COMMUNITY FORESTRY PROGRAM
CITY OF ALTA VISTA, KANSAS

INVENTORY RESULTS AND MANAGEMENT RECOMMENDATIONS
October 2014

PREPARED BY:
Kim Bomberger
Community Forester
Kansas Forest Service
2610 Claflin Road
Manhattan, Kansas 66502
785-532-3315

CITY OF ALTA VISTA, KANSAS

October 2014

INTRODUCTION

A 100% inventory of street and park trees within the city limits of Alta Vista was conducted October 1, 2014. This is the first public tree inventory for the city. In this inventory, all publicly-owned trees were recorded as to their species, size, and condition class, defined as:

GOOD: Healthy vigorous tree with no apparent signs of disease or mechanical injury. The tree is representative of its species and requires little or no corrective work.

FAIR: Tree of average condition and vigor for the area, with minor insect injury, disease or physiological problems. May lack desirable form characteristics of the species, and may require some corrective pruning or repair.

POOR: Tree is in general state of decline, and may show severe mechanical, insect or disease damage, but death is not imminent. May require major repair, renovation or replacement.

DEAD AND DYING: Dead or death imminent from Dutch elm disease or other causes.

Grateful acknowledgment is given to Tree Board Chair, Ryan Armbrust, for his assistance and support in the completion of this project.

The purpose of this report is to provide information to the City of Alta Vista and the Alta Vista Tree Board to aid in the continued development of a community forestry planting and management program. Ideally, a program should include a mission statement, goals, objectives based upon the goals, strategic planning (3 - 5 years) and annual plans of work that identify the activities that will be carried out. The appendices of this report contain information relevant to the selection, planting and care of trees. This information is included in support of this report as well as with future technical needs. The report binder is broken down into the following subject areas: Inventory Results, Tree Value, Specie Composition, Condition Classes and General Recommendations**.**

A community forestry program should address management of the public tree resource.

Healthy trees may be the first opportunity to provide a favorable impression to Alta Vista citizens and visitors.

Well- trained city staff and tree board members should monitor and address trees in poor or declining health.

INVENTORY RESULTS

At the time of the inventory, there were 739 park and street trees located within the city limits of Alta Vista, representing approximately 41 different species. Street trees included all trees in the right of way and on the boundary of. Park trees included those in Alta Vista City Park. Silver maple comprises 23% of the total population with green ash at 17% of the total. Siberian elm follows at 10% and hackberry at 9% of the population.

In the Alta Vista area, where a large variety of tree species will grow well, no single species should comprise more than 10% of the total number of trees. Over population by a single species can make a community vulnerable to losing a large number of trees to a single insect or disease. Dutch elm disease in American elms and emerald ash borer in ash trees are examples. Silver maple, green ash, and Siberian elm are at and over the maximum recommended stocking rate of 10% and should be discouraged for future planting on a large scale. Hackberry is approaching the 10% level and careful consideration is advised in the further planting or encouragement of that species as well.

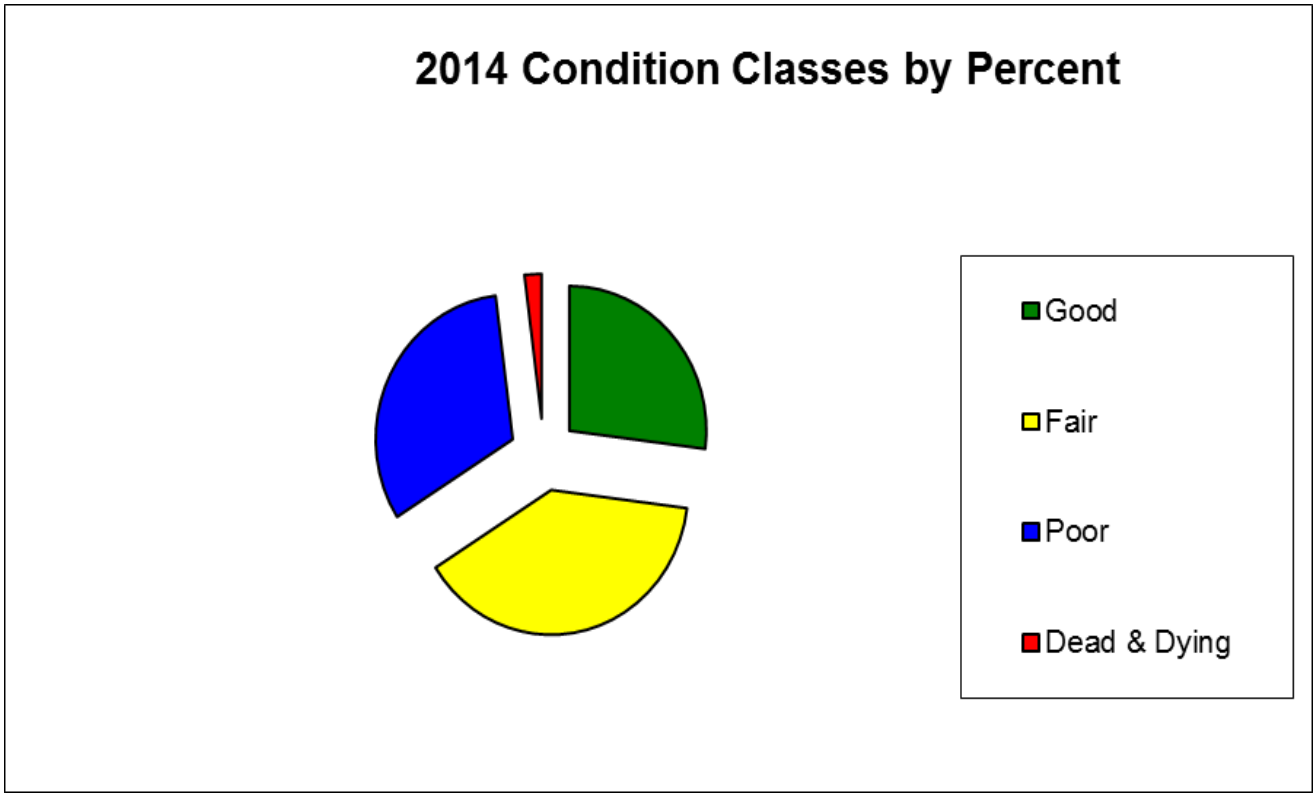
The condition and health of the species is an important consideration. At the time of the inventory, the summarized field data shows that 27% of all trees are reported to be in good condition, followed by 39% in fair, and 32% in poor condition. Approximately 15 (2%) dead and dying trees were identified. This reflects similar condition ratings that we would expect to find in Kansas communities that recently have taken the steps to form a forestry program like Alta Vista has. These categories can help identify future management needs. For example, based on the breakdown of condition classes 27% (200 trees) have no specific management needs, 39% (287 trees) require minor pruning, maintenance or insect and disease controls, and 32% (237 trees) require more intensive management intervention. All dead and dying trees should be removed as quickly as possible.

Note: In the time since the inventory, several trees have been removed from within utility right-of-ways. A record of those removals is included as a separate document.

Healthy trees provide many benefits for the entire community, such as improved water and air quality, carbon dioxide storage, energy savings and aesthetic value.

Freeman, Norway, red, silver and sugar maple comprise 26% of the total population. This population is more than the recommended level of 20% for any genus. Some tree insects and pests don't attack an entire genus but as emerald ash borer has shown, all *Fraxinus* in this country are vulnerable.

Mature tree care often requires the work of professional arborists.



GOOD: Healthy vigorous tree with no apparent signs of disease or mechanical injury. The tree is representative of its species and requires little or no corrective work.

FAIR: Tree of average condition and vigor for the area, with minor insect, injury, disease or physiological problems. May lack desirable form characteristics of the species, and may require some corrective pruning or repair.

POOR: Tree is in general state of decline, and may show severe mechanical, insect or disease damage, but death is not imminent. May require major repair, renovation or replacement.

DEAD AND DYING: Dead or death imminent from Dutch elm disease or other causes.

TREE VALUE

Trees provide many services to the community and environment. Trees add beauty and create an environment beneficial to our well-being by:

- Adding and defining natural character to our cities and towns.
- Providing us with colors, flowers, forms and textures.
- Screening undesirable views and softening the harsh lines of masonry, metal and glass.
- Reduce and cut noise pollution by acting as sound barriers.
- Defining space and providing landscape interest and continuity.

Direct and measurable benefits of trees are also very significant. Properly selected and planted trees can:

- Reduce air pollution by trapping and holding particulate pollutants and absorbing carbon dioxide and other dangerous gasses.
- Conserve water and reduce soil erosion.
- Save energy by reducing glare and providing cooling shade in the sunny hotter months and windbreaks during the cold winter months.
- Increase property values from 7% to 15%.

The value figures in the following tables were computed using an equation developed by the International Shade Tree Conference which takes into consideration intrinsic values such as shade and beauty. The estimated value of all inventoried trees within the Alta Vista city limits is in excess of $1.4 million dollars.

The above figure is used only as an estimate based on currently accepted calculations. Inventory values and data are pertinent to the determination of adequate yearly budget levels needed to improve and maintain the public tree resource.

Trees add measurable values to our communities

The 2014 value of inventoried street and park trees in Alta Vista is $1,485,297.

Trees provide many ecosystem services that can now be quantified through i-Tree Streets, a street tree resource analysis tool for urban forest managers. See Appendix A for specific ecosystem services and other benefits provided by Alta Vista's public trees.

SPECIES COMPOSITION

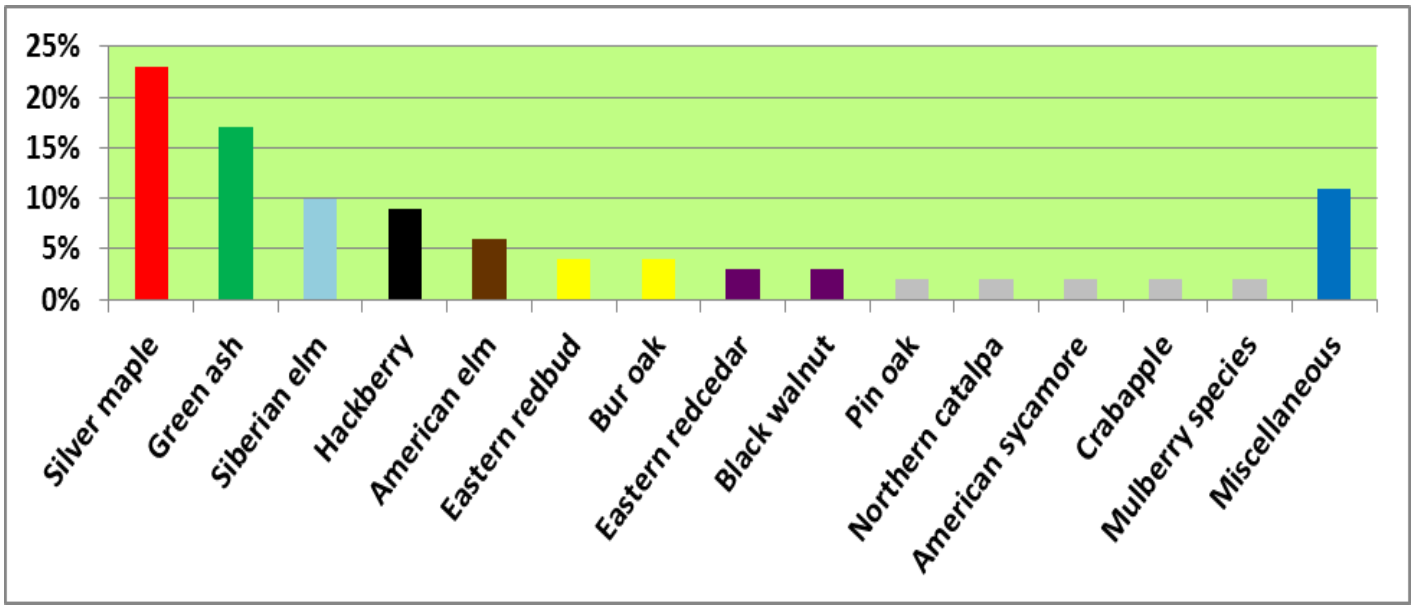
PUBLIC TREE RESOURCE - City of Alta Vista, Kansas
October 2014
Percent of Inventory Total

SPECIES	No. of Trees	Avg. Dia.	% Good	% Fair	% Poor	% Dead & Dying	% of Total Trees	Value
Silver maple	168	20”	23%	46%	30%	1%	23%	$213,859
Green ash	126	21”	8%	28%	62%	2%	17%	$344,441
Siberian elm	72	21”	0%	42%	53%	5%	10%	$50,167
Hackberry	63	20”	10%	51%	39%	0%	9%	$189,900
American elm	46	23”	11%	70%	20%	0%	6%	$132,180
Eastern redbud	33	7”	37%	39%	21%	3%	4%	$17,448
Bur oak	26	15”	69%	31%	0%	0%	4%	$104,413
Eastern redcedar	19	15”	53%	21%	26%	0%	3%	$42,130
Black walnut	19	12”	69%	26%	5%	0%	3%	$42,368
Pin oak	17	21”	47%	41%	12%	0%	2%	$77,853
Northern catalpa	16	18”	38%	12%	50%	0%	2%	$27,649
American sycamore	16	20”	88%	6%	0%	6%	2%	$60,942
Crabapple	13	6”	77%	15%	8%	0%	2%	$8,744
Mulberry species	12	14”	9%	58%	33%	0%	2%	$10,190
Miscellaneous*	93	13”	52%	34%	10%	4%	11%	$163,013
TOTAL	**739**	**18”**	**27%**	**39%**	**32%**	**2%**	**100%**	**$1,485,297**

***Miscellaneous:** (Tree species that represent 1% or less of the total inventoried public tree population):

Arborvitae; baldcypress; boxelder; black and ornamental cherry; common chokecherry; cottonwood; fruit species; goldenraintree; honeylocust; littleleaf linden; Freeman, Norway, red and sugar maple; mimosa; northern red and sawtooth oak; ornamental pear; pecan; Austrian, ponderosa, and Scotch pine; Lombardy poplar; Colorado blue spruce; sweetgum and weeping willow.

2014 Public Tree Species Composition



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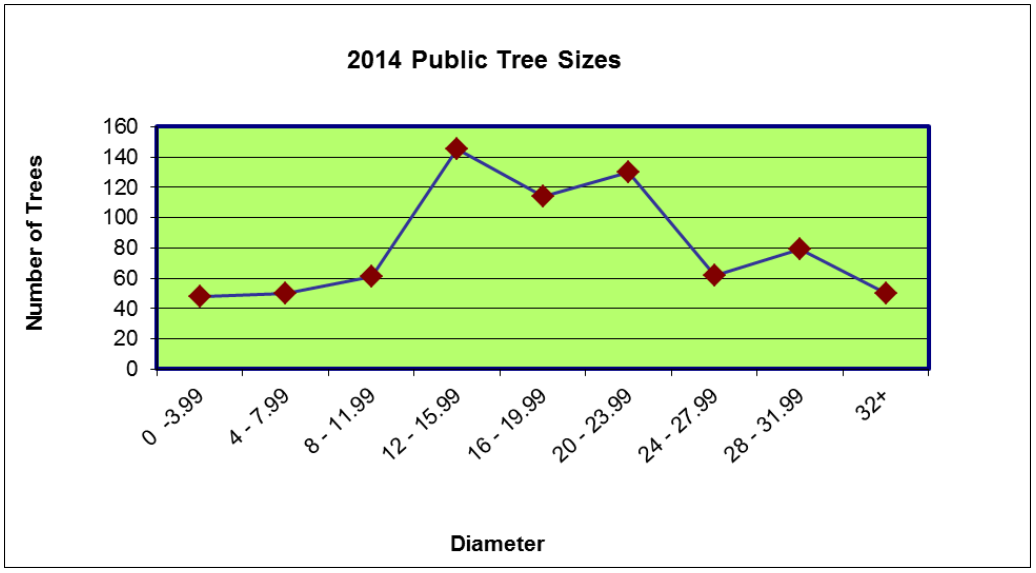
TREE SIZE

The following graph shows the size class of all public trees inventoried. Fifty-seven percent (57%) of the inventoried trees in Alta Vista are in the diameter categories less than 20 inches. I would encourage the city and tree board to increase the number of small-sized trees in public areas versus larger trees. A population of smaller trees is more likely to overcome severe weather events as opposed to large mature and over-mature trees. A high population of large diameter trees can indicate an over-mature population with potentially very high maintenance and removal needs. At the time of the inventory, there were 321 trees in the larger diameter classes (20+ inches). This population of trees is dominated by silver maple with 81 trees. Species with 5+ trees over 20 inches in diameter include green ash (66), Siberian elm (47), hackberry (36), American elm (32), pin oak (13), sycamore (9), northern catalpa (8), bur oak (7), and black walnut (5).

There are 50 public trees at and larger than 32 inches in diameter. Species in this size category include: green ash (17), silver maple (15), Siberian elm (5), hackberry (3), northern catalpa, American elm, mulberry, and bur oak (2 each), cottonwood and northern red oak with one each.

Two factors to consider when managing tree species that are larger in diameter are the number of poor condition trees and species type. Looking at species 20 *inches or more in diameter and in poor condition* found 49 green ash, 29 silver maple, 19 Siberian elm, 17 hackberry, 6 northern catalpa, 5 American elm, 2 (each) mulberry, pin oak and eastern redcedar, and 1 cottonwood meeting this criteria.

The city should familiarize themselves with these species and locations as these trees will have potentially high maintenance needs and increasing risks for failure as they continue to mature. See the enclosed inventory reports for specific specie information regarding size and condition.



Cottonwood, hackberry, Siberian elm, Tree of Heaven, boxelder, silver maple, Bradford pear, poplar and willow are species with very high species hazard indices. Refer to the enclosed draft publication *Guidelines for Assessing Failure Potential Associated with Tree Defects* for specific species information.

PLANTING TRENDS

The City of Alta Vista tree planting trends were developed by examining all trees less than four inches in diameter. Forty-eight (48) young trees were found in public areas in Alta Vista. These newly planted trees represent 7% of the total tree population and have a total value of $1,684. The majority of these young trees are in good to fair condition. There is a fair diversity of species being planted in Alta Vista public areas overall; however, the city and tree board should research and plant new species in public areas to increase the diversity of trees within the city. ***A goal could be to increase the number of species present on public properties from 41 to 60 within the next 10 years.***

PLANTING TRENDS

Species	# of Trees under 4"	% of Total Trees Under 4"	Value
Crabapple	7	15%	$380
Eastern redbud	7	15%	$272
Black walnut	6	13%	$288
Siberian elm	5	11%	$28
Silver maple	4	8%	$48
Bur oak	4	8%	$220
Mulberry species	3	6%	$32
Green ash	2	4%	$48
Goldenraintree	2	4%	$100
Northern catalpa	1	2%	$36
Black cherry	1	2%	$32
Common chokecherry	1	2%	$42
Cottonwood	1	2%	$42
American elm	1	2%	$10
Fruit tree species	1	2%	$42
Hackberry	1	2%	$16
Ornamental pear	1	2%	$48
YOUNG TREE TOTAL**	**48**	**7% Of All Trees**	**$1,684**

Planting

Planting is the most important aspect of most programs. This facet generally has the most appeal for, and most support by, the public and governing administration. Consideration should be given not only to the planting of trees, but for the **establishment** of trees. In other words all losses should be replanted until a 100 percent survival is achieved. I would also recommend that the City of Alta Vista consider the following specific recommendations in regards to planting:

The city should budget money for the planting and establishment of a certain number of desirable and recommended species of trees each year. Alta Vista could lose 50% *or more* of its canopy in the next 10 to 15 years. Fifteen trees (2%) were identified as dead or dying and these trees should be removed in a prompt manner. Thirty-two percent (32%) of the total tree population is in poor condition, with many trees in that category at higher potential for accelerated decline in health due to storm damage, cavity development and other structural decline. Some of the fair condition trees, especially those more prone to storm damage, poor compartmentalizers of decay and susceptible to other sources of decline, may need to be replaced, especially those populations comprised of hackberry, silver maple, catalpa, cottonwood, willow, Siberian elm, green ash, honeylocust, and redbud. Emerald ash borer is a future threat to the 126 ash trees, thousand cankers disease could threaten black walnut, pine wilt will continue to impact pines and Dutch elm disease is still present in many communities.

The propensity to develop structural defects that often cause failure is another consideration for loss of trees. The following species of trees found in the inventory are generally rated with high and very high species hazard indices: *ash, honeylocust, ornamental and Bradford pear, pecan, cottonwood, poplar, Colorado blue spruce, black walnut, boxelder, cottonwood, Siberian elm, hackberry, silver maple, and willow.* Trees rated as fair within these species could worsen in condition if damaged by severe weather events or experience increased defect formation. This data can be found in the table on page 5 of this report and within the enclosed data sheets to identify the percentages of fair condition trees with high and very high hazard indices.

A tree's diameter can be used as an indicator of age. Species with large average diameters should be monitored closely. Their condition will help determine the necessary level of management. Larger trees should also be monitored for decline from natural causes or stress-induced decline. Species with larger average diameters include: American elm (23"), baldcypress (22"), green ash (21"), Siberian elm (21"), northern red oak (21"), pin oak (21"), hackberry (20"), silver maple (20") and American sycamore at 20" average diameter.

Large diameter trees are susceptible to age-related and environmental stresses.

Some poor condition trees may be managed back to improved condition with some fair condition, large diameter trees continuing to mature and decline in health. ***A goal should be to decrease the number of dead and dying, poor and fair condition trees while increasing the number of good condition trees within the city limits of Alta Vista. A regular pruning cycle is a very beneficial management tool that will improve the condition of trees.***

The draft publication *Guidelines for Assessing Failure Potential Associated with Tree Defects* is included as a reference to provide detailed information concerning severe and critical defects, failure profiles of common Kansas trees and Kansas species hazard indices.

Based on the current findings of this inventory, coupled with known insect and disease problems of certain species, I would discourage any future planting/promotion of the following species:

Species	Reason	Alternative
Silver maple Green ash Siberian elm Hackberry	Overstocked	Ginkgo (Male) American linden Caddo sugar maple Lacebark and other improved elm selections
Green ash	Borers – ash/lilac and potential for emerald ash borer; ash yellows disease	Goldenraintree American yellowwood Western soapberry
Green ash Willow Siberian elm Cottonwood Hackberry Boxelder Silver maple	Hazard tree potential	Shantung maple Chinkapin oak Osage-orange (Male) Japanese pagodatree
Scotch and Austrian pine	Pine Wilt disease Needle diseases	Limber or pinyon pine Black Hills spruce Upright Chinese juniper Large variety of evergreens
Maples	Exceeds stocking recommendation for genus	London planetree Wide variety of oaks Kentucky coffeetree
Honeylocust	Thyronectria canker Honeylocust complex	Hophornbeam Hedge maple

The publication *Tree and Shrub Problems in Kansas: Diseases, Insects, and Environmental Stresses* (http://www.ksre.ksu.edu/bookstore/pubs/MF3132.pdf) offers pictures and detailed information about many problems of woody plants in Kansas. In addition, a list of common plant problems found in Kansas may be accessed at http://www.hfrr.ksu.edu/p.aspx?tabid=586.

Coupled with the knowledge of what "not" to plant is the identified need of what can be successfully established in Alta Vista. I would offer the following recommendations to meet the general planting needs of the city. *I would, however, emphasize that these are general recommendations and planting projects should not be limited by this list.*

Small Trees (under 30 feet at maturity)

- Crabapple (refer to K-State Research and Extension Crabapple publication).
- Amur maple
- Serviceberry
- Japanese tree lilac
- Common chokecherry

Medium Trees (30 - 70 feet at maturity)

- Lacebark elm
- Kentucky coffeetree
- Ginkgo (male)
- Shantung maple
- American yellowwood
- Osage-orange (thornless/fruitless)
- Western soapberry
- Chinkapin oak
- Sawtooth oak
- Nuttall oak
- English oak
- American and littleleaf linden
- Japanese pagodatree

Large Trees (more than 70 feet at maturity)

- Shumard red oak
- Swamp white oak
- American elm and hybrids
- Baldcypress
- London planetree

Evergreen Trees

- Upright Chinese junipers
- Eastern redcedar and cultivars
- Black Hills spruce
- Pinyon pine
- Limber pine
- Ponderosa pine

Serviceberry in bloom

Ginkgo in fall color

Sawtooth oak during winter dormancy

Ponderosa pine foliage and cones

Please refer to the enclosed *Preferred Tree List for Northeast Kansas* for further details and expanded species recommendations. The supplementary document *Trees Worth Trying* and publication *Shade and Ornamental Trees for Kansas* offer additional species information.

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A successfully established tree on a very poor, heavy clay site.

The proper planting of trees is critical for successful establishment. One of the biggest hurdles that a city can face with tree planting is planting in unprotected areas with poor soils and inadequate moisture. In addition to difficult site conditions, trees continue to be planted incorrectly and continue to be planted with stem girdling or stem encircling roots. When these poorly developed root systems are placed in the landscape, it is likely that the tree will not grow to a mature size. The function of tree roots are harmed when planted too deeply. Some basic recommendations to remember when selecting and planting trees are:

- Start with selecting high quality nursery stock. See page 1 of this publication: http://www.ksre.ksu.edu/bookstore/pubs/L870.pdf.
- Determine if the root flare is at the top of the root ball or at the top of the soil in the container before purchasing the tree. Visit http://www.ksre.ksu.edu/bookstore/pubs/MF1119.pdf and the above publication.
- Remove any soil that covers the root flare (where the trunk and first roots meet), dig the hole depth according to the remaining root mass and place the root flare at or slightly above the soil original level.
- Stake trees when environmental conditions could cause the roots to shift and move during the establishment period. See http://www.ksre.ksu.edu/bookstore/pubs/MF1120.pdf for proper staking methods.
- Mulch the tree. Do not pile mulch against the tree stem and do not place more than 3 to 4 inches of mulch over tree roots. Excessive mulch can be as damaging as planting too deeply. Visit the following publication for proper mulching techniques http://mdc.mo.gov/sites/default/files/resources/2010/04/3792_1460.pdf.
- Ensure that establishing trees have adequate soil moisture the first three years after planting and any other time then rainfall amounts do not moisten the soil to a depth of twelve inches (12”). Learn how to water newly-planted and established trees by viewing http://www.ksre.ksu.edu/bookstore/pubs/MF2800.pdf and http://www.ksre.ksu.edu/bookstore/pubs/MF2801.pdf.

Additional Resources to Avoid Tree Planting Problems:

- The University of Minnesota Extension. *A practitioner’s guide to stem girdling roots of trees.* Found online at http://www.extension.umn.edu/garden/yard-garden/trees-shrubs/practitioners-guide-to-stem-girdling-roots
- Sydnor, T. Davis. *Girdling Roots –A Problem of Shade Trees.* Found online at http://ohioline.osu.edu/hyg-fact/1000/1139.html

Industry Standards and Best Management Practices:

- AmericanHort. *American Standard for Nursery Stock*. ANSI Z60.1-2014. Found online at http://americanhort.org/documents/ANSI_Nursery_Stock_Standards_AmericanHort_2014.pdf
- International Society of Arboriculture. ANSI A300 Standards and Best Management Practices. Found online at http://www.isa-arbor.com/store/category.aspx?cid=117

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Maintenance

Maintenance is the portion of a tree program that is most often overlooked by most communities. Nothing can be more detrimental to citizen and board support than to waste money on tree plantings which die from neglect due to lack of water, mower injury, poor pruning or insect and disease. A maintenance program/schedule should be set up for every planting, and periodic surveys should be made to determine which trees to remove and prune. Pesticide treatments are costly and should be used only on select trees of excellent condition and form. Proper species selection and a good sanitation program (dead tree removal) are much more effective at preventing insect and disease outbreak than pesticide application. In fact, most pesticide applications do not prevent insect and disease problems; rather they focus on control after the problem exists. Appropriate tree selection, planting and maintenance allows trees to grow at their optimum growth rate which is the best way to prevent insect and disease problems. Proper pruning, especially when trees are young, can eliminate unnecessary work and labor costs later on and help minimize storm damage. Maintaining mulch zones around the base of younger trees, eliminating grass and weeds in these mulched areas and the timely delivery of water are critical to the healthy establishment of trees.

Proper pruning is critical for a strong maintenance program

Please refer to the enclosed appendices for further information on tree maintenance recommendations.

I would suggest that citizens, tree board members and city employees learn to identify and implement controls for some of the common problems associated with the following species:

Poor staking practices can lead to tree decline and death

Austrian and Scotch Pine:	Tip blight (*Diplodia*), needle blight (*Dothistroma*), pine wilt
Cedar:	Kabatina blight, Cercospora blight, bagworms, spider mites
Ash species:	Anthracnose, ash borers, ash yellows, emerald ash borer
Maple species:	Anthracnose, verticillium wilt, root rot, flatheaded borer, Asian longhorned beetle
Oak Species:	Oak wilt
American Elm:	Dutch elm disease
Black walnut:	Thousand cankers disease of walnut

The health and vigor of most pine species continues to decline in most Kansas communities

This list represents potential, common and potentially controllable insect and disease problems associated with several tree species within Alta Vista. It is not intended to be a comprehensive list. Please refer to the enclosed insect and disease publications for further details. Further recommendations on species selections, removals and planting innovations are included in the recommendation section of this report. For more topics relating to trees visit
http://www.hfrr.ksu.edu/p.aspx?tabid=603

Dead and Dying Tree Removal

In order to remove hazards to life and property, reduce the spread of disease, provide for beautification and reduce maintenance costs, it is highly recommended that any remaining dead and dying trees be removed as quickly as possible from the Alta Vista public properties. The inventory shows that approximately 15 trees were determined to be dead or dying and in need of removal. Depending on specific situations, management needs and capabilities, the 237 trees in the poor condition class may also be in need of removal in the near future. *Silver maple, green ash, Siberian elm, hackberry, American elm, eastern redbud, eastern redcedar, northern catalpa, cottonwood, and mulberry have 20% or more of their species in the poor condition category, totaling about 224 trees from the population of those specific species.* Silver maple, hackberry, green ash, cottonwood, northern catalpa, ornamental pear and Siberian elm are highly prone to storm damage and structural decline, especially as they age. Other large diameter species are susceptible, as well, to damage and decline as those species mature, so the potential for removals certainly could increase due to several trees reaching a mature or over-mature state.

Decay is the primary cause of whole tree failure. This tree should be removed.

TREE RISK MANAGEMENT

A community tree inventory plays an important role in tree risk management. An inventory provides detailed information about the diversity, health and age of the community forest. This information, in turn, gives forest managers and city leadership necessary information to make informed decisions in developing tree risk management strategies.

Cracks in trees elevate the risk of failure. This tree should be removed.

The two guiding principles of tree risk management programs are:

1. Increase public safety
2. Promote tree health and sustainability

As detailed in *Community Tree Risk Management: Program Planning and Design*, a community forestry program would integrate tree risk management, tree planting, emergency response and tree pruning and maintenance programs. When a community adopts a proactive approach to public tree management, the result will be a healthier and safer tree resource. This extensive publication may be found online at: http://www.na.fs.fed.us/spfo/pubs/uf/utrmm. It is ***strongly recommended*** that city staff and tree board members review and integrate pertinent components from this resource into your community tree program.

The presence of fruiting bodies is an indicator of advanced decay.

CONCLUSION

Trees are an asset to any community. They modify the urban environment, beautify a community, add property value, and are usually responsible for the first and last impression of a town. The city of Alta Vista should be commended for its undertaking of a community forestry program and for creating a tree board. This commitment to community tree management will only benefit the city and all who live in and visit it. Based upon the recent inventory results and recommendations I would offer the following highlights and priorities:

- At the time of the inventory, 739 public trees were located within the city limits of Alta Vista, of which 27% were in good condition, 39% in fair condition and 32% poor condition. Approximately 15 trees were considered dead and dying – 2% of the population.
- Any remaining dead and dying trees should be removed as soon as possible.
- The 39% of poor trees, 237 trees in total, are in need of intensive management assistance or will need to be removed in the near future.
- The 32% of fair trees, 287 trees in total, have minor maintenance requirements such as pruning or insect and disease control needs.
- Silver maple comprises the largest percentage of species, followed by green ash, Siberian elm and hackberry which combine for a total of 59% of the total population.
- There are several species with average diameters at or over 20 inches – totaling 321 trees. These species comprise 43% of the total tree population.
- Approximately 41 species are represented in the inventoried areas of Alta Vista.
- To charter a future course for the city it is recommended that a mission statement with desired goals and objectives be identified for the community including elements of results, criteria, time frames and specific targets to be reached. Possible targets within the next 10 to 15 years could be:
  -Increase the number of species established to 60.
  -Decrease the number of dead and dying trees to 1%.
  -Increase the number of good condition trees to 40%.
  -Plant and establish 400 trees in anticipation of the loss of the 321 trees that are more than 20" in average diameter and ash that will be lost to emerald ash borer.
- Establish an annual budget and plan of work which targets the needs of planning, planting, maintenance and removals.
- Due to overstocking, high failure potential, and insect and disease problems it is recommended that the following species not be planted or encouraged in the future: silver maple, hackberry, ash, Siberian elm, Scotch and Austrian pine, honeylocust, Bradford and ornamental pear, cottonwood, and willow.
- A philosophy of planting and establishment of quality trees, rather than quantity of trees, is recommended.

27% of Alta Vista's public trees are in good condition.

43% of all trees have average diameters 20" or larger.

Tree planting is an investment for our environment and future.

APPENDIX A
Ecosystem Services of Alta Vista's Public Trees

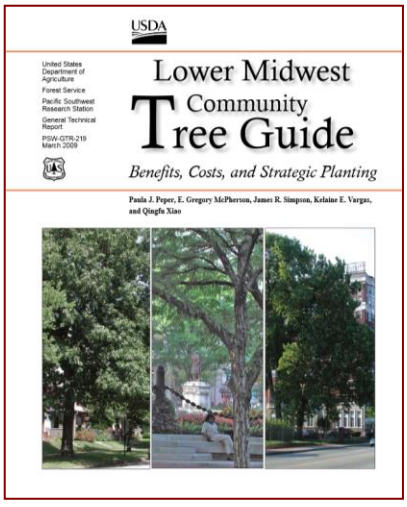
In addition to the many benefits listed on page 4 of this report, trees provide specific environmental services to the community that can now be quantified through use of i-Tree Streets, a software program that provides community forestry analysis and benefits assessment tools. i-Tree Streets quantifies benefits such as energy savings, air quality improvement, carbon dioxide reduction, stormwater runoff reduction and property value increases.

To be able to calculate these benefits, Alta Vista's inventory data was imported into the program. It should be pointed out that values used in this management recommendation are derived by different formulas. It should also be recognized that the enclosed i-Tree reports reveal ***only the total benefits*** of the trees and do not include any calculation of the cost to maintain and manage the trees. If the reports did, it would substantiate that the benefits provided by Alta Vista's trees are worth more than the cost to maintain them, perhaps **three times** more than the cost. Trees do pay us back. See http://www.na.fs.fed.us/urban/treespayusback for more information.

Highlights of the enclosed i-Tree Streets reports revealed the following ***total annual benefits:***

Energy	66.2MWh, 1,605 Therms	$6,063
Carbon dioxide sequestered and avoided	285,570 net total pounds	$942
Air quality: pollutants absorbed, and avoided	1,882 pounds	$2,224
Stormwater: rainfall intercepted	3,353,363 gallons	$20,791
Aesthetic/Other	N/A	$24,848
Total Yearly Benefits		**$54,868**

While not an annual benefit, the public tree resource also stores a considerable amount of carbon dioxide – 5,231,712 pounds - with a calculated benefit of **$17,265**



Please refer to the enclosed STREETS reports for specific information and values. The *Lower Midwest Community Tree Guide*, the basis for the data and values utilized in STREETS, provides yet more detailed and pertinent information. It may be found online at http://www.fs.fed.us/psw/publications/documents/psw_gtr219/psw_gtr219.pdf .

NOTES: