



# CRITERIA FOR SUSTAINABLE LANDSCAPES

Dan Stever

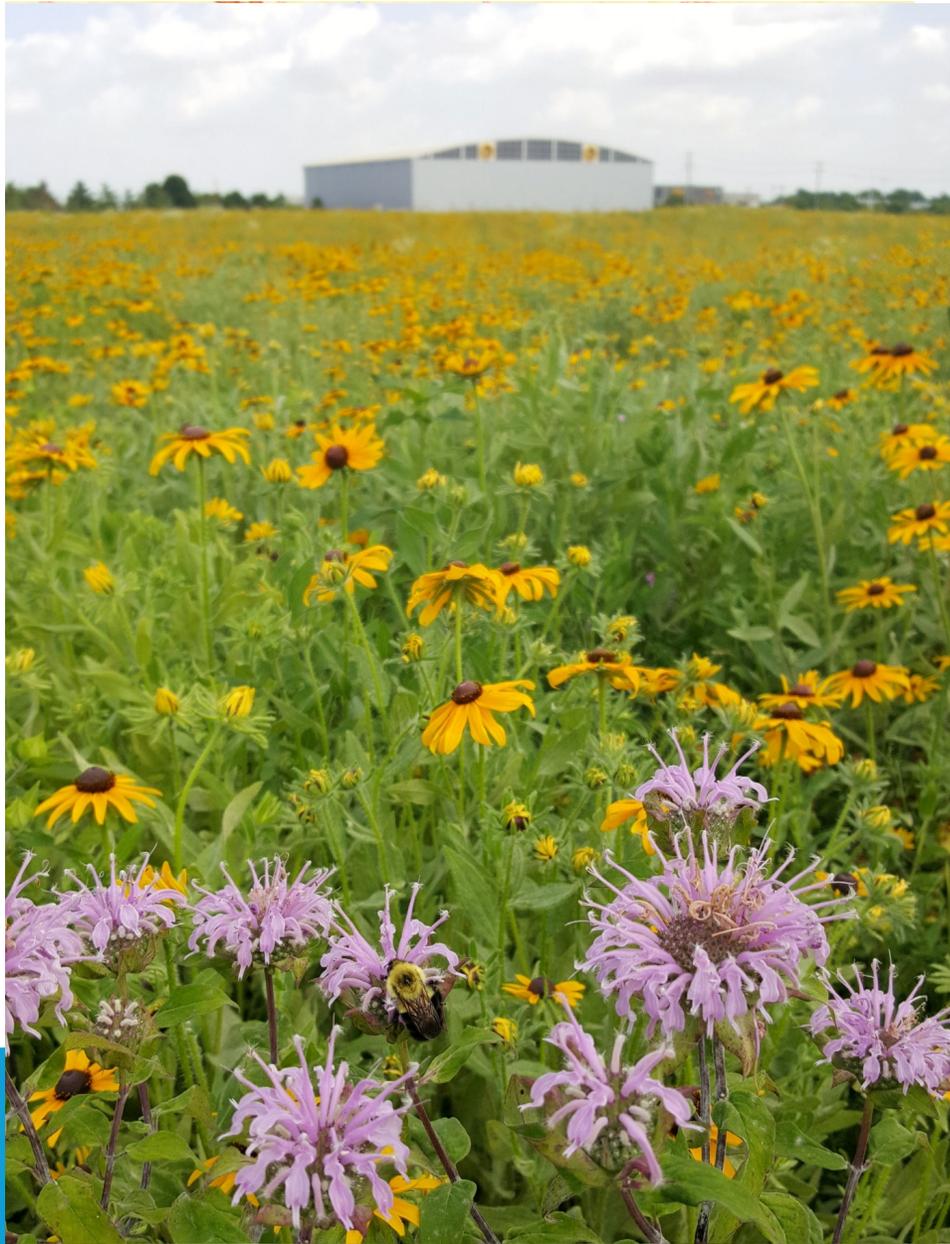


Design

Install

Maintain

Improve



# Design Criteria

- Compliance
- Improve Community Health
- Better Plant Choices
- Reduced Maintenance

# Compliance



**LEXINGTON**

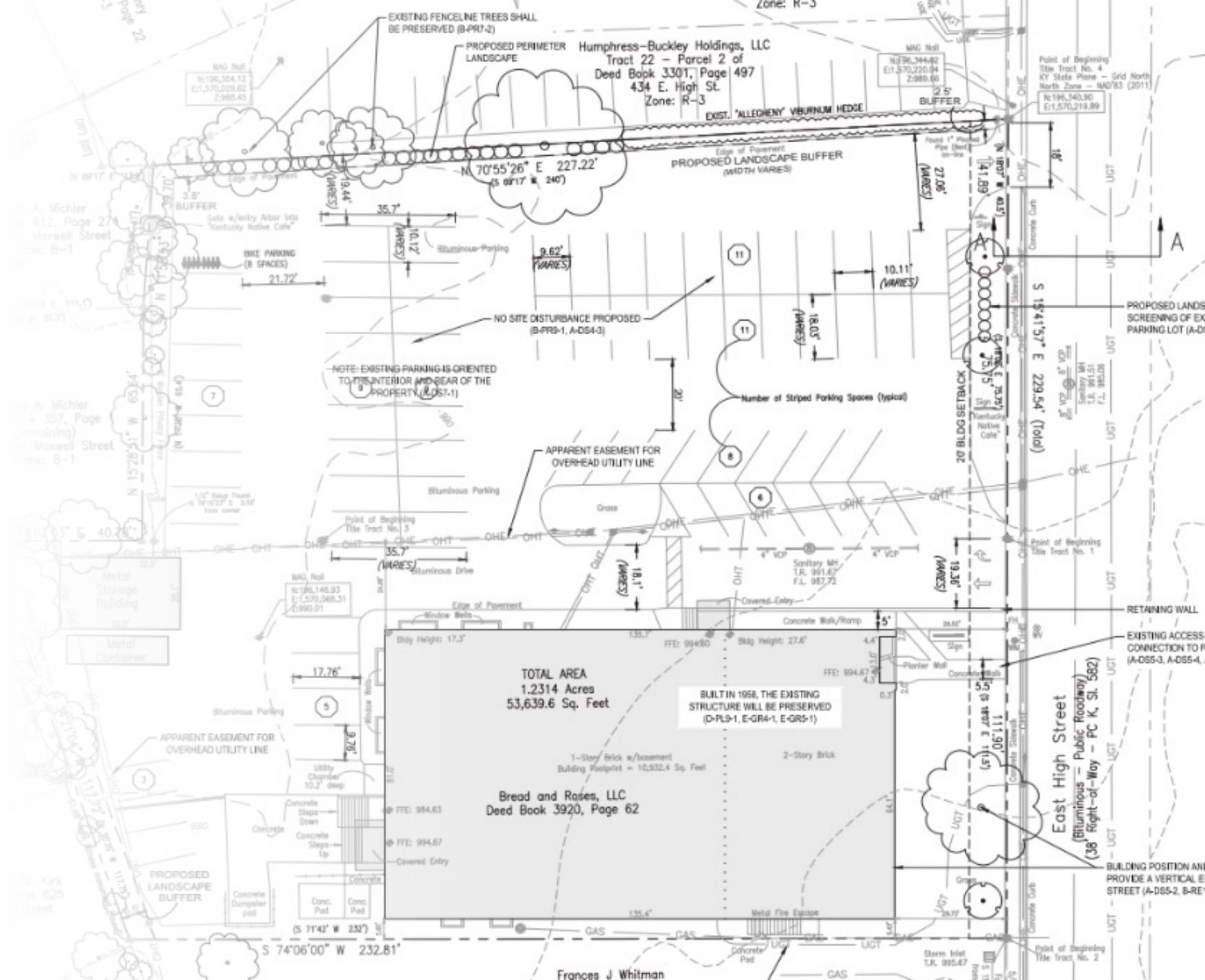
## Articles

- 17b – Street Tree Regulations
  - 18 – Landscape and Land Use Buffers
  - 26 – Tree Protection Standards
- 
- Updates Coming Soon!



# Compliance

- Tree inventory
- Landscape review
- Applying for variances



# Loopholes – undeveloped land

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- Tree Removals
  - No tree preservation standards currently in Kentucky or Lexington.
  - Large native trees often removed prior to listing to make the land more attractive to purchasers.
  - Large native trees often removed prior to finalization of sale to remove development hurdles.



URBAN TREE CANOPY  
**ASSESSMENT**



LEXINGTON, KENTUCKY

AUGUST | 2022



CRITERIA		GRADES
<b>CURRENT CANOPY</b>	The USA contained 23% UTC. The USA has not yet achieved its goal of 30% citywide canopy cover.	<b>C+</b>
<b>POTENTIAL CANOPY</b>	The USA contained 33% PPA, which could bring its total canopy cover to 56% if all plantable space is utilized.	<b>D+</b>
<b>STORMWATER CONTROL</b>	Lexington's trees absorb 113 million gallons of water per year, providing over \$1 million in annual stormwater benefits.	<b>F</b>
<b>HEAT MITIGATION</b>	Lexington-Fayette County had 23,297 acres of impervious land cover and only 12,649 acres of tree canopy.	<b>F</b>

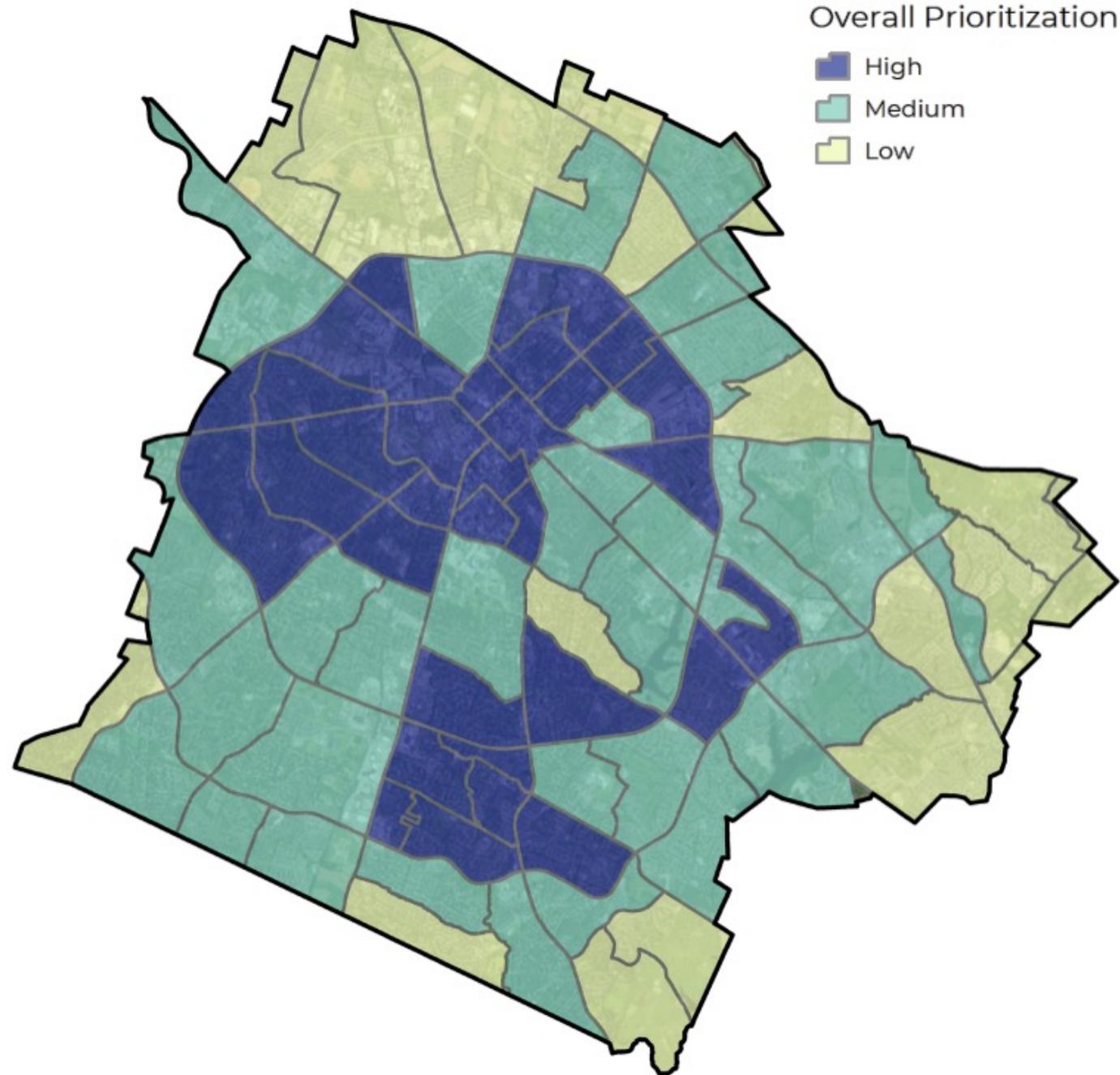


# Improve Community Health

# Prioritization Criteria

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- Existing Canopy Coverage
- Asthma Rates
- Poverty
- Heat Island
- Proximity to Busy Roads
- Race
- Vulnerable Populations (Age)



Make Better  
Plant Choices-

Easier Said  
Than Done



- Most landscape architects' knowledge is inadequate
  - Leads to long term issues
- Not all plants sold at nurseries are appropriate
- Most landscapers are machine people, not plant people
  
- So, what's a layperson to do?



# Better Plant Choices for Reduced Maintenance

- Dwarf shrubs that don't require pruning
- Use small trees by signs
- Avoid overused plants
- Pest and disease resistance
- Use species instead of cultivars
- Reduce total turf area



## LOOK LEFT & LOOK RIGHT

Choose plants that your  
neighbors don't have



# Brief List of Plants to Avoid in the Bluegrass

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- Anything Invasive
- Azaleas and Rhododendrons – root rot and soil pH
- Holly bushes – black root rot, no cure
- Inkberry – black root rot, no cure
- Boxwoods – lots of pests and diseases
- Laurels – root rot
- Redbuds – verticillium wilt, no cure
- Spruce – needle cast diseases
- Sugar Maples – climate change loser



# Kentucky Climate Change Winners & Losers

## High Adaptability

1. Winged Elm – *Ulmus alata*
2. Sweetgum – *Liquidambar styraciflua*
3. Bitternut Hickory – *Carya cordiformis*
4. Southern Red Oak – *Quercus falcata*
5. Hackberry – *Celtis occidentalis*
6. Silver Maple – *Acer saccharinum*
7. Persimmon – *Diospyros virginiana*
8. Hop Hornbeam – *Ostrya virginica*
9. Shumard Oak – *Quercus shumardii*
10. Bur Oak – *Quercus macrocarpa*

## Low Adaptability

1. Tulip Poplar – *Liriodendron tulipifera*
2. Sugar Maple – *Acer saccharum*
3. White Oak – *Quercus alba*
4. Sassafras – *Sassafras albidum*
5. Pignut Hickory – *Carya glabra*
6. Beech – *Fagus grandifolia*
7. Black Walnut – *Juglans nigra*
8. Dogwood – *Cornus florida*
9. Northern Red Oak – *Quercus rubra*
10. Pawpaw – *Asimina triloba*

# Benefits of Urban Trees

Research has linked the presence of urban trees to...



**PROTECTING BIODIVERSITY**  
including habitat for migrating  
birds and pollinators



**REDUCING OBESITY LEVELS**  
by increasing physical activity  
including walking and cycling



**REDUCING RISK**  
of cardiac disease, stroke,  
asthma due to improved

**When it comes to health benefits,  
Are All Trees Equal?**



**REDUCING STORMWATER,**  
removing pollutants out of waterways,  
reducing urban flooding



**COOLING** city streets by 2-4° F,  
reducing deaths from heat and  
cutting energy use



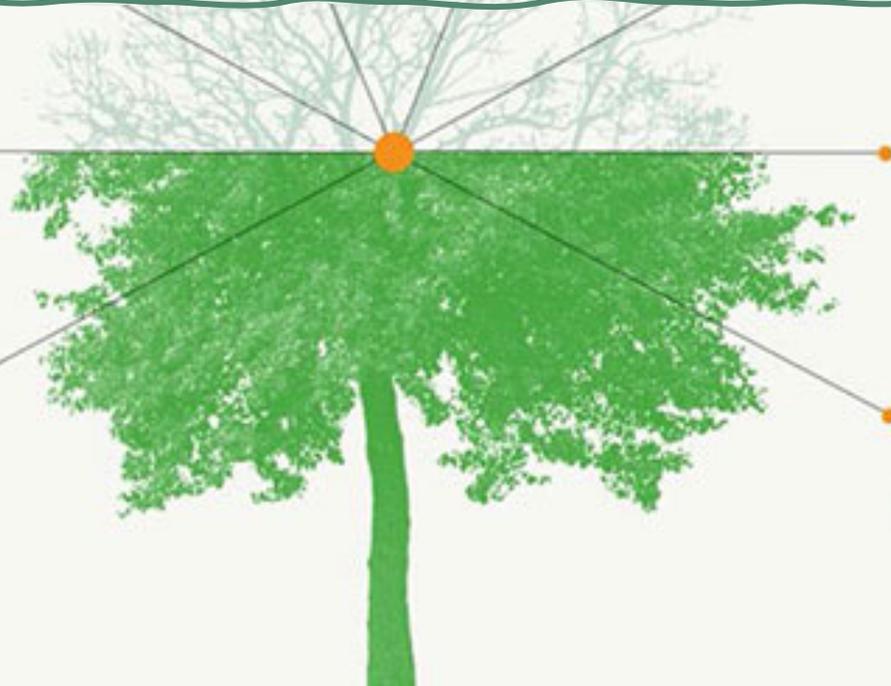
**INCREASING**  
neighborhood property values



**FILTERING** up to a third of fine  
particle pollutants within  
300 yards of a tree



**REDUCING STRESS** by helping  
interrupt thought patterns that  
lead to anxiety and depression



# Better Plant Choices Directly Impacting Health

## Contribute Most to Ozone

1. Sweetgum – *Liquidambar*
2. Black Gum - *Nyssa*
3. Oak Trees - *Quercus*
4. Black Locust - *Robinia*
5. Sycamore – *Platanus*
6. Poplar - *Populus*
7. Willow – *Salix*
8. Golden Rain Tree – *Koelreuteria*
9. Katsura – *Cercidiphyllum*
10. Spruce – *Picea*

## High NOx Areas

- Within ½ mile of high and medium traffic roads
- Areas with idling vehicles, parking lots, and drive-thru
- Traffic areas with poor air circulation

## At-Risk Populations

- Daycares & Schools
- Senior Centers
- Hospitals
- Homes with people who have asthma, lung disease, heart disease, diabetes
- Recreational & Athletic Centers

## Actually Reduce Ozone

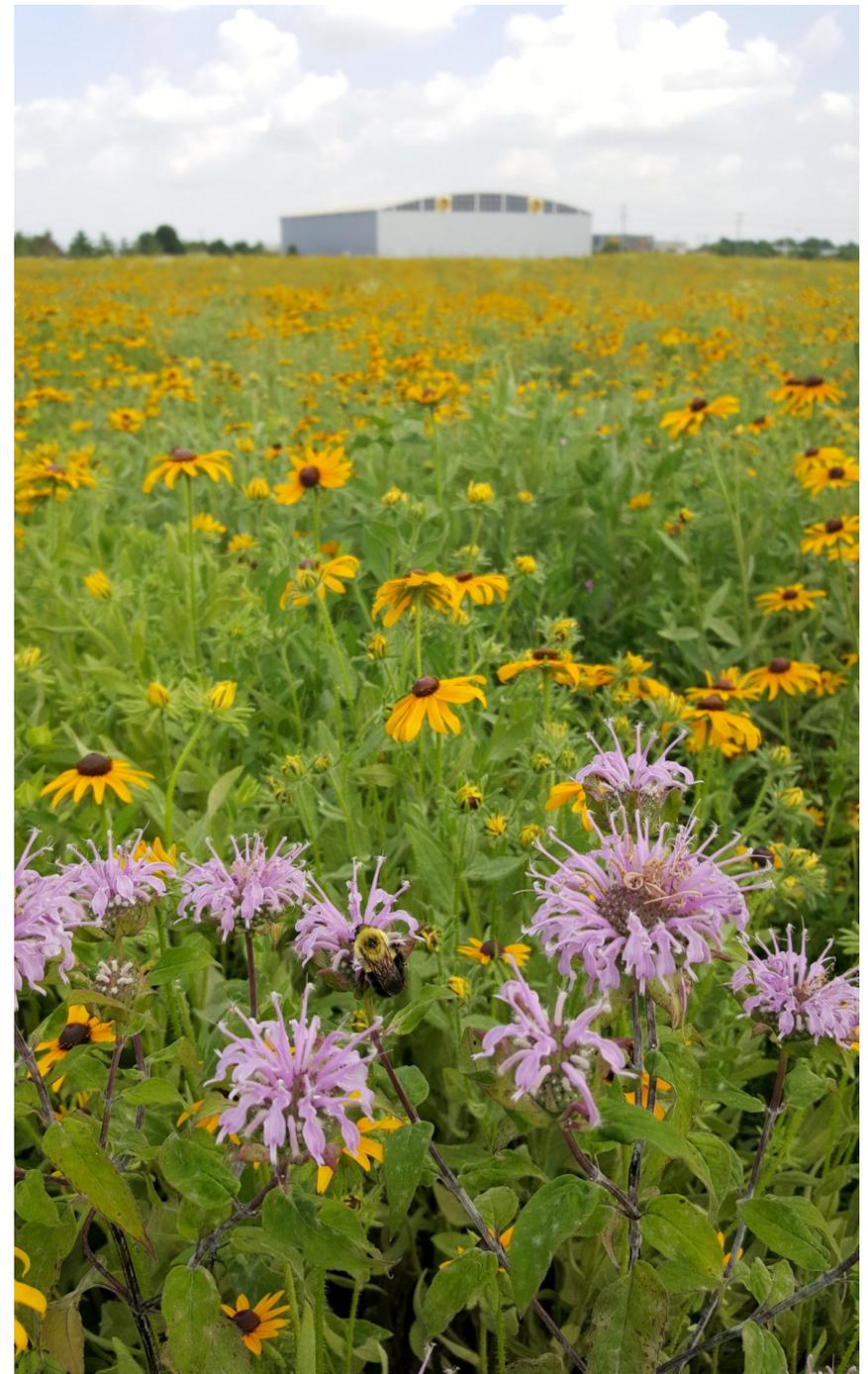
1. Elm – *Ulmus*
2. Lindon / Basswood – *Tilia*
3. Beech – *Fagus*
4. Birch – *Betula*
5. Tulip Poplar – *Liriodendron*
6. Dawn Redwood – *Metasequoia*
7. Maples – *Acer*
8. Buckeyes – *Aesculus*
9. Hackberry – *Celtis*
10. Magnolias – *Magnolia*

-REPLACE TURF WITH PRAIRIE

-AMAZING STORMWATER CONTROL, UP  
TO 9" OF RAINFALL PER HOUR  
BEFORE RUNOFF

-EXCELLENT CARBON SINK, AS MUCH AS  
24,000 LBS OF ROOTS PER ACRE

[Tallgrassrestoration.com](http://Tallgrassrestoration.com)



## Installation Criteria

- Write a strong RFP
  - Long term plant health
- Use smaller plants
  - Every inch of tree caliper equals 2-3 years establishment time.
  - Example: 2" tree = 4-6 yrs
- Avoid low bid





# Three Ways We Kill Our Trees

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# What to include in your next RFP

- Soil volume
  - Small trees – 300 cu ft
  - Medium trees – 1,200 cu ft
  - Large trees – 2,700 cu ft
  - <https://hort.ifas.ufl.edu/woody/documents/EP309.pdf>
- Root balls
  - Remove excess soil from rootballs until the root flare is uncovered.
  - Remove any circling roots.
- Planting depth
  - The root flares of trees shall not be less than 2” or more than 4” above final grade.
- Tree ring mulch
  - 3’ radius from trunk minimum.
  - Mulch not to touch tree trunk.



# Maintenance Matters

- Standard contracts don't provide for all your landscape's needs
- Most landscapes are in a slow state of decline
  - Terrible soil
  - Bad designs
  - Improper installations
  - Insufficient services
  - Missing plant healthcare

# RFP Considerations

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- Growing season about 36 weeks long
  - Standard contracts are 28 visits
- Less herbicide use requires more hand labor and frequent visits
- Monthly plant healthcare inspections
- Don't cutback perennials until spring



# RFP Considerations

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- Monthly irrigation inspections for coverage and damages
- Irrigation zones for landscape beds and turf need to be separate
- Water infrequently and deeply
- Do you have stormwater filters in storm drains?
- What about your raingardens or green roof?



# Green Doesn't Always Equal Green



- >40 million acres of turf
  - 4<sup>th</sup> largest of all crops (corn, soy, wheat)
  - Larger than the state of New York
  - America's largest irrigated crop
    - 7 billion gallons per day
      - 50% wasted
  - 2% of fuel use, but 5% of emissions
  - Turf is a net emitter of CO<sub>2</sub>
- **Management Practices Matter**
  - **Turf can become a net sink of CO<sub>2</sub>, but it takes specialized knowledge and more money.**

# Green Doesn't Always Equal Green

Save Time. Save Money. Save the Environment.

## No P On My Lawn!

*Why we don't and you shouldn't either*

### Did you know?

- Phosphorus (P) is carried by stormwater from lawns to waterways.
- Excess P pollutes our waterways and promotes harmful algal blooms.
- Kentucky home landscapes can be managed with a P-free diet.

Proper lawn management practices can reduce P pollution.

Conduct a soil test before applying fertilizer.

- N fert pollution –
  - 40% volatilize; 30% leaching
- P fert pollution –
  - Bluegrass soils have so much phosphorus that nearly 100% leaches
- > 50 million pounds of herbicide annually
  - Cultural Control can reduce herbicide use
  - IPM best practices
  - Requires knowledge and more money
- Never spray for grubs



No Mosquito Spraying!

## How to Properly Mulch a Tree



The higher the mulch, the closer to God.



## Do's and Don't's of Mulching

- Never use landscape fabric – it kills the soil
- No dyed mulch, no cedar mulch, no rock mulch
- Use arborist chips – LFUCG endorsed
- Leave your leaves

# Scheduled Replacements

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- Think of plants the same as filters, blacktop, or roofs.
- Everything has a (mostly) predictable lifespan.
- Plan accordingly.





# Typical Lifespans

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- Perennials 3-10 years
  - Some can be immortal with proper care
- Shrubs 10-30 years
  - 5% loss rate after 10 years
  - Rejuvenation
- 30 year trees:
  - Dogwoods, birch, cherry, pines
- 50 year trees:
  - Maple, catalpa, magnolia, elm
- 100 year trees:
  - Oak, coffee tree, beech, cypress

# Improvements

- Cost prohibitive to implement multiple sustainable options all at once.
- Look for grants to help.
  - KY dept of Energy and Environment – nonpoint source pollution focused
  - KY division of water - green infrastructure grants
  - Trees Lexington!
  - Lex Grow Trees
  - Stormwater quality incentive grants



# Thank You!

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LEXINGTON  
LAWN AND  
LANDSCAPE

