m. to 6:00 p.m. Downers Grove Public Works Office, 5101 Walnut Ave.

Name (Print Clearly) _____

Address/PO Box _____

City/State/Zip _____

Phone # _____ Cell # _____

Email _____

Please complete this form and return it with your payment to: Attn: Jan Roehll; The Conservation Foundation; 10S404 Knoch Knolls Rd.; Naperville IL 60565. **Orders are limited to stock availability. Order early to get the best selection.**

Orders must be received by Thursday June 1, 2017

Make checks payable to: The Conservation Foundation

	Species	Description (Approx. ht.)	Price	Total	Total $	Mature Height
Trees	Blue Beech (shrub form)(Capinus caroliniana)	5 gallon, 3 ft.	$30			15-20 ft.
	Illinois Pecan (Carya illinoinensis)	5 gallon, 3 ft.	$35			60-80 ft.
	Sweet Bay Magnolia (Magnolia virginiana)	5 gallon, 3 ft.	$35			40 ft.
	Tulip Tree (Liriodendron tulipifera)	5 gallon, 3 ft.	$35			60-90 ft.
	Sycamore (Platinus occidentalis)	5 gallon, 3 ft.	$30			75 ft.
	Black Cherry (Prunus serotina)	5 gallon, 3 ft.	$30			30-40 ft.
	White Oak (Quercus alba)	5 gallon, 3 ft.	$30			50-80 ft.
	Hill Oak (Quercus ellipsoidealis)	5 gallon, 3 ft.	$30			40-50 ft.
	Bur Oak (Quercus macrocarpa)	5 gallon, 3 ft.	$30			50-80 ft.
	Chinquapin Oak (Quercus muehlenbegii)	5 gallon, 3 ft.	$30			50-80 ft.
	Red Oak (Quercus rubra)	5 gallon, 3 ft.	$30			50-80 ft.
	Bald Cypress (Taxodium disticum)	5 gallon, 3 ft.	$30			40-50 ft.
			Subtotal		**$**	

Shrubs listed on page 2.

If you have any questions, please call Jan Roehll 630-428-4500 ext. 121 or email her at jroehll@theconservationfoundation.org

The plant descriptions are on the following pages or find them on the website: http://theconservationfoundation.org

USDA Forest Service

Several joint surveys have been conducted of the Downers Grove public with regards to their perception of street trees. These studies have provided useful information for managing trees in street corridors. In 1985, an article about such a survey was published by Herbert Schroeder and Paul Appelt titled "Public Attitudes Towards a Municipal Forestry Program." The survey revealed the public generally placed importance on all tree services with the top three being removal of hazardous trees, disease and insect control, and tree planting respectively. These three services are still major components of the Urban Forestry Program.

A second tree survey focused on particular tree species and was published in 1992. Generally, there was a high level of satisfaction with the street tree, with a strong indication that people would like to have larger, more mature-looking, and faster growing trees. The most important benefits involved the visual quality of the tree and its contribution to the appearance of the home and yard. Physical benefits such as cooling the air and removing pollutants were seen as quite minor. Of the three studied trees (green ash, hackberry, Kentucky coffeetree), green ash was the most preferred while Kentucky coffeetree was the least preferred. At the time, green ash was widely planted in the parkways because of its adaptability to a wide range of soil conditions. The trade-off with this faster growing tree is the higher maintenance associated with increased pruning to maintain street clearance and a higher percentage of storm damage clean up.

A third study surveyed residents about either individual street trees in front of their home or all the street trees in the neighborhood, and was published in 1996. Residents in the individual tree survey rated six of the eight species between "good" and "very good". The most important benefits were visual - "pleasing to the eye" and "enhances the look of my yard and house". Overall, annoyances were rated as being much less significant than the benefits. Residents in the survey of the five different neighborhoods of street trees also rated the benefits as visual. Annoyances were all rated significantly higher in the neighborhood tree survey than in the individual tree survey but overall were still of minor significance compared to the benefits. Overall, there was a strong indication that people would like to have larger, more mature-looking, and faster growing trees. However, residents of the faster growing silver maple neighborhoods did rate the annoyances as more severe.

Copies of all studies are on the following pages.

PUBLIC ATTITUDES TOWARD A MUNICIPAL FORESTRY PROGRAM

by Herbert Schroeder and Paul Appelt[1]

Abstract. A midwestern community was surveyed to assess satisfaction with quantity, quality, and maintenance of street trees; importance of services provided by its forestry department; and possible sources of public dissatisfaction.

Public administrators and policymakers constantly face tough choices of how best to allocate finite resources to satisfy often conflicting demands. Municipal forestry programs indeed must compete with other programs for necessary resources. City managers, budget directors, and elected officials, who are responsible for program funding, are often forced to allocate available resources without the benefit of reliable, quantitative information about public support for various programs. A public survey can help to document the importance of trees to the public and the level of public support for forestry programs.

A carefully designed survey can be used to assess how a municipal forestry program is perceived by the public. Lack of mututal understanding between a forestry department and the public can be detected, and specific problems that may require special attention can be highlighted. In the absence of systematically gathered information on public attitudes, primary feedback from residents may be in the form of calls from people with problems or complaints. The actual extent of awareness and satisfaction with forestry services may remain unknown.

In this article we present the results of a survey that was used to assess public attitudes toward forestry programs and services in a midwestern community. This survey shows how information on public attitudes can be obtained. In addition, the results of the survey suggest some factors that may give rise to dissatisfaction among some members of the public.

The Survey

The survey was designed to fill both sides of a single sheet of paper. The major areas of information sought were the residents' satisfaction with the quantity and quality of trees in their neighborhood, the importance of a variety of services provided by the forestry department, the adequacy of tree maintenance and response to public inquiries, and sources of awareness about the forestry program. The forms contained both closed-format and open-ended questions. The closed-format questions (i.e., yes/no responses and rating scales) allowed for quick responses and easy coding of data, while the open-ended questions allowed the respondents to follow up in more detail on their answers to the closed-format questions. Although they are more difficult to tabulate and analyze, open-ended questions often provide valuable insights into the public's viewpoint.

The survey form, a cover letter, and a postage-paid reply envelope were mailed to 593 single family residences in February 1983. The addresses were selected from water billing system accounts, which were listed alphabetically by street name. A survey was sent to every 10th residence on the list. In all, 191 surveys were returned, for a response rate of 32 percent.

Results

In this article we will focus primarily on responses to the closed-format questions. Summaries of responses are found in Tables 1 and 2. All but one of the respondents considered parkway trees to be an asset to the community (Table 1). The majority of people were satisfied with quantity and quality of trees, and felt that the village provided adequate maintenance of parkway trees. Of those people who had inquired about tree problems in the last year, a little over

1. Mr. Appelt is Village Forester of Downers Grove, Illinois.

half were satisfied with how the forestry department had responded to their inquiries. Analysis of written comments indicated that the most common source of dissatisfaction was denial of a request that was beyond the scope of the program.

The survey revealed a fairly high level of awareness (58%) of the forestry department's services and programs. Respondents said that the most common sources of information about the department's programs were news articles and a column in the local newspaper. Some other sources included village crews, word of mouth, and contact with the village forester.

Most forestry department services were rated as important or very important by most respondents (Table 2). Only watering was considered unimportant by a majority of people. Services rated most important were removal of hazardous trees, gypsy moth control, Dutch elm disease control, and tree planting.

Although the survey showed a generally high level of satisfaction with quantity, quality, and maintenance of parkway trees, we felt it was important to try to understand what factors might be related to dissatisfaction with one or more of these items. To learn more about these responses, we did several further analyses.

Contact with the forestry department concerning a problem or request appears to be related to the person's feelings about the adequacy of tree maintenance (Table 3). Of the people who had not made inquiries, 85 percent felt maintenance was adequate. For those who made inquiries and were satisfied with the response, all but one (96%) felt maintenance was adequate. But for those who were not satisfied with the response, only 67 percent thought maintenance was adequate. Although this is still a majority, it does appear that failure to get desired results on a specific request may cause some people to conclude that the forestry program provides inadequate maintenance in their neighborhood.

We also found evidence that satisfaction with maintenance is related to the importance people attach to certain tree care services. First, we used factor analysis to classify survey items into a smaller number of categories based on how people rated them. Factor analysis places two items in the same category if people responded to them similarly. That is, if we know how a person rated an item in one of the categories, we would expect that he or she would rate other items in the same category in about the same way. This may mean that people see the items in one category as being similar or related in some way.

Table 1. Responses to survey items.

Question	*Percent answering "yes"*
Do you consider parkway trees to be an asset to the community?	99
Are you satisfied with the quantity of parkway trees in your neighborhood?	71
Are you satisfied with the quality of the parkway trees in your neighborhood?	72
Do you feel that the village provides adequate maintenance of parkway trees in your neighborhood?	84
Have you called the forestry department with an inquiry about public or private tree problems or services within the last year?	24
If "yes", were you satisfied with the response to your request?	13
Were you aware of the forestry department services and programs prior to receiving this mailing?	58

Table 2. Means and standard deviations of importance ratings for forestry department services.

Service	*Mean**	*S.D.*
Removal of dead/hazardous trees	1.7	.5
Gypsy moth control	1.6	.6
Dutch elm disease control	1.5	.7
Planting parkway trees	1.5	.7
Other insect control	1.3	.8
Trimming parkway trees	1.1	.9
Repair to damaged trees	1.1	.9
Consultation with homeowners regarding tree problems on public or private property	1.0	.9
Cabling/bracing weak limbs	0.5	1.2
Fertilization of parkway trees	0.2	1.2
Watering parkway trees	−0.4	1.2

* 2 = very important; 1 = important; 0 = don't know; −1 = not very important; −2 = worthless

The analysis of our data produced one category containing the "basic" tree services of trimming, planting, and removal; another category containing Dutch elm disease, gypsy moth, and other insect control; and a third category containing the other services, which might be considered "optional" tree care.

All survey respondents tended to give high ratings to the importance of basic tree services and insect control. But the analysis also showed that people varied in how they rated the importance of optional tree care services. Next, in comparing the ratings given to the optional services, we found that people who felt maintenance was inadequate attached significantly higher importance to these optional services than those who felt maintenance was adequate ($p < .05$ in an analysis of variance). This suggests that dissatisfaction with maintenance may arise among people who place importance on a wider range of tree services and therefore have higher expectations of the forestry department program.

We also wanted to find out whether people's satisfaction with trees and the forestry program is influenced by the character of the neighborhood where they live. For each distinct section of the village, the village forester estimated the age of the neighborhood, the tree density (low, medium, or high), and the average parkway tree size. Each survey form was coded as to which of these sections the address was in. We found several significant relationships between neighborhood characteristics and the survey responses.

People from neighborhoods 11-40 years old were more likely to be satisfied with quantity of trees than were people from areas newer or older than that (Table 4). This might be because trees in newer neighborhoods are too small to create an impression of substantial tree cover, while in older neighborhoods removal of large trees over recent years may cause residents to feel that the number of trees is inadequate compared to what they remember from earlier years. This suggests that satisfaction with quantity is not simply a function of the number of trees on the street. In fact, there was no significant relation between satisfaction with quantity and the forester's estimate of the number of trees in the neighborhood. Public satisfaction with tree quantity may depend on the type and size of trees and on changes in the tree population over a period of years.

With respect to tree size, people from neighborhoods with large (13" diameter or greater) trees were most likely to feel that maintenance was adequate, and people from areas where 7-12" trees predominated were least likely to feel maintenance was adequate (Table 5). Dissatisfaction with maintenance may be related to several years of delay in pruning trees in some sections of the community. Many trees obviously needed pruning because low limbs were beginning to obstruct traffic. Also, when trees were actually pruned in some of these

Table 3. Crosstabulation of maintenance adequacy with inquiry (column percents are in parentheses).

		Made no inquiry	*Satisfied with response*	
			yes	*no*
Maintenance adequate	yes	123 (85%)	24 (96%)	14 (67%)
	no	22(15%)	1 (4%)	7 (33%)

Chi square = 7.54 (p = .023)

Table 4. Crosstabulation of quantity satisfaction with neighborhood age (column percents are in parentheses).

		Neighborhood age		
		under 11 yrs.	*11-40 yrs.*	*over 40 yrs.*
Satisfied with quantity	yes	9 (50%)	51 (82%)	76 (68%)
	no	9 (50%)	11 (18%)	35 (32%)

Chi square = 8.05 (p = .018)

Table 5. Crosstabulation of maintenance adequacy with average parkway tree size (column percents are in parentheses).

		Tree Size (dbh)		
		2-6"	*7-12"*	*over 12"*
Maintenance adequate	yes	23 (82%)	35 (71%)	102 (91%)
	no	5 (18%)	14 (29%)	10 (9%)

Chi square = 10.29 (p = .006)

areas, larger limbs were removed than would have been necessary had the trees been pruned two or three years earlier. To some residents such pruning probably seemed too severe.

Discussion

The results of this survey can be useful in several ways. First, they provide the forestry department with an idea of the public's general attitude toward trees and the forestry program. The results show that the majority of those surveyed felt that trees are important, were satisfied with quantity and quality of trees, and felt that maintenance was adequate.

The survey also provides information on the importance people place on various tree care services. While high priority was placed on the basic services, such as planting and removal, virtually all the services were rated as important. This information could be used to argue against budget cuts that would force the forestry department to curtail some of its services. This is particularly the case with insect control programs. Gypsy moth and Dutch elm disease, respectively, ranked second and third in importance, higher even than planting and surpassed only by removal of hazardous trees.

The survey results are also useful in suggesting some possible sources of dissatisfaction among the public. It appears that some people expect more of the forestry program, placing greater importance on "optional" tree care services, and that these people are more likely to feel that existing maintenance programs are inadequate. Public information efforts might be useful to explain how priorities are set in allocating scarce resources. The survey indicates that the local newspaper is the best means currently used to communicate with the public about the forestry program. However, only 44 percent of the sample were aware of the forestry program through articles or columns in the local newspaper. This suggests that the forestry department should look for more effective ways to communicate their programs to the public.

It also appears that when the forestry department does not carry out a resident's request for a tree care service, the resident may conclude that the department provides inadequate maintenance. Again, careful explanation of why some services must receive low priority or are beyond the scope of the forestry program may help to keep the support of people whose individual requests must be turned down.

Finally, by noting which kinds of neighborhoods are more dissatisfied with some aspects of the forestry program, the forester may be able to revise the program in those neighborhoods. For example, dissatisfaction with maintenance in neighborhoods with 7-12" dbh trees suggests that mainteance programs in those areas should be scrutinized.

It may be impossible to eliminate all dissatisfaction with a forestry program. However, information obtained from a survey such as this can serve as a basis for public information activities and program revisions that could minimize complaints and improve support for forestry activities.

U.S. Forest Service
North Central Forest Expt. Station
Chicago, Illinois

HOUSEHOLDERS' EVALUATIONS OF STREET TREES IN SUBURBAN CHICAGO

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Village Forester, Village of Downers Grove,
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Residents of a Chicago suburb were surveyed about the street trees in front of their homes and in their neighborhoods. The survey determined residents' perceptions of the benefits and annoyances they receive from the trees; the trees' size, shape, and growth rate; and the quality of maintenance the trees receive.

Research on the esthetic quality of residential streets in the midwest has shown that street trees are the single strongest positive influence on the quality of the view along the street (Schroeder & Cannon, 1983; Buhyoff et al., 1984; Lien & Buhyoff, 1986; Schroeder & Cannon, 1987). Research carried out independently in Ohio and Michigan communities has yielded comparable models for predicting how the visual quality of street corridors varies depending on the number and size of street trees (Schroeder et al., 1986).

These studies have provided useful information for managing vegetation in street corridors, but they have several important limitations:

1. They examine the view looking along the street more or less as it would be seen by a passing motorist. The visual quality of the view from this perspective is not necessarily the same as it would be from the perspective of a person viewing the street from a yard or house.

2. The studies use photographs to represent the appearance of the streets. These photographs accurately depict the global visual character of the street, but do not convey visual details of individual trees, nor important nonvisual benefits and annoyances that homeowners experience through day-to-day contact with a tree.

3. Evaluations of the visual quality of streets have usually been made by people who do not live in the neighborhoods or communities shown in the photographs.

To obtain more detailed knowledge of householders' perceptions and preferences about the trees in front of their own homes, a survey was developed and tested in California cities (Sommer et al., 1989; Sommer & Sommer, 1989). This survey asked people to evaluate their overall satisfaction with the street trees in front of their residences, the importance of several benefits and annoyances associated with street trees, and their satisfaction with attributes such as the size, shape, and growth rate of the trees. Significantly different levels of satisfaction and different sets of specific problems were associated with trees of different species located in different cities. These results provide extremely useful information to guide future decisions on species selection for urban street trees.

The results of the California survey are not immediately applicable to communities in other parts of the country because differences in tree species, climate, demography, and other factors may give rise to very different patterns of response. Therefore, this survey method is best viewed as a tool that can be employed by individual urban foresters to obtain information from the people in their own communities. As a first step in the dissemination of this research methodology to communities outside of California, the present study used the survey approach to assess residents' satisfaction with three tree species in Downers Grove, a suburb of Chicago, Illinois.

Methods

The survey used by Sommer et al. (1989) was modified to include factors relevant to the Chicago area, remove factors relevant to California but not to Chicago, and include items of specific interest to this community. The survey was mailed to homes with three different species of trees: hackberry (*celtis occidentalis*), green ash (*fraxinus pennsylvanica*), and Kentucky coffee-tree (*gymnocladus dioicus*). A cover letter told the homeowner that the survey was being conducted by the Downers Grove Forestry Department in conjunction with the U.S. Forest Service and the Morton Arboretum. A postage-paid return envelope was included. In cases where there was more than one street tree in front of a home, a village employee marked the tree to be evaluated with a small spot of paint.

Results and Discussion

Response Rate

Of the 223 questionnaires mailed out, 90 were sent to homes with hackberry trees, 93 to homes with green ash, and 40 to homes with Kentucky coffeetree. Forty-one questionnaires (46%) were returned for hackberry, 43 (46%) for green ash, and 21 (53%) for Kentucky coffeetree. The overall response rate was 47.1 percent. Some of the returned questionnaires were unusable, either because the respondent left many questions unanswered, or because the respondent answered for more than a single tree or for a tree of the wrong species. This reduced the usable responses to 36 for hackberry, 36 for green ash, and 16 for Kentucky coffeetree.

Overall Results

This section summarizes the combined results for all three species of trees. Respondents in this survey had a generally positive opinion of their trees; 65 percent rated their tree as "good" or better. Twenty percent rated their tree as "poor" or "very poor." While this is a minority, it is still a large enough percentage to be of concern.

The most important benefits of street trees were visual--"pleasing to the eye" and "enhances look of my yard and house." Other important benefits included "brings nature closer," "increases property values," and "increases sense of community." The highest rated benefits averaged only between "minor" and "moderate" on the benefit scale. The fact that the benefits were not rated higher is perhaps due to the generally small size of the trees in the sample (see the discussion below on tree size).

The least important benefit was "flowers on tree." This probably reflects the fact that none of the species examined in this survey have showy flowers. Other benefits that were rated low included specific physical benefits such as "reduces noise," "slows wind speed," and "cools home in summer." The low performance of the trees on these more physical benefits may have been in part due to the small size of the trees. Also, the location of the trees (on the street and not right next to the house) would make them unlikely to have a cooling effect on the house itself.

The most important annoyances of trees in this survey involved falling leaves and other debris, insects, and diseases. The least important annoyances were those involving falling flower parts and those involving the tree blocking the sun or the view and making the surroundings too dark. Again, the minor importance of these annoyances may be due to the small size of the trees and the absence of flowering species in this study.

Overall, the annoyances were rated as being less important than the benefits. Even the strongest annoyance was rated on average between "minor" and "no annoyance." This suggests that, although noticeable problems may occur on particular trees, the annoyances of these trees are generally less prominent in people's minds than their benefits.

Three additional questions asked whether the trees attracted different kinds of animals, specifically birds, bees, and squirrels. According to the respondents, birds were attracted most frequently (41%), squirrels less often (19%), and bees hardly at all (5%). Birds were overwhelmingly viewed as a benefit, while bees and squirrels were generally viewed as neither a strong benefit nor an annoyance.

Several questions asked about people's satisfaction with different attributes of their trees. On average, people were satisfied with the form or shape of their tree. Seventy-seven percent thought their tree had a somewhat or very attractive shape, while only 20 percent thought the shape was unattractive. People were less satisfied with the size of their trees, however. Over half of the respondents said their tree was too small, while 32 percent thought it was just right. No one thought their tree was too large. Half of the respondents thought that their tree grew at a good rate. A substantial proportion (35%) thought their tree grew too slowly, and no one thought their tree grew too fast. Dissatisfaction with the size and growth rate of the trees was also reflected in the open-ended responses. People frequently commented that they were looking forward to the time when their tree would have a larger, fuller, more mature look. Several expressed impatience or disappointment with the slow growth rate of their tree.

The great majority indicated that their opinion of their tree had not changed over time. Of those that had changed, most indicated that their opinion had improved as the tree grew and acquired a more mature look (or at least that they expected that this would happen).

Most of the sample (67%) thought that maintenance of their tree was "good" or better. About one-fourth of the sample thought that the village should provide additional maintenance services. The most frequently requested additional services were pruning or trimming and fertilizing or feeding.

Despite the fact that most people expressed at least moderate satisfaction with their present tree, the majority (53%) said they would definitely or probably have preferred the village to have planted a different tree originally. Only 25 percent said they would not prefer a different tree. The most frequently preferred species named was maple (including red maple and sugar maple). The next most preferred was oak. The characteristics of preferred tree species most frequently named were color, large size, full shape, and fast growth rate.

Background questions

To characterize the respondents in this survey, several background questions were asked. The sample was evenly divided between male and female, with an average age of about 45 years. Average household income was fairly high ($56,000). Most respondents (82%) had attended college or technical school, with about half having completed degrees. The average length of occupancy was 12 years, and almost all owned their own house. Most of the respondents in this survey did their own yard work.

There were few differences in background characteristics between the subsamples that evaluated different species of trees. People with green ash trees tended to have a somewhat shorter average length of residency (9 years as opposed to 13 years for Kentucky coffeetree and 14 years for hackberry). People with Kentucky coffeetree were somewhat more likely to rent rather than own their residence, although the proportion of renters was still quite low. Overall, the responses to background questions were quite similar across the three subsamples, so it is unlikely that differences in preferences for tree species were caused by differences in these background variables.

Species differences

There were definite differences in responses to the three species of trees. Green ash received the highest overall

Table 1. Significance of independent effects of species and size on overall opinion.

Source	Sum of squares	df	Mean square	F	P
Species	6.56	2	3.28	5.43	.007
Size	10.09	1	10.09	16.70	.000
Species x Size	0.58	2	0.29	0.48	.622
Error	39.87	66	0.60		

opinion ratings. Its benefits were also rated higher than the benefits of the other species, particularly the important benefits of "pleasing to the eye," "increases property value," "fall color," and "increases sense of home and family." Green ash was given the highest ratings for shape, size, and rate of growth, and was also seen as being better maintained by the village. It was seen as attracting birds more often than the other species, and this was perceived as an advantage. Residents with green ash were less likely to wish that the village had planted a different kind of tree than were residents with the other two species. Green ash was clearly the tree with the best "image" in this survey.

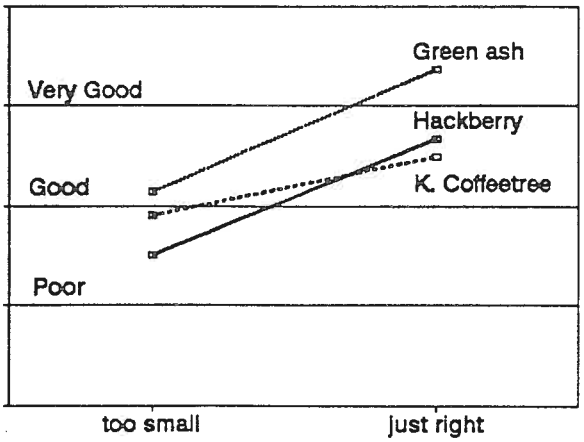

Figure 1. Overall opinion of street tree: Effect of species and size.

Kentucky coffeetree, on the other hand, appeared to be the least preferred species in the study. Its benefits were rated lower on average than those of the other two species, and its annoyances were seen as more severe. The problems of falling leaves, limbs, and especially sticks and pods were rated as more severe for this species than for the other two. Kentucky coffeetree attracted birds less often than the other two species, and was most often rated as being too small. Residents with Kentucky coffeetree were the most likely to wish that a different species had been planted originally.

Hackberry was rated approximately equal to Kentucky coffeetree in overall opinion, but did not exhibit any particularly strong specific annoyances. Its fall color was rated lower than that of the other two species. It attracted squirrels more than the other two species, but this was seen as neither a strong benefit nor an annoyance.

Table 2. Mean overall opinion rating (1=excellent,...,5=very poor) for different tree species and sizes (number of cases in parentheses).

	Size	
Species	Too small	Just right
Hackberry	3.50 (20)	2.33 (9)
Green ash	2.86 (14)	1.63 (16)
K. coffeetree	3.09 (11)	2.50 (2)

It appears from peoples' responses that the three species examined in this study were not equivalent in size, and that small size of the trees was a major source of dissatisfaction. This raises the question of whether preferences among species differed because the green ash species in this study happened to be represented by older, larger trees than the other two species.

An analysis of the combined effects of tree species and the perceived adequacy of tree size on overall satisfaction suggests that the differences in preference between species cannot be attributed solely to the difference in size between the trees representing each species. Both species and size have independent significant effects and their interaction is not significant (Table 1).

On average, trees evaluated as "too small" were rated as "good" in overall opinion, and trees evaluated as "just right" in size were rated as "very good" in overall opinion. Green ash was rated slightly below "very good" in overall opinion, while the other two species were rated as "good" (Table 2, Figure 1).

Relation Between Street Tree Benefits and Overall Satisfaction

Almost all of the individual benefits are positively correlated with both overall satisfaction with the tree and satisfaction with village maintenance of the tree (Table 3). This means that people who gave high ratings to the individual benefits of their tree also tended to rate their general satisfaction with the tree as high, and people who gave low ratings to individual benefits tended to rate general satisfaction as low. The benefits that seem to be most strongly related to overall satisfaction are "pleasing to the eye," "enhances look of my yard," "brings nature closer," and "increases property values." "Flowers on tree" and "cools home in summer" are the only two benefits that do not appear to be related to overall satisfaction.

Table 3. Correlations between street tree benefits, overall opinion, and opinion of maintenance.

Benefit	Correlation with overall opinion	Correlation with opinion of maintenance
Pleasing to the eye	.771 **	.571 **
Increases property value	.508 **	.466 **
Flowers on tree	.110	.113
Fall color	.375 **	.365 **
Gives shade	.283 *	.381 **
Reduces noise	.342 **	.349 **
Slows wind speed	.333 **	.357 **
Increases privacy	.422 **	.325 **
Increases sense of community	.399 **	.405 **
Cools home in summer	.119	.206
Filters pollutants from the air	.390 **	.387 **
Screens unwanted views	.254 *	.244 *
Brings nature closer	.538 **	.480 **
Enhances look of my yard and house	.589 **	.496 **
Increases sense of home and family	.398 **	.387 **
Provides spiritual values	.493 **	.303 *
Mean of all benefits	.542 **	.500 **

* $p<.05$ ** $p<.01$

Table 4. Correlations between street tree annoyances, overall opinion, and opinion of maintenance.

	Correlation with overall opinion	Correlation with opinion of maintenance
Sap drips from tree	-.104	-.001
Causes allergies	-.036	-.007
Insect damage to tree	-.139	-.057
Attracts annoying insects	-.087	.036
Roots too close to surface	-.093	-.089
Sidewalk damaged by tree roots	.020	.105
Branches or suckers from base or roots	-.166	-.055
Fruit, nuts, sticks, or pods fall from tree	-.219 *	-.062
Flower parts fall from tree	-.045	.056
Fallen leaves in autumn	-.041	-.126
Leaves fall throughout summer	-.207*	-.181
Falling limbs	-.006	-.051
Makes street or yard dark	.044	.127
Reduces safety by limiting visibility	.114	-.025
Roots clog sewers	.125	.111
Diseases on tree	-.207 *	-.065
Blocks view	.061	.077
Blocks sun so lawn won't grow	-.006	.042
Mean of all annoyances	.077	.151

* $p<.05$

Relation Between Street Tree Annoyances and Overall Satisfaction

Most of the individual annoyances are not significantly correlated with either overall satisfaction or satisfaction with maintenance (Table 4). This suggests that the presence of particular annoyances does not necessarily result in a lower overall evaluation of the tree or its maintenance. The only annoyances that do seem to be related to overall satisfaction are "fruit, nuts, sticks, or pods fall from tree," "leaves fall continuously throughout summer," and "diseases on tree."

Conclusions

The survey was effective in revealing the overall level of satisfaction, the most important benefits and annoyances, and the desired improvements in street trees from the point of view of the residents who experience the trees in front of their houses. There was a generally high level of satisfaction, but with a strong indication that people would like to have larger, more mature-looking, and faster growing trees. The most important benefits involved the visual quality of the tree and its contribution to the appearance of the home and yard. Physical benefits such as cooling the air and removing pollutants were seen as quite minor. Green ash was the most

preferred tree. Kentucky coffeetree, which had a problem with falling pods and sticks, was the least preferred.

The homeowners' desire for larger and faster growing trees is understandable, but urban foresters must weigh this desire against the longer term costs of selecting fast growing trees. Individual residents naturally take a short-term point of view; many of them may live in a particular home for only 4 or 5 years. Faster growing trees will provide more short term enjoyment for these residents but will incur greater maintenance and replacement costs over time. The urban forester must take a longer term view of the community's welfare, since trees planted today must serve not only present residents but future residents as well. From this point of view, trees with a slow or moderate growth rate may be the best choice despite the frustration they cause for current residents.

The major limitations of this survey were the small number of participants, the small number of species, and the apparently small size of the trees. If it is assumed that certain benefits of the trees, for example shade, are proportional to the size of the trees, then a valid comparison of the species should include substantial numbers of mature trees. Collecting information on the actual sizes of the trees (instead of just the residents' perceptions of adequacy of size) would also be very desirable for interpreting the responses that people give. All of these limitations could be addressed in future studies using this kind of questionnaire in Downers Grove and other Chicago-area communities.

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MANAGING URBAN AND HIGH-USE RECREATION SETTINGS

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HOUSEHOLDER EVALUATIONS OF STREET TREES IN A CHICAGO SUBURB

by Herbert W. Schroeder and Steven R. Ruffolo[1]

Abstract. Residents of Downers Grove, Illinois were surveyed about the street trees in front of their homes and in their neighborhoods. Householders' perceptions of benefits and annoyances of eight street tree species and of five types of neighborhood tree populations were compared. The survey assessed residents' satisfaction with the benefits and annoyances they receive from the trees; the trees' size, shape, and growth rate; and the diversity of tree species and sizes in their neighborhoods.

Research on the aesthetic quality of residential streets in the midwest has shown that street trees are the single strongest positive influence on the perceived quality of the view along the street (1,2,3,4). In these studies, researchers took photographs at systematically selected locations looking along streets. They then showed the photos to groups of people and instructed them to use a rating scale to evaluate the visual quality of each scene. Research using this method has been carried out independently in Ohio and Michigan communities and has yielded statistically comparable models for describing how the visual quality of street corridors varies depending on the numbers and sizes of street trees (6).

These studies provide useful information for managing vegetation in street corridors, but they also have several important limitations:

1. They examine the view looking along the street, more or less as it would be seen by a passing motorist. The visual quality of the view from this perspective is not necessarily the same as it would be from the perspective of a person walking along a sidewalk or viewing the street from a yard or house.
2. While the photographs used in these studies can accurately depict the overall visual character of the street, they do not show the finer visual details of individual trees, nor do they convey important nonvisual benefits and annoyances that homeowners may experience through day-to-day contact with a tree.
3. In almost all of these studies, the photographs depict street trees at a single season of the year, usually summer. They do not show important visual features that appear during other seasons — such as fall color, spring flowers, and winter twig patterns — nor do they capture the dynamic effect of seasons changing throughout the year.
4. The evaluations of visual quality of streets in these studies have usually been made by people who do not actually live in the neighborhoods or communities shown in the photographs. While there is no reason to expect that these evaluations would be different from those of residents of the photographed neighborhoods, in general it would be more desirable for local urban foresters to have street tree evaluations from actual residents of their own communities.

To obtain more detailed knowledge of householders' perceptions of and preferences for the trees in front of their own homes, a survey method has been developed and tested in California cities (7,8). In this method, people are asked to evaluate 1) their overall satisfaction with the street trees in front of their own residences; 2) the importance of various benefits and annoyances associated with these trees; and 3) their satisfaction with attributes of the trees such as size, shape, and growth rate. Significantly different levels of satisfaction, benefits, and annoyances were found for trees of ten different species located in eight California cities (9).

These results provide useful information for California communities to use in making decisions about species selection and maintenance practices

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for their urban street trees. The results of the California survey, however, are not directly applicable to communities in other parts of the country, due to differences in tree species, climate, demography, and other factors that may give rise to different preferences and evaluations. Therefore, this survey methodology is best viewed as a tool that may be applied by individual communities across the country to obtain information from their own residents. As a first step in applying this method to communities outside of California, we used Sommer's survey approach to assess residents' satisfaction with street trees in the Chicago suburb of Downers Grove, Illinois.

Methods

We modified the questionnaire developed by Sommer et al. (8) to add some factors relevant to the Chicago area, to remove factors that were relevant to California but not to the Chicago area, and to include items of specific interest to the Downers Grove Forestry Department. In 1988, the survey was mailed to homes with three different species of trees: hackberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*), and Kentucky coffee-tree (*Gymnocladus dioicus*). A cover letter told the homeowner that the survey was being conducted by the Downers Grove Forestry Department in conjunction with the U.S. Forest Service and the Morton Arboretum. A postage-paid return envelope was included. In cases where there was more than one street tree in front of a home, a village employee marked the tree to be evaluated with a small spot of paint.

Preliminary results from the first survey were summarized by Schroeder and Ruffolo (5). Two years after the first survey, in 1990, a second survey was mailed out to a new sample of people. This second survey extended the original sample of tree species to include 5 additional types of trees: American linden (*Tilia americana*), honey locust (*Gleditsia triacanthos*), Norway maple (*Acer platanoides*), oak (*Quercus* spp.), and Callery pear (*Pyrus calleryana*). Thus, a total of 8 species of trees were studied.

Also in 1990, a modified version of the tree evaluation survey was mailed to a new sample of residents, to obtain data on people's evaluations of the trees in their neighborhood as a whole, instead of just about the one tree in front of their home. This survey asked essentially the same questions as the individual tree survey, but in reference to "the trees growing along the street in your immediate neighborhood, that is, within a block or two of your home." Four new questions were also added to this survey, asking people about their perception of the diversity of tree species and sizes in their neighborhood, and about their preference for having uniform or diverse tree sizes and species in their neighborhood.

The neighborhood tree survey was mailed to residents in five neighborhoods, which were designated by the village forester as representing different types of tree populations: 1) even-aged mature trees of a single species (silver maple) with a closed canopy (i.e. tree crowns from opposite sides of the street meet overhead); 2) even-aged mature trees of a single species (green ash) with an open canopy (i.e. tree crowns do not meet over the street); 3) mixed ages and mixed species of trees with a closed canopy; 4) mixed ages and mixed species with an open canopy; and 5) small (immature) trees of mixed species.

Results

A combined total of 662 questionnaires about individual trees were mailed out in 1988 and 1990. Of these, 307 usable questionnaires were returned, for a response rate of 46 percent (Table 1). Questionnaires about neighborhood trees were mailed to 500 homes in 1990. Of these, 233 were returned, for a response rate of 47 percent (Table 2). Responses were tabulated and evaluation ratings were averaged so that comparisons could be made between species of individual trees and types of neighborhood tree populations.

Background Questions

Several background questions were included in the survey to enable us to characterize the people who responded to the surveys. Except in the cases noted below, the background characteristics did not differ significantly among residents who had different species of trees or who lived in different neighborhoods.

The respondents were fairly evenly divided

Table 1. Response rates for individual street tree survey.

Species	Questionnaires mailed	returned	Usable %
American linden	62	31	50
Green ash	93	36	39
Hackberry	90	36	40
Honey locust	100	51	51
Kentucky coffeetree	40	16	40
Norway maple	100	57	57
Oak	89	37	42
Pear	88	43	49

Table 2. Response rates for neighborhood street tree survey.

Neighborhood	Questionnaires mailed	returned	Usable %
Even-age, closed canopy, silver maple	100	53	53
Even-age, open canopy, green ash	100	44	44
Mixed ages, mixed species,closed canopy	100	41	41
Mixed ages, mixed species, open canopy	100	44	44
Mixed species, small trees	100	51	51

between male (53 percent) and female (47 percent). They ranged widely in age. Thirty-seven percent were in their 20's or 30's, 27 percent were in their 40's, and 36 percent were over 50 years of age. Overall, 97 percent of the respondents owned their own homes, and only 3 percent rented. About 72 percent of the respondents did their yard work for themselves, while most of the remainder indicated that yard work was done by other members of the family.

The average length of residence was about 12 years, but this varied somewhat between subgroups within each of the surveys. In the neighborhood survey, residents of the small-tree neighborhood had occupied their homes for a shorter length of time (6.6 years) than residents of the other neighborhoods. In the individual tree survey, people with green ash trees had the shortest length of occupancy (8.7 years), and people with Norway maple had the longest occupancy (16.2 years).

The respondents varied widely in their educational level. Overall, they were relatively well educated. Seventy-one percent had completed a college or technical school degree, and 33 percent of these had gone on to do at least some graduate work. Twenty-nine percent did not go past grade 12. A relatively high number of people chose not to reveal their income. Among those who did respond, 45 percent had incomes below $54,000, and 55 percent had incomes above $54,000.

Overall, the responses to background questions were quite similar across the subgroups of the sample. Thus, with the possible exception of length of residence, it is unlikely that the variations in preferences for street trees reported below are related to differences in these background variables.

Evaluations of Individual Trees

Overall opinion. Residents in the individual tree survey had a generally positive opinion of their trees (Figure 1). Six of the eight species had average ratings between "good" and "very good". Pear, Norway maple, and American linden received the highest ratings. The two lowest rated species, Kentucky Coffeetree and Hackberry, were rated slightly less than "good" in overall opinion.

Benefits. The most important benefits of street trees were visual - "pleasing to the eye" and "enhances look of my yard and house" (Figure 2). Other important benefits include bringing nature closer, increasing property values, and increasing sense of community. For all species combined, the highest rated benefits averaged between "minor" and "moderate" on the benefit scale, with only "pleasing to the eye" rating above moderate.

The least important benefit averaged over all species was "flowers on tree." This reflects the fact that only one of the species examined in this survey had showy flowers. Other benefits that were rated low included specific physical benefits such as "reduces noise," "slows wind speed," and "cools home in summer." The low ratings for these benefits may in part be due to the location of the trees (on the street and not right next to the

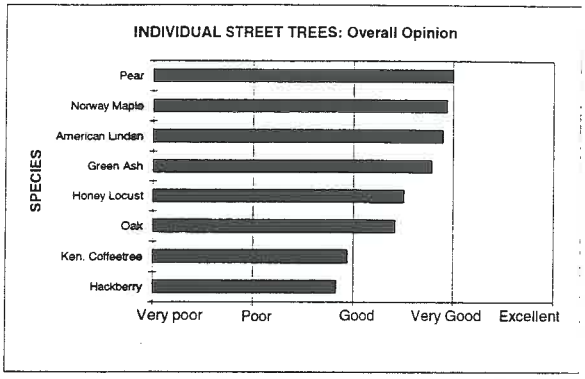

Figure 1

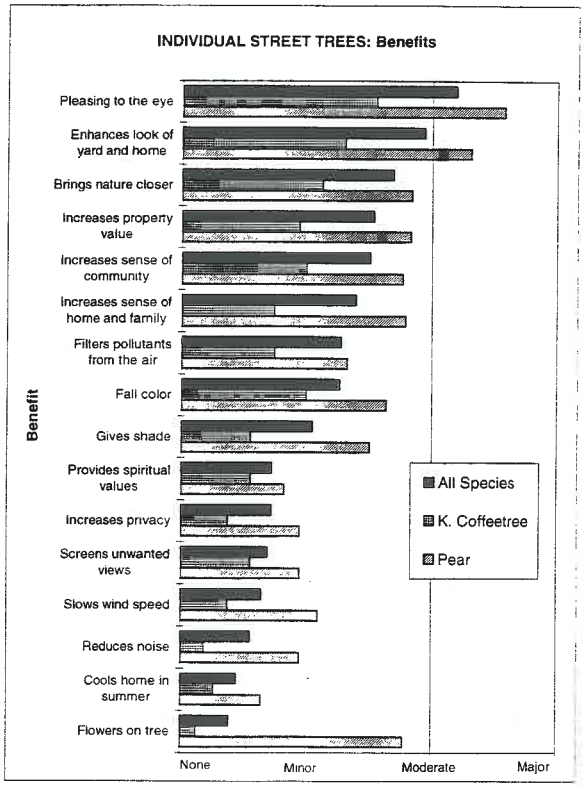

Figure 2

house), which would make them unlikely to have much physical effect on the house itself.

The eight tree species differed significantly in how residents rated their benefits. In general, the trees with the highest overall opinion ratings were also rated higher than other species on several of the specific benefits, and the species with the lowest overall opinion ratings were rated lower on several specific benefits. The profile of benefit ratings for the most preferred species (pear) and one of the less preferred species (Kentucky Coffeetree) are included in Figure 2. The most striking difference in ratings was for the benefit of "flowers on trees," which for obvious reasons was rated much higher for pear than for any other species.

Annoyances. Overall, annoyances were rated as being much less significant than benefits of individual street trees (Figure 3). Even the strongest annoyance, averaged over all species, was rated as no more than "minor". Although noticeable problems may occur on particular trees, it appears that overall the annoyances of these trees are less prominent in people's minds than their benefits.

For all species combined, the most significant annoyances in the individual tree survey involved falling leaves in autumn, other falling debris, suckers, insect problems, and diseases. The least significant annoyances were those involving the tree blocking the view or making the surroundings too dark or unsafe.

Profiles of annoyance ratings for separate species can shed light on why certain species were rated higher or lower than others. Figure 3 includes profiles for pear and Kentucky coffeetree. Pear trees showed no specific annoyances that were particularly serious compared to the average. Falling flower parts did appear somewhat higher than average as an annoyance for this species, but were far from a serious problem. Kentucky coffeetree, on the other hand, had a relatively serious problem with falling debris. The large pods and compound leaves of this species were seen by many people as creating a litter problem in their yards.

Wildlife. The survey also included questions about the residents' perception of three kinds of animals associated with their trees — birds, bees, and squirrels. Residents were asked whether or not their tree attracted these animals, and if so whether or not this was a problem. Birds were seen as a positive aspect of trees, with 47 percent of the respondents saying that their tree attracted birds, and 69 percent of these saying that the birds were a benefit. Bees and squirrels were substantially less prominent in people's awareness than birds. Twenty-one percent of the respondents

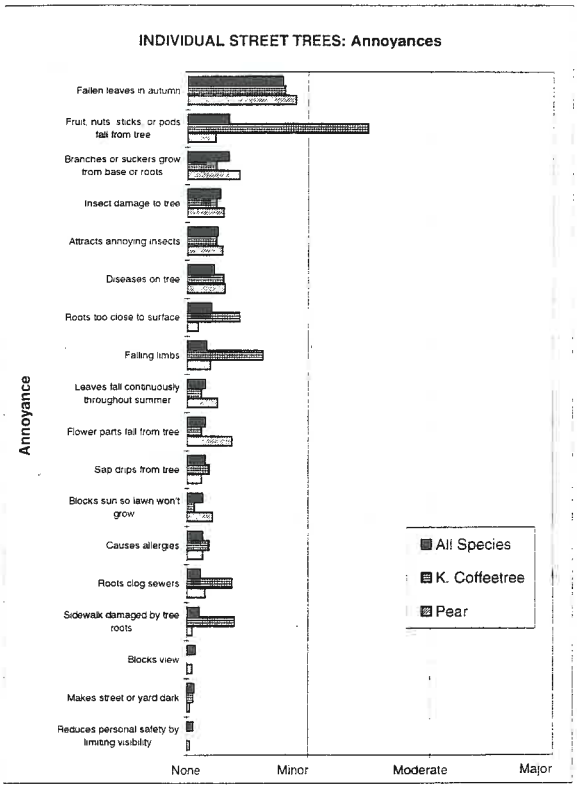

Figure 3

said that their tree attracted squirrels, while only 8 percent said that their tree attracted bees. Residents with pear trees, however, were much more likely (33 percent) to say that their trees attracted bees. For both squirrels and bees, about 30 percent of the people who said that their trees attracted these animals indicated that the animals were a benefit, while over half said that they were neither a benefit nor an annoyance.

Shape, size, and growth rate. Residents were asked about their satisfaction with the shape, size, and growth rate of their trees (Figure 4). On average, people were satisfied with the form or shape of their tree. Most of the species were rated as somewhat or very attractive in shape. Pear, American linden, and green ash were given the highest ratings for shape. The two lowest rated species, Kentucky coffeetree and hackberry, were rated as neither attractive nor unattractive in shape.

People were less satisfied with the size and growth rate of their trees than with their shape. On average, the respondents rated the size of their trees as too small. Virtually no one rated their tree as too large. Pear was rated the best of any species on size, and Kentucky coffeetree was rated the worst. Trees were rated somewhat better on growth rate than on size; but again, virtually no one thought that their tree grew too fast. Norway maple had the most desirable growth rate, while oak was rated the worst in terms of its slow growth rate. Kentucky coffeetree and hackberry also were rated low on growth rate.

Evaluations of Neighborhood Trees

Overall opinion. In general, residents in the neighborhood tree survey rated their overall opinion of their neighborhood trees as between "good" and "very good". There were only small differences in overall opinion between the five neighborhoods that were surveyed. The small-tree neighborhood was rated slightly lower than the other neighborhoods, but still averaged about "good" on the

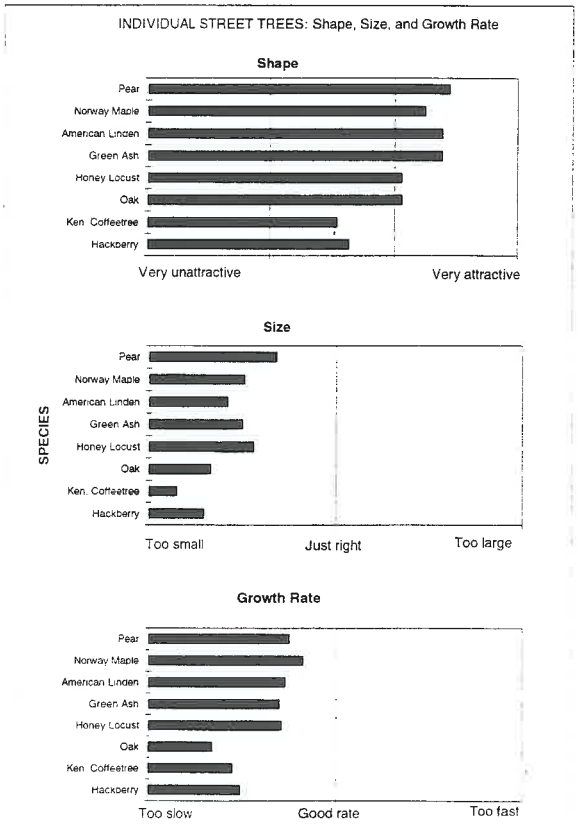

Figure 4

scale of overall opinion. The other four neighborhoods did not differ significantly in overall opinion ratings.

Benefits. As in the individual tree survey, the most important benefits associated with neighborhood trees were visual: "pleasing to the eye", and "enhances look of yard and home" (Figure 5). Most benefits were rated significantly higher in the neighborhood tree survey than in the individual tree survey. This suggests that the presence of many trees in a neighborhood has a cumulative effect that is greater than the benefits of any one individual tree. This was especially the case for the benefits of shade and privacy, as well as for the physical benefits of reducing noise, slowing wind speed, and cooling the home.

The significance of benefits also appears to be related to the size of the trees. As would be expected, the small-tree neighborhood was rated lower than the other neighborhoods on most of the benefits. Additionally, the two closed-canopy neighborhoods were rated relatively high on reducing wind speed, reducing noise, and increasing privacy, while the two mixed-species neighborhoods were rated higher than the others on fall color.

Annoyances. Annoyances were all rated significantly higher in the neighborhood tree survey than in the individual tree survey but overall were still of minor significance compared to the benefits (Figure 6). The most serious annoyances for the neighborhood trees were autumn leaves falling, other falling debris (sticks, pods, etc.), insect damage, sap dripping, roots too close to the surface, and sidewalks damaged by roots.

The even-age, single-species, closed canopy neighborhood stood out as having many more annoyances than the other neighborhoods. This neighborhood consisted predominantly of mature silver maples, and it was rated significantly higher than the other neighborhoods on 12 out of the 18 annoyances on the list. In general, annoyances were rated as less severe in the small-tree neighborhood and in the even-age, single-species (green ash), open-canopy neighborhood than in the other neighborhoods.

Wildlife. Birds, bees, and squirrels were a more important factor in the neighborhood tree survey than in the individual tree survey. Eighty-eight percent of the respondents said that their neighborhood trees attracted birds, 28 percent said the trees attracted bees, and 78 percent said they attracted squirrels. Of these, 84 percent saw birds as a benefit, 27 percent saw bees as a benefit, and 36 percent saw squirrels as a benefit. People in the small-tree neighborhood were less likely to say that their trees attracted birds or squirrels.

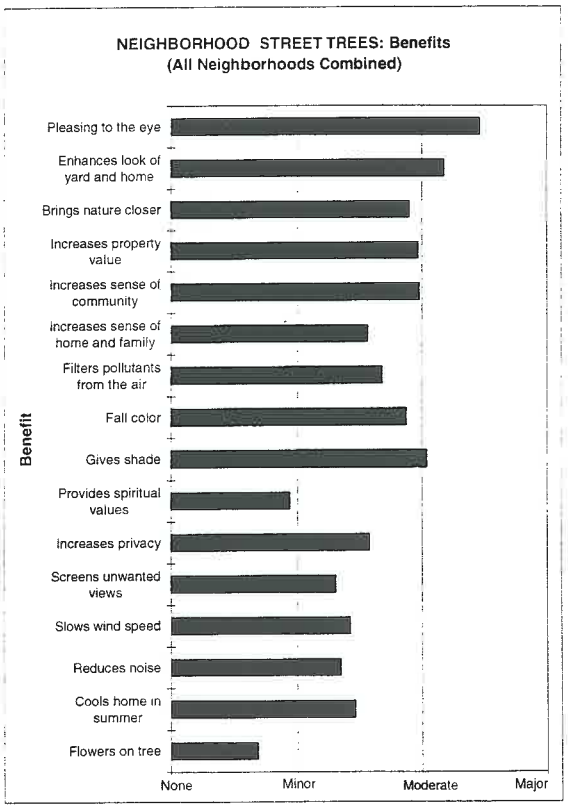

Figure 5

Size, growth rate, and shape. As was the case for individual street trees, neighborhood trees in general were seen as attractive in shape, but somewhat too small in size and too slow in growth rate. Not surprisingly, these tree attributes received the lowest ratings in the small-tree neighborhood. Only in the even-age, closed canopy, silver maple neighborhood were the size and growth rate evaluated as "just right". In general, the neighborhoods with closed canopies were rated as more satisfactory on tree size and growth rate than were

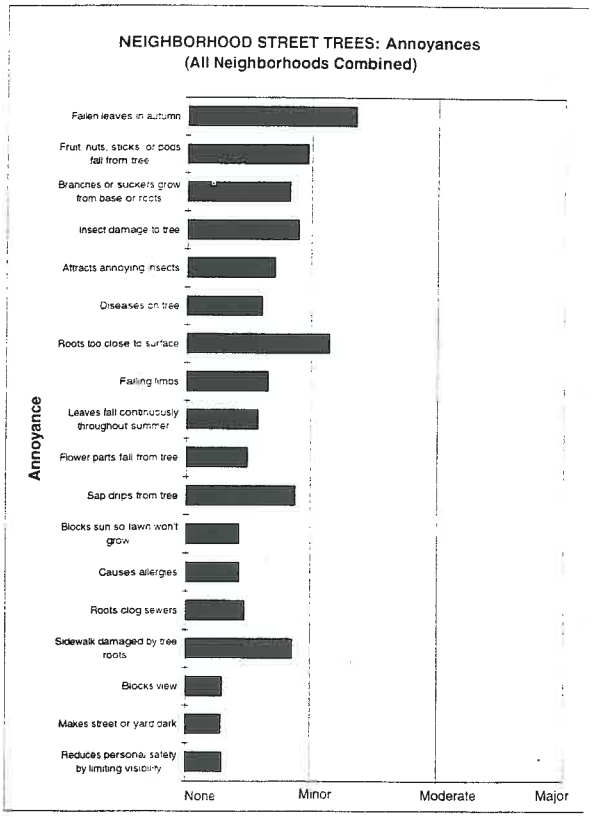

Figure 6

the neighborhoods with open canopies.

Species and size diversity. An important purpose for conducting the neighborhood survey was to learn about people's perceptions and preferences regarding diversity in their street trees. Questions on the survey addressed both the degree of diversity that people currently perceived in their neighborhood, and the degree of diversity that they would prefer to have. First, residents were asked whether the trees in their neighborhood were mostly the same size or a mixture of sizes. Then they were asked which they would most prefer, to have trees in their neighborhood that are all the same size or a mixture of different sizes. These same two questions were then repeated with respect to diversity of tree species.

Residents' perceptions of both size and species diversity in their neighborhoods (Figure 7, top half) were consistent with the designation of those neighborhoods by the village forester. The neighborhoods designated as having mixed ages and species were rated much higher on both size diversity and species diversity than were the neighborhoods designated as having even-aged single species. The small-tree neighborhood was rated low on size diversity and high on species diversity. The even-age open-canopy neighborhood was rated somewhat higher than the even-age closed-canopy neighborhood on both size diversity and species diversity.

Residents' preferences for size and species diversity are shown in the bottom half of Figure 7. Residents in all of the neighborhoods showed at least a moderate preference for having diverse tree species in their neighborhoods. This preference was slightly stronger in the two neighborhoods with mixed ages and species than in the even-age single-species neighborhoods. In regard to size diversity, residents seemed to prefer the conditions already existing in the neighborhood where they lived. Those living in mixed age/species neighborhoods expressed a preference for diverse sizes while those living in even-age neighborhoods expressed a preference for uniformly sized trees. Residents of neighborhoods with small trees were

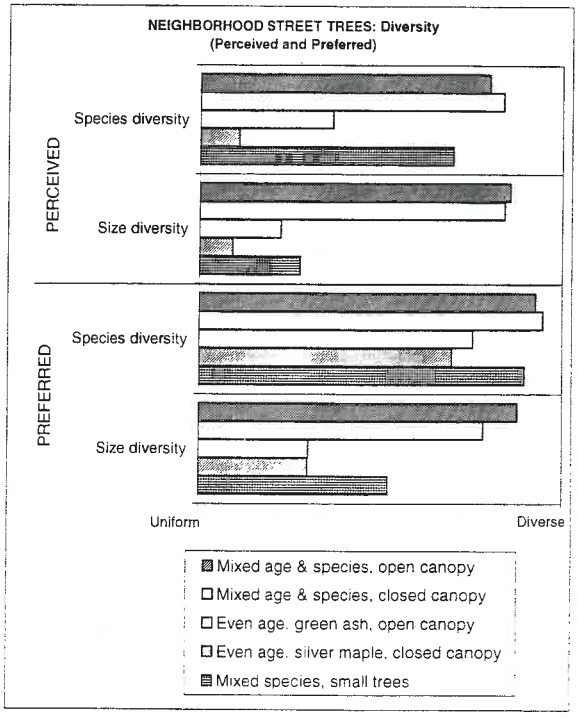

Figure 7

evenly divided on this question.

Discussion

The purpose of this survey was to provide information that would be helpful to the community of Downers Grove for selecting and maintaining trees so as to enhance the quality of neighborhoods for residents. The survey provides a detailed view of the overall level of satisfaction and of the importance of various benefits and annoyances from the point of view of residents who experience these trees in front of their houses and in their neighborhoods. Response rates were very good for a mail survey, suggesting that residents of Downers Grove have a high level of interest in their trees and how they are managed.

The most important benefits involved the visual quality of trees and their contribution to the appearance of the home and yard. Physical benefits such as cooling the air and removing pollutants were seen as relatively minor for individual street trees, but were somewhat more prominent when viewing trees in the neighborhood as a whole.

Overall, the benefits of trees were more prominent and significant than the annoyances. In some cases, however, specific annoyances associated with a particular species led to dissatisfaction with that species. The most notable example was Kentucky coffeetree, which had a problem with falling pods and sticks, and was one of the least preferred species.

While there was a generally high level of satisfaction with existing trees, there was also a strong indication that people would like to have larger, more mature-looking, and faster growing trees. Only in the neighborhood of mature silver maples did residents say that the size of their trees was "just right". The severity of many of the annoyances, however, was also greater in the mature silver maple neighborhood, suggesting that the desired tree size carried a price in the form of increased problems with surface roots, suckers, dripping sap, and falling leaves and debris.

The homeowners' desire for larger and faster growing trees is understandable, but public officials responsible for managing street trees must weigh this desire against the longer term costs of selecting fast growing trees. Many individual residents may incline toward a short term point of view; some of them may only plan to live in a particular home for 3 or 4 years. Faster growing trees will provide more short-term enjoyment for these residents but will incur greater maintenance and replacement costs over time. The public tree official must take a longer term view of the community's welfare, since trees planted today must serve not only present residents but future residents as well. From this point of view, trees with a slow or moderate growth rate may be the best choice even if they cause some frustration for some current residents.

The survey demonstrated that people can accurately perceive the degree of species and size diversity of tree populations in the neighborhoods where they live. Overall, people said that they preferred a diversity of species. This suggests that efforts to avoid street tree monoculture and its attendant hazards would be well-accepted by these residents. Preference ratings for size diversity, on the other hand, suggest that people tend to prefer the degree of size diversity that they already have in their neighborhood. Thus it is possible that people in even-aged neighborhoods might initially be displeased with efforts to increase the size diversity of trees in their neighborhoods, but that they may come to prefer the increased diversity after they have become used to it.

Caution should be exercised in generalizing these results to other neighborhoods and communities, since the responses to this survey may have been influenced by factors specific to these particular neighborhoods at the time of the survey. In particular, the results for individual species must be interpreted relative to the age and size of the existing trees in these neighborhoods. Certain important benefits of trees, for example shade, are proportional to the size of the trees, and many of the individual trees represented in this survey probably had not yet reached their full, mature size. The results should therefore be interpreted as a "snap-shot" of the benefits provided by these trees at one moment in their life-span, and not as an assessment of the value of the trees over their entire life. In future applications of this survey method, it would be desirable to collect information on the actual sizes and ages of the trees

(instead of just the residents' perceptions of adequacy of size), to aid in interpreting the responses that people give.

Conclusion

We feel that this survey methodology provides a simple and effective way of assessing the performance of a community's street trees and of guiding future tree selection, planting, and maintenance. The data can be easily tabulated and displayed using spreadsheet software of the kind typically found on personal computers. Sophisticated statistical tests, while desirable for scientific purposes, are not essential for interpreting the basic results. Copies of the survey forms and details on the research procedures are available through consultation with the first author of this paper. We hope that other communities will benefit from applying this approach to understanding their residents' satisfaction with their street trees.

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Zusammenfassung. Die Anwohner von Downers Grove, Illinois wurden über die Bäume vor ihrem Haus und in der Nachbarschaft befragt. Die Ansichten der Hauseigentümer über die Vorteile und Nachteile von acht Straßenbaumarten und fünf Typen von benachbarten Pflanzengesellschaften wurden miteinander vorglichen. Die Umfrage überprüfte die Befriedigung der Anwohner über die Vorzüge und die Ärgernisse, die die Bäume verursachen; z.B. Die Baumgröße, Aussehen und Wachstumsrate, die Artenvielfalt und unterschiedliche Größe der Bäume in der Nachbarschaft.

Illinois Cooperative Extension Service, United States Department of Agriculture and Morton Arboretum

Over the years, the Forestry Division has worked with entomologist Dr. Fred Miller on monitoring various insect levels and associated damage in various studies sponsored by the extension service, departments of agriculture and the Morton Arboretum. Observations across northern Illinois as to the types of insects, their current levels in various locations for a given year, and any related tree conditions or causes contributing to insect levels has helped in the determination of future expected infestations and control measures. Various insects have been studied in great detail, and include the periodical cicada, several ash borer species, honeylocust plant bug and elm leaf beetles. Dr. Miller has published reports in the Journal of Arboriculture. .

Various parkway trees are part of an ongoing experimental fertilizing project with the Morton Arboretum research staff. Pin oak and red maple which naturally grow in acidic soils develop a condition called chlorosis (low chlorophyll development causing yellow leaves) when they are planted in alkaline soils. Little growth, branch dieback, and general decline are the result once chlorosis becomes more prevalent. Other trees, such as honeylocust and green ash, prefer acidic soils though they will tolerate alkaline soils and still flourish. In northern Illinois, urban soils tend to be alkaline as a result of construction that removes surface soils and exposes or disturbs alkaline subsoils. Lawn care fertilizers and the influx of deicing products used during winter snow removal activities also contribute to alkaline soil conditions. When these popular trees, pin oak for its pyramidal shape and red maple for its superb fall color, are planted in alkaline soils, their growth and longevity are poor. Unfortunately, the Village planted many pin oak and red maples in the past. Some have actually grown surprisingly large before chlorosis became a problem. Rather than cut the trees down and start over with a new parkway tree, several were selected to be part of this study if the trees had a nice crown shape with the only problem being the yellow foliage. The experimental fertilizing treatments help acidify the soil as well as supply nutrients which are unavailable in alkaline soil conditions. So far, tree health improvements have been gradual.

The accumulation of deicing products in soils at various locations in Downers Grove was measured and compared with other areas. Honeylocust, one of the more salt tolerant tree species, has suffered decline and death in the downtown Downers Grove area as a result of soil salt. The following article titled "Factors affecting accumulation of deicing salts in soils around trees" summarizes the results. Currently, the Downers Grove Snow Removal Plan calls for reduced salt usage that will hopefully limit salt accumulations.

Various trees have been obtained from the Morton Arboretum for a variety of occasions. Experimental hybrid elm trees have been obtained from Dr. Ware, research dendrologist, and are planted in the parkways throughout the Village. These trees resemble the beloved American elm

in shape and size, and are resistant to Dutch elm disease. Hybrid elms and hybrid oaks have also been obtained for Arbor Day plantings at the grade schools over the years. In 1997, the Morton Arboretum donated a tree to the Village to celebrate both 125 years of Arbor Day and the 75th year as Chicagoland's Garden of Trees.

FACTORS AFFECTING ACCUMULATION OF DEICING SALTS IN SOILS AROUND TREES

by R.G. Hootman, P.D. Kelsey, R. Reid, and K. von der Heide-Spravka

Abstract. Parkways, street tree planter boxes, and highway medians and roadsides are locations where soil accumulation of deicing salts is highest. Sodium chloride is the most common deicer applied in the United States. Sodium chloride and other salts accumulating in the root zone may instigate and exacerbate street tree decline. Salts affect soil aggregate stability, porosity, and water and nutrient uptake in trees. Data collected in Chicago, Illinois show much higher soil sodium (1,272 µg/g) and chloride (348 µg/g) in the center of newly installed, narrow, raised medians along Lake Shore Drive after one winter, compared to the center of wide medians along the roadway (236 µg/g sodium and 23 µg/g chloride). Proximity to high speed traffic and its associated spray and splash were reasons for this. In suburban Downers Grove, Illinois, grade level street tree planter soils had extremely high levels of sodium (1,426 µg/g to 2,277 µg/g) compared to adjacent raised planter soils. The raised planters did not receive salt-laden runoff, splash, plowed snow, or direct application from salt spreaders.

Urban parkway and street tree planters present hostile environments for plants. Deicing salts, primarily sodium chloride, contribute to the harsh environments. Trees and large shrubs are of particular concern because of their monetary and aesthetic value. Excessive soil salts cause many of the same symptoms in plants as salts deposited directly onto tissue, though patterns and severity of symptoms may differ. Direct damage to plants from soil salts include reduced moisture uptake by plant roots. The plants subsequently exhibit scorched foliage due to desiccation of the tissue. Roots and associated mycorrhizae may also be killed (5). Transport of excessive sodium or chloride to the above-ground tissue may result in dieback and lack of vigor (6). Indirect impacts of salts include sodium competition with potassium, calcium, magnesium and other cations, potentially reducing nutrient uptake in plants (16). Excessive sodium breaks down soil structure by dispersion of colloids resulting in reduced pore space. Rubens (15) reports that soil sodium at 10% of cation exchange capacity will begin impacting physical soil properties.

Soils immediately adjacent to salted roadways are most susceptible to increased sodium and chloride levels. The majority of this is attributed to salt-laden splash and meltwater runoff. More than 90% of salts spread onto roadways are transported no further than 15 m (49 ft) from the road (3). Langille (11) found that soil sodium levels had increased from 18 µg/g to 68 µg/g after one winter within 12 m (39 ft) of a new interstate highway in Maine. Although a statistically significant change, these soil concentrations were not above the 250 µg/g threshold of sodium and chloride considered excessive to most trees. Kelsey and Hootman (10) found an average of 846 µg/g of sodium in the upper 10 cm (4 in) of roadside sidewalk planter soils in suburban Chicago. In two parkway sites, Kelsey and Hootman (9) found soil sodium levels as high as 620 µg/g to a depth of 15 cm. Sodium levels in each of these studies were extremely high and potentially injurious to most trees. Hofstra et al. (6) noted significantly higher soil sodium and chloride within 30 m (100 ft) of an Ontario roadway. Sodium was as high as 700 µg/g and chloride as high as 1000 µg/g within the 30 m (100 ft) distance.

Site characteristics affect salt runoff and accumulation. Iverson (8) found potentially phytotoxic sodium levels in depressions receiving expressway runoff compared to nearby uplands, and Piatt and Krause (14) note significantly greater chloride accumulation in soils downslope from a roadway compared to upslope.

Total deicing salt use in cold climates has been rising since 1970 due to increasing roadway construction and public safety concerns. Rates of application per lane-km, however, have not risen significantly (3,4,7). Urban regions tend to have higher application totals, and winters with more storms have more salt usage (4,7). Gales and

VanderMeulen (4) indicate metropolitan Detroit averaged about 22 metric tons (mt) of salt applied per lane-km (40 tons [t] per lane-mi) per winter from 1965 to 1990, while Michigan overall averaged 14 mt per lane-km (25 t per lane-mi) for the same period. The Illinois State Toll Highway Authority (ISTHA) (7) has averaged nearly 21 mt per lane-km (37 t per lane mi) per winter along the section of Interstate 88 at The Morton Arboretum near Lisle, Illinois, or 126 mt per km (220 t per mi) of six lane expressway. Municipalities in the Chicago, Illinois region average about 13 mt per lane-km (23 t per lane-mile) (18).

This study examines various planter types and roadway scenarios around those planters to determine their influence on the accumulation of deicing salts in the soil.

Methods

Two study areas were selected: the median of Lake Shore Drive in Chicago and streetside sidewalk planters in the central business district (CBD) of Downers Grove, Illinois. The two areas reflect dichotomous salt-use scenarios because of environmental and traffic pattern differences.

Lake Shore Drive has eight lanes of traffic and a 65 km per hour (40 mph) winter speed limit. Four sites on the Drive were chosen to represent various roadway and median characteristics that might affect deicer application, dispersal, and deposition. Two sites were within a narrow, raised median

Figure 1. Narrow median planter along Lake Shore Drive, Chicago, with Lake Michigan in the right background. The planter is raised 0.8 m (2.5 ft) above the roadwaw. Photo credit: Jim Nachel

Figure 2. Grade level and raised planters in Downers Grove. Photo credit: Jim Nachel

and two sites were within a wide, road-level median. Traffic counts at each site show essentially equal traffic levels (2). The narrow median is 3 m (10 ft) wide and raised 0.8 m (2.5 ft) above the roadway (Figure 1). The wide median is about 30 m (100 ft) across and level with the roadway. One surface soil sample (0-15 cm deep, 0-6 in) was gathered on 28 December 1992 and on 30 March 1993 in the center of each median site.

Streets in the Downers Grove CBD are two lanes and speeds are less than 50 km per hour (30 mph) due to the stop-and-go traffic at intersections. A soil sample was taken at each of two grade level planters and each of two raised planters in 1991; only one grade level planter and one raised planter were sampled in 1993 (Figure 2). Samples in Downers Grove were taken at depths of 0-10 cm (0-4 in) and 20-30 cm (8-12 in).

All soils were tested for pH, electrolytic conductivity, elemental concentrations, cation exchange capacity, and base saturation. Sodium adsorption ratio (SAR) and exchangeable sodium percent-

age (ESP) were calculated for each soil (1, 17). These are given below.

(Eq. 1) SAR = $Na^{+}/([Ca^{+++}Mg^{++}/2)1/2$.
(Eq. 2) ESP = (Exchangeable Na^{+}/Cation Exchange Capacity)x100%.

Results and Discussion

Snowfall during the winter of 1992-93 at Chicago's O'Hare Airport was officially 118 cm (46 in), about 13 cm (5 in) above average (12, 13). The airport is not on the lakefront. Lakefront data were not available. There were also freezing rain and mixed precipitation events; the total number of deicing events in each study area is not known.

Lake Shore Drive median, Chicago. The winter of 1992-93 was the first in which the narrow, raised planter soils were in place; the wide median had been physically undisturbed for about 45 years. The December sample was gathered after deicing for the season had begun and does not reflect the new, pre-deicing, uncontaminated planter soil. The high soil sodium, chloride, SAR, and ESP in the new raised planters on 28 December reflect how quickly deicing salts had already accumulated in the soil (Table 1).

The two planter types each increased in sodium, chloride, SAR, and ESP between the beginning and end of the study (Table 1). Sodium and chloride increased to extremely high levels in the narrow median after only one season, although variation was quite high (Table 1 and Figure 3). Sodium saturation in this planter soil increased during the winter at the expense of calcium and magnesium saturation (Figure 4). Potassium showed little change. The close proximity of the narrow median to traffic and associated heavy splash and spray is the reason for the elevated levels. The high speed of the traffic was significant in causing the heavy splash and spray.

The wide median was much lower in sodium, chloride, SAR, and ESP throughout the winter compared to the narrow median, although variation was high (Table 1). This median does not receive direct splash or runoff, only aerial deposition, thus, this median had relatively low levels of deposition and accumulation, as evidenced by the soil sodium concentrations at the start of this study.

Soil pHs above 8.3 signify sodium-affected chemistry; this is not typical of humid region soils. Where sodium deicers are used extensively in the Chicago area, soil pHs have been found as high as 9.9 (10). Though elevated, no pHs on Lake

Table 1. Mean soil salt properties.

Site	Date	Depth (cm)	Sodium (µg/g)	Chloride (µg/g)	pH	SAR	ESP
Medians of Lake Shore Drive, Chicago.							
Narrow, raised	Dec. 1991	0-10	424±11	106±26	7.6±0.1	10.8±0.1	9.3±0.3
	March 1993	0-10	1272±443	348±73	7.9±0.5	32.7±12.9	23.7±8.1
Wide, at grade	Dec. 1991	0-10	344±381	56±16	7.6±0.2	8.2±8.9	6.5±6.9
	March 1993	0-10	236±78	23±8	7.6±0.1	5.8±2.1	4.8±1.8
For the planter types in Downers Grove.							
Grade level	Aug. 1991	0-10	1600±686	278±173	8.1±0.1	48.9±18	40.6±9.4
	May 1993*	0-10	1529	129	8.5	41.8	37.6
	Aug. 1991	20-30	1486±586	440±42	8.5±0.1	48.0±15	40.4±7.7
	May 1993*	20-30	2277	223	8.1	63.2	47.7
Raised	Aug 1991	0-10	199±13	220±57	7.5±0.1	3.8±0.8	4.2±1.2
	May 1993*	0-10	217	104	7.8	4.3	4.8
	Aug. 1991	20-30	127±28	180±28	7.3±0.1	2.6±0.1	2.4±0.1
	May 1993*	20-30	93	110	7.4	2.1	1.8

* May 1993 included only one site

Shore Drive were above 8.3 (Table 1).

As noted by Kelsey and Hootman (10), conductivity is not a useful criterion for evaluating sodium chloride affected soils. Electrolytic conductivity data in this study were all less than 1.1 mmhos/cm and are not presented individually.

Downers Grove planters. The data from study sites in Downers Grove vary considerably. The sites with the highest sodium, chloride, pH, SAR, and ESP levels were the grade level sidewalk planters (Table 1). The levels of sodium in these planter soils are higher than other data reported in the region (8,9,10). These planters receive roadway splash and spray, get direct deicer application from spreaders, and receive salt-laden sidewalk runoff. Each of these contributes greatly to the accumulating salts. The soils also have a high clay content, which minimizes leaching of the accumulated salts. This is perhaps best indicated at the 20-30 cm (8-12 in) depth, which showed an accumulation of sodium between 1991 and 1993, with SAR and ESP also increasing.

Despite being located adjacent to the street, the raised planters have significant advantages with regard to salt protection. Unlike Lake Shore Drive, traffic splash is minimal here because of the lower traffic speed. Sidewalk meltwater cannot run off into these planters. The data reflect these observations. Sodium, chloride, SAR, and ESP were very low and do not represent a stressful plant environment (Table 1 and Figure 3). Changes from 1991 to 1993 were negligible, suggesting sodium and chloride deposition was minimal during that time.

Soil pHs in the Downers Grove grade level planters were higher than all other sites in this study (Table 1). Some pHs were above 8.3, indicating sodium impact on soil chemistry.

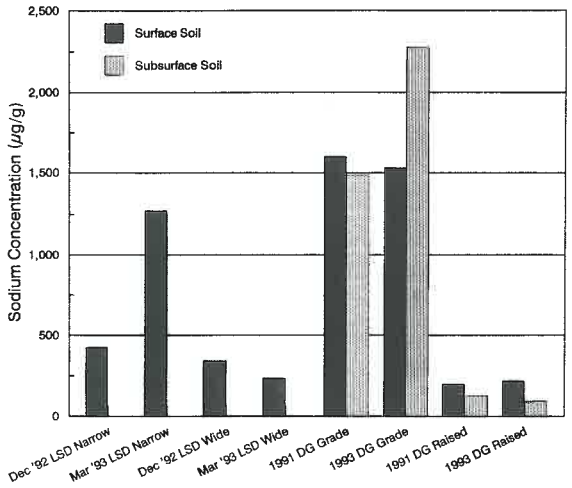

Figure 3. Mean soil sodium in Lake Shore Drive (LSD) and Downers Grove (DG) planters.

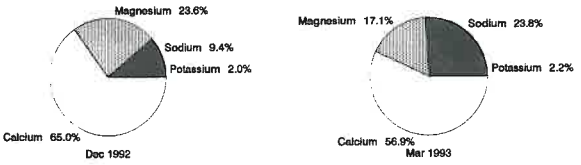

Figure 4. Mean percent base saturation of the narrow median planter surface soils on Lake Shore Drive.

Summary

Planter type and traffic patterns in an area, among other factors, influence the levels of salt entering the soil. Newly installed median planter soils along Lake Shore Drive, Chicago, in less than one winter season, accumulated levels of deicing salts considered stressful to most woody plants. Two primary factors contributed to this accumulation: 1) narrowness of the planters and their proximity to traffic, which made them susceptible to splash and spray from traffic in both directions, and 2) high traffic speed, which induced greater levels of splash that easily breached the median planter wall. Sites farther from direct roadway splash, spray, and runoff accumulated much less salt. Soils gathered in the center of a 30 m (100 ft) wide median that had been in place on the Drive for several decades, had little salt accumulation over the season and minimal stress values.

Soil salt indicators varied greatly within and among planter types in Downers Grove. Grade level sidewalk planters had very high sodium, chloride, SAR, ESP, and pH in the soil surface and at depth over the course of two years. Leaching is minimal over time in this planter type due to the

high deposition rates and high clay content of the soil. The high salts in grade level planters were attributed to salt-laden splash and spray from roadway traffic, salt-laden plowed snow, sidewalk meltwater runoff directly into the planter, and direct salt application from road and sidewalk spreading. Levels of salts in raised planters in the same location were very low and not considered stressful.

Several options are available for municipalities to minimize or eliminate deicing salt accumulation in planters. Dobson (3) thoroughly reviews methods of reducing salt damage, including the following:

- Examine the use of abrasives or alternative deicers that do not contain sodium or chloride. The more expensive alternatives could be used selectively on smaller scales, such as near environmentally sensitive areas or on sidewalks.
- Calibrate salt spreaders. In England, application rates were found to be 2 to 8 fold higher than recommended due to failure to calibrate the spreaders.
- Eliminate hand spreading, which promotes uneven application and wastes deicer compound.
- Irrigate planter soils to leach sodium and chloride before spring growth. Be sure to avoid saturated conditions. Leached potassium or magnesium can be replaced through application of fertilizers.
- Apply gypsum (calcium sulfate) to the soil, which decreases sodium buildup by displacing it with calcium. This may also lessen dispersion of soil particles and the resultant loss of soil structure caused by excessive sodium.
- Design and engineer sites to keep salt spray, runoff, and plowed snow away from planters. Ideas include raised planters to eliminate runoff, lowered speed limits to reduce splash and spray, and high-density fabric fencing around planters to reduce splash and spray onto the soil.

Acknowledgment. The authors wish to thank Steve Ruffolo, Assistant Director of Public Works for the Village of Downers Grove, and the City of Chicago for making planter sites available for study. This project was funded in part by a research contract from the Chicago Park District.

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Résumé. Le chlorure de sodium est le sel de déglaçage le plus couramment utilisé aux États-Unis. Le chlorure de sodium, ainsi que les autres sels utilisés, s'accumule dans la zone des racines, et peut créer et amplifier des problèmes de dépérissement chez les arbres de rues. Les sels affectent la stabilité des agrégats du sol, la porosité du sol ainsi que l'eau et les éléments minéraux disponibles pour l'arbre. Des données recueillies à Chicago en Illinois montrent des concentrations de chlorure de sodium plus élevées dans le centre des terre-pleins surélevés de construction récente de la rue Lake Shore en comparaison avec le centre de terre-pleins plus larges. Dans la banlieue de Chicago, les plantations d'arbres au niveau de la rue ont des concentrations plus élevées de sel comparé aux plantations surélevées à proximité. Les plantations surélevées ne reçoivent pas autant de sel en provenance de la fonte, des éclaboussures, des amoncellements de neige ou directement des épandeuses d'abrasifs.

Zusammenfassung. Sodiumchlorid ist das in den USA am häufigsten angewendete Enteisungsmittel. Sodiumchlorid und andere Salze, die sich in der Wurzelzone akkumulieren, können de Rückgang von Strassenbäumen in Gang setzen und verschlimmern. Die Salze beeinflußen die Stabilität der Bodenaggregate, die Porösität und die Wasser-und-Nährstoffaufnahme in Bäumen. Die erhobenen Daten in Chicago, Illinois, zeigen einen viel höheren Sodiumchloridgehalt im Zentrum von neu errichteten, erhöhten Mittelstreifen der Seeuferstrasse verglichen mit dem Zentrum von breiten Mittelstreifen. In den Vorstadtbezirken von Chicago haben die Böden der Grünstreifen, die in Ebene mit der Straße liegen, verglichen mit höher gelegenen Grünstreifen extrem hohe Sodiumwerte. Die höher gelegenen Pflanzstreifen bekommen weniger salzbelastetes Spritzwasser, seitlich hochgepflügten Schnee oder direkte Salz-Applikationen von den Streufahrzeugen ab.

Illinois Department of Natural Resources

Downers Grove has received 2 grants from the Illinois Department of Natural Resources. Authorized through the Urban Forestry Assistance Act, the grants provide 50/50 cost-share reimbursement for projects that enhance the quality of trees in their community.

In 1996, Downers Grove was 1 of 29 communities awarded $187,275 in grants to provide technical assistance for urban forestry programs. The project involved a combination of tree plantings and development of a driving tour of trees brochure. The main theme involved driving through a portion of Downers Grove to view a variety of native trees, both the older large trees and the smaller newly planted native trees. The total project cost $5279, and the State reimbursed the Village $2468.

In 1997, Downers Grove was 1 of 21 communities awarded nearly $100,000 for forestry projects. The project was to locate all the parkway trees for the GIS system. The total project cost was $14,200 with the State reimbursed the Village $5,000.

Metropolitan Mayors Caucus

Downers Grove has received 1 grant so far from the Metropolitan Mayors Caucus. Authorized through the Federal funds, the grants provide 80/20 cost-share reimbursement for projects that are related to Emerald Ash Borer.

In 2011, Downers Grove was 1 of 46 communities awarded over $833,000 in grants for reforestation related to Emerald Ash Borer (EAB). The project involved the removal of 80 ash trees and the replacement planting of 80 trees of various tree species. The total cost of the project was $44,694 and the Metropolitan Mayors Caucus reimbursed the Village $20,000.

Chicagoland Grows

Chicagoland Grows is an innovative plant introduction program which has been developed to promote and encourage the use of plant cultivars that are well adapted to northern conditions. The Chicago Botanic Garden, The Morton Arboretum, and the Ornamental Growers Association of Northern Illinois are responsible for the development and operation of the Program with the Chicago Botanic Garden serving as Program Coordinator. Over the years, several trees developed

by the program have been planted in the parkways including Marmo Freeman Maple, State Street Miyabe Maple, Triumph Hybrid Elm, and Exclamation London Planetree.

Boy Scouts

Over the years, Forestry staff has assisted several boy scouts in order to obtain Eagle Scout ranking. Previous projects involved staff demonstrating proper pruning techniques for projects. In 2001, the project involved making bluebird boxes and then installing the boxes on Village, Sanitary District and Park District property. In 2002, the project involved cutting burlap and twine sections, and then installing the bands on larger oaks in the Village parkways in order to monitor gypsy moth caterpillars. In 2011, the project involved pavers for a trail project in Lyman Woods, of which the Village helped in the transport and delivery of the pavers.

Girl Scouts

For their 100th anniversary, Girl Scouts of Greater Chicago and Northwest Indiana developed projects to plant evergreen trees. In Downers Grove, one troop raised money for their tree with a penny collection. The girls "earned" their pennies by doing good deeds. The evergreen spruce tree was then planted at the 71st Street Watertower on Arbor day, Friday April 27, 2012.

ComEd

See Chapter 6 – Tree and Stump Removals

Girl Scouts Help Village Celebrate Arbor Day

Last updated: Public Relations Specialist | Monday, April 30, 2012

Daisy and Brownie Girl Scout troops from Downers Grove celebrated Arbor Day on Friday, April 27, 2012, by planting a spruce tree at the 71st Street water tower. The tree was planted in honor of the 100th Anniversary of Girl Scouts. Each girl raised money to purchase the tree by performing good deeds.