

**Urban and Community Forestry in Rhode Island:
Incorporating Trees into the Plan**

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Abstract

Trees are essential for the well-being of the ecosystem and provide numerous other functions that benefit the health and welfare of people. But harsh environmental conditions in the urban areas and development in rural areas jeopardize the long-term survival of trees. Municipalities in Rhode Island need to develop urban and community forestry programs to promote the survival and protection of trees.

In order to gain a better understanding about how trees are currently managed in Rhode Island, I interviewed representatives from 30 of the 39 municipalities. The data resulting from the interviews demonstrate that many of the municipal programs are missing some or all of the components that are necessary to insure the long-term health of their forests. Many municipalities, for example, lack a tree replacement plan, do not perform routine maintenance, and do not involve community members. Due to the disparity amongst municipal tree programs, I recommend that stricter guidelines should be provided on the state level.

The Rhode Island Urban and Community Forest Council (now the Rhode Island Forest Council) and the State Division of Planning are preparing an urban and community forestry component for inclusion in the State Guide Plan. This component would provide the municipalities with needed guidelines concerning the development of their tree management programs. I recommend that the guide plan component should encourage the protection of trees on undeveloped properties, emphasize the benefit of conducting an inventory, stress the importance of a routine maintenance plan, and suggest ways to involve community members.

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Part I: Introduction

Human activities have taken a visible toll on the nation's urban and community forests. Reacting to this loss, the United States Forest Service, state and local environmental agencies, community members and many others have rallied to establish pro-active tree protection and management programs. The first major national initiative was taken by the U.S. Forest Service when it formed its Cooperative Forestry department in 1978. Yet despite the guidance on the national level, there are still numerous communities that lack urban and community forestry programs.

In fact, Washington, Delaware and Vermont are the only states that provide guidelines for urban and community forestry on the state level. As a Rhode Island resident, I was interested to learn about the management of urban and community forests in the state. I began my research by contacting John Campanini who is the chairman of the Rhode Island Forest Council¹. Mr. Campanini informed me that one of the Council's primary goals was to institute state-wide requirements for the management of urban and community forests. In 1996, the Council received a grant to write an urban and community forestry component into the state guide plan which would place requirements on the comprehensive plans of all municipalities in the state (this plan will be discussed in depth in Part III). This became the central focus of my thesis: to determine what should be included in this guide plan component. However, I also realized that before I

¹ Before March 22, 1997, the Rhode Island Forest Council was called the Rhode Island Urban and Community Forest Council. The Council is a non-profit, non-governmental organization that will be discussed further in Part III.

could make recommendations of substance, I would first need to know how the urban and community forests in the state were already being managed.

The following paper is a discussion of my research, which I have compiled into three sections. Part I provides a background on the topic of urban and community forestry and why management programs are necessary. In Part II, I discuss my primary research on the situation in Rhode Island today, and analyze the municipal programs. Finally, Part III contains a summary of a few policy options, with special attention focused on recommendations for the new urban and community forest component for the state guide plan.

Urban and community forestry defined

Just what is 'urban and community forestry'? At first it may seem strange to discuss forests and cities within the same context, however, the definition used by the United States Forest Service can be used for clarification. The Forest Service has defined urban and community forestry as being, "The comprehensive management of trees and related natural resources in populated areas." (*Vital Communities 7/96*, pg. 4) There are two key words in this definition which are pivotal to developing an understanding of the concept of urban and community forestry: "forests" and "management". The following is a discussion of these two components.

Trees as part of a forest ecosystem

Although 'community forests' in rural areas can be fairly easily conceptualized, it is confusing to think of the trees that line the city streets as components of a forest. It seems that most people have an understanding of forests as being "a large thick growth of trees and underbrush." (Miriam Webster) But forests can be more accurately defined

as being the trees and other natural resources that make up an ecosystem. Trees interact with other system components including soil, water, air, insects, and wildlife; all of which are of course, still present in urban landscapes. However, because trees play such an integral role in the ecosystem, the number and health of trees will have a direct effect on how well the system functions. It is through an understanding of the functions of trees within an ecosystem, no matter if the trees are in the city or the suburbs, that urban and community trees are labeled as "forests".

The necessity of management

While trees are an integral part of an ecosystem, nature alone will not insure trees' survival; human activities such as development threaten the existence of forests. It is because of the negative effects of human interactions with forest ecosystems that the US Forest Service emphasized a need for "management" within their definition of urban and community forestry.

Management programs are considerably different in rural versus urban communities. In cities, trees are confronted with a multitude of harsh environmental conditions. One of the most pronounced conditions is inadequate root space, which results when street trees are planted in a median between the side walk and the road. In these pits, trees generally have limited access to nutrients since dead leaves are often taken away before they can decompose in the soil. In addition, compaction resulting from pedestrian traffic makes it difficult for water to leach through the soil, and limits the amount of oxygen accessible to the roots². Other harsh environmental conditions more pronounced in urban areas are the deposition of salt, oil and dog urine on tree roots.

²Roots need at least 50 percent oxygen in the soil in order to grow. (Shading 97)

Trees cannot survive these types of conditions for long periods of time, and the result is that urban trees live an average of only five to thirty years (Shading 88).

In community forests, trees are, of course, confronted by a much different set of conditions than those encountered by urban trees. The major factor affecting the survival of trees in rural areas is development. Too often, developers clear-cut sites, believing it is cheaper and easier to bulldoze than to selectively cut only those trees that are in the way of development. However, there are numerous financial and social benefits to leaving trees standing at development sites. These benefits will be discussed in the next section.

Development is very much a threat in Rhode Island, considering that it is the second most densely populated state in the country. And although there are a number of municipalities that pride themselves on their 'rural character', these are the very areas that witnessed the largest percentage increase in populations from 1980 to 1990. In the last decade, populations per square mile in the rural areas of Rhode Island increased by 15.3% as opposed to a 1.8% increase in the urban areas. (RIPEC³) Furthermore, given the population projections, it is believed that by the year 2010, an additional 148,000 acres may be needed for new development in Rhode Island (Johnson 155-4-1). In order for rural communities to protect their forests, management programs need to be implemented to require that trees on undeveloped lots are not clear-cut. So due to development in rural areas and harsh environmental conditions in urban areas, human intervention and management are needed in order to insure the survival of urban and community forests.

³This data was taken from a booklet published by the Rhode Island Expenditure Council.

The benefits of trees

There is a desire to promote the protection and long-term survival of trees because trees provide numerous benefits. Not only are trees a central component of forest ecosystems, but trees are integral to the infrastructure of communities as well. Trees can help to promote physical and psychological health, a cleaner, more sustainable environment, and can provide a considerable net economic benefit.

Social-psychological benefits

Those persons who know nothing about the environmental or ecological functions of trees are likely to react to trees based on socially or psychologically-influenced feelings. The reasons many people plant trees and enjoy being in their presence are not necessarily tangible, but could be emotional, perhaps even unconscious. In 1984, Ulrich conducted a study to try to identify some of these difficult-to-measure reactions to trees. He compared the recoveries of patients hospitalized for identical surgical procedures. Those patients with a view of trees out their windows, recovered more quickly and with less side effects than those patients who had a view of a brick wall (Ebenreck 54). Ulrich also conducted a study in which a group of students were shown 50 slides of natural scenes and another group was shown 50 slides of urban areas. Those students who were shown the slides of nature felt less stressed afterwards and those in the other group felt more stressed (Ebenreck 54).

Another study was conducted in Chicago by Sullivan and Kuo to test some of the assumptions about the effects of trees on urban communities. They "...are finding signs

of stronger communities where there are trees...In buildings with trees, people report a stronger feeling of unity and cohesion with their neighbors; they like where they are living more and they feel safer than residents who have few trees around them (Sullivan 2). Trees provide a sense of community; a connectivity and vitality within neighborhoods which is promoted by the U.S. Forest Service in order to emphasize the need for healthy ecosystems⁴. Certain significant trees can also contribute to a sense of community by being a source of pride and history for a neighborhood. In fact, many tree protection committees and volunteer organizations start out as a response to the wrongful death of historic trees⁵.

Some people are aware of the social-psychological benefits of trees and feel a need to be in the presence of trees. In the city, trees provide residents with a bit of nature and an escape from the built-up, asphalt-covered environment. Some of the most sought after (and expensive) residential buildings in New York City are those that surround Central Park. By the time the Park was finished, values of properties nearby increased nine fold (NAHB 14). Similarly, the presence of trees in rural communities may be the very reason that a person is drawn to live in that community. This is demonstrated, for example, by the high percentages of persons who will pay more for a home on a treed lot (this will be discussed under *Economic benefits*).

However, just as some people have a deeply rooted need to be in the presence of trees, others despise them. This sometimes occurs when a 'nuisance' is created when trees drop branches and leaves. Others dislike trees because they believe trees can

⁴See "Urban and Community Forestry on Course into the Future: Vital Communities through Healthy Ecosystems-- A Strategic Approach". USDA Forest Service, July 1996.

provide a hiding place for criminals. These concerns are valid and should not be discounted. Certainly the perception of trees can be enhanced through better maintenance programs, clean-up programs, and crime prevention programs. However, trees in neighborhoods where people do not like trees are not going to be cared for or appreciated. In order to avoid planting trees where they are not wanted, it is essential that residents are involved in locating sites for plantings and the participation in planting projects⁶.

Environmental benefits

Perhaps trees would be better appreciated if people knew more about their environmental benefits. These include the filtering of pollution, the mitigation of soil erosion, cooling of the air, and blocking of harsh winter winds, enabling energy conservation. The first item to be addressed is the ability for trees to filter particulates and pollutants from the air. These include localized pollutants generated by cars in the form of small particles and carbon monoxide. "The amount of carbon sequestered annually by one tree less than 8 cm (3 inches) in trunk diameter (d.b.h.) equals the amount emitted by one car driven 16 km (10 miles)." (Chicago study *iv*) This carbon sequestering function is essential considering that carbon dioxide is a greenhouse gas. The gas acts as the glass on a greenhouse, allowing the sun's rays in to the earth's atmosphere, but preventing them from leaving. Combined with other greenhouse gases, the net effect will be a global rise in temperature of 2.5 degrees Celsius in by 2100 (World Resources 209). Therefore, the number and health of trees in an area in relation

⁵This was the case, for example, in South Kingstown, Rhode Island. The town chopped down a few Ash trees that were each over 300 years old, causing a group of angered citizens to form the Advisory Group on Trees.

⁶ The importance of community involvement will be discussed in Part II.

to the amount of pollution not only have a direct effect on the quality of the air but will have an indirect effect on global temperatures.

Residents of cities and towns can do their part to help mitigate emissions by planting and protecting trees in their local communities. Those communities who invest in the trees can then reap the benefits of pollution mitigation. For example, Los Angeles, which has severe traffic congestion problems, is known for having numerous ozone hazard days each summer. The Planning Department of Los Angeles estimated that one million trees would be needed to filter up to 200 tons of ozone every day. The Tree People of Los Angeles took on the challenge and planted one million trees in the three years prior to the 1984 Olympics (Shading 240).

Trees not only purify air, but they also help to retain water within the ecosystem. Cities are characterized as having a high percentage of impervious surfaces. The majority of rain water is lost to the drainage system, carrying oil and other pollutants from the streets into the nearest water way. Where soils are permeable, trees help to channel rain water into essential underground aquifers by capturing water before it escapes into drainage pipes. Research by Rowntree shows that the urban forest can

"significantly modify the water budget of an urban region. For example, in a one-inch rainstorm over twelve hours, the interception of rain by the canopy of the urban forest in Salt Lake City reduces surface runoff by about 11.3 million gallons, or 17 percent...This allows surface water recharge, cuts the cost of wastewater disposal, and averts the flooding and sedimentation of city streams or rivers." (Shading 51)

This points to another environmental benefit of trees; trees help to reduce soil erosion. A study conducted in the Gunpowder Falls Basin in Maryland found that, "...forest land produced about fifty tons of sediment per square mile per year; established

urban and suburban land, fifty to 100 tons; farmland, 1,000 to 5,000 tons; and land stripped for construction, 25,000 to 50,000 tons." (Shading 53). This is why it is essential to protect trees within a buffer zone at construction sites.

Trees enable energy conservation as well. They provide shade and cool the air through the conversion of water to vapor (referred to as evapotranspiration). The effect of trees on air temperatures is so pronounced that, rural areas with large numbers of trees can be up to nine degrees cooler than neighboring urban areas (NAHB 8). In addition, deciduous trees⁷ strategically planted around buildings on the east and west sides can shade the building and reduce the need for air conditioning. Similarly, evergreen trees planted on the north and west side of buildings can help to protect against harsh winter winds, reducing the need for heating. This ability for trees to reduce the need for air conditioning and heating has the indirect benefit of reducing energy consumption.

Economic benefits

There are substantial economic benefits to these energy conservation functions. Strategically planted trees can save the homeowner up to 20% on heating bills and 10-50% on air conditioning costs (NAHB 5). In addition, a study conducted in Chicago by McPherson and others (herein referred to as the "Chicago study") estimated that through energy savings and other benefits, the net economic value of one tree over a 30 year period is \$402 (Chicago study v).

Developers can also gain monetarily from saving trees at construction sites. A survey of builders conducted by the National Association of Home Builders found that people are willing to spend more money for a home surrounded by lots of trees.

"Builders reported that 43 percent of home buyers paid up to \$3,000 more, 30 percent paid between \$3,000 and \$5,000 more, and 27 percent spent over \$5,000 more--with 8 percent of those spending an additional \$10,000--for wooded lots (NAHB 1)⁸.

Conclusion

Given these social-psychological, environmental and economic benefits, there are sound reasons to plant and protect trees for present and future generations. However, in Rhode Island there are no strict requirements on the state level for urban and community forestry management. The decision to manage urban and community forests is largely left to municipal governments, which are granted the power to make land use decisions in their communities. This power is delegated through the land use enabling acts of states, with the view that municipalities are better able to make local land use decisions. The various approaches to urban and community forestry taken by the 39 municipalities in Rhode Island are described in the next chapter.

⁷Deciduous trees are recommended so that the sun is able to shine through the branches during the winter months.

⁸However, developers who are unaware of how to protect trees at development sites without damaging roots will inevitably result in a cost for the home owner; damages to a tree's roots could cause it to die within a few years (NAHB 33).

Part II: Urban and Community Forestry in Rhode Island

In the state of Rhode Island, there is very little legislation pertaining to urban and community forests. One of the few specific requirements is Public Law 2-15-8, which requires that all municipalities must replace trees removed from public property⁹. However, given the budget constraints in the state, this mandate is seldom (if ever) enforced by the Forestry Division of the RI's Department of Environmental Management (DEM). Therefore, the decision to manage urban and community forests is left to the municipalities which are granted the power to make land use decisions.

It was therefore necessary to research how the municipal governments were managing their forests in order to have a general understanding of the management of trees in the state. I began this research by inquiring with Bruce Payton, the state Urban and Community Forester at DEM, about the municipal programs. He informed me that from 1992 to 1994, he has sent a survey to each municipality as part of the USDA grant application process. The survey consists of eight questions which require mostly 'yes/no' responses. For example, the first question asks if the municipality has a tree ordinance. I analyzed the results of these surveys and gained a generalized understanding of the municipal programs, but the surveys were not able to provide an in-depth understanding of the level of management amongst the municipalities. Subsequently, I decided it was necessary to research the topic more extensively. Since the municipalities were taking an

⁹ Section 2-15-8. Permits for cutting or removal of plants or debris—Replacement of damaged or removed trees.--- "...and when the application is made for the cutting or removal of trees along any highway...the

average of about one year to return the surveys sent out by Mr. Payton, I decided that instead of utilizing a written survey, I would attempt to interview a representative from each of the 39 municipalities.

Methodology

The purpose of the interviews was multifold: to learn more about each municipality's program including the level of maintenance and community involvement, and whether or not there were obstacles to the implementation of the program. I wrote the interview protocol based on these objectives. I then obtained a list of 39 contacts from Bruce Payton. These contact persons varied in occupation, and included town planners, Tree Wardens, Conservation Commission chairpersons, and others. In some cases, the contact person referred me to someone else in the community.

I decided to conduct the interviews over the telephone for several reasons. The first is, of course, that this method of interviewing is quite convenient. It would have been extremely time consuming (and a waste of gas) to drive all over the state to interview the contacts. Furthermore, I thought that the interviewee would appreciate the more relaxed nature of the telephone interview versus a face-to-face interview. Finally, I thought it would be quicker to reach persons on the phone than to try to schedule an appointment. The downfall to conducting interviews on the telephone, however, is that there are times when a telephone interview lacks the personal connection that is needed for a more open discussion.

Another aspect of the interview process that should be discussed is the method used to record the data. I did not tape record the interviews (because I was not aware of

permit shall contain a provision that the applicant shall replace any trees that are removed or in the

the ability to do so), and had to rely upon note-taking. Although I was able to write down some quotes, it was impossible to write down everything, and there is a good chance that I missed a few key statements. Therefore, in the discussion of the interview results that follows, the reader should be aware that most of the supporting statements have been paraphrased. And in many cases, the notes were not sufficient to enable me to provide paraphrased quotes as evidence for my statements. But before discussing my results, I should also mention the piloting process.

I piloted my questions on six interviewees then asked Dr. Zarcadoolas, professor of Social Research at the Center for Environmental Studies, to critique the questions. She had numerous comments and so I restructured the protocol taking many of her suggestions into account (see Appendix A). The next 12 interviews were conducted on the same day, over a period of six hours. I tried to follow my protocol fairly closely although I omitted questions if I thought they were inappropriate or had already been answered. Furthermore, I probed for additional responses if I believed the question had not been fully answered, and probed when responses were interesting or needed clarification.

Most all of the interviewees were very kind. Some were willing to stay on the phone for long periods of time; I had two interviews that lasted almost forty-five minutes. However, most interviews took between ten and twenty minutes. If the contact person believed he or she could not answer my questions then the contact referred me to another person to interview; this occurred approximately one third of the time. Only two interviewees were abrupt and seemingly irritated by my questions, the contacts from

opinion of the issuer are substantially damaged...at his own expense...”

Woonsocket and Foster. The interviewee from Foster, however, did refer me to another person to contact in the municipality (although I was unable to reach that person).

Of the 39 municipal contacts, three were not contacted because the telephone numbers were wrong and due to time constraints, I did not attempt to find the correct numbers. These were Narragansett, Tiverton, and Burrillville. In addition, I did not interview a Providence contact because I had already spoken with John Campanini, Providence's Urban Forester, on numerous occasions about various issues covered in the interview protocol. Of the remaining 35, I interviewed someone from 30 of the municipalities. The ones remaining are Gloucester, Jamestown, Cumberland, West Warwick, and Foster (of which my interaction was so brief that no real data came of the conversation). I did not interview a representative from these municipalities because I had to stop researching in order to write up the results. I hope that excluding these municipalities will not adversely affect the overall results of my research.

Interview notes were entered into the computer using Microsoft Word. I then alphabetized the interviews by municipality and began to search the data for themes based on several different criteria. Firstly, I made a one or two word notation next to a phrase if it was an issue that was also stressed in the literature. I also made a notation if I found a statement to be particularly interesting or if an issue was mentioned several times. I then underlined and italicized my notations next to each phrase in order to identify it as a theme. After this preliminary analysis, I was able to revisit my interviews and search by theme (using the "Find" function in Word) in order to conduct a more comprehensive analysis.

Ethics

In the *Results and Analysis* section of this paper, the interviews will be discussed without mention of the interviewees' names. This decision was made in order to protect the interviewees identity and possible stigmatization. Although the information discussed in the interviews was, for the most part, uncontroversial, it is possible that comments could be interpreted inappropriately.

Another concern is that although I told the interviewees at the outset of the interview that I was conducting thesis research, I told only two explicitly that the conversation would be discussed in my thesis. It can be said that this is an assumption that should have been made given that I told them I was conducting thesis research, however, not telling the interviewees this explicitly is an error on my part. A statement concerning anonymity was verbalized during only two interviews because I found that in those two interviews, the introduction seemed too long and too formal, and the statement caused the interviewees to react awkwardly. In subsequent interviews, I eliminated that sentence from the introduction. After those two interviews, three respondents actually asked what my forum of discussion would be. To these persons I explained that the notes from the interviews would be discussed in my thesis, but that the interviewee would remain nameless. Before judgments are made about the identities of the interviewees, the reader should note that each municipality has numerous persons who could have been interviewed.

Results and Analysis

Given that there is such a wide range of municipal types in Rhode Island (rural, coastal, and urban), it is not surprising that there is a wide range of protection and management programs¹⁰ in the state. Tree management programs are obviously multi-faceted; they involve large numbers of people including relevant governmental agencies and community groups. Furthermore, there are numerous factors within tree management programs that can affect the health of an urban or community forest. Many of these factors were discussed during the interviews.

In order to simplify the discussion of the interview results, I have chosen just a few areas to examine more closely. These areas were chosen for a number of reasons. Certain aspects of programs were deemed important before the interviews were even conducted because of the questions that were asked. The questions were written based on an understanding of the literature on urban and community forestry (which will be summarized within the results in order to simplify the discussion). However, I found that the majority of responses indicated, through the types of responses received, and the frequency that the topics were mentioned by the interviewees, that I made sound choices when devising the interview protocol. Therefore, questions from the interview protocol were largely determinants of which themes were chosen to analyze in detail.

Another reason I have chosen only a few areas through which to assess the municipal programs is that a discussion of the entire list of themes is too lengthy to include within this text. Just a few of these themes are such issues as pressure from developers, political obstacles, clear-cutting, lack of manpower, tree farms, and other points of interest.

¹⁰ I am using the term 'programs' to refer to any type tree management scheme in a municipality. However,

Therefore, I have chosen five major areas in which to assess the municipal programs: (1) *Regulations*: Is there a tree ordinance and/or tree protection requirements in the municipality's subdivision regulations?; (2) *Budgets*: How is money allocated amongst the three components of management (plantings, maintenance, and removals)?; (3) *Inventories*: Has an inventory been conducted or proposed?; (4) *Maintenance*: Is the 'program' proactive or reactive?; and finally, (5) *Community involvement*: Are community members regularly involved with plantings and/or maintenance? The following is a discussion of each of these criteria in more detail. Within each section I have also summarized the literature research to substantiate the importance of these criteria, and to assess the data collected in the interviews.

Regulations

Regulations are pivotal to urban and community forestry programs since the absence or presence of regulations in the municipality and the level of stringency of the regulations are key determinants for how well forests are managed. Municipal regulations pertaining to trees are ordinances and subdivision regulations which place restrictions on development. More progressive ordinances and subdivision regulations contain, for example, requirements pertaining to the protection of trees on undeveloped property, providing adequate space for trees along streets, and the identification of a manager to oversee the program. One researcher, Kielbaso, says, "Every city with an outstanding tree program has a good spokesperson for trees..."(Shading 37) He goes on to say that, "With an enlightened city, a well-thought-out ordinance, and an urban forest manager in place, the elements of an ideal program are all possible." (Shading 38) Therefore, the

officially, a 'formal program' is defined by the RIDEM to be any management program in which the budget

level of regulations in the municipality provide the seed for a flourishing tree management program. In the words of the interviewee from Barrington, ordinances give programs "some teeth". The contact from Cranston concurred when he said that instituting an ordinance was one way he would improve their program.

But of course, the presence of regulations and their stringency are irrelevant if the regulations are not enforced. This did prove to be an issue in some instances; a number of interviewees mentioned the fact that their municipality disregards the state legislation that requires the replacement of all trees removed from public property. A few interviewees acknowledged the existence of the mandate but claimed that the municipality has been unable to comply because of inadequate funding. On a few occasions, similar situations were discussed in relation to municipal regulations. Coventry, for example, has maintenance guidelines which are not enforced due to a lack of funding. Nevertheless, in most municipalities, regulations are the major source of guidance for the tree management programs. The following is a discussion of the types of regulations that have been adopted by the municipalities.

Rhode Island's municipal regulations:

Of the 39 municipalities, only 11 have a tree ordinance, four are in the process of writing one, and two have a landscape ordinance. It should be noted that there is some margin of error with these numbers because some interviewees were unaware of the regulations in existence, and the data available concerning those municipalities not interviewed was collected in 1995¹¹. Furthermore, the number of municipalities that have tree protection requirements in their subdivision regulations is less exact because I

is at least \$2/capita.

did not realize this would be an issue until the fifth interview. In subsequent interviews I asked about subdivision-related issues where I thought it was appropriate. I found that there are ten municipalities (out of 30) that have some level of tree protection requirements written into their subdivision regulations.

The municipal regulations vary considerably in their stringency. Some do not require tree protection at all. Some are a bit better, in that they require that developers protect and/or plant trees only when it is deemed necessary by the planning board or tree warden. East Greenwich, North Smithfield and Westerly are the municipalities that have regulations that require street trees are planted or protected only where 'needed'. These weak regulations probably arise out of a hesitation to infringe upon the rights of developers. However, there are numerous other requirements placed on the developer (who passes the cost on to the property owner) that are fairly well accepted, such as requiring that developers construct roads, utility lines, and other infrastructural elements. Trees left standing along the throughway should also be considered part of the infrastructure.

Rhode Island's municipal regulations also differ in terms of how they require street trees to be planted. In order for a tree to survive, it must have adequate root space. One of the factors contributing to the shortened life-span of urban trees is that too often, trees are planted in pits in between the sidewalk and the road. A tree's roots normally extend beyond the drip-line of the crown so it is inevitable that the roots of a tree planted in between the sidewalk and the road will be seriously confined.

¹¹ The last survey, sent out by Bruce Payton in 1994, was collected in 1995.

A few municipalities have tried to avoid this situation by requiring street trees to be planted on the lawn side of properties. This is the case in Coventry where the interviewee exclaimed that this sometimes means that trees are planted on the owner's property. Similarly, Warwick just amended their subdivision regulations to require that trees are planted on the lawn side of the sidewalk. And in Newport, the tree ordinance was just amended to allow the municipality to plant trees on private property where they feel it is needed. Each of these regulations contains a clause which says that the property owner is not permitted to cut the tree down. These are examples of some of the few municipalities in the state that place requirements upon property owners.

There are comparably few municipalities that place restrictions on developers. In most municipalities all trees, except those on public property, could potentially be clear cut. This is obviously not in the public interest and therefore, it is desirable to impose restrictions on tree removal incident to development. Warwick is one community that scrutinizes landscape development plans prior to permit approval. In addition, Providence's tree ordinance requires that 70 percent of the trees on a lot are protected during development (which has little effect since there is almost no development in Providence). Warren's subdivision regulations require that the developer cut 'a minimal number of trees' and also requires that street trees be planted. Finally, a few others such as Richmond and Hopkinton promote cluster developments which require that developers set aside land for the preservation of trees and open space.

Budgets

Funding over the long-term is needed in order to insure that programs will be stable and well-managed. Unfortunately, during times of economic difficulty, town

councils often drop tree funding to the bottom of the priority list. Councils should realize that by imposing tree protection and planting requirements on developers (as discussed under *Regulations*), municipalities that are being developed can save a considerable amount of money on the costs of plantings. This savings on the cost of street tree plantings can be fairly substantial when one considers that the tree alone can cost anywhere from \$45 to \$150 (approx.). Savings on plantings would enable the municipality to devote more funds to maintenance and removal costs. Maintenance is a key factor in determining how long the trees will live and will be discussed further at a later point. However, maintenance is often considered to be necessary only after storms. These 'reactive' programs can actually cost more than routine programs because of the costs incurred by damages from falling branches.

Budget allocations for tree management differ according to the types of tree stock in the municipality. Rural municipalities are likely to spend more money on tree removals because they have less of an incentive to replace trees. In urban areas where there is little development, budgets are more likely to be allocated towards plantings. Maintenance is also a cost which is factored in at varying levels depending on the priorities of the tree managers. Kielbaso says that, "Overall, if a city is to achieve something like an ideal program, a more desirable balance would be to allocate about 40 percent of funds for trimming, 14 percent for removal, and 10 percent for planting." (Shading 40) Obviously, if a municipality is spending most of their money on removals then they will witness a severe decline in their tree stock over time.

Rhode Island's municipal budgets:

Unfortunately, too few of Rhode Island's municipalities can afford or are aware of a need for a 'balanced' approach to funding their tree programs¹². It is not surprising to note that almost all of the interviewees expressed concern about a lack of funding for tree management. In fact, a few municipalities have zero dollars available to fund the management of their urban and community forests; these include West Warwick and Exeter. Cranston received a grant from Bruce Payton in 1995 but had to return it because they lacked the personnel to implement the program. In addition, there are a number of towns that have very small budgets, such as Glocester with \$600; Tiverton with \$1,500; and Burrillville with \$10,000¹³.

On the other end of the budgetary scale, there are several municipalities that spend a substantial amount of money on their tree programs. According to the 1994 survey conducted by Bruce Payton, thirteen municipalities spend at least \$2/capita. These include East Providence which has an annual budget of \$125,000 (which is \$3/person); Newport, with a budget of \$127,000; and Providence which spends \$450,000 per year including the contributions of the Mary Elizabeth Sharpe Street Tree Endowment.

As discussed earlier, budgets can also have a considerable impact on management programs by the way they are allocated. I found that Rhode Island has a few municipalities that spend most of their budgets on tree removals. This is the case with North Scituate where the majority of their \$10,500 budget is allocated towards removals. The interviewee went on to say that they replace only 1/4 of the trees removed, largely due to the fact that North Scituate already has a lot of trees. Johnston has a similar

¹²I am using 'balanced' to mean the allocation funding towards plantings, maintenance, and removals. (See

approach, removing trees if a resident informs the Tree Warden about a rotting tree. These municipalities probably remove a lot of trees because their tree stock is old and rotting trees pose a considerable safety hazard. Therefore, if only a small amount of money is available, then hazard reduction is (and should be) the top priority.

Inventories

Municipal governments would know better how to allocate their budgets if they conducted an inventory of the tree stock. An inventory enables the tree managers to assess the health, age and number of trees in the municipality (usually just those on public property). An inventory is important for a number of reasons. Inventories are necessary to determine what species of trees have been planted and in what location. Species mix is desirable in order to protect against disease. This lesson was learned too well in the 1970s when whole portions of urban forests were wiped out by the Dutch Elm disease. Secondly, age mix is important in order to insure the existence of the urban or community forest over the long-term. The problem with planting all of the trees along one street at one time is that they will probably all die at the same time as well. An inventory can assist the municipality in determining which species to plant. In the same vein, an inventory can enable municipalities to determine which trees are in poor health and will need to be removed, and therefore, where to plant trees.

Rhode Island's municipal inventories:

Although only two municipalities have conducted an inventory (Providence and Newport), many are aware of the need to diversify tree species and a few would like to conduct an inventory in the future. Newport demonstrates what can result from a

the above quote by Keilbaso.)

comprehensive inventory. They hired a consulting firm, Appraisal, Consulting, Research and Training (ACRT), to conduct an inventory during the summer of 1992. An analysis of the results found that only about half of the spots available for trees had trees planted at them. Consequently, they have implemented a program where over a 20 year period (to diversify the age and to spread out the costs), they are planting many different types of species at the available sites. They also target these plantings in areas where they have determined from the inventory that trees will have to be removed. An inventory has proven essential to the management and improvement of the urban forest of Newport.

Aside from Providence, most municipalities lack the funding and the support to conduct an inventory as extensively as Newport. Without conducting a major inventory, Pawtucket recognized the need to diversify the species of its Slater Park which is full of Red Oaks, all about the same age. Over the past six years they have implemented a diversification program to mix the species type and the age of the trees. In addition, they have gathered the funds and support to conduct an inventory of all trees on public property this year. South Kingstown made the March 21st *Providence Journal* concerning its decision to conduct an inventory during the summer of 1997. They plan to hire a consulting firm to complete a majority of the project, and to use volunteers to do the rest. Barrington is also in the process of obtaining the software to conduct an inventory of their trees during the summer of 1997.

On the other hand, there are municipalities that recognize the need for an inventory but do not have the funding to do so. This is the case with Coventry where the interviewee (without being asked) expressed the desire to conduct an inventory but

¹³This data was taken from the "1994 Municipal Needs Assessment" survey conducted in 1995 by Payton.

lacked manpower and funding. However, municipalities who recognize the need for an inventory are further along in the process than those who do not even allocate money towards replacements. Although an inventory requires considerable funding to complete initially, it is relatively cheap to maintain. It is unfortunate that more funding and education is not available for this purpose, because inventories are an integral step in improving tree management programs.

Maintenance

Maintenance is an essential component of tree management programs because it has a direct effect on both the health of the tree and the perceptions of community members. Gary Moll says that, "No single activity can improve the immediate health of urban trees more than maintenance...[to keep trees] alive, healthy and safe." (Shading 128) The average life of an urban tree can be easily extended through proper maintenance. Maintaining urban trees entails pruning, fertilizing, removing damaged branches, and curbing pest problems. Maintenance should include trimming trees every 2 years for first 6 years then every 5 after that; watering trees occasionally during first 3 years; mulching soil after 1 year and aerating soil as-needed in the following years (Shading 128). Municipal tree programs that devote sufficient attention to these tasks will increase the survival rate of their urban forests over time. This has been demonstrated by a program instituted by the city of Milwaukee. Through a carefully planned and practiced routine maintenance program, Milwaukee has successfully doubled the average life-span of their trees compared to the trees in an average city (128).

Older trees provide more benefits, so there are good reasons to try to extend the lives of trees. If trees are not adequately maintained, the survival rate will plummet,

requiring that more trees will need to be removed, and replaced. As previously discussed, tree replacements require considerable expenditures which could be saved if fewer trees were removed. In addition the saving money, the older trees are desirable because the Chicago study found that large, healthy trees remove 60 to 70 times more pollution than small trees (Chicago study 63).

A proper maintenance program is also essential because the existence and type of maintenance program can have a direct effect on how the trees are viewed by community members. In an interview conducted in the fall of 1996, a community leader from South Providence told me that he believes that community members have a negative perception of trees because they are poorly maintained.

Rhode Island's municipal tree maintenance programs

Many municipalities have no (or no enforced) standards for maintenance, and instead, base their programs on responses to emergencies and on residents' telephone calls. Yet many interviewees expressed concern about the lack of a proper maintenance program in their municipality. Six interviewees actually mentioned the desire for guidelines pertaining to maintenance (without a probe).

On the other hand, those municipalities that do conduct maintenance regularly often contract out to the lowest bidder, and many other programs fall under the jurisdiction of Public Works Departments. Several interviewees expressed the concern that the personnel in these departments lack the knowledge and training needed to maintain trees properly.

Utilities

All municipalities in the state have an agreement with their utility provider to trim the trees that can potentially come into contact with power lines. Utility companies need to regularly trim trees to keep a clearance around the wires and avoid melt downs and fires. Narragansett Electric provides power to 27 of the 39 municipalities. They have implemented a routine maintenance program to trim trees in each of the 27 municipalities every four years. The Senior Arborist at Narragansett Electric said that due to this routine maintenance program, trees are the second cause of power outages (as opposed to the first cause for most of the other companies under the parent company, New England Electric Supply). In addition, Narragansett Electric has stressed worker training programs and approximately 98% of the workers are certified arborists. This is a commendable number but should be the norm for workers who are hired to maintain trees.

The other thirteen municipalities are supplied with power by Eastern Utilities. They have a very different approach to the maintenance of trees. Instead of a four year cycle, they operate on a two to three year cycle. However, this program has been very costly for the company and they have recently begun removing trees that pose a continuous hazard. For example, in the fall of 1996, they removed thousands of trees in North Smithfield. Fortunately, they also attempted to plant replacements in most spaces. Although this came at a great cost (around \$50,000), they now no longer have to maintain trees in North Smithfield. This program demonstrates the effect utility company can have on the tree stock of a municipality (if given the permission by the municipal government).

Despite the efforts of Narragansett Electric and Eastern Utilities, it seems as though a few members of the public do not have a very positive perception of the way in which trees are currently being pruned by utilities companies. One interviewee said, 'utilities need to start trimming trees for the health of the tree and not the health of the wires.' Public law 2-14-2. requires that all municipal governments appoint someone to the (paid or unpaid) position of Tree Warden, to act as the guardian of the trees in the municipality. However, a few municipalities do not comply with this law: West Warwick and Woonsocket do not have the position filled at this time. Furthermore, the respondent from Portsmouth said that although they have a tree warden, the person has not been needed since he was re-appointed last year. The forestry division of DEM should enforce this law in order to promote tree-friendly trimming practices and the supervision of tree care activities.

Yet pruning in a manner that is healthiest for the tree or safest for the power line, might not necessarily look as aesthetically pleasing as not trimming the tree. Although the utilities have recently made improvements, it is possible that a lack of maintenance programs in the past have caused some community members to have a negative perception of trees. A few interviewees discussed some of these negative perceptions of trees. In Pawtucket, the interviewee informed me, when I asked if there were any obstacles to program implementation, that "one woman hates trees." And this was attributed to the her anger at the mess created by dropping leaves. Older persons in East Providence have also complained about the leaves.

Some of these perception issues can be resolved through proper planning and maintenance as well as through education. The problem of leaves is not a maintenance

problem since it is an inevitable natural occurrence of many types of deciduous trees. However, tree managers can plant certain species types such as honey locusts that drop leaves that disintegrate shortly after falling. Also, residents can be educated on the benefits of mulching leaves on their lawns to avoid raking.

The problem of broken sidewalks can also be solved through planning. Trees should be planted at sites that are large enough so that their roots will not tear up the sidewalks. However, there is not much that can be done for those older trees that are already ripping up sidewalks, except to cut back sidewalks. These trees will need to be removed once the hazard is considered too great.

Lastly, falling branches are a problem that can be reduced through a routine maintenance program. If dead branches are removed during maintenance, then fewer will fall during storms. All of these measures will help to reduce the hazards posed by trees and can also help to promote positive perceptions of trees amongst community members.

Community Involvement

The public should be included in all stages of the planning and implementation process. Through attention to community values, foresters can insure that the type of trees and their locations are suitable to community members. "...[I]t is important for the urban forester to understand the communities, cultures and values of urban forest residents." (McDonough 6) Representation of the diverse communities within the municipality should be encouraged throughout the planning and implementation process. Partnerships create a network of support to increase the exchange of ideas and resources amongst municipal groups and residents.

Increased public participation in the development and implementation of the tree program is much more likely to result in a healthy urban forest. Residents who participate in planting and/or have a monetary investment in the tree are more likely to care for the tree themselves. This stewardship promotes the health and longevity of the forest. Furthermore, public participation in tree programs can enhance the positive perception of trees. Robert Sommer conducted a study in Sacramento, California on this very issue. Through a survey of participants of the Sacramento Tree Foundation program, the researchers discovered that participants had, "...a higher overall opinion of the tree, less of a desire to see the tree removed, and less of a desire for a different tree."(Sommer 325) Furthermore, the survey went on to demonstrate that after participation in the STF program, individuals also had an increased perception of their neighborhoods (325).

The USDA also stresses the need for community involvement in tree programs. Its "Vital Communities through Healthy Ecosystems" is based on the principle that increasing public involvement enhances the benefits received from the tree program in addition to increasing the sustainability of the forest. (USDA 1995) The composite of these principles indicates that community involvement is a pivotal part of a well-managed and sustainable municipal tree program.

Community Involvement in Rhode Island's municipal tree programs

Most municipalities in the state involve residents and community groups only occasionally. This involvement is often associated with events, for example, when an individual or organization plants a memorial tree. In a number of municipalities, there are also group-planting projects on holidays like Arbor Day. One successful example of

a group-planting project occurred in East Greenwich. The planning department received a grant issued by Bruce Payton from USDA's America the Beautiful program to plant 70 trees on two Saturdays. The Little League, Boy Scouts, Girl Scouts, and members of the Planning and Public Works departments all volunteered to plant the trees. The interviewee from East Greenwich was so proud of the event that he exclaimed that, " It was the most satisfying thing I have worked on in the city."

But few municipalities involve residents as a matter of habit. One of the exceptions is Newport, which is heavily focused on community involvement. They have a cost-share program with residents in which the city and the resident both pay 50 percent of the cost of the tree. After the tree is planted, the resident is required to remove the stakes after one year, re-mulch, and then prune and re-mulch the tree in the third year. (This last step often does not get completed). Nevertheless, the interviewee believes that this community involvement is one reason why the municipality is able to boast that 93-96% of their newly planted trees live as long as the other trees in the city. Because this community involvement is seen as so essential to tree survival, Newport is going to continue the cost-share program even if an endowment is established.

Community involvement is believed to be an essential component of Providence's program as well. In her interview with the *Providence Journal*, Leslie Urgo said that,

to "The survival rate of our trees is 92 percent, which is very high. In municipalities where they persist in doing it the old way--paying a contractor to put up a tree, with no one having responsibility for it afterwards--the failure rate runs from 40 to 60 percent...So it really does make all the difference in the world. When the neighbors themselves plant the tree, they feel ownership and the tree becomes an extension of their space." (11/12/96)

Providence's program is viewed as a model by many of the other municipalities. The interviewees from Central Falls and East Greenwich both mentioned the desire to eventually have programs like Providence. Some of the commendable aspects of Providence's program are its endowment, tree farm, and cost/share program. Although the endowment and the ability to have a tree farm are largely circumstantial, many other municipalities should consider implementing a cost/share program. Such programs give the residents some autonomy and promote stewardship. With an investment in the trees, the community members are more likely to care for the trees, thereby contributing to the overall health and longevity of the forest.

Summary

There is a wide range of tree management programs throughout the state of Rhode Island. A few municipalities such as Providence and Newport have well established, sustainable programs, while there are a growing number of other municipalities that are making strides in their tree management practices. Yet there are still many municipalities that are far behind in the way they approach urban and community forestry. This is not to say, however, that the interviewees were not eager to discuss tree management. All interviewees except two were supportive of the concept of urban and community forestry. Yet the fact remains that 22 municipalities do not have an ordinance pertaining to tree protection and are not in the process of writing one.

It is difficult to pinpoint the causes behind this phenomenon. However, discussions with the interviewees indicate that the lack of funding and political conflicts are the two major reasons why many municipalities have not developed legally enforceable tree management programs. Whether these are caused by a lack of education

or petty political bickering is a subject for another research project. Some municipalities might not possess the knowledge required to develop proper management programs. In Part III, I will discuss my recommendations to help to remedy this situation.

Part III: Planning for Urban and Community Forests in Rhode Island

The interviews indicate that the majority of municipalities lack formal tree management programs. Most of the interviewees, however, were very enthusiastic about discussing tree management and seemed eager to take a more pro-active approach. Of course, these feelings might not translate into actions since the interviewees (being planners, tree wardens, conservation commission chairpersons and others) are not those that have the power to allocate the budgets for municipalities. Many respondents encountered barriers to creating more active management programs because of political conflicts in the town or a lack of monetary support from the town council. In order to encourage town councils to take a more pro-active approach, I believe that there needs to be more leadership provided on the state level.

However, given that neither the tree replacement law nor the legal requirement to have a tree warden is enforced, the state needs to take an alternate approach to the way in which tree management programs are currently mandated. There are several policy measures to be considered. The first is to develop more stringent laws and to enforce them better. This is impractical for a number of reasons. It seems that given Rhode Island's history of delegating powers to the local governments, the municipalities have grown used to a certain level of autonomy. Therefore, many view state regulation as an imposition upon municipal rights. If more strict laws were instituted, a backlash could result, defeating the purpose of the regulations.

As one interviewee said, Rhode Islanders have a New England-type mind-set which purports a "live free and die mentality". It is this mind-set which also contributes to a resistance to what is viewed to be over-regulation by the state government. Given this mentality, policy decisions restricting the municipal governments must be framed in a manner that is acceptable to the municipalities if the laws are to be implemented.

Of course, one way to encourage implementation would be to accompany the mandate with state-level funding. In fact, state law 45-13-9. "Reimbursement to cities and towns for the costs of state mandates," says that the state must provide funding for any new expenditure that it requires a city or town to make. However, it seems that the state has issued a series of regulations without properly funding them. One interviewee said, "everybody is screaming about Unfunded mandates", demonstrating that this is very much an issue in the state right now. Another person said, "The State is real good about mandating and creating lots of laws but not funding them." Unless the state can gather together large sums of money (and the state is expecting a surplus in 1997), it will be both impractical and unpopular to propose that additional regulations are adopted. Another option is to take a preemptive approach and encourage better forest management through the land use planning mechanism.

Planning in Rhode Island

Because it is the planning department of governments that issues permits relating to land use, it is evident that the planning departments can and should play a major role in promoting urban and community forest management. Through comprehensive planning, tree ordinances, subdivision ordinances and zoning ordinances, planners play a key role in shaping the urban and rural greenscape. Municipalities are enabled to make these land

use decisions through the Rhode Island Comprehensive Planning and Land Use Regulation Act (section 45-22.2 of the UU General Laws of Rhode Island). This Act was developed as a response to an onset of rapid development during the 1980s. The state government realized the need to amend the land use enabling acts and adopted the Act in 1988.

This Comprehensive Planning and Land Use Regulation Act requires that all municipalities develop Comprehensive Plans in accordance with the Act and that they be consistent with the state Guide Plan which is written by the state Division of Planning. Furthermore, the Act mandates that all municipal ordinances and regulations must be brought into conformance with this Comprehensive Plan within one year of its institution. These requirements are referred to as the consistency doctrine, which is essentially the implementation mechanism of the planning process.

The consistency doctrine legitimates the planning mechanism, and therefore it is repeated throughout Rhode Island's land use regulations. The doctrine operates on two levels: the Comprehensive plans must be consistent with the Guide Plan, and the local actions must be consistent with the Comprehensive plans. Since it is consistency with municipal regulations that is of pertinence, a few of the relevant clauses relating to consistency are as follows:

Rhode Island Comprehensive Planning and Land Use Regulation Act of 1988:

45-22.2-13. Compliance--

(C) For those municipalities with comprehensive plans approved pursuant to this chapter all municipal land use decisions by municipalities shall be in conformance with the approved municipal plan.

For communities with municipally adopted comprehensive plans which have not received state approval pursuant to this chapter, such municipalities shall conform their land use decisions to the locally adopted comprehensive plan until such time as state approval is granted.

Rhode Island Zoning Enabling Act of 1991:

Section 45-24-30. General purposes of zoning ordinances.-- Zoning regulations shall be developed and maintained in accordance with a comprehensive plan prepared, adopted and as may be amended in accordance with chapter 22.2 of this title...

Rhode Island Land Development and Subdivision Review Enabling Act of 1992:

Section 45-23-31. Purpose and consistency with comprehensive plan, zoning ordinance and other local land use regulations.--

(A) ...The local regulations shall also be consistent with the adopted local comprehensive plan, local zoning ordinance and all other duly adopted local development regulations.

Another clause includes a measure for recourse if the municipality does not write an approved comprehensive plan:

45-22.2-13. Compliance.— (A) In the event a municipality has failed to submit a comprehensive plan in accordance with the provisions of this chapter...the director shall then prepare, and the state comprehensive plan appeals board shall adopt, for the municipality in question, a comprehensive plan which satisfies the requirements of this chapter....

(B)...The municipality shall be responsible for the administration and enforcement of the plan.

(C) All land use decisions by the municipalities shall be in conformance with the approved municipal comprehensive plan.

Since the consistency doctrine requires that municipal regulations must be in accordance with the Comprehensive Plans, which in turn must be consistent with the state Guide Plan, what is contained within the state Guide Plan can have a direct effect on the land use decisions in the municipalities. State planning is therefore a powerful (and a logical) mechanism through which to affect municipal land use decisions. However, there is currently no mention of urban or community forestry in the state guide plan. This is

why the Rhode Island Forest Council (RIFC)¹⁴ has recognized the need to include an urban and community forestry component into the state guide plan.

The Council is a non-profit, non-governmental organization that was started in 1992. Since then they have been a powerful force in the state, and have been very successful at promoting urban and community forestry through conferences, workshops, and other forums. Chaired by John Campanini, the Providence Urban Forester, the Council has also been very influential through its grant awards and educational programs. Since the Council was founded, one of its primary goals has been to see to it that an urban and community forestry component is written into the state guide plan.

The Council took the first step toward achieving this goal by applying for a \$20,000 grant, which they were awarded last year. They hired the State Division of Planning, with George Johnson as the principal author, to write the Guide Plan component. (Mr. Johnson also wrote the Greenways Guide Plan Element 155.) The urban and community forestry component is to be written into Guide Plan Element 161 which is the Rhode Island Forest Resources Management Plan. This element currently deals almost exclusively with the practice of commercial forestry in Rhode Island (which has diminished greatly over the years). Through this partnership with the Division of Planning, the Council hopes to have the urban and community forestry component written and approved by early 1998.

Limitations to planning

Before discussing in more detail what will and should be included in this plan, it is important to note the limitations of the planning process. The first is that the guide

¹⁴Before March 22, 1997, the Rhode Island Forest Council was called the Rhode Island Urban and

plan must be worded in a manner that enables the policies to be applicable to the varying types of municipalities in the state. Although this generality will also make it more appealing in the eyes of the state legislature, this limits the extent to which strict policies can be included in the component. The more detailed and thorough the guide plan component is, the more likely it is that the guide plan policies will be directly implemented in the municipalities. However, given the need for generality, it is likely that the guide plan policies will have to be written in a manner that leaves much room for interpretation. There is one recourse, however, and this is that since the state planning department must approve the urban and community forestry components of the municipal comprehensive plans, they can reject the amendments if they are interpreted too broadly.

Another limitation of the planning mechanism deals with the constraints of the bureaucratic process involved with planning. There will most likely be a considerable time lag before the urban and community forestry component is implemented in the municipalities. After all, it has taken some municipalities over eight years to develop comprehensive plans. Only fifteen municipalities have comprehensive plans which have actually been adopted, while fourteen others are in the final stages of the review process. This time lag demonstrates the complexity of the planning process, or perhaps that the municipalities lack full commitment to the process.

It is in some ways understandable, however, that it has taken the planning departments so long to write the initial documents. Many of the comprehensive plans are over 300 pages; municipalities do not, and should not take the 'comprehensive' requirement lightly. Furthermore, the hope is that once the original comprehensive plans

are written and approved, amendments will become easier to make, so there is some reason to hope that a community forest component might be effective in a shorter time.

A third limitation to planning is that the state cannot easily force municipal governments to comply with the Division of Planning's guidelines. Aside from the power to approve or reject plans, and the ability to withhold bond money and other sources of funding, there is no easy way for the state to enforce planning laws. The burden is therefore left to the citizen to call attention to illegal activities and, if need be, to take action in court. For example, if a municipality's land use regulations do not comply with their comprehensive plan, and the municipality does not respond to state threats, it is up to a resident or organization to take legal action. The problem with this notion is that it requires that the constituency is knowledgeable about the existing regulations. However, planning departments stress public awareness and participation both in the writing and approval process. Hopefully the citizens who participate, or those who are knowledgeable about municipal regulations and plans, will come forth if a discrepancy arises.

There has been one court case of this nature that has upheld the consistency doctrine in Rhode Island. This was the case of Narragansett Electric versus the Town of East Greenwich in December of 1994. Narragansett Electric took the Town to court because the town had made amendments to their municipal regulations that were not consistent with their comprehensive plan. While the Town asserted that they did not need to be consistent, the court negated this claim. The official court ruling reads as follows:

"...the comprehensive plan...establishes a binding framework or blueprint that dictates town and city promulgation of conforming zoning and planning ordinances...The General Assembly has clearly instructed...'*each city and town to conform its zoning ordinance and zoning map to be consistent with this comprehensive plan.*' [emphasis added by the court]." (DP Monthly Progress Report, 2/95, pg. 2)

So the precedent in Rhode Island is that the consistency doctrine is clearly recognized as law. The hope is that this decision will be upheld in future court cases.

In sum, although three limitations have been discussed, these are not so restrictive as to discount the planning process completely. Planning is still viewed as a viable and necessary mechanism through which to regulate urban and community forest protection and management. Obviously, the Rhode Island Forest Council still views amending the state guide plan element as a worthwhile idea. This component is in the process of being written, and I have a number of recommendations for what should be included.

Recommendations for guide plan component

In March 1997, Mr. Johnson sent out a prospectus to inform the parties involved both what (generally) will be included in the guide plan component and a time line by which it is to be completed. As it stands now, the component is proposed to include seven parts (please see Appendix B) and is to be completed by February of 1998. I have talked with Mr. Johnson about what might be contained in the component and he informed me that it will probably resemble Washington State's guidelines for its municipalities. This booklet, entitled "Community Forestry and Urban Growth: A Toolbox for Incorporating Urban Forestry elements into Community Plans ", has been discussed by both John Campanini and Bruce Payton as a model for what they would like to see contained in the urban and community forestry component of the guide plan.

The Washington State toolbox is a non-mandatory list of policy recommendations, divided into six land use areas: a land use/urban design element, a transportation element, a housing element, a capital facilities element, a utilities element, and an energy element. The Washington State Department of Natural Resources based this approach upon an understanding that trees are part of the infrastructure and can affect and are effected by all areas of land use. Following the Washington State model, my first recommendation for Rhode Island's forestry component is that it should address tree protection from a variety of perspectives.

However, Washington's Toolbox does not address the need to develop tree management programs. In this way the Toolbox cannot be used as the only model. This would be self-defeating since the primary purpose of the Rhode Island guide plan component is to guide the municipalities in the development of tree protection and management programs. Instead of presenting an exhaustive list of policy guidelines, I have four major recommendations for what should be included in the guide plan component. These were developed from ideas gathered from secondary research, and were substantiated by the results of my primary research, using interviews.

The following three areas should be emphasized in the guide plan component:

- Why and how to protect trees on undeveloped property
- Why and how to conduct an inventory
- Why and how to develop a routine maintenance program
- Why and how to seek regular involvement of community members

Development

Given that the majority of development in Rhode Island is occurring in the rural areas, it is imperative that municipalities take a proactive approach to protecting trees on undeveloped lots. As already been discussed, a few municipalities in the state encourage tree protection in their ordinances and subdivision regulations. Some regulations require that certain percentages of trees are protected, others require that developers obtain approval for their site development plans from the municipality's tree manager. These options should be discussed and encouraged in the guide plan component.

Other municipalities encourage tree protection through the promotion of cluster developments. Cluster developments promote the preservation of the 'rural character' of municipalities by clustering the housing units on smaller lots, and protecting large portions of the undeveloped areas for trees and open space. Developers often find cluster developments favorable because they save on the costs of infrastructural elements such as larger roads and longer utility lines. Of course cluster developments cannot be required, however, the guide plan component can and should encourage their use.

Inventories

The need for an inventory has already been discussed extensively. Inventories provide a basis for the decisions of tree managers, enabling them to assess the tree stock and to develop goals and program guidelines. This is necessary to avoid accidents and surprises. If all the trees on one street are the same species and the same age then the tree manager will know she needs to plant other species before those die. Furthermore, if a manager relies on residents to provide notice of a tree hazard, then someone or something could be hurt before the tree is identified as being dangerous. Inventories help to warn the manager of potential tree hazards and create an action plan. Better decisions can be

made concerning where trees will need to be removed, which trees require maintenance, and where to target plantings.

Many municipalities do not have the funding to hire a consulting firm to conduct an inventory, nor do some have the manpower to supervise volunteers to do the work. Hence, the interviewee from Newport suggested that municipalities conduct a drive-by assessment of trees on public property. The assessment does not need to be totally comprehensive, but the assessor should take note of species type, location, and approximate age and tree health. This type of inventory can be conducted fairly easily and fairly quickly. The Rhode Island Forest Council has a mini-grant program (awarding sums up to \$750) which could help to fund the purchase of the computer software required¹⁵. Given that so few municipalities have conducted or are considering conducting an inventory, it is imperative that the task is thoroughly explained, and promoted within the guide plan component.

Maintenance

The guide plan component should also stress the importance of a balance amongst the three areas of management: plantings, maintenance and removals. Too often, management seems to be focused on removals, and only a few municipalities are trying to keep up with the tree replacement law. However, some have taken the pro-active approach. Many of these employ the public works department to occasionally 'tidy up' and take care of potential hazards, but I have not come across any municipalities that have tree-certified workmen maintaining trees on a regular basis.

¹⁵ Although funded by a grant from the America the Beautiful program, Burrillville, for example, just purchased the TreeKeeper Jr software to help them conduct an inventory.

The guide plan needs to stress the importance of maintenance. If budgets were allocated into maintenance programs then fewer removals and plantings would be needed. Through the adoption of a routine maintenance program, communities would promote the longevity of their forests and the positive perception of trees amongst community members. Of course, those municipalities that only have enough funding for the removal of hazards should continue to remove them. However, hopefully through the promotion of urban and community forestry through the guide plan component, councils will either allocate more money towards their programs or will apply for an America the Beautiful¹⁶ grant to help set their programs on the right track.

Although some communities already contract out to arboreal firms, those that utilize public works departments could improve maintenance practices by training employees in proper pruning techniques. The state Forestry Division holds training sessions four times every year. The costs incurred to the municipality from sending workers to these sessions would be minimal compared to the costs that result from improper maintenance of trees. Once workers have been properly trained, it is important for municipalities to develop a pro-active rather than a reactive approach. In addition, the guide plan component could recommend how municipal governments could allocate budgets, stressing the importance of major allocations towards maintenance.

One possible avenue for expanding maintenance programs is to hire the utilities companies to regularly trim trees. Currently, the companies only trim the parts of the trees that have a potential to cause a power outage. Maintenance can be a costly measure and since Narragansett Electric is already on a four year cycle then there is a possibility

¹⁶ America the Beautiful grants can be applied for through Bruce Payton at RIDEM. These USDA grants

that fruitful partnerships could arise. Although, Eastern Utility's tree removal and replacement program may be less appealing to municipalities, especially those with numerous historically significant trees, those municipalities who are powered by Narragansett Electric, could benefit from a more extensive contract.

However, the utilities companies would have no incentive to trim the parts of trees that do not pose a threat to the wires unless they were compensated for the extra work. It is likely that if the municipality chose to pay the utility company, instead of contracting out to another firm, the costs to the municipality would be less than hiring out another contractor since the utilities already trim many parts of the street trees.

Community Involvement

Municipalities can also improve the health and longevity of their tree stock by involving residents with planting and maintenance of new trees. This is especially helpful when planting street trees in front (or on) a resident's property. As previously discussed, a resident that has a monetary investment in a tree or participated in the planting event will be more likely to care for the tree herself. Community involvement also promotes cohesion and solidarity within the neighborhood. A neighborhood tree planting day may be an opportunity for residents to meet each other. The tree then becomes not only a community asset but also a historical marker, a source of pride shared by neighbors. The guide plan component should emphasize the need for community involvement and could suggest ways in which municipalities can involve community members through street tree cost-share programs, group-planting days, adopt-a-spot or tree, and education programs.

can be quite substantial; for example, the Town of Tiverton was awarded \$5,000 in 1996. However, the

I think municipalities will be receptive to the new urban and community component in the guide plan because after talking to the interviewees about the prospect of the component, I asked a question added by Dr. Zarcadoolas. "Do you think adding this urban and community forestry component into the state guide plan is a good idea?" The responses, on the whole, were quite positive. However, some said they would need more information about the component to answer the questions and the interviewees from Westerly and Smithfield said they would be skeptical since their municipalities are so rural. In addition, the contact from North Providence, for example, mentioned the concern over the ability to muster up political support for the component.

Summary

The implementation of the urban and community forestry component will be a positive step towards better management of forests in Rhode Island. Given the potential for growth in the state, especially the rural areas that are expected to develop 148,000 acres by the year 2010, it is imperative that programs are implemented now to protect tree resources (Johnson 155-4-1). Rhode Island is the second most densely populated state in the country, and with development occurring in the rural areas, it is essential that municipalities take appropriate actions to protect and manage their tree resources. This will insure that fewer trees will have to be planted in the future. It will also secure a forest presence over the long term, a fundamental requirement of sustainability. In the words of John Campanini, "The rural areas of Rhode Island are potentially tomorrow's

municipality must be willing to at least partially match the grant in order to receive funding.

urban forests. Through planning, we have an opportunity to guide development in manner that protects trees, and to promote the comprehensive management of our urban and community forests."(interview) I hope that the guide plan component succeeds at achieving what it has the potential to do for urban and community forests in Rhode Island.

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Appendix A

Interview Protocol

Introduction

Good Morning. My name is Clare Olsen and I am a student at Brown University conducting thesis research on Rhode Island's municipal tree programs. I received your name from Bruce Payton, the state urban and community forester, and I would like to ask you a few questions about urban forestry in your municipality. My questions should only take about ten minutes. May I begin?

Questions:

Program description

1. It is my understanding that _____ already has a forestry program, but I am unaware of what the program consists of. Could you tell me a bit about the goals of your municipality's tree program?
2. Does the program include guidelines for maintenance of the municipality's trees? [Could you tell me a bit about what these guidelines are?] How effective has this been?
3. What groups or individuals are involved with this program? (oversight) Who oversees the day-to-day activities?
4. Do you recall how much money is allocated towards the program? And do you know if these funds have increased, decreased, or stayed the same over the past few years? How is this money dispersed to suit the program needs?

Community involvement

Next I would like to ask you about community involvement. Some municipalities have sought community involvement prior to implementation, others after, and some do not involve community members at all.

6. Are community members involved with planting and/or maintenance? If so, how are they involved?
7. Do you think community members (both residents and council persons) have been supportive of the program?

Valuation

8. Have there been any obstacles to the implementation of the tree program?
9. Is there anything you would suggest to make the _____ tree program better? Where are you headed next?

Guide plan

10. As you may have heard, there is a proposal to include an urban and community forestry component into the state guide plan. Do you have any suggestions for what might be included in this plan in order to assist your municipality?
11. Do you think this is a good idea?
12. That is about all the questions I have. Is there anything you would like to add?