URBAN FORESTRY MASTER PLAN ADVISORY GROUP

WORKSHOP #1: THE TREES

THE CITY OF COLUMBUS RECREATION AND PARKS

TODAY'S AGENDA:

I. Welcome & Introductions (10 mins)

II. Presentation: (15 mins)
Overall Project Summary & Today's Topic

III. Facilitated Discussion (90 mins)

IV. Next Steps

www.ColumbusUFMP.org

SAVE THE DATES FOR NEXT TWO MEETINGS:

WORKSHOP #2 "THE PLAYERS"
Thursday, March 5th, 8:00–10:00 a.m.

WORKSHOP #3 "MANAGEMENT APPROACH"
Thursday, April 2, 8:00–10:00 a.m.

WHY A MASTER PLAN IN COLUMBUS?

- Rapid expansion and significant growth expected in Columbus
- Current Columbus urban tree canopy cover is 22%
- Resiliency in the face of climate changes requires healthy urban forest
- Work needed in equity, management, and health of urban forest

WHY A MASTER PLAN IN COLUMBUS?

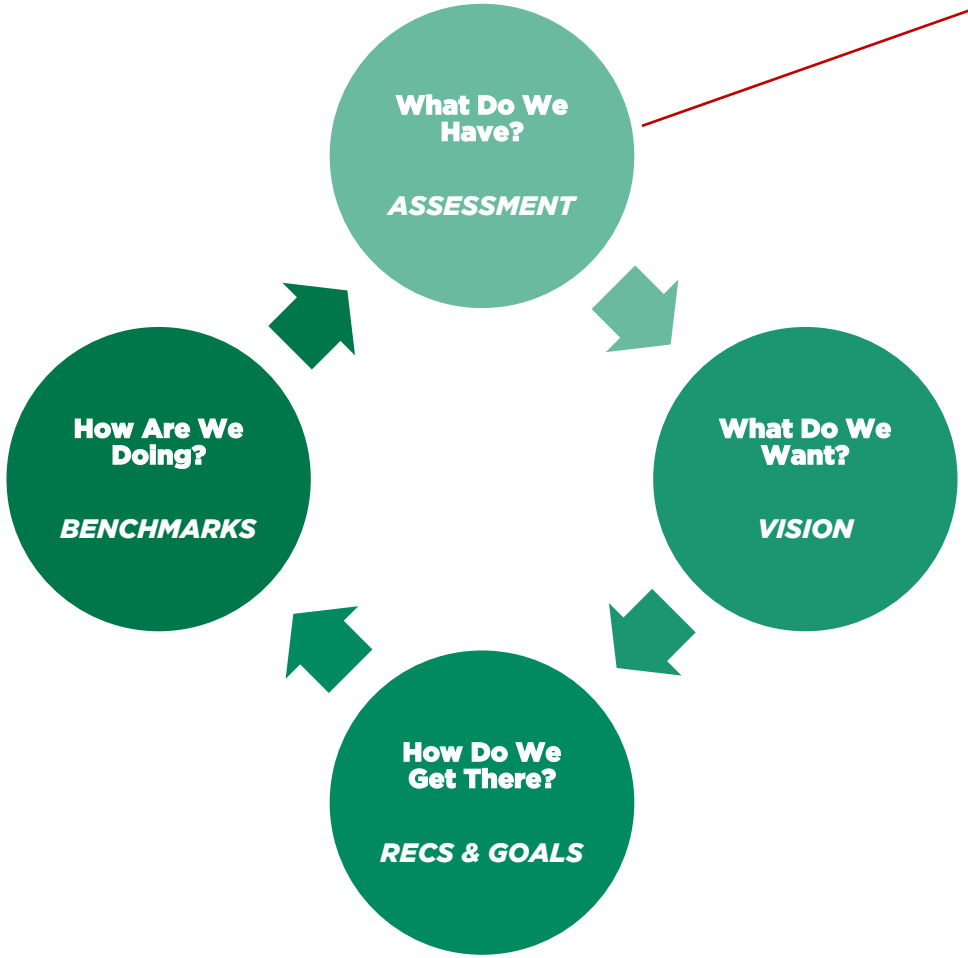
Columbus Tree Benefits		Units (lbs)	Unit	Value ($)
AIR QUALITY IMPROVEMENTS	AIR: Carbon Dioxide removed (CO_2)	31,700	lbs.	$21,062
	AIR: Nitrogen Dioxide removed (NO_2)	70,620	lbs.	$22,891
	AIR: Ozone removed (O_3)	1,384,840	lbs.	$2,104,116
	Sulfur Dioxide removed (SO_2)	206,780	lbs.	$17,891
	Particulates removed (dust, dirt, soot, smoke, liquid droplets) (PM_{10})	797,700	lbs.	$2,491,337
CARBON ABSORBTION	Carbon Sequestration (CO_2 removed from air, held in plant tissue)	137,272	tons	$2,658,038
STORMWATER INTERCEPTION	Avoided Stormwater Runoff (intercepted by trees)	331,183,583	gals.	$29,475,339
			Total Annual Benefits	**$36,790,675**
	Carbon Storage Over Lifetime of Trees	4,256,530	tons	$82,420,631

- Energy savings
- Improved public health (mental and physical)
- More successful business districts
- Less crime
- Stronger communities
- Higher property values
- Higher quality of life
- Wildlife habitat

- Critical to cities
- Positive ROI
- 80-90% Privately Owned

THE APPROACH

#1 Adaptive Management Approach



#2 Structure for Assessing the Sustainability of an Urban Forest

How sustainable is the Columbus urban forest?

- The Trees
- The Players
- The Management Approach

Kenney, W. A., et al. 2011. "Criteria and Indicators for Sustainable Urban Forest Planning and Management." Arboriculture & Urban Forestry 37(3): 108 – 117.

Clark, J. R., et al. 1997. "A Model of Urban Forest Sustainability." Journal of Arboriculture 23(1): 17 – 30.

TODAY'S TOPIC: THE TREES

Indicators of a Sustainable Urban Forest THE TREES	Overall Objective or Industry Standard		Performance Levels Low	Moderate	Good	Columbus Today
Urban Tree Canopy Cover	Achieve the desired tree canopy cover according to goals set for the entire city and neighborhoods. Alternatively, achieve 75% of the total canopy possible for the entire city and in each neighborhood.		Canopy is decreasing, limited data is available or no goals are set.	Canopy is not dropping, but not on a trajectory to achieve the established goal.	Canopy goal is achieved or well on the way to achievement and/or relative canopy is over 75%.	2015 Urban Tree Canopy (UTC) assessment (using 2013 imagery) revealed a 22% UTC currently; 37% relative UTC. No historical data on canopy to determine direction of canopy (increasing or decreasing). No canopy goals have been set to date.
Equitable Distribution	Ensure that the benefits of tree canopy are available to all, especially for those most vulnerable within the community. Achieve low variation between tree canopy and equity factors citywide by neighborhood.		Tree canopy is not equitably distributed across the community.	Tree canopy is moderately equitable in distribution across the community.	Tree canopy is equitable in distribution across the community.	Tree canopy cover is not equitably distributed across the city. UTC levels at the neighborhood level range from 6% to 49%, and average benefits per acre by neighborhood range from under $300 to $1900.
Age Distribution	Establish a diverse-aged population of public trees across the entire city and for each neighborhood. Ideal standard: 0-8" DBH: 40% 9-17" DBH: 30% 18-24" DBH: 20% Over 24" DBH: 10%		Age distribution is not proportionately distributed across size classes at the city level.	Age distribution is evenly distributed at city level, though unevenly distributed at the neighborhood level or neighborhood level data not available.	Age distribution is generally aligned with the ideal standard diameter classes both city-wide and at the neighborhood level.	Columbus' public tree population trends heavily towards young (0-8" DBH) trees. Young and Establishing trees (<17" DBH) are distributed relatively proportionately across the city. Mature and maturing trees (>18" DBH) are concentrated in the center and northern areas of the city and are lacking in the outer areas of the city.
Condition of Publicly Owned Trees (trees managed intensively)	Possess a detailed understanding of tree condition and potential risk of all intensively-managed, publicly-owned trees (streets, parks). This information is used to direct maintenance actions.		No current information is available on tree condition or risk.	Information from a partial or sample or inventory is used to assess tree condition and risk.	Information from a current, GIS-based, 100% complete public tree inventory is used to indicate tree condition and risk.	Existing tree inventory data provides condition, but no risk rating. Additionally, a large portion of the inventory is now dated, which also negates the accuracy of listed condition data.
Condition of Publicly-Owned Natural Areas (trees managed extensively)	Possess a detailed understanding of the ecological structure and function of all publicly-owned natural areas (such as woodlands, ravines, stream corridors, etc.), as well as usage patterns.		No current information is available on tree condition or risk.	Publicly-owned natural areas are identified in a sample-based "natural areas survey" or similar data.	Information from a current, GIS-based, 100% complete natural areas survey is utilized to document ecological structure and function, as well as usage patterns.	Management and monitoring of natural areas is limited to occassional invasive removal and emergency responses only. No condition/risk data is currently catalogued.
Diversity	Establish a genetically diverse population of publicly-owned trees across the entire city and for each neighborhood. Industry standards recommend that no more than 30% of any family, 20% of any genus, or 10% of any species dominate the urban forest.		Public tree population does not follow the recommended industry standard.	Only one level (family, genus, species) is following recommended standards.	The industry standard recommending no more than 30% of any family, 20% of any genus, or 10% of any species has been met.	The City has 220 different species that make up its urban forest and strives to select the right species for the planting location. No species makes up more than 10% of the city tree population. The genus Maple (Acer) makes up 29% of the city tree population.
Suitability	Establish a tree population suited to the urban environment and adapted to the overall region. Suitable trees are gaged by level of susceptibility or resilience to imminent threats (pests, storms, climate changes), are considered the "Right Tree for the Right Place" concept and are non-invasive.	Space Above	Less than 50% of trees are considered suitable for the site or data is unavailble to make this determination.	50% to 75% of trees are considered suitable for the site.	More than 75% of trees are considered suitable for the site.	Accurate data on overhead conflicts is not available.
		Space Below (utility & hardscape conflicts)	Less than 50% of trees are considered suitable for the site or data is unavailble to make this determination.	50% to 75% of trees are considered suitable for the site.	More than 75% of trees are considered suitable for the site.	Accurate data on ground level conflicts is not available.
		Soil Condition	Less than 50% of trees are considered suitable for the site or data is unavailble to make this determination.	50% to 75% of trees are considered suitable for the site.	More than 75% of trees are considered suitable for the site.	Data on soil condition of planting sites is not available.
		Climate Change Adaptability	Less than 50% of trees are considered suitable for the site or data is unavailble to make this determination.	50% to 75% of trees are considered suitable for the site.	More than 75% of trees are considered suitable for the site.	According to the USFS climate change model TreeAdas, almost 20% (9 species) of the existing public tree position is expected to experience some decline based on climate change in the next 100 years.
Trees on Private Property	Possess a solid understanding of the extent, location and general condition of trees on private lands.		No data is available on private trees.	Current tree canopy assessment reflects basic information (location) of both public and private canopy combined.	Detailed information available on private trees. Ex: bottom-up sample-based assessment of trees.	2015 Urban Tree Canopy assessment provides basic information on location of tree canopy on private property. No information on health/condition/species of individual trees on private property exists currently.

Indicators of a Sustainable Urban Forest		Assessed Performance Level		
		Low	Mod.	Good
The Trees	Tree Canopy	■		
	Size/Age Distribution		■	
	Condition of Public Trees - Streets, Parks	■		
	Condition of Public Trees - Natural Areas	■		
	Species Diversity		■	
	Species Suitability	■		
The Players	Neighborhood Action		■	
	Large Private Landholder Involvment	■		
	Green Industry Involvement		■	
	City Department/Agency Cooperation	■		
	Funder Engagement		■	
	Utility Engagement	■		
	Public Awareness	■		
	Regional Collaboration	■		
The Management Approach	Tree Inventory	■		
	Canopy Assessment			■
	Equitable Distribution	■		
	Management Plan		■	
	Risk Management Program		■	
	Maintenance Program - Streets, Parks		■	
	Maintenance Program - Natural Areas	■		
	Planting Program	■		
	Tree Protection Policy		■	
	City Staffing & Equipment	■		
	Funding	■		

TIMELINE / WORK PLAN

Phase I & II: Project Start Up & Team Establishment (October - December 2019)

Phase III: Discovery (January – April 2020)

Data Analysis / Research / GIS (now - April)

City Operations Review (now - April)

- Three Advisory Group Workshops (January - March)
  - #1: **Trees, Thursday, January 30, 8:00–10:00 a.m.**
  - #2: **Players, Thursday, March 5, 8:00–10:00 a.m.**
  - #3: **Management, Thursday, April 2, 8:00–10:00 a.m.**
- Interviews (February/March)
- Public Meeting – March 4th
- Speaking Circuit (ongoing)

Phase IV: Result Synthesis, Planning for Next Steps (May-July)

INPUT SOURCES FOR TREE DATA

- City tree inventory - 127,000+ trees
- 2015 tree canopy assessment (2013 imagery)

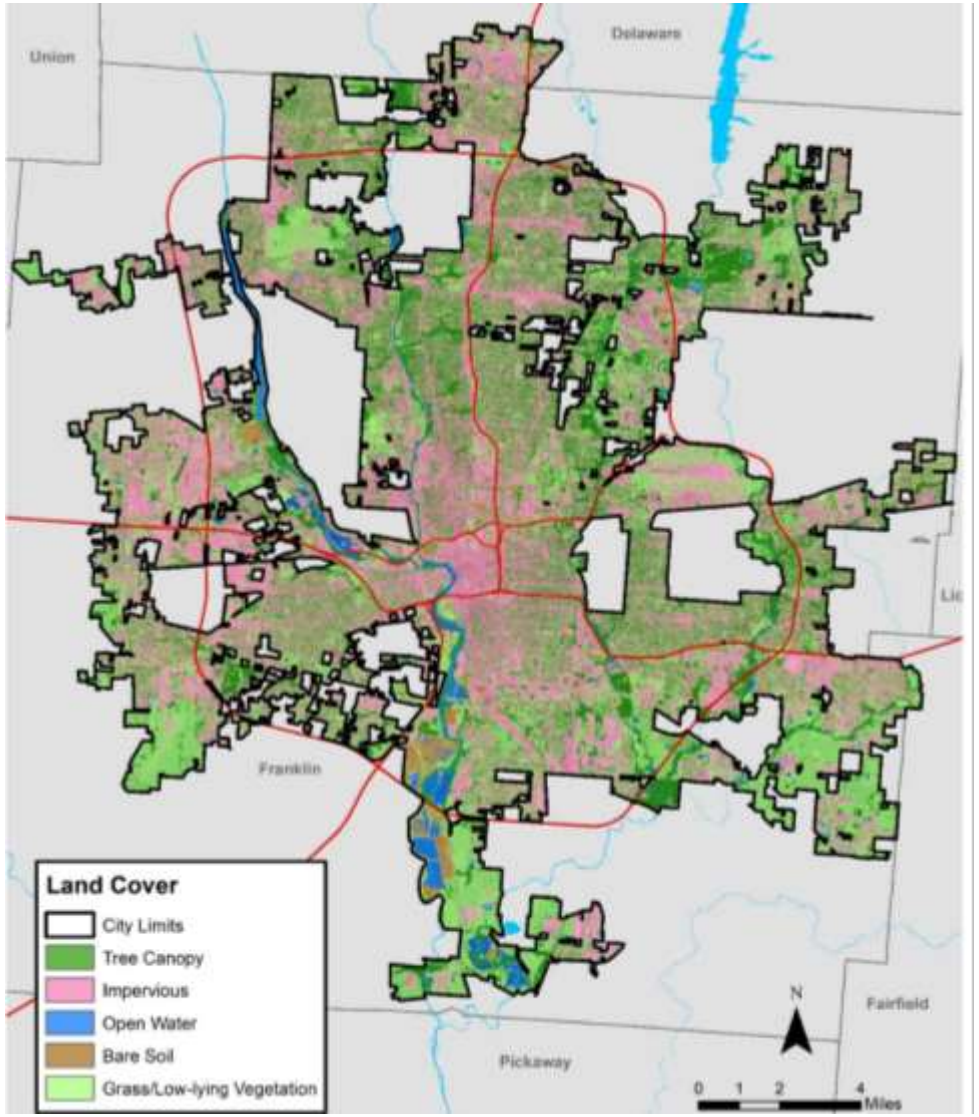
INDICATOR 1: TREE CANOPY COVER

SCORE: LOW

Is the City working towards achieving an established canopy cover goal/target?

COLUMBUS:

- City does not have canopy goals or targets
- No historical data on canopy cover to track trends

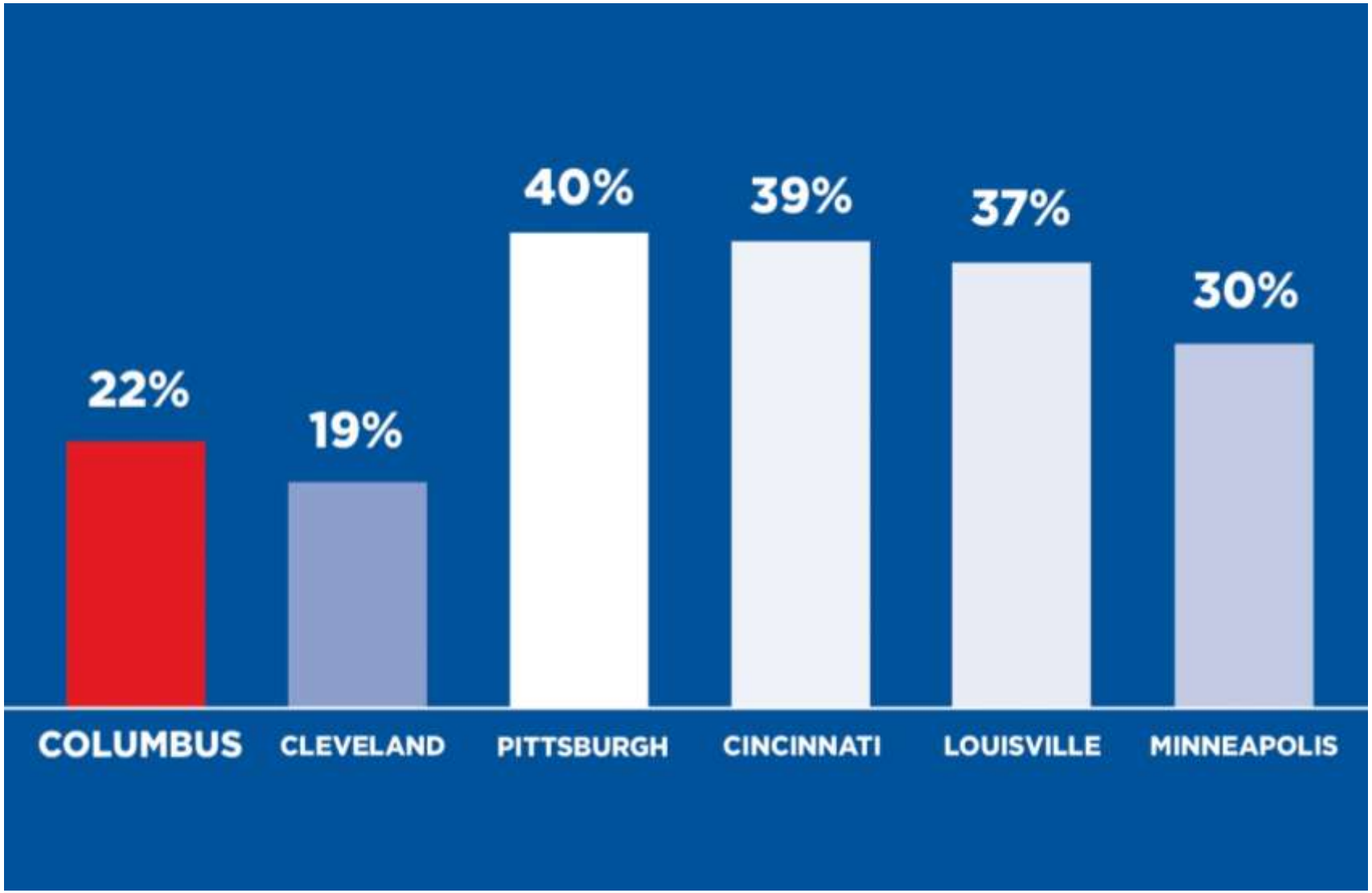


INDICATOR 1: TREE CANOPY COVER

SCORE: LOW

COLUMBUS:

- 22% Urban Tree Canopy Cover, or UTC (2013)
- Possible canopy cover 59%



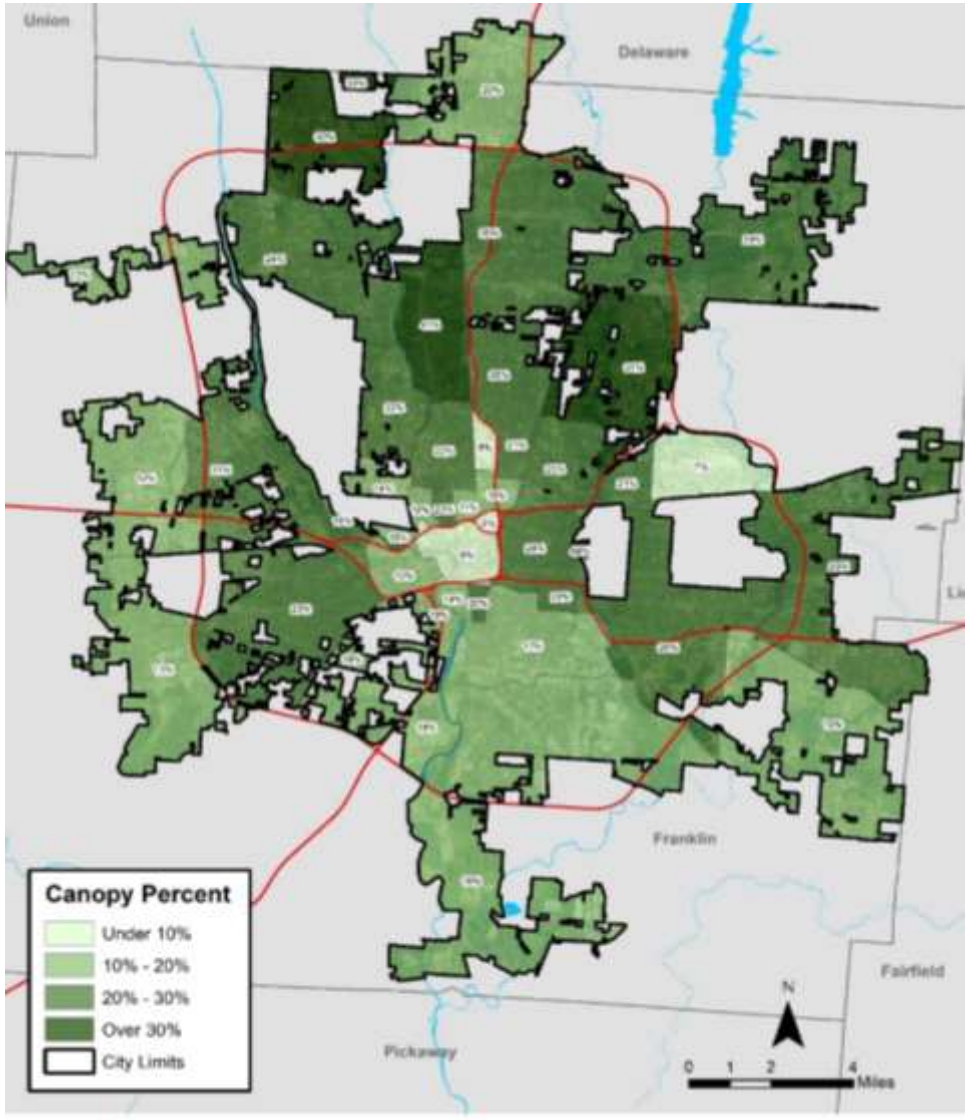
INDICATOR 2: LOCATION OF CANOPY / EQUITY

SCORE: LOW

Is the canopy distributed evenly around the community?

COLUMBUS:

- Percent of tree canopy cover in Columbus Communities ranges from 9% to 41%



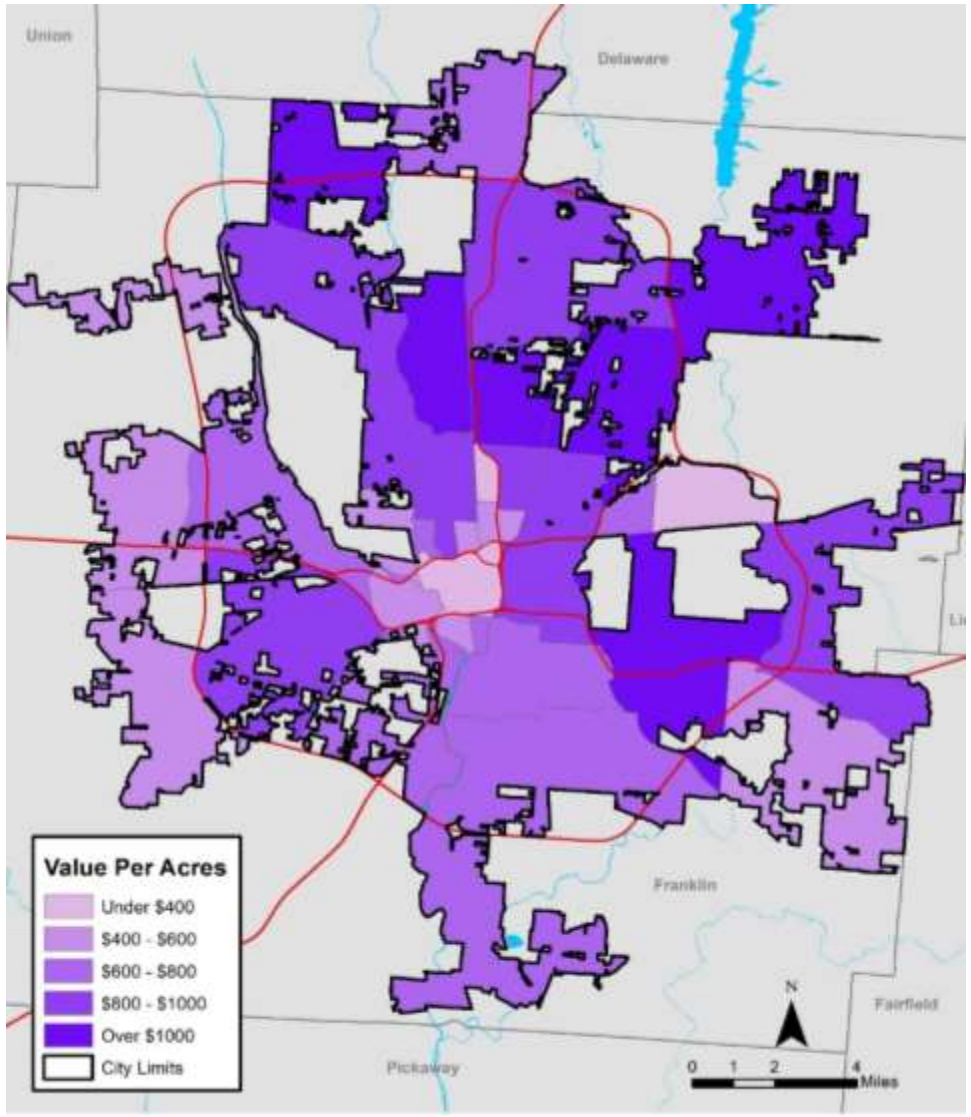
INDICATOR 2: LOCATION OF CANOPY / EQUITY

SCORE: LOW

Are the benefits trees provide available to all, especially the most vulnerable in the community?

COLUMBUS:

- Tree benefits per acre in Columbus Communities range from $400/acres to $1900/acres

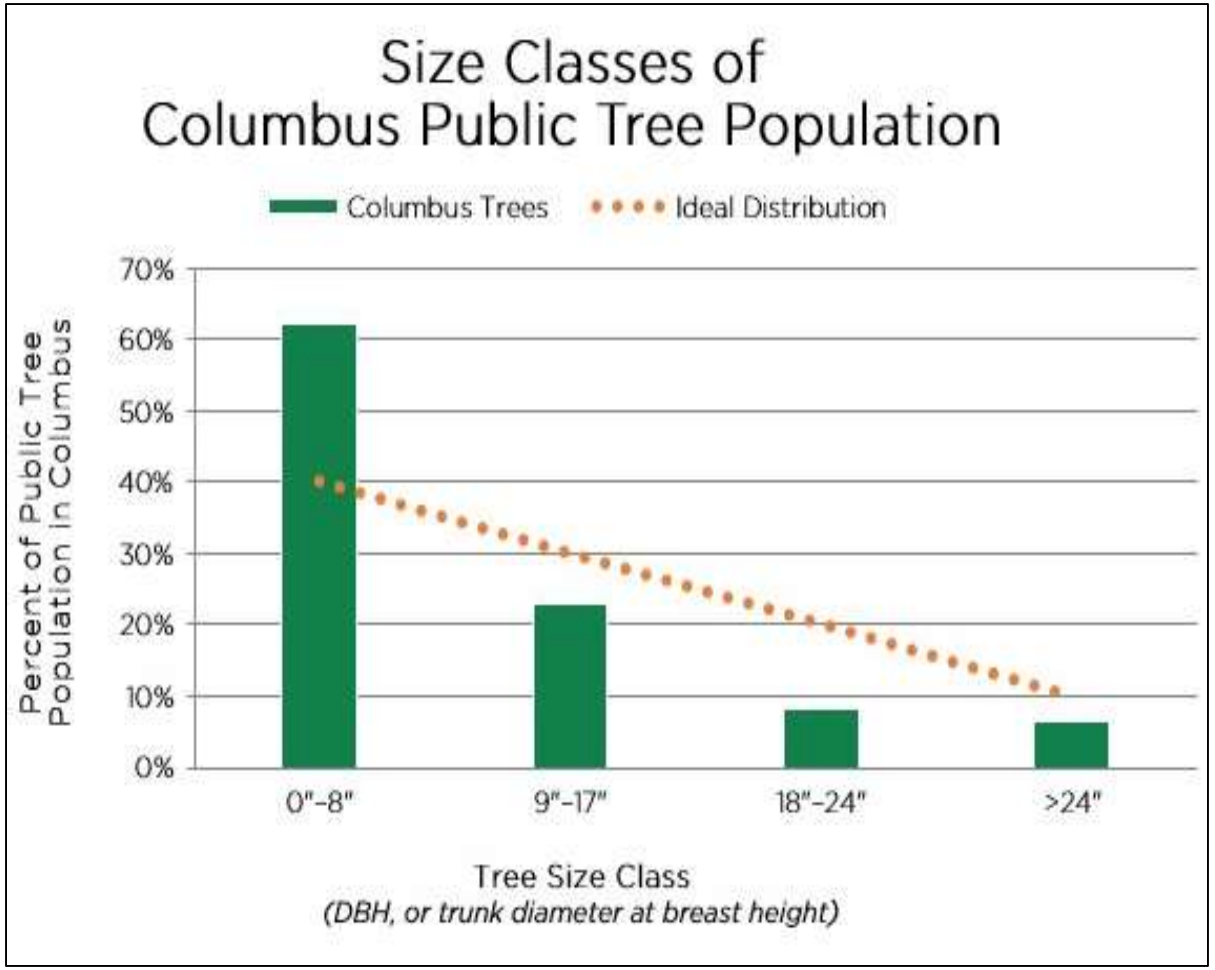


INDICATOR 3: SIZE RANGES

SCORE: LOW

Is there a diverse mix of tree sizes in the public tree population?

Diameter Class (DBH)	Columbus Trees	Ideal Size Distribution
0-8”	62%	40%
9-17”	23%	30%
18-24”	8%	20%
>24”	6%	10%



INDICATOR 4-6: CONDITION & RISK

SCORE: LOW & MODERATE

Is there accurate information in the city's tree inventory on condition and **risk?**

COLUMBUS:

- **Over last 5 years only 10% of the tree inventory has been updated.**
- **Size, condition and risk have not been updated for more than 90%** of the city's inventoried trees.
- **Important Indicators of:**
  - RISK to public
  - Future Canopy (sustainability & resilience)

Tree Condition Class	Columbus Trees (Number)	Percent of All Columbus Trees
Dead	1,828	1%
Poor	6.295	5%
Fair	73,598	58%
Good	45,403	36%
Excellent	594	<1%

INDICATOR 7: DIVERSITY / PEST VULNERABILITY

SCORE: MODERATE

Does the City have diversity of trees in its publicly-managed tree population?

10/20/30 Guideline

- No more than **10% of population is any one species** (e.g. red maple)
- No more than **20% of population is any one genus** (e.g. maple)
- No more than **30% of the population is any one family** (e.g. Sapindaceae)

Important Indicator of

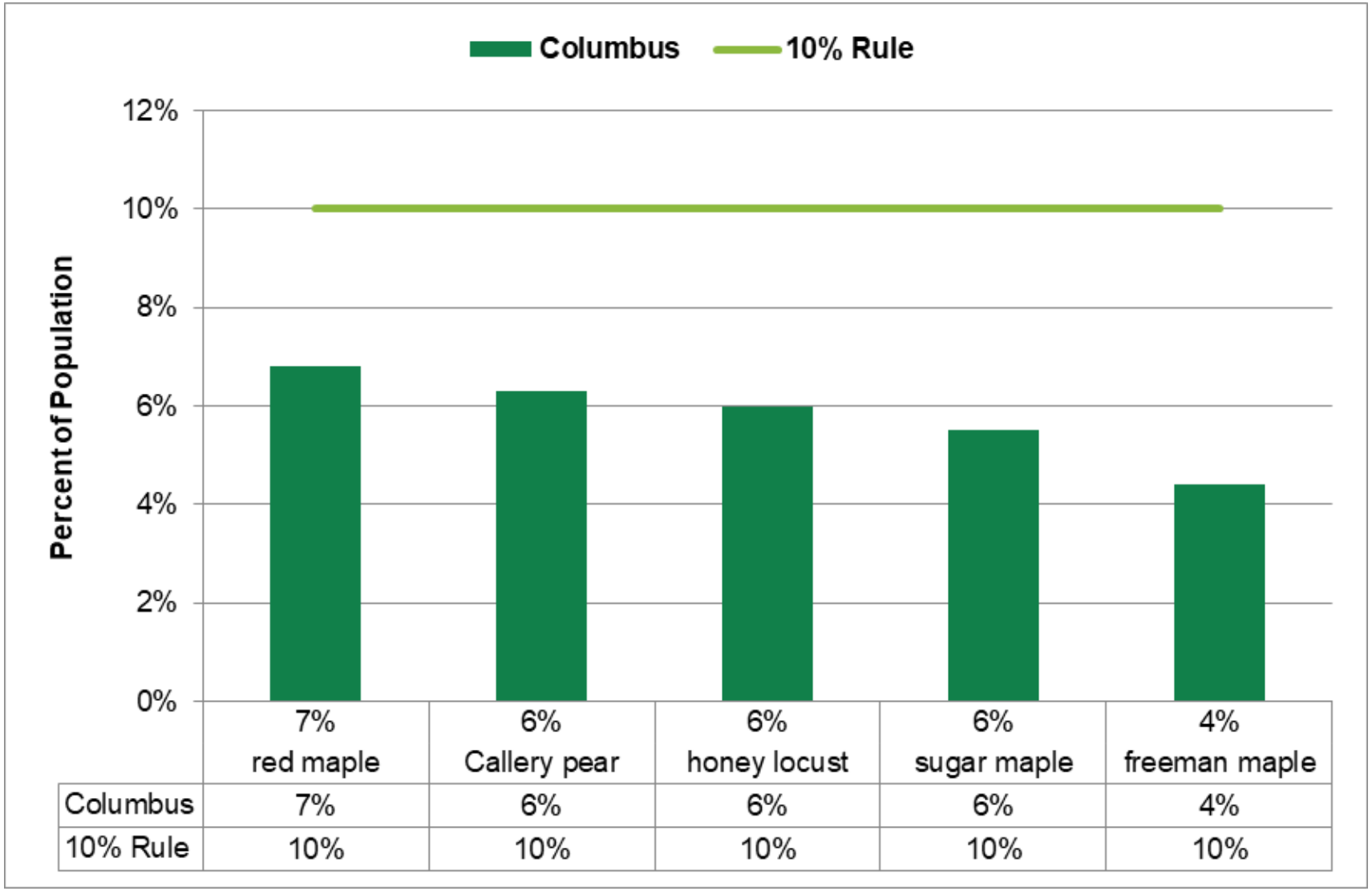
- Tree canopy resilience to pest, diseases and changing weather
- Future Canopy (sustainability)

INDICATOR 7: DIVERSITY / PEST VULNERABILITY

SCORE: MODERATE

COLUMBUS:

- Species Diversity
  - No species is greater than 10%



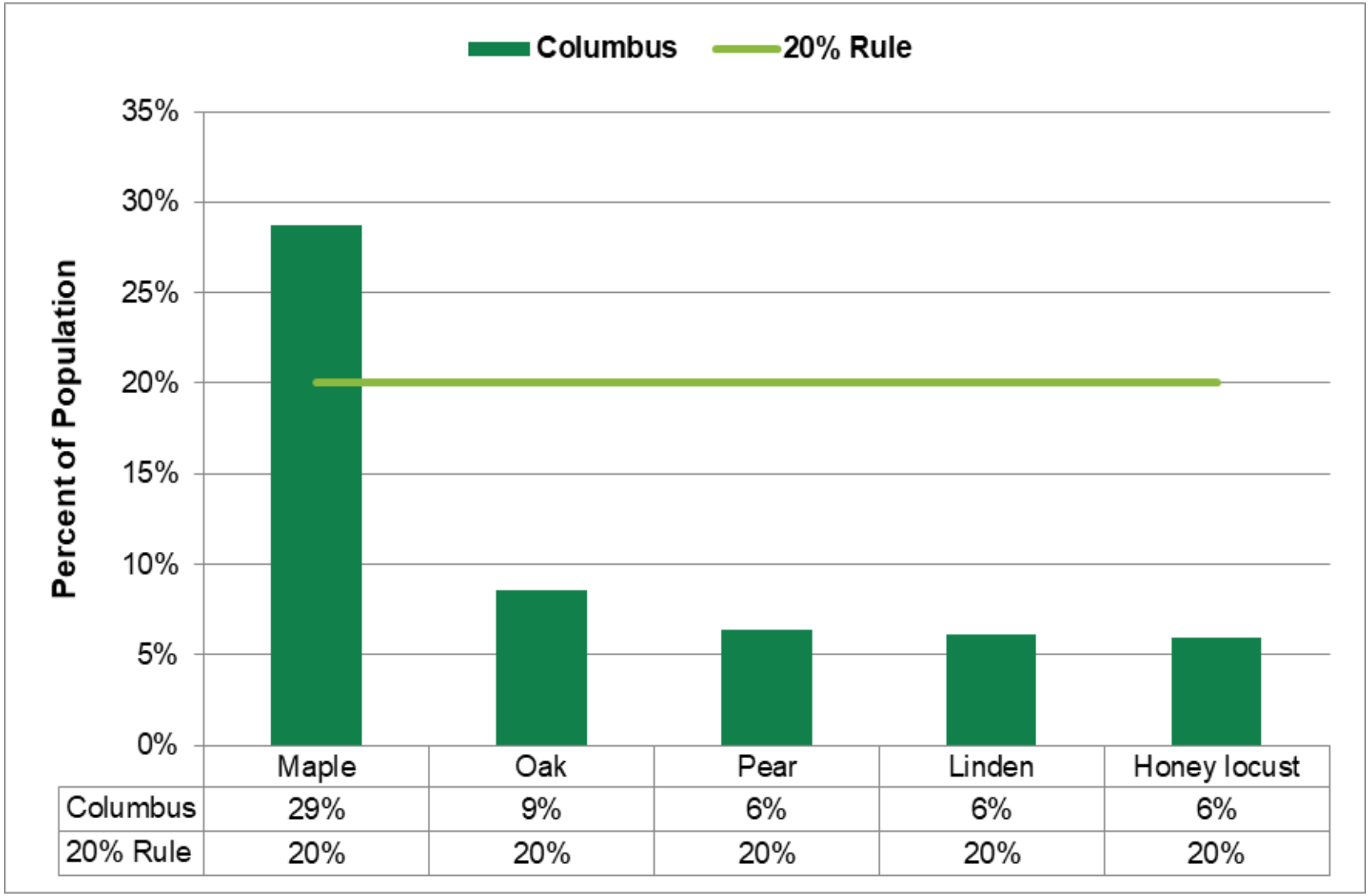
	7% red maple	6% Callery pear	6% honey locust	6% sugar maple	4% freeman maple
Columbus	7%	6%	6%	6%	4%
10% Rule	10%	10%	10%	10%	10%

INDICATOR 7: DIVERSITY / PEST VULNERABILITY

SCORE: MODERATE

COLUMBUS:

- Genus Diversity
  - Genus Maple is greater than 20%



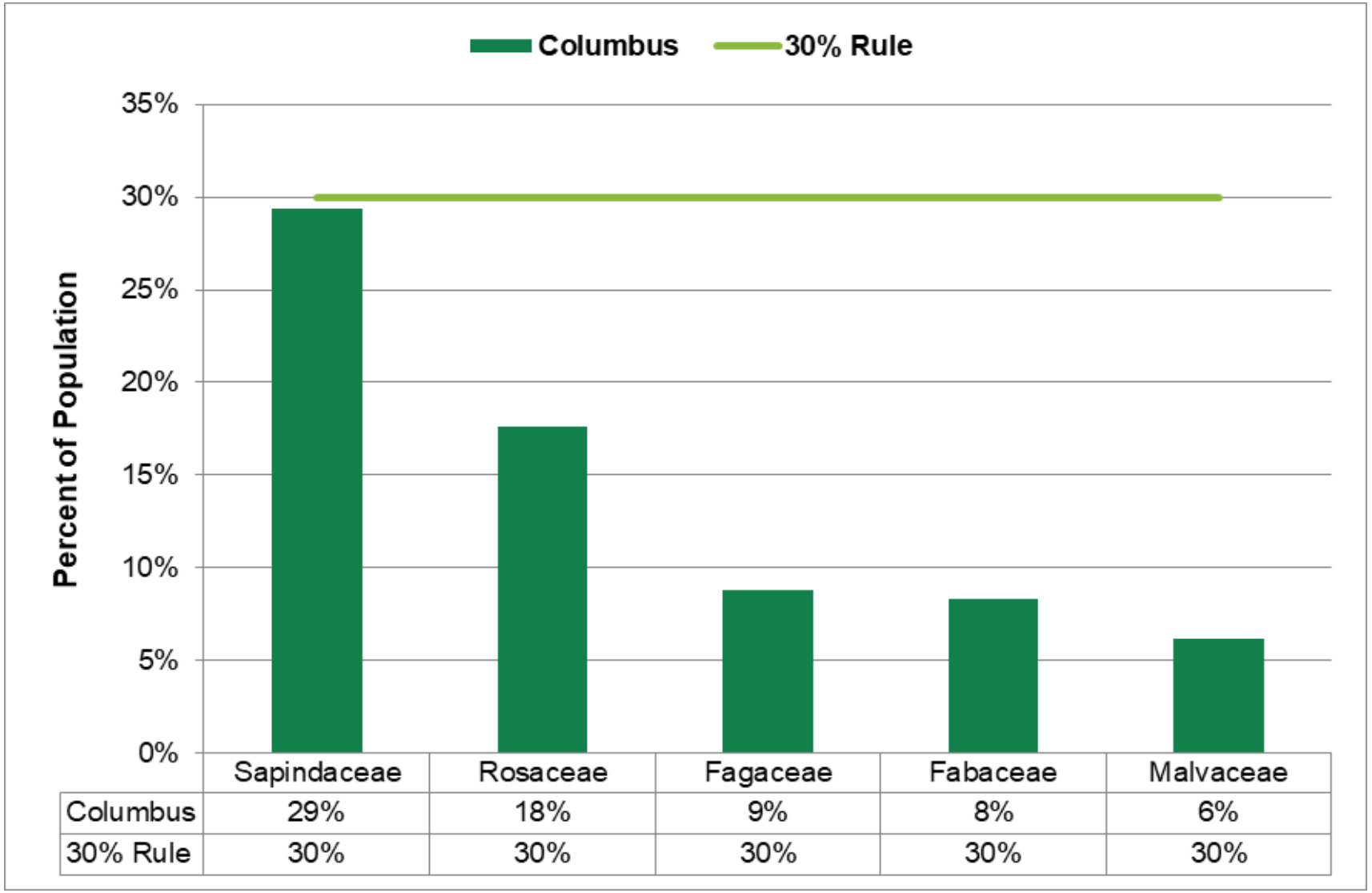
	Maple	Oak	Pear	Linden	Honey locust
Columbus	29%	9%	6%	6%	6%
20% Rule	20%	20%	20%	20%	20%

INDICATOR 7: DIVERSITY / PEST VULNERABILITY

SCORE: MODERATE

COLUMBUS:

- **Family Diversity**
  - No Family makes up more than 30% of the population
    - Sapindaceae (maple family) at 29%



	Sapindaceae	Rosaceae	Fagaceae	Fabaceae	Malvaceae
Columbus	29%	18%	9%	8%	6%
30% Rule	30%	30%	30%	30%	30%

INDICATOR 8: SUITABILITY

SCORES: LOW & GOOD

- How suitable are sites along streets in the city to support the long-term survival of a tree? Factors considered, include:
  - Space Above - SCORE: LOW
  - Space Below - SCORE: LOW
  - Soil Conditions - SCORE: LOW
  - Invasives - SCORE: MODERATE
  - Climate Change Adaptation: SCORE: GOOD
- Important as an indicator of Resilience and Sustainability

INDICATOR 8: SUITABILITY

SCORES: LOW & GOOD

Impact of climate change on public tree species in Columbus?

SCORE: GOOD

	Proportion of Public Tree Inventory	Common Name	Expected Change *(average across all four scenarios)*
Species Habitat Suitability is Predicted to Decrease for these Species by 2100	0.6%	white ash	-69%
	5.6%	sugar maple	-67%
	0.4%	black cherry	-73%
	0.4%	white oak	-23%
	0.7%	black walnut	-4%
	2.1%	northern red oak	-25%
	6.9%	red maple	-31%
	1.6%	American basswood	-72%
	1.5%	swamp white oak	-40%
No Change	0.7%	eastern white pine	-
Species Habitat Suitability is Predicted to Increase for these Species by 2100	1.5%	hackberry	29%
	2.2%	silver maple	45%
	6.0%	honeylocust	79%
	0.4%	sycamore	11%
	0.7%	green ash	128%
	0.3%	eastern cottonwood	38%
	0.9%	pin oak	45%
	0.9%	eastern redbud	54%
	1.2%	sweetgum	will begin to emerge
	0.5%	river birch	will begin to emerge

Prasad, A. M., L. R. Iverson., S. Matthews., M. Peters. 2007-ongoing. A Climate Change Atlas for 134 Forest Tree Species of the Eastern United States [database].

https://www.nrs.fs.fed.us/atlas/tree, Northern Research Station, USDA Forest Service, Delaware, Ohio.

TIME TO HEAR FROM YOU:

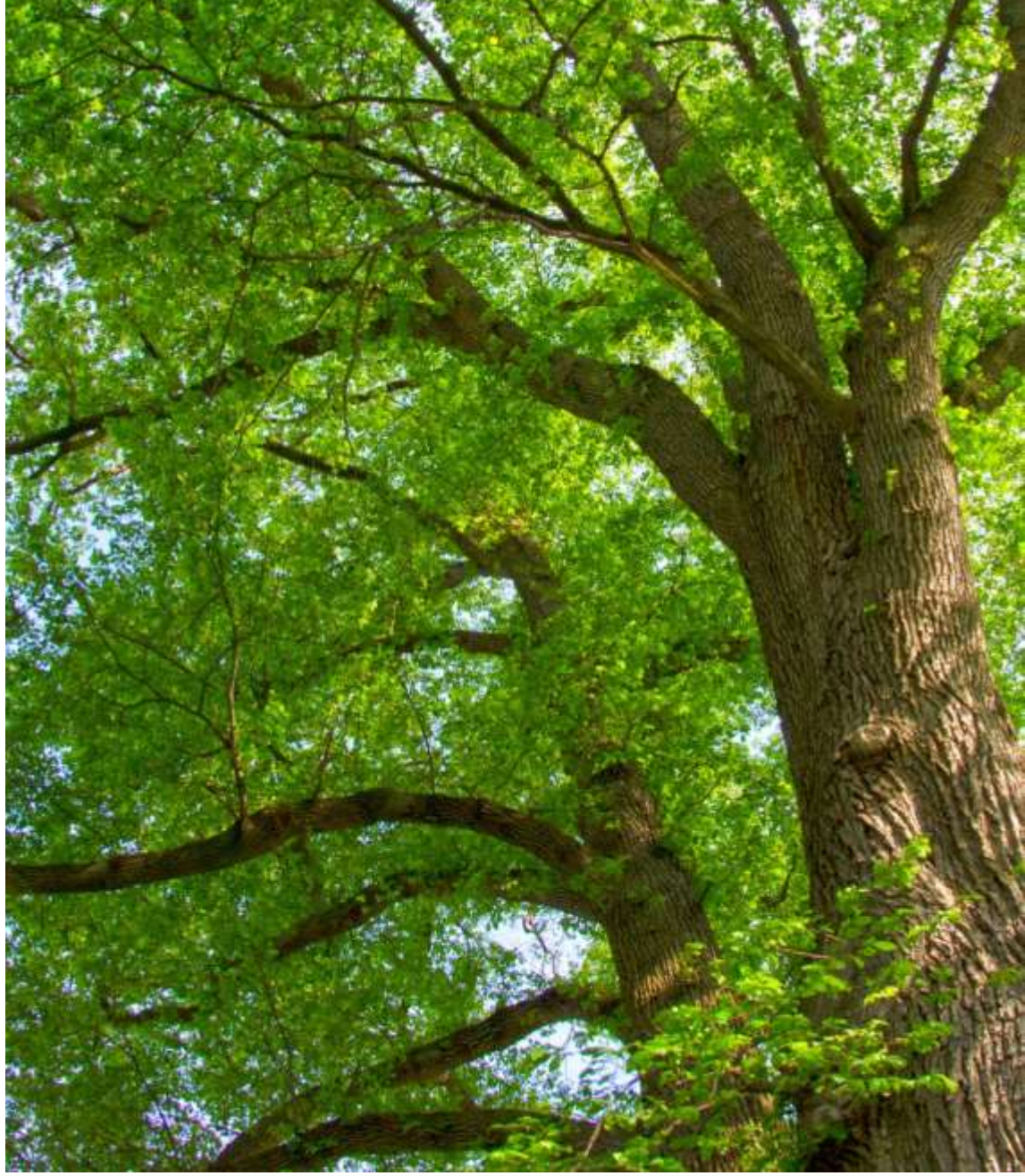
THREE GROUP DISCUSSIONS

Discussion 1: Priorities & Goals (30 mins)

Discussion 2: Challenges (30 mins)

Discussion 3: Solutions / Ideas (30 mins)

Photos: Randall Schieber Photography

Priorities Reported Back

- Grow Canopy (Overall & Equitably)
- Tree Longevity
- Protection Measures
- Better Data
- Stakeholder Participation at all Levels
- Community Engagement
- Resources
- Education