

Section 106 Documentation

Louisville Regional Airport Authority
Bowman Field Airport Area Safety Program

Inventory of trees for runways 6, 24 and 33

Summary of findings

Prepared for:

Hanson Engineering

1601 Belevedere Rd. Suite 303 South

West Palm Beach, Florida 33406

Prepared by:

Beechwood Trees & Gardens, Inc.

Paul G. Clinton, arborist

7906 Floydsburg Road

Crestwood, Kentucky 40014

Introduction:

This tree inventory was conducted to gather information for the Bowman Field Airport Area Safety Program. The inventory serves two main purposes: 1. To identify the objects (trees) that have penetrated into restricted air space and those close to penetrating, and 2. To evaluate the tree population for an environmental report being prepared for the Federal Aviation Administration.

The trees have all been numbered and locations charted on a map. Each tree was identified and assessed for size, age, condition, and estimated maximum height. The identity of the trees is listed by common name and botanical name. In some cases the exact species could not be identified from a distance but the genus could be determined. For instance several ash species were probably present but all ash trees were grouped into genus *Fraxinus*. The size of the trees was estimated at a distance and grouped into size categories.

Estimated maximum height was determined by referencing several sources of tree height information and averaging them. References were: Mary Warton's Trees & Shrubs of Kentucky, Michael Dirr's Manual of Woody Landscape Plants, Kentucky Division of Forestry, Kentucky's State Champions, Mitchell & More, The Trees of North America, and William Harlow, Textbook of Dendrology.

Analysis:

The complete tree inventory of runways 6, 24 and 33 consists of 3,512 trees. The dominant species, listed by abundance are: flowering dogwood, hackberry, Bradford pear, mulberry, red maple, American holly, Silver maple, black cherry, Japanese maple, sugar maple.

Most of the trees inventoried (approximately 70%) were planted by the land owners or land managers with the other 30% consisting of species not typically planted but commonly found growing in fence rows and unmanaged areas. Many of these natural growth trees are species that grow very tall and may grow into the restricted air space.

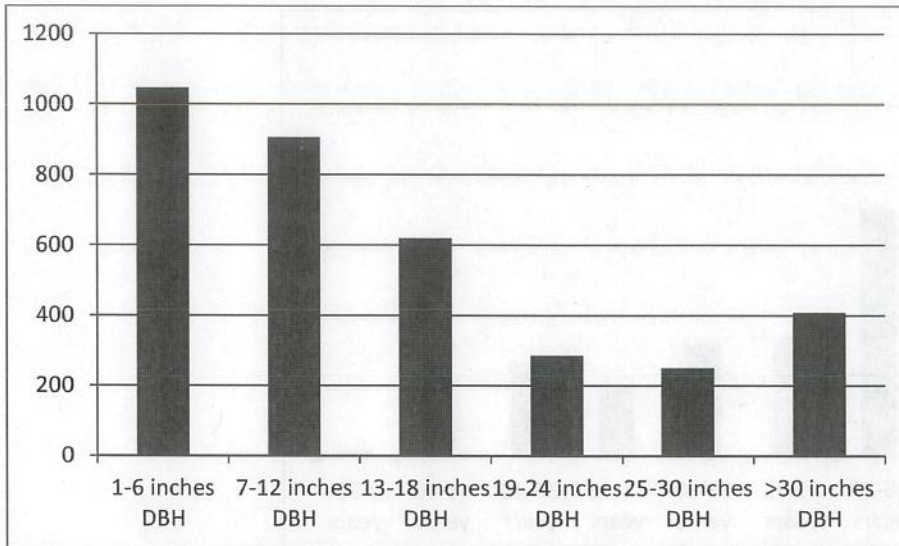
The distribution of tree sizes shows that many of the trees are young and or small growing species. In the runway 33 neighborhoods many young trees are growing in the fence rows and drainage ways. In the runway 6 neighborhood the trees are older and consist of many small-growing species like dogwood and Japanese maples with fewer fence row trees.

An analysis of the estimated maximum heights shows that many of these trees are species that will grow very large and may grow into the restricted air space. Over 50% of the trees present were species that will grow over 70 feet tall.

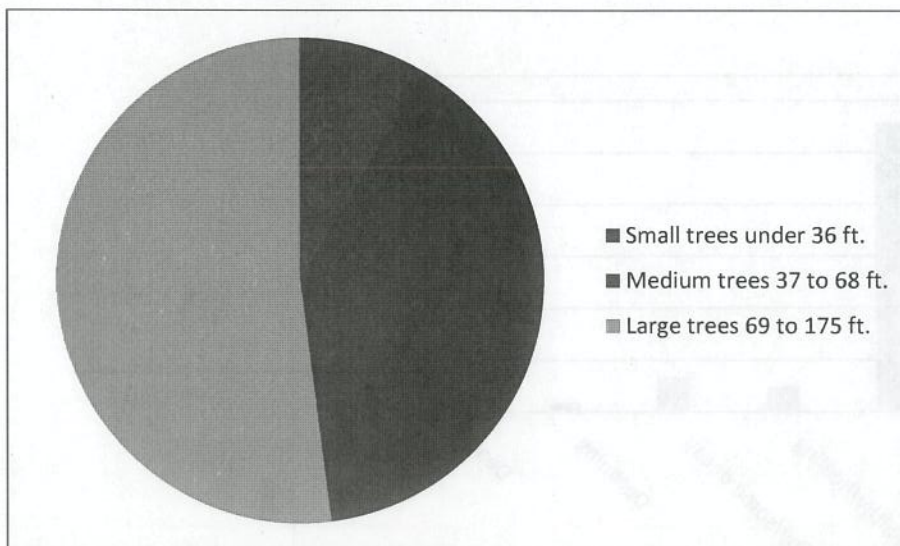
The majority of the trees inventoried are less than 25 years old. Many of the young trees are growing up in unattended fence rows particularly in the runway 33 neighborhood. Many recently planted trees were counted showing that people are actively planting a lot of new trees.

The majority of the trees are healthy. The soils in this area are deep and fertile and ideal for trees.

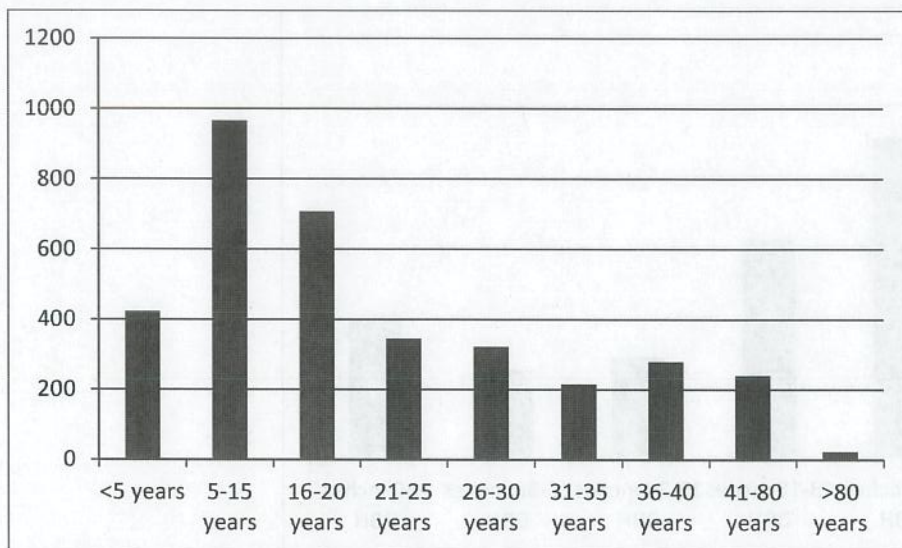
Tree sizes:



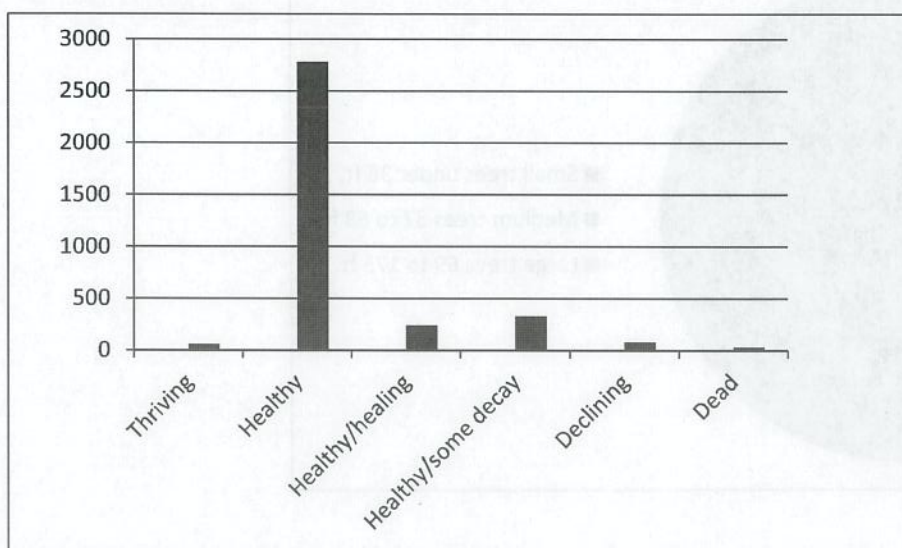
Estimated Maximum Heights:



Tree age categories:



Tree condition class:



Appendix 5:

DRAFT

Botanical Name	Common Name	Runway 6	Runway 24	Runway 33	Runway 15	Totals
<i>Abies concolor</i>	White fir	3				3
<i>Acer amurense</i>	Amur maple	2				2
<i>Acer buergerianum</i>	Trident maple	3				3
<i>Acer griseum</i>	Paperbark maple	9				9
<i>Acer henryi</i>	Henry maple	2				2
<i>Acer miyabe</i>	State Street maple	3				3
<i>Acer negundo</i>	Boxelder	9	262	37		308
<i>Acer palmatum</i>	Japanese maple	84	2	18		104
<i>Acer platanoides</i>	Norway maple	7		5		12
<i>Acer pseudoplatanus</i>	Sycamore maple	1				1
<i>Acer rubrum</i>	Red maple	118	27	95	4	244
<i>Acer sacharinum</i>	Silver maple	59	28	105		192
<i>Acer sacharum</i>	Sugar maple	70	14	48	6	138
<i>Aesculus sp.</i>	Flowering horsechestnut	13	3		25	41
<i>Ailanthus altissima</i>	Tree-of-heaven		3		12	15
<i>Albizia julibrissin</i>	Mimosa	2		4		6
<i>Amelanchier sp.</i>	Serviceberry	23	2	1		26
<i>Asimina triloba</i>	Pawpaw	7		3		10
<i>Betula nigra</i>	River birch	33	12	9		54
<i>Betula sp.</i>	Birch	2		1		3
<i>Carpinus betulus</i>	European hornbeam	6	1			7
<i>Carpinus caroliniana</i>	American hornbeam	1				1
<i>Carya glabra</i>	Pignut hickory		1			
<i>Carya illinoensis</i>	Pecan	2	4			6
<i>Carya ovata</i>	Shagbark hickory	1	2			3
<i>Castanea mollissima</i>	Chinese chestnut	3	6	1	2	12
<i>Catalpa speciosa</i>	Catalpa	11	11	9	1	32
<i>Cedrus sp.</i>	Cedar	1				1
<i>Celtis occidentalis</i>	Hackberry	69	191	74	95	429
<i>Cercidiphyllum japonicum</i>	Japanese pagodatree	1		1		2
<i>Cercis canadensis</i>	Redbud	94	9	15	3	121
<i>Chamaecyparis obtusa</i>	Hinoki falsecypress	6				6
<i>Chionanthus virginicus</i>	Fringetree	3			3	6
<i>Cladrastis kentukea</i>	American Yellowwood	12	3			15
<i>Cornus amomum</i>	Silky dogwood				1	1
<i>Cornus florida</i>	Flowering dogwood	223	11	72	3	309
<i>Cornus kousa</i>	Kousa dogwood	20	6			26
<i>Cornus mas</i>	Cornelian cherry dogwood	5				5
<i>Corylus avellana</i>	Filbert	3				3
<i>Cotinus obovatus</i>	Smoketree	6				6
<i>Crataegus phaenopyrum</i>	Washington hawthorn	4	2		3	9
<i>Cryptomeria japonica</i>	Japanese cedar	28				28
<i>Diospyros virginiana</i>	Persimmon	3	1			4
<i>Fagus grandifolia</i>	American beech	4	1			5

<i>Fagus sylvatica</i>	European beech	3		2		5
<i>Franklinia alatamaha</i>	Franklin tree	3				3
<i>Fraxinus</i> sp.	Ash	26	188	25	14	253
<i>Ginkgo biloba</i>	Ginkgo	20	3	1		24
<i>Gleditsia triacanthos</i>	Honeylocust	12	5		5	22
<i>Gymnocladus dioica</i>	Kentucky coffeetree	7	2			9
<i>Halesia diptera</i>	Mountain silverbell	2				2
<i>Halesia carolina</i>	Silverbell	1				1
<i>Hamamelis virginiana</i>	Witchhazel	3				3
<i>Ilex crenata</i>	Foster holly	94	5	5		104
<i>Ilex opaca</i>	American holly	145	5	39	2	191
<i>Juglans cinerea</i>	Butternut			1		1
<i>Juglans nigra</i>	Black walnut	19	94	8	27	148
<i>Juniperus communis</i>	Common juniper	2				2
<i>Juniperus chinensis</i>	Chinese juniper	23		7	1	31
<i>Juniperus virginiana</i>	Eastern redcedar	75	16	18	1	110
<i>Koeleruteria paniculata</i>	Goldenrain tree	9	2	1		12
<i>Lagerstroemia indica</i>	Crape myrtle	56		16		72
<i>Liquidambar styraciflua</i>	Sweetgum	8		1		9
<i>Liriodendron tulipifera</i>	Tulip tree	15	11	16	4	46
<i>Maclura pomifera</i>	Osage orange	1	5	3		9
<i>Magnolia grandiflora</i>	Southern magnolia	23	4	12		39
<i>Magnolia</i> sp.	Magnolia	36	1	6		43
<i>Magnolia stellata</i>	Star magnolia	4		2		6
<i>Magnolia virginiana</i>	Sweetbay magnolia	21	4	1		26
<i>Magnolia x soulangiana</i>	Saucer magnolia	7	6	6		19
<i>Malus</i> sp.	Crab apple	36	5	22		63
<i>Metasequoia glyptostoboides</i>	Dawn redwood	2	5			7
<i>Morus</i> sp.	Mulberry	91	132	118	6	347
<i>Nyssa sylvatica</i>	Blackgum	10				10
<i>Parrotia persica</i>	Persian ironwood	3				3
<i>Paulownia tomentosa</i>	Paulownia		3			
<i>Picea abies</i>	Norway spruce	37	28	5	5	75
<i>Picea alba</i>	White spruce	1	1			2
<i>Picea omorica</i>	Serbian spruce	1	3	1		5
<i>Picea orientalis</i>	Oriental spruce				17	17
<i>Picea pungens</i>	Blue spruce	35	11	11	1	58
<i>Pinus nigra</i>	Austrian pine	3	6	1	1	11
<i>Pinus parviflora</i>	Japanese white pine	4				4
<i>Pinus sylvestris</i>	Scotch pine		1		8	9
<i>Pinus strobus</i>	Eastern white pine	67	118	13		198
<i>Pinus thunbergii</i>	Japanese black pine	1				1
<i>Pistacia chinensis</i>	Pistachio	1				1
<i>Platanus occidentalis</i>	American sycamore	1	56	4	5	66
<i>Platanus x acerifolia</i>	London planetree	1				1
<i>Populus deltoides</i>	Cottonwood	1	15	2		18
<i>Prunus persica</i>	Peach			1		1
<i>Prunus serotina</i>	Black cherry	53	28	29	31	141
<i>Prunus</i> sp.	Flowering cherry	54	3	22		79
<i>Prunus virginiana</i>	Chokeberry	2		1		3

<i>Pseudotsuga menziesii</i>	Douglas fir	5				5
<i>Pyrus calleryana</i>	Bradford pear	32	1	194		227
<i>Quercus acutissima</i>	Sawtooth oak	3				3
<i>Quercus alba</i>	White oak	6	5	3		14
<i>Quercus bicolor</i>	Swamp white oak	5			1	6
<i>Quercus coccinea</i>	Scarlet oak	2				2
<i>Quercus imbricaria</i>	Shingle oak	4	2			6
<i>Quercus macrocarpa</i>	Bur oak	3	2			5
<i>Quercus nigra</i>	Water oak		1			
<i>Quercus pagoda</i>	Cherrybark oak	4				4
<i>Quercus palustris</i>	Pin oak	58	45	28	5	136
<i>Quercus phellos</i>	Willow oak	12	17	1	1	31
<i>Quercus prinus</i>	Chestnut oak	5	1			6
<i>Quercus robur</i>	English oak	2				2
<i>Quercus rubra</i>	Red oak	12	15	6	5	38
<i>Quercus sp.</i>	Oak	1				1
<i>Robinia pseudoacacia</i>	Black locust	7	47	8		62
<i>Salix babylonica</i>	Weeping willow	1	1			2
<i>Salix matsudana</i>	Peking willow	3		3		6
<i>Salix sp.</i>	Willow oak	2	5			7
<i>Sassafras albidum</i>	Sassafras	3				3
<i>Styrax japonicus</i>	Japanese snowbell	1				1
<i>Syringa reticulata</i>	Japanese tree lilac	7				7
<i>Taxodium ascendens</i>	Pond cypress	3				3
<i>Taxodium distichum</i>	Bald cypress	2	28	2		32
<i>Taxus sp.</i>	Yew	3				3
<i>Thuja sp.</i>	Arborvitae	34	142	2		178
<i>Tilia americana</i>	American basswood	1	2			3
<i>Tilia cordata</i>	Little leaf linden	4	3		3	10
<i>Tsuga canadensis</i>	Hemlock	44	2	2		48
<i>Ulmus x</i>	Elm	4				4
<i>Ulmus americana</i>	American elm	34	149	36	10	229
<i>Ulmus parviflora</i>	Paperbark elm	2	1			3
<i>Ulmus pumila</i>	Siberian elm	15	7	21		43
<i>Ulmus x hollandica</i>	Jacqueline Hilliar dwarf elm	1				1
<i>Viburnum prunifolium</i>	Blackhaw	7				7
<i>Zelkova serrata</i>	Zelkova	3	22	1		26
		Runway 6	Runway 24	Runway 33	Runway 15	
		2307	1866	1205	311	5689

RUNWAY 6 & 33 APPROACH MAINTENANCE PROGRAM
AGE COMPARISON OF TREES ACTUAL to ESTIMATE

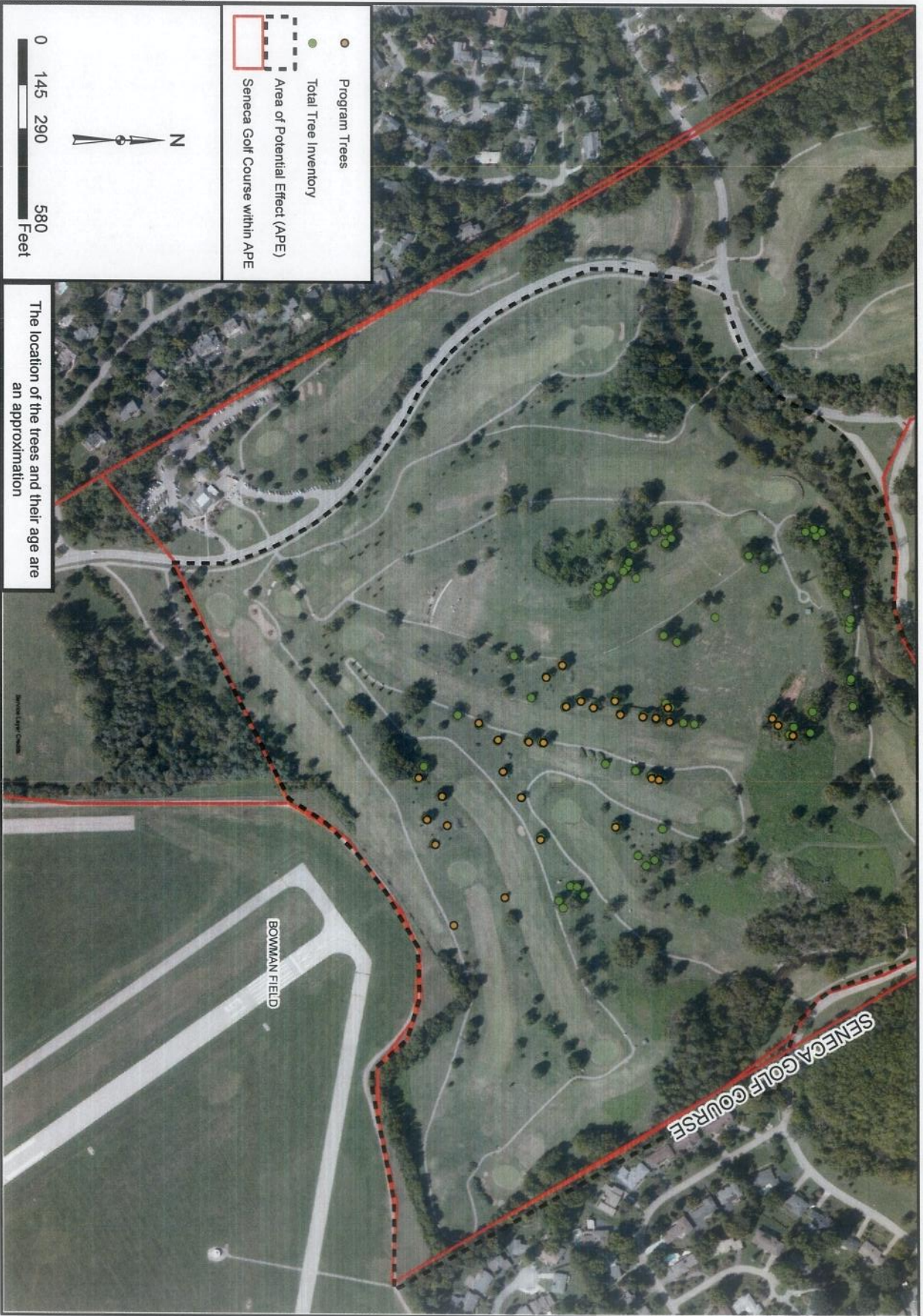
Tree Number	Address	Type	SIZE		AGE	
			Estimated	Actual	Estimated	Actual
02D	Drayton Drive	Silver maple	30-36"	34"	41-80	40
03D	Drayton Drive	White pine	12-18"	17"	26-30	40
29D	Drayton Drive	Silver maple	36+ "	42"	41-80	35
01G	Gladstone ROW	Pin oak	30-36"	33"	36-40	42
03G	Gladstone ROW	Silver maple	24-30"	27"	31-35	35
04K	Kent Road	Red maple	30-36"	34"	41-80	54
04L	Landor Ave	Silver maple	30-36"	33"	41-80	43
06L	Landor Ave	Siberian elm	36+ "	44"	41-80	62
07L	Landor Ave	Siberian elm	30-36"	33"	41-80	63
08L	Landor Ave	Silver maple	36+ "	40"	41-80	65
11L	Landor Ave	Hackberry	24-30"	25"	36-40	45
17L	Landor Ave	Hemlock	0-12"	6"	16-20	27
18L	Landor Ave	Hemlock	0-12"	6"	16-20	27
19L	Landor Ave	Hemlock	0-12"	7"	16-20	27
20L	Landor Ave	Ash	24-30"	28"	16-20	27
15A	Drayton Drive	Pin oak	36+ "	48"	80+ "	56
16A	Drayton Drive	Silver maple	36+ "	52"	80+ "	55
17A	Drayton Drive	American elm	12-18"	16"	26-30"	12
20A	Landor Ave	Black cherry	24-30"	27"	36-40	42
21A	Landor Ave	Black cherry	24-30"	26"	36-40	41
22A	Landor Ave	American elm	24-30"	26"	36-40	40
23A	Landor Ave	Black walnut	30-36"	36"	5-15 ??	40
24A	Landor Ave	Black walnut	18-24"	18"	31-35	35
25A	Landor Ave	Tulip poplar	30-36"	30"	36-40	45
26A	Landor Ave	Catalpa	24-30"	25"	36-40	45
27A	Landor Ave	Black cherry	18-24"	20"	31-35	24
28A	Landor Ave	Black walnut	18-24"	20"	31-35	28
29A	Landor Ave	Tulip poplar	12-18"	15"	26-30	20
30A	Landor Ave	Sugar maple	12-18"	15"	26-30	24
31A	Landor Ave	American elm	7-12"	12"	26-30	15
32A	Landor Ave	Ginkgo	7-12"	9"	21-25	15
33A	Landor Ave	Blue spruce	7-12"	12"	21-25	27
34A	Landor Ave	Blue spruce	7-12"	12"	21-25	27
35A	Landor Ave	Blue spruce	7-12"	10"	21-25	27



EXHIBIT 1



EXHIBIT 2



HANSON.
Hanson Professional Services, Inc.
www.hanson-hs.com

Office: Nashville
Hanson Professional Services, Inc.
2700 Main Ave., Suite B
Louisville, KY 40205
Phone: (602) 461-0772
Professional Services Corporation
#16-00106

BOWMAN FIELD

BOWMAN FIELD
2815 TAYLORSVILLE RD
LOUISVILLE, KY 40205

**BOWMAN FIELD
AIRPORT AREA
SAFETY
PROGRAM**

**SECTION 106
COORDINATION**

NO.	DATE	DESCRIPTION	DATE	DESCRIPTION
1				
2				
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DATE:	12/06/14
CAO FILE:	
LAO FILE:	
DOAN BY:	ASB
REVIEWED BY:	LRH

**SENeca
GOLF COURSE
TREES
APPROXIMATELY
25 YEARS OLD
OR OLDER**



EXHIBIT 4

DRAFT Copy – NOT FOR PUBLICATION

DEED OF AVIGATION EASEMENT

This DEED OF EASEMENT made this _____ day of _____, 20____, by and between _____ (“Grantors”) and the Louisville Regional Airport Authority, a body politic and corporate existing pursuant to KRS Chapter 183 (“Authority”).

WITNESSETH:

That for the sum _____ Dollars (\$) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Grantors do hereby grant, bargain, sell, and convey unto the Authority, its successors and assigns, with covenant of General Warranty, for the use and the benefit of the public for so long as Bowman Field Airport (the “Airport”) is a public use airport, a perpetual avigation easement and an aircraft operations and aircraft noise easement (“Easement”) and right of way appurtenant to the Airport for the unobstructed use and passage of all types of aircraft (as hereafter defined) in and through the air space above Grantor’s property in Jefferson County, Kentucky, described in Exhibit A attached hereto and made a part hereof (the “Premises”), which airspace is further described as follows:

All that airspace above an imaginary plane over the Premises, the elevations of which plane are depicted by the elevation lines delineated on Exhibit B attached hereto and made a part hereof, to an infinite height above said imaginary plane.

A. Together with the continuing rights, without additional consideration, the Easement shall afford the Authority the following rights:

1. The right to prevent the erection or growth into the airspace within the Easement of any natural or artificial object, tree, or vegetation;
2. The right to remove or alter from the airspace within the Easement, or at the sole option of the Authority, as an alternative, to mark and light as an obstruction to air navigation, any such natural or artificial object, tree, or vegetation now or in the future upon the Premises within the Easement;
3. The right of reasonable ingress and egress to and from the Easement over the Premises for the aforesaid purposes upon reasonable notice;
4. On those occasions, if any, when it is necessary for the Authority to come upon the Premises for the purpose of trimming any natural or artificial object, tree, or vegetation encroaching within the Easement herein granted, the right to cut back or trim said vegetation ten (10) feet below the Easement herein granted to accommodate future growth of said vegetation.

B. Grantors further covenant and agree that they will not hereafter erect or permit the erection or growth upon the Premises of any building, structure, tree, bush, or other natural or artificial vegetation, or any part thereof, extending into the airspace contained in the Easement. Grantors further covenant and agree that they will not permit or suffer to remain upon the

DRAFT Copy - NOT FOR PUBLICATION

Premises any tree or other object extending into the airspace contained in the Easement, except to the extent that any buildings or structures existing on the date of this Deed of Avigation Easement may already encroach upon the Premises, in which case the Authority shall have the right to mark and light such encroachments as obstructions to air navigation, as indicated in Paragraph A(2), or enter the Premises and trim such vegetation, as indicated in paragraph A, above.

C. For the purpose of this instrument, the term "aircraft" shall mean any contrivance now known or hereafter invented, used or designed for navigation of or flight in the air, without limitation now or in the future as to speed, size, noise, characteristics, frequency or time of operation, by whomsoever owned or operated.

D. Grantors acknowledge that aviation is an expanding and developing activity, and that the degree to which one or more of the rights granted herein may affect or burden the underlying real estate may change or increase with the passage of time, and any such changes or increases shall not be a cause for Grantors, their successors and/or assigns to seek or recover additional compensation or damages.

E. The easements, servitudes and covenants imposed hereby shall be perpetual, shall benefit and be appurtenant to the Airport, shall be binding upon and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors, transferees and/or assigns; shall constitute covenants running with the land so long as the Airport continues to be operated as an airport; and shall not be amended, superceded, modified or released except by express written agreement of the parties hereto. If any provision hereof shall be determined void or unenforceable by a court of competent jurisdiction, all other provisions hereof shall remain in full force and effect. This instrument contains the entire understanding of the parties with respect to the subject matter hereof. This instrument shall be governed and construed in accordance with the laws of the Commonwealth of Kentucky and applicable federal laws and regulations.

IN TESTIMONY WHEREOF, witness the execution hereof by the Grantors as of the day and year first written above.

GRANTORS:

Exhibit A	[Legal Description of the Grantor's Property]
Exhibit B	[Drawing Showing Elevation Lines of Imaginary Plane Over the Grantor's Property]



MEMORANDUM

TO: Aaron Braswell, Federal Aviation Administration

FROM: Hanson Professional Services Inc.

DATE: March 21, 2016

SUBJECT: Response to Dr. Ames' comments

On October 21, 2015, Dr. David Ames delivered his evaluation of the Cultural Resources Evaluation for the Bowman Field Airport Area Safety Program to Pleas for the Trees. The FAA has asked that it be addressed as a part of the 106 submission to the Kentucky State Historic Preservation Office for the project. In short, the report purports that the CRE does not adequately evaluate the historic significance or context of the resources within the Area of Project Effect, nor does it adequately assess the contribution of the vegetation to the historic properties within which it occurs.

The CRE cites appropriate state and local reference works used to define the historic contexts used in the evaluation of properties adjacent to Bowman field where the proposed federal activity will take place. The Ames report is quick to acknowledge that the National Register Bulletin that he coauthored is not cited. However, it is common for determinations of eligibility not to cite every single resource applicable. What was cited directly allowed the researcher to define six (6) suburbs as meeting the criteria for eligibility to the National Register of Historic Places at the local level for their ability to exhibit trends in early to mid-20th century development of suburban Louisville. Seneca Golf Course was also included in the assessment but lacks sufficient integrity to be eligible for the National Register due to extensive remodeling over the years.

Once this historic context was established, the reviewer defined periods of significance for each of the subdivisions evaluated as eligible:

Seneca Vista 1937-1955
Seneca Manor 1937-1958
Kingsley 1926-1964
Seneca Village 1947-1954
Seneca Village 2 1951-1960
Hathaway 1927-1966

These periods of significance are correctly assessed in accordance with the NPS definition as "span of time in which the property attained the significance for which it meets the National Register criteria"; specifically, the period of development of the lots offered for sale and building. Further, it is acknowledged that features within the historic districts that contribute to our understanding of the historic nature of this context include all elements from that period of significance, including but not limited to the houses, garages, streets, sidewalks, fencing and vegetative growth, whether designed or casual.

It can be demonstrated from the attached exhibits that the vast majority of existing trees (specifically addressed here as they are the landscape feature affected by the proposed project) are less than 25 years old and therefore, do not date anywhere near the period of significance for any of the identified districts. Exhibits identify those trees that are believed to be over 50 years old and date either within the period of significance or close to it. Due to a very small number of these trees, it can be seen on the exhibit that the safety program will not affect enough of the historically significant canopy to have any effect on those qualities that cause these suburbs to be eligible to the National Register of Historic Places.

[illegible]

SIZE:
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 NO FILE:
 YOUT BY:
 DRAWN BY: KBS
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HEET TITLE

HAWTHORNE
NEIGHBORHOOD
TREES
APPROXIMATELY
50 YEARS OLD
OR OLDER

EXHIBIT 1



The location of the trees and their age are an approximation

Map of the APE area showing Program Trees, Total Tree Inventory, Area of Potential Effect (APE), and APE Neighborhoods. Includes a North arrow and a scale bar from 0 to 580 feet.

BOWMAN FIELD

BOWMAN FIELD
2815 TAYLORSVILLE RD
LOUISVILLE, KY 40205

LOWMAN FIELD AIRPORT AREA SAFETY PROGRAM

SECTION 106
COORDINATION[illegible]

SENECA
GOLF COURSE
TREES
APPROXIMATELY
50 YEARS OLD
OR OLDER

EXHIBIT 3

