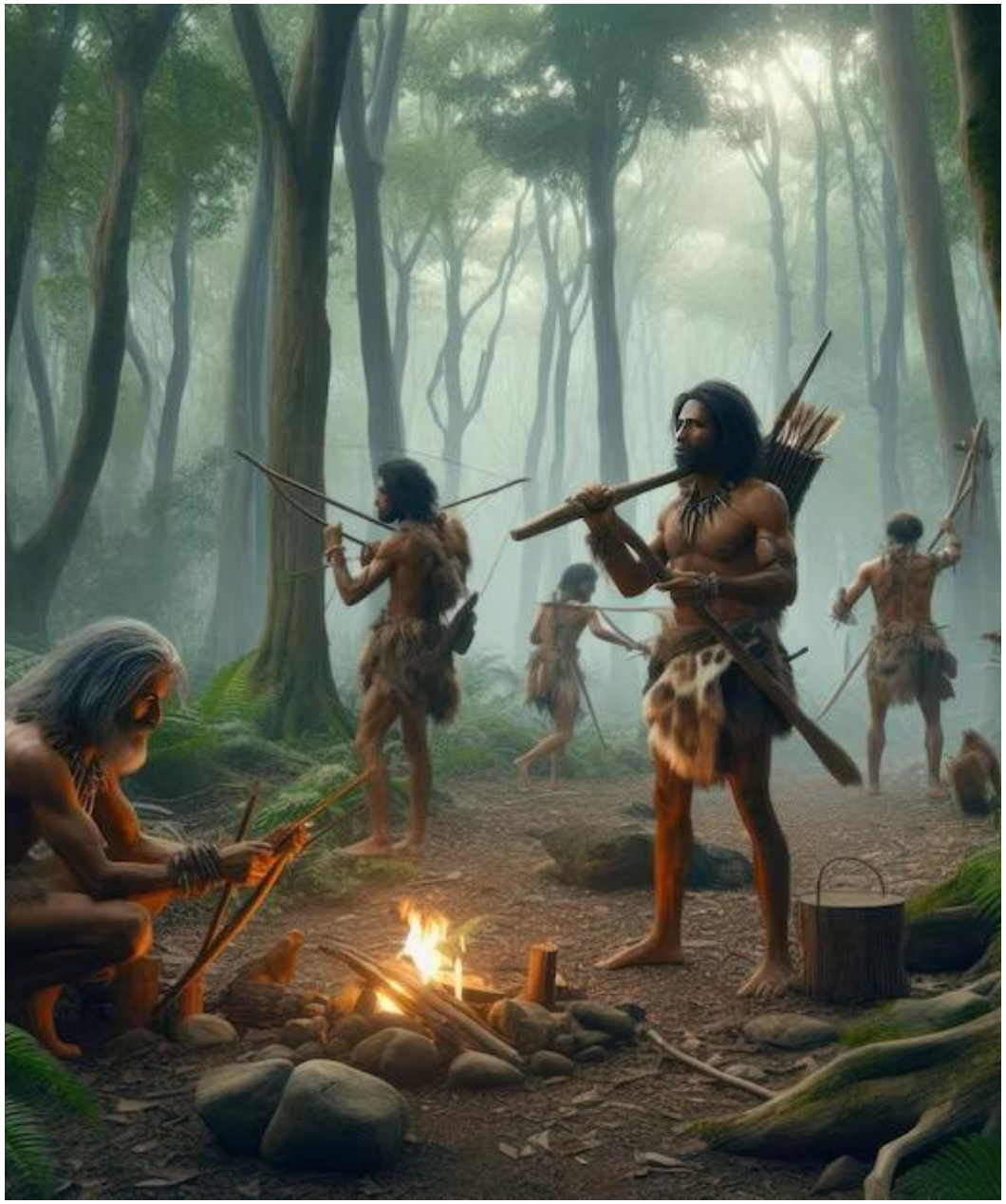
Money Really Does Grow On TREES

Steve Sinclair
Former Director of Forests
State of Vermont

Humans are Forest Dwellers



Value of Trees

Environmental

Social

Economic

TREE

-Perennial, woody plant

-Single stem or trunk

-Distinct crown of foliage

-Mature height of at least 13 feet

-Trunk diameter of at least 3 inches

FOREST

-Land stocked at least by 10 percent of trees

-Ecosystem with other plants, animals, and microorganisms

-Defined by specific criteria, such as tree height, canopy cover, species composition or age.

FOREST AND TREES OF DELAWARE

FORESTS

- 353,000 acres
- 29 percent forest cover
- 79 percent privately owned

SUSSEX COUNTY

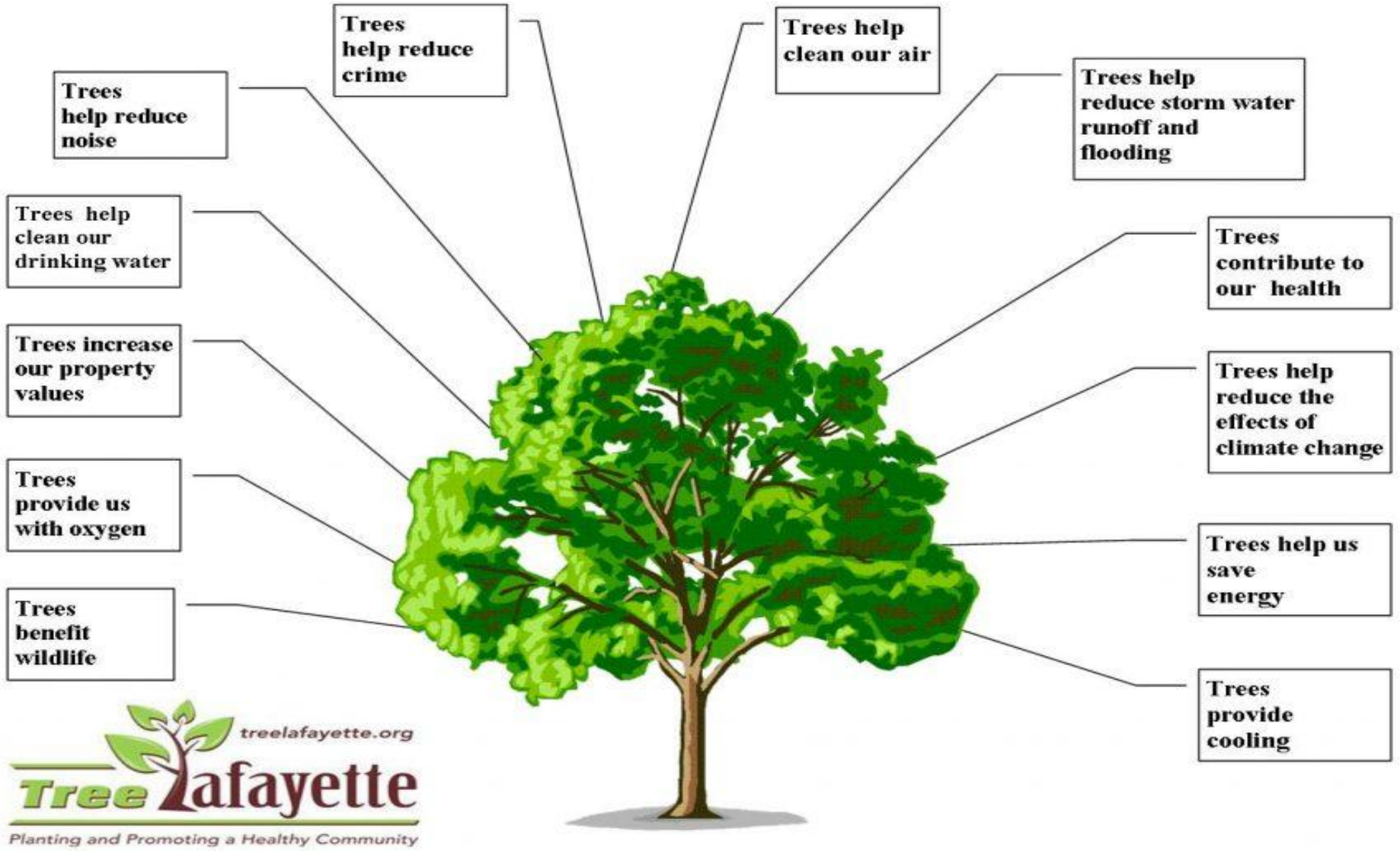
190,000 Acres, 26% cover

TREES

- 235 million live trees >1”
- Red Maple, Loblolly Pine and Yellow Poplar most abundant species

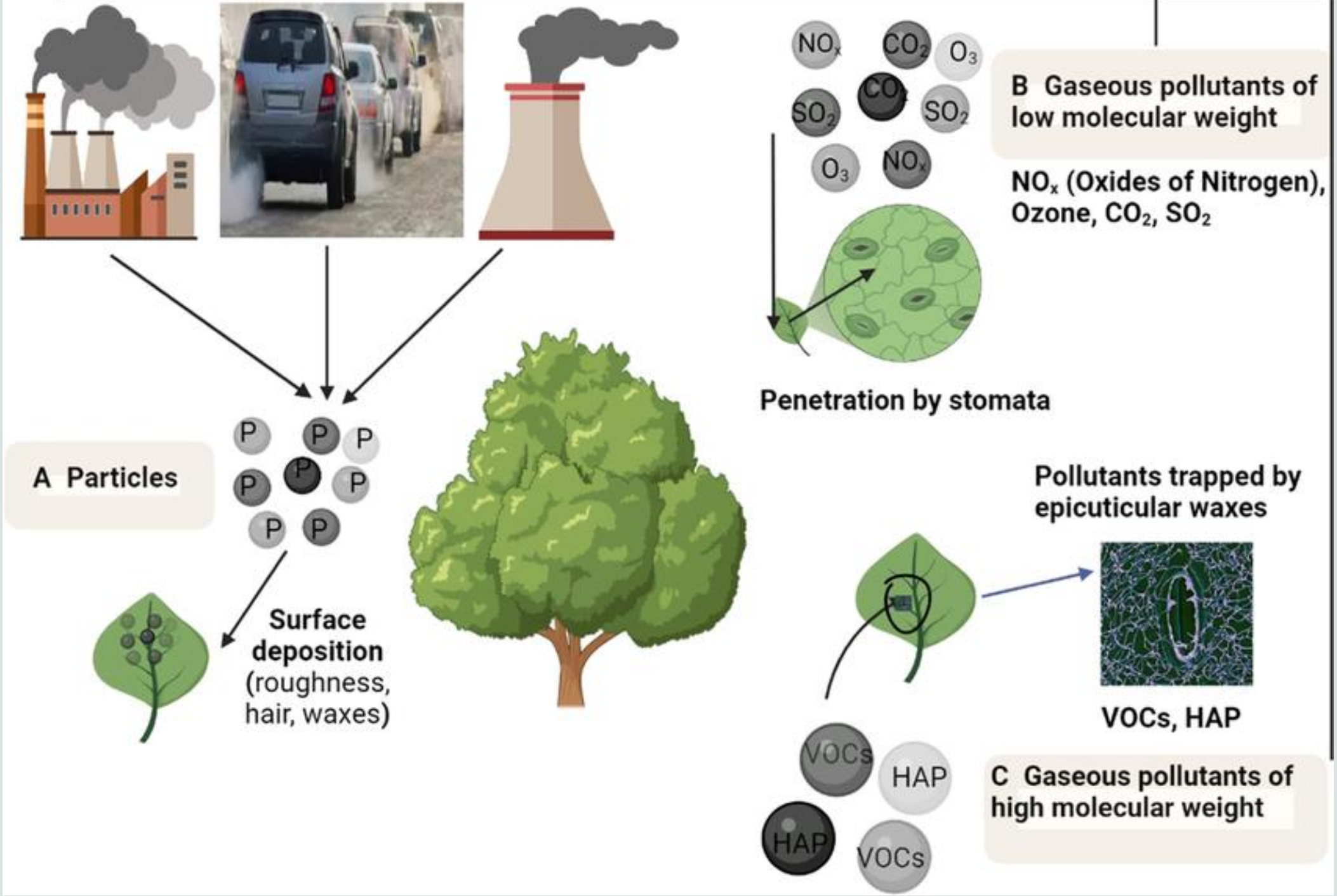
- Source- Delaware Forest Service, 2023

THE BENEFITS OF TREES



Trees Help Clean Our Air

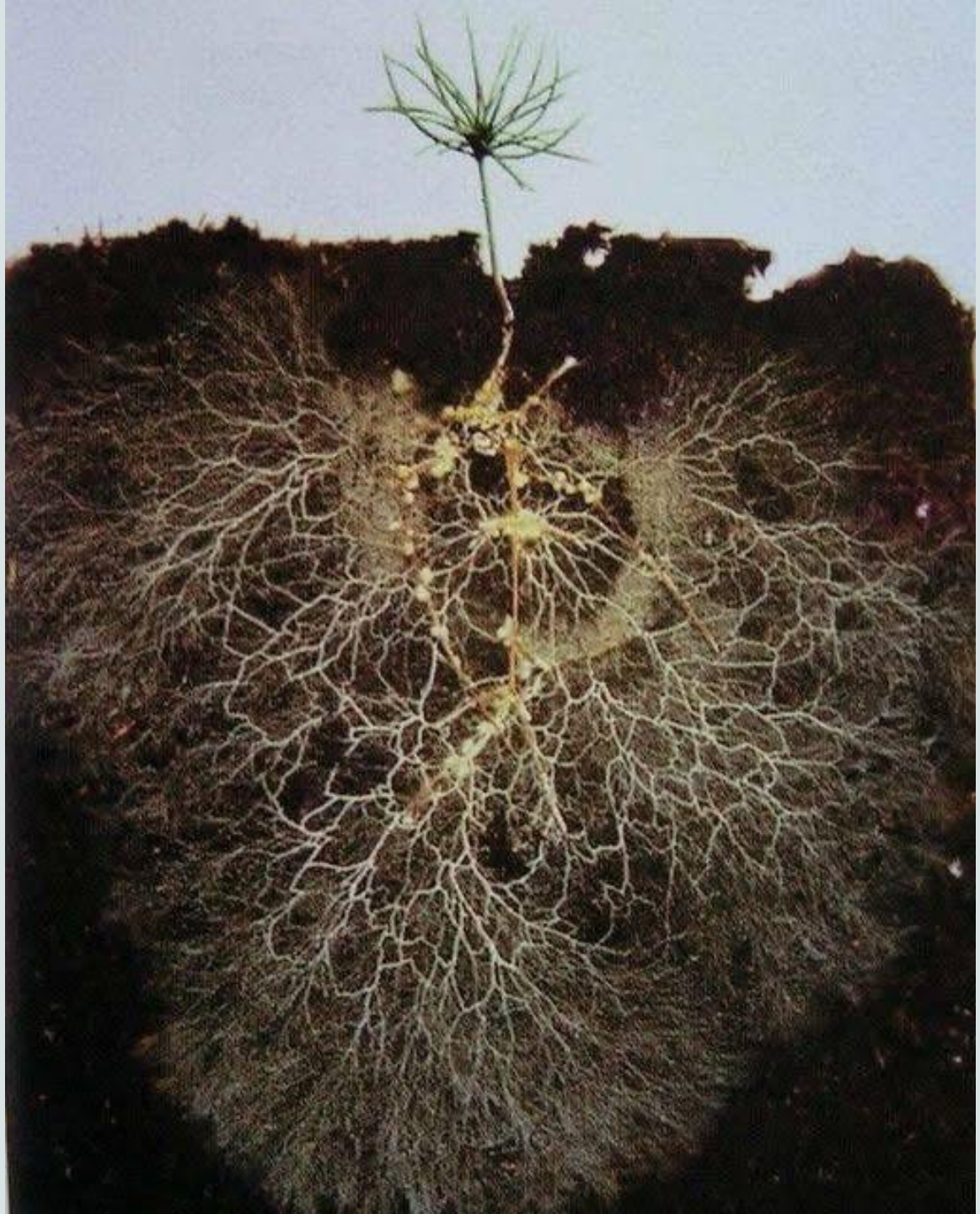
Trees absorb odors, pollutants and gases (nitrogen dioxide, carbon dioxide, ammonia, sulfur dioxide, ozone) and filter particulates out of air by trapping them on leaves and bark


B Gaseous pollutants of low molecular weight
NO_x (Oxides of Nitrogen), Ozone, CO_2, SO_2
Penetration by stomata
A Particles
Surface deposition (roughness, hair, waxes)
Pollutants trapped by epicuticular waxes
VOCs, HAP
C Gaseous pollutants of high molecular weight

Studies have indicated that roadside trees can significantly enhance indoor air quality, reducing nearby pollutions levels by more than 50 %. One tree can remove up to 30 lbs of air pollution per year

Trees Help Reduce Stormwater Runoff and Flooding

Trees reduce runoff by breaking rainfall allowing rain to flow down slowly from leaves and trunk into the ground. Tree roots act like sponges, absorbing water from the ground and helping in groundwater recharging. Tree roots hold soil in place, reducing erosion



One large tree captures 1,000 gallons of rain annually. Combining trees with other natural landscaping can reduce storm runoff by up to 65%

Trees Improve Human Health

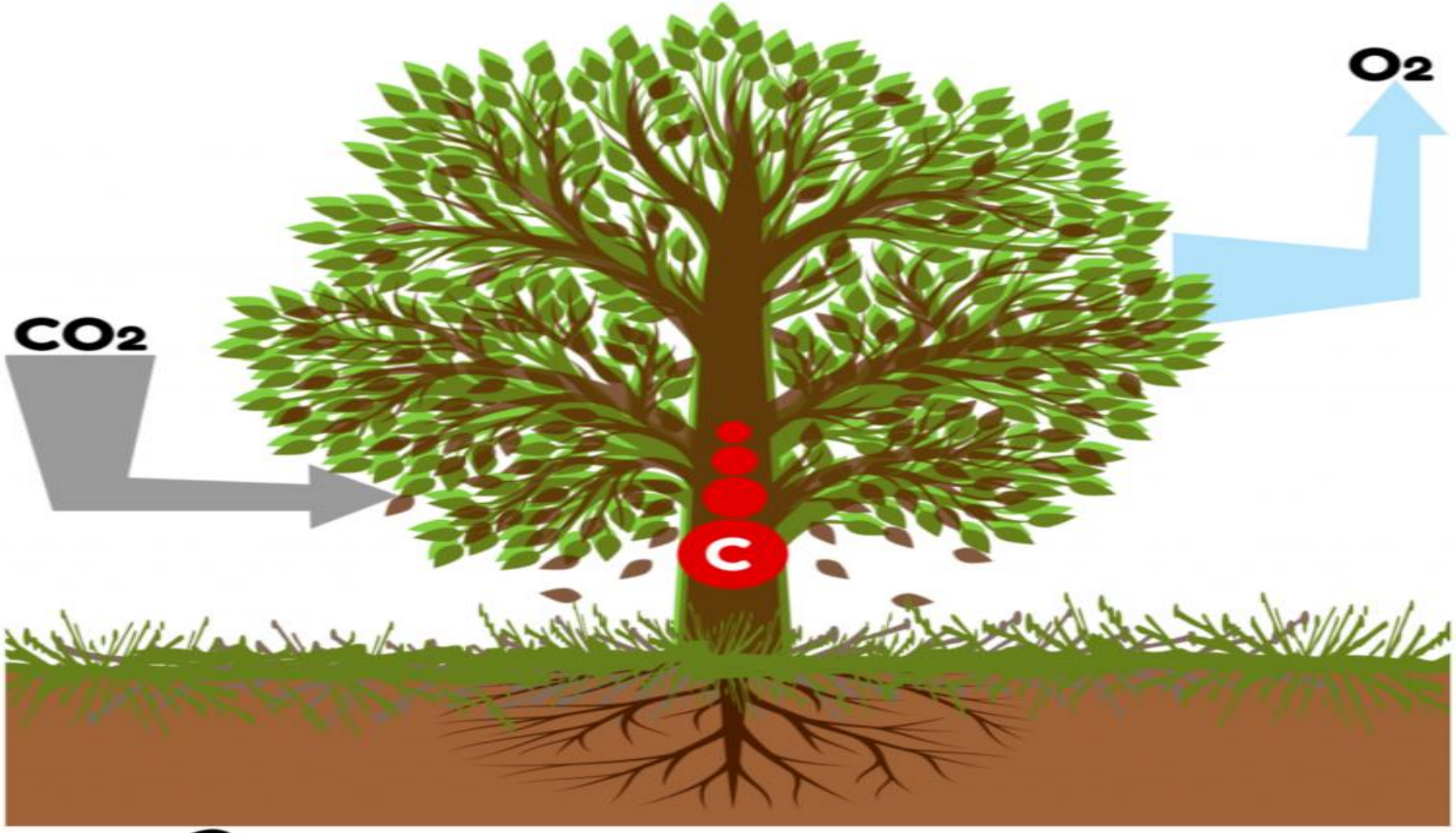
Trees filter airborne pollutants and reduce conditions that cause asthma and other respiratory problems. Areas with higher tree canopy show increases in outdoor activity, improve worker productivity, decrease tension and depression and speed up recovery

Workers without nature views from their desks claimed 23% more sick days. Patient recovery time in hospitals reduced by 15% with views of trees

Trees Combat Climate Change

Trees play a vital role by absorbing carbon dioxide in leaves and storing carbon in trunk and roots, while releasing oxygen back into the air from leaves

CARBON SEQUESTRATION

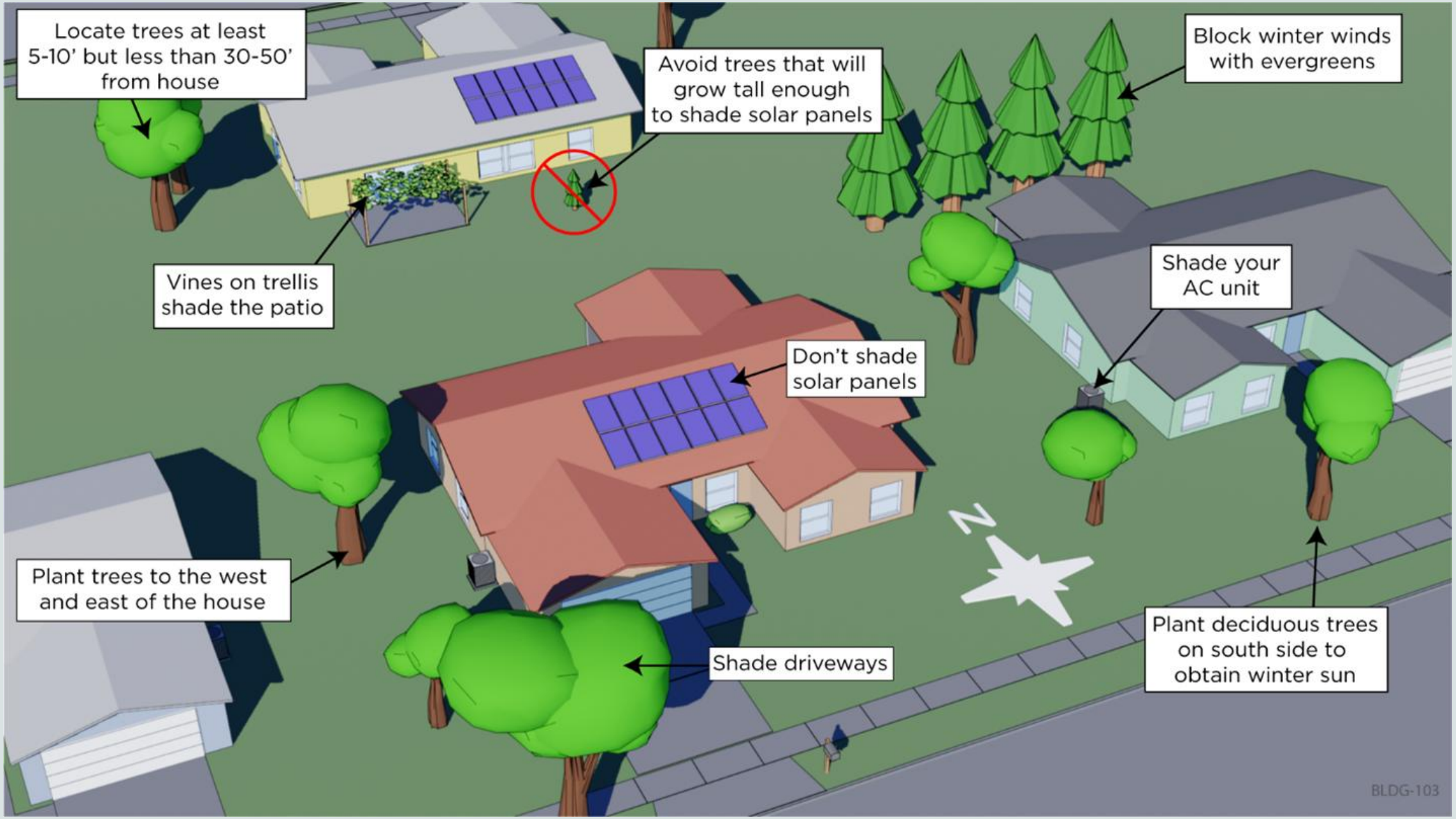


- ✔ Carbon Dioxide is absorbed by trees.
- ✔ Trees capture and store Carbon.
- ✔ Oxygen is released back into the air.

An acre of mature trees can absorb as much CO_2 as a car produces driven 26,000 miles. A single tree can absorb over 48 lbs of CO_2 annually

Trees Can Save Energy

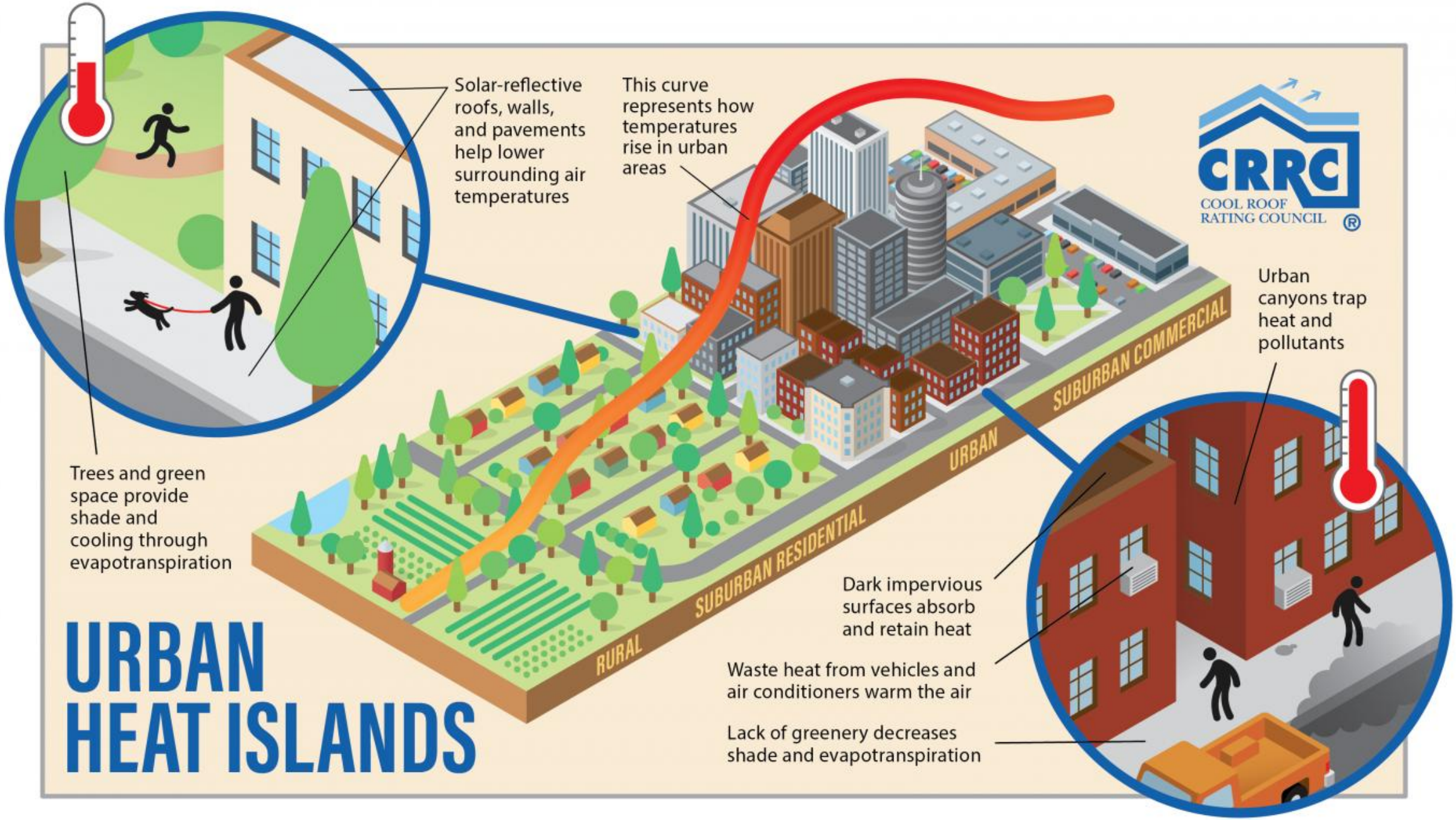
Tree canopy can shade buildings and act as buffers and wind screens.


Locate trees at least 5-10' but less than 30-50' from house
Avoid trees that will grow tall enough to shade solar panels
Block winter winds with evergreens
Vines on trellis shade the patio
Shade your AC unit
Don't shade solar panels
N
Plant trees to the west and east of the house
Shade driveways
Plant deciduous trees on south side to obtain winter sun
BLDG-103

Properly placed trees around buildings can reduce energy consumption, cutting air conditioning needs by 30% and save 25% on heating costs.

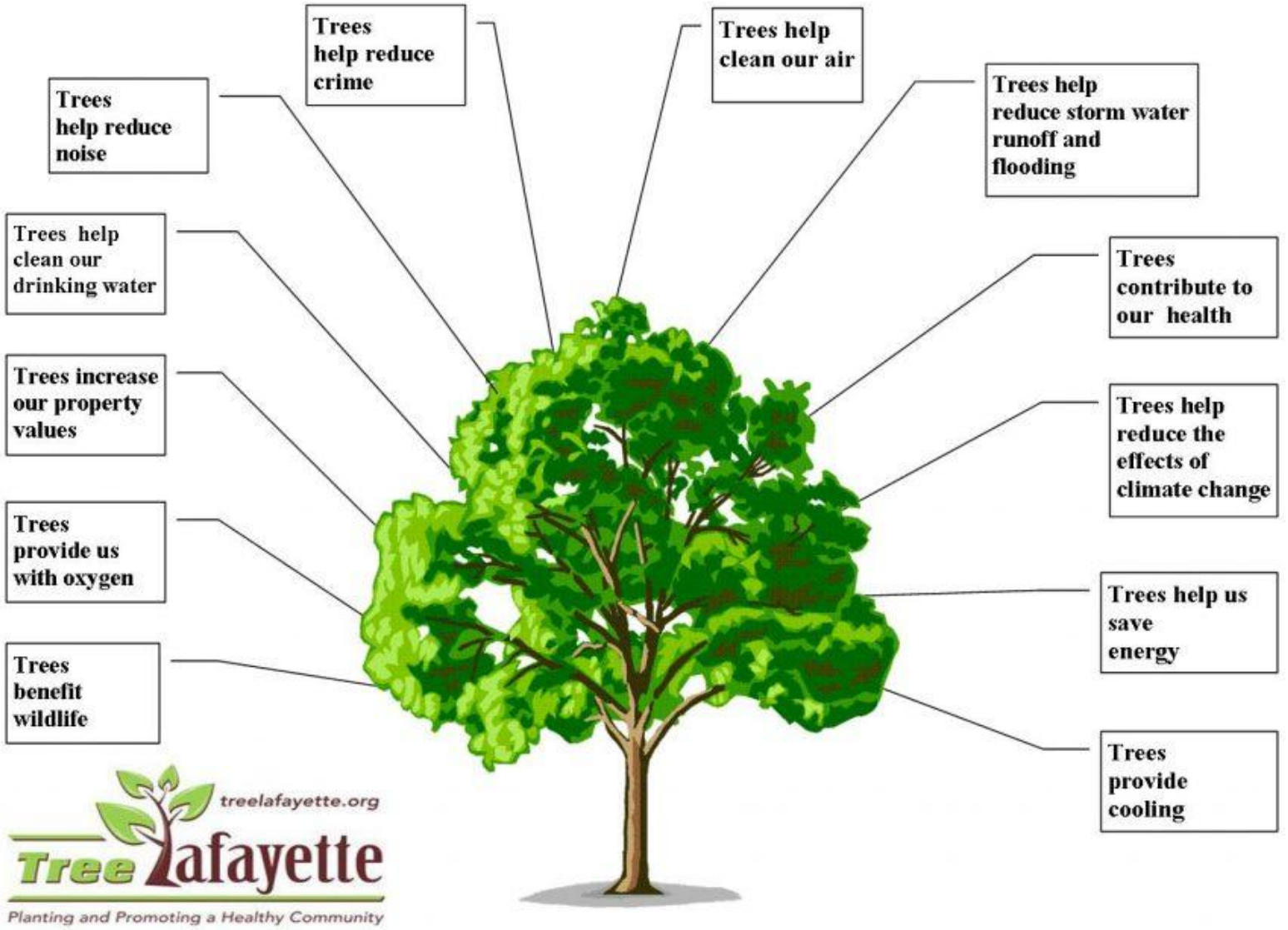
Trees Cool the Air

Trees shade surfaces and through evapotranspiration release water vapor into the air


Solar-reflective roofs, walls, and pavements help lower surrounding air temperatures
This curve represents how temperatures rise in urban areas
CRRC
COOL ROOF RATING COUNCIL
Urban canyons trap heat and pollutants
Trees and green space provide shade and cooling through evapotranspiration
RURAL
SUBURBAN RESIDENTIAL
URBAN
SUBURBAN COMMERCIAL
Dark impervious surfaces absorb and retain heat
Waste heat from vehicles and air conditioners warm the air
Lack of greenery decreases shade and evapotranspiration
URBAN HEAT ISLANDS

Evapotranspiration can reduce peak summer temperatures by 2-9 degrees

THE BENEFITS OF TREES



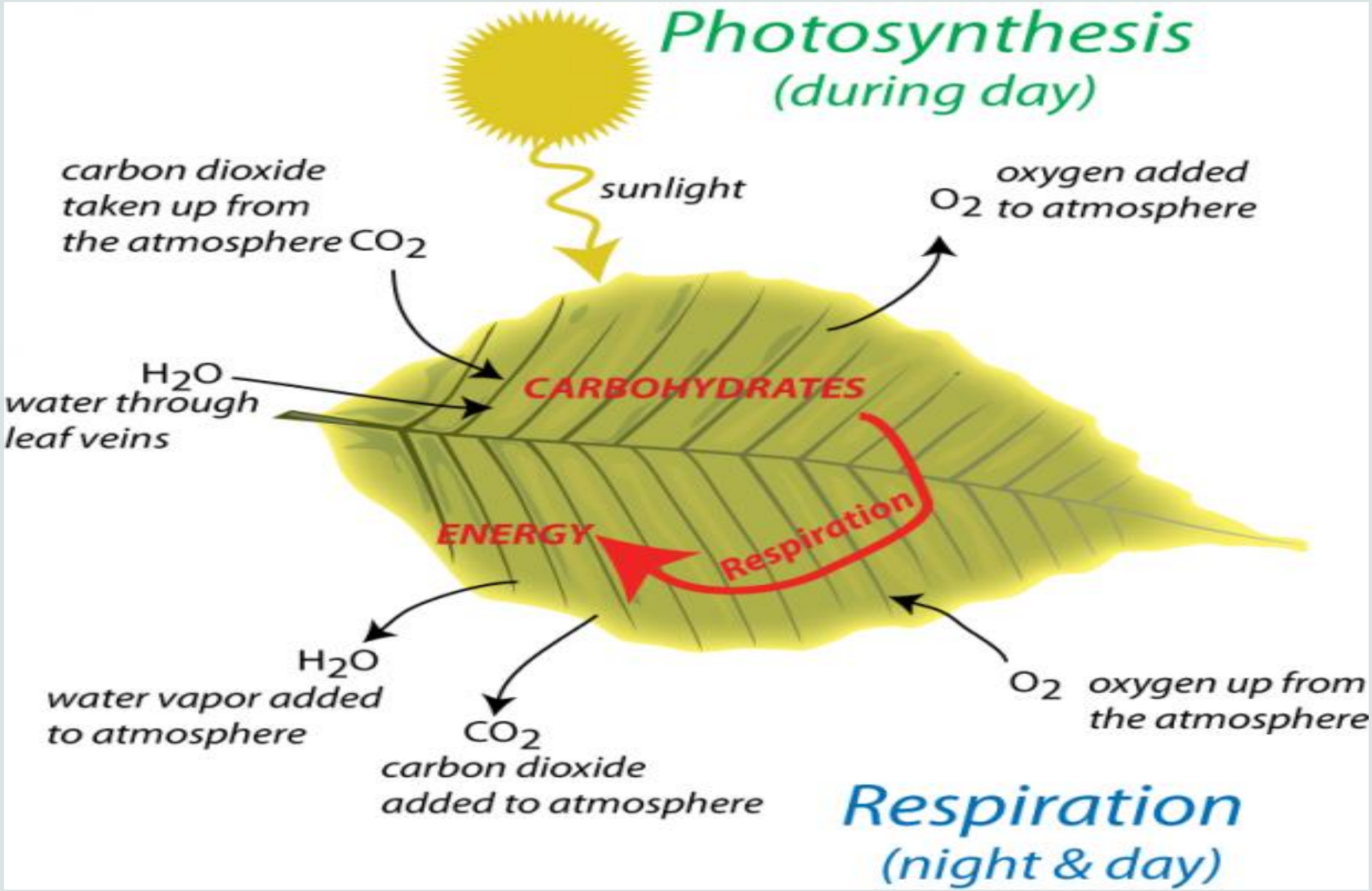
Trees Provide Wildlife Habitat

Trees and forests are essential for providing vital wildlife habitat, supporting a wide range of species, bringing nature back into our communities, offering enjoyment and serving as indicators of local environmental health

Urban forests can contribute to biodiversity, nesting sites, food sources, and wildlife corridors. Over 1,000 species rely on trees for survival

Trees Provide Oxygen

Trees are one of the largest generators of oxygen. Trees produce oxygen as they remove and use CO2 through the process of photosynthesis


Photosynthesis
(during day)
carbon dioxide
taken up from
the atmosphere CO_2
sunlight
oxygen added
O_2 to atmosphere
H_2O
water through
leaf veins
CARBOHYDRATES
ENERGY
Respiration
H_2O
water vapor added
to atmosphere
CO_2
carbon dioxide
added to atmosphere
O_2 oxygen up from
the atmosphere
Respiration
(night & day)

A single tree can supply a day's worth of oxygen for 4 people. The Amazon rainforest produces 20% of the world's oxygen

Trees Increase Property Values

Trees add value to a property and communities. Shoppers are drawn to well landscaped spaces


Cleveland Heights, OH
Krugerville, TX
The Transit Guy

Homes with street trees sold for an average 5% more and 2 days faster. In studied cities, for every $1 spent on tree planted yielded $5 in benefits

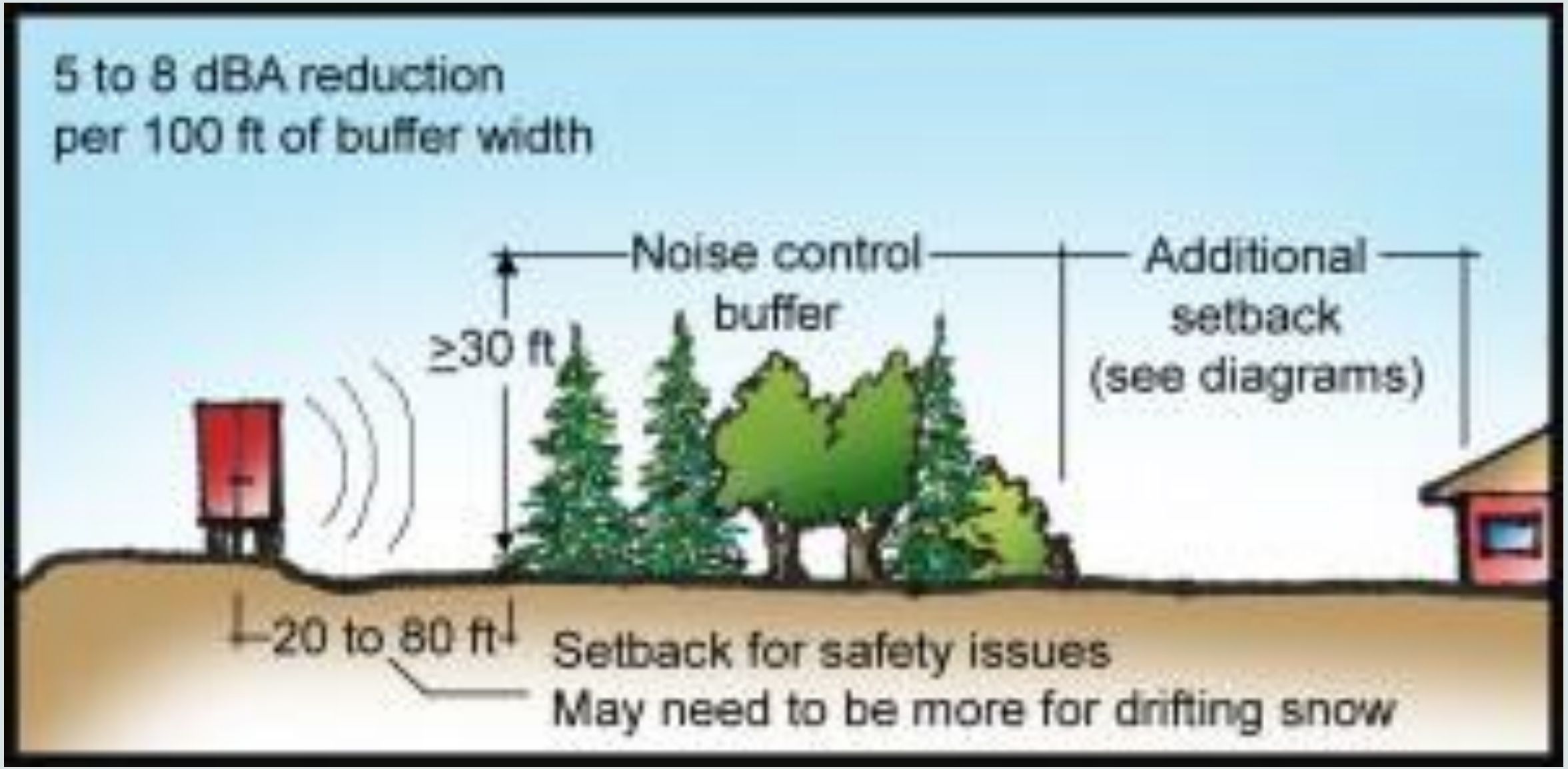
Trees Provide and Improve Drinking Water

Trees and forest watersheds are critical for providing quality drinking water. Tree roots pull in contaminants as the water infiltrates into soil and slow water flow.

In 1997 NYC invested $1.5 billion in forest preservation, avoiding need to build a $6 billion filtration plant

Trees Reduce Noise

Trees help reduce noise levels by blocking and absorbing sounds. Tree lined streets and roads are safer for traffic.


5 to 8 dBA reduction
per 100 ft of buffer width
Noise control
buffer
Additional
setback
(see diagrams)
≥30 ft
20 to 80 ft
Setback for safety issues
May need to be more for drifting snow

Tree barriers can reduce noise by 5-10 decibels through absorption and deflection. There are many studies on impact of street trees on traffic calming

Trees Reduce Crime

Trees and natural landscaping increases a sense of community well-being

Studies have shown public housing residents with trees and natural landscapes reported 25% fewer acts of vandalism, domestic aggression and violence.

Trees Also:

Promote healthy soil

Beautify spaces

Get people outside and connected to the natural world

i-Tree

Tools for Assessing and Managing

Forests & Community Trees

Regular office hours are November 13th 2pm ET - join us here or download the recurring calendar invitation

All Tools

i-Tree has developed tools to help a wide variety of users understand the benefits that trees provide **for over 20 years**. Below are links to the complete suite.

Tools for assessing individual trees

1. MyTree - **Are you new to i-Tree?** Start with our EASIEST tool! MyTree helps you understand the benefits of **individual trees** in minutes.
2. i-Tree Design - A full-featured web tool with expanded building interactions and forecasting for estimating the benefits of **individual trees**.
3. i-Tree Eco - Our flagship tool that can be used to evaluate an **existing tree inventory** OR **new field data collection** to derive **individual tree** benefit estimates. (*requires installation on a Windows computer)*

Tools for tree canopy area assessments

1. OurTrees - Get fast facts about the **trees in your community as well as US Census information**. If you are **new to i-Tree** and looking to spread the word about the benefits of tree canopy cover, start here!
2. i-Tree Landscape - **Tree canopy and U.S. Census information** at your fingertips! Identify **priority planting & protection** areas for **your community.** Forest-related map layers and data tables all in one place.
3. i-Tree Canopy - From the chair in your office, easily **estimate land cover and tree canopy** plus benefits using random point sampling on aerial imagery. Use imagery in Google Earth to compare two i-Tree Canopy projects, past and present to monitor tree canopy change in your community.

MyTree

mytree.itreetools.org

Where is your tree?

820 Savannah Rd, Lewes, DE 19958, USA

Search

?

Fine-tune the location of your tree by tapping a spot on the map below.

Some locations may fail to calculate if no matching location is found

Streets | Satellite

Next, describe your tree →

MyTree
A tool for assessing individual trees.

Home Project Menu

Tell us about your tree:

Location*

820 Savannah Rd, Lewes, DE 19958, USA
Lat: 38.76835, Lng: -75.14589

Tree Species (Stumped? Try a Name or Icon or type to search)*

Northern red oak

Common

Help with tree identification

Tree Condition*

Excellent

Trunk Size (in.)*

46

Diameter

Sun Exposure*

Full Partial Shade

MyTree Benefits

Over 20 years.

Northern red oak, *(Quercus rubra)*

Serving Size: 46.00 in. diameter
Condition: Excellent
Location: Lewes, De, United States
Expected i-Tree benefits over 20 years: $1,887.71

Discover benefits of all your community trees!

Carbon Dioxide Uptake	**$353.21**
Carbon Sequestered[1]	1,632.48 lbs
CO_2 Equivalent[2]	5,985.78 lbs
Storm Water Mitigation	**$72.13**
Runoff Avoided	8,071.63 gal
Rainfall Intercepted	140,558.52 gal
Air Pollution Removal	**$7.10**
Carbon Monoxide	14 oz
Ozone	672.91 oz
Nitrogen Dioxide	70.25 oz
Sulfur Dioxide	4.47 oz
$PM_{2.5}$	8.31 oz
Energy Usage[3]	**$802.24**
Electricity Savings	1,718.86 kWh
Heating Fuel Savings	43.54 MMBtu
Avoided Energy Emissions	**$653.03**

Air Pollution Removal	**$7.10**
Carbon Monoxide	14 oz
Ozone	672.91 oz
Nitrogen Dioxide	70.25 oz
Sulfur Dioxide	4.47 oz
$PM_{2.5}$	8.31 oz
Energy Usage[3]	**$802.24**
Electricity Savings	1,718.86 kWh
Heating Fuel Savings	43.54 MMBtu
Avoided Energy Emissions	**$653.03**
Carbon Dioxide	10,982.04 lbs
Carbon Monoxide	88.52 oz
Nitrogen Dioxide	40.07 oz
Sulfur Dioxide	702.7 oz
$PM_{2.5}$	20.3 oz

Benefit estimates are based on USDA Forest Service research and are meant for guidance only. Visit www.itreetools.org to learn more.

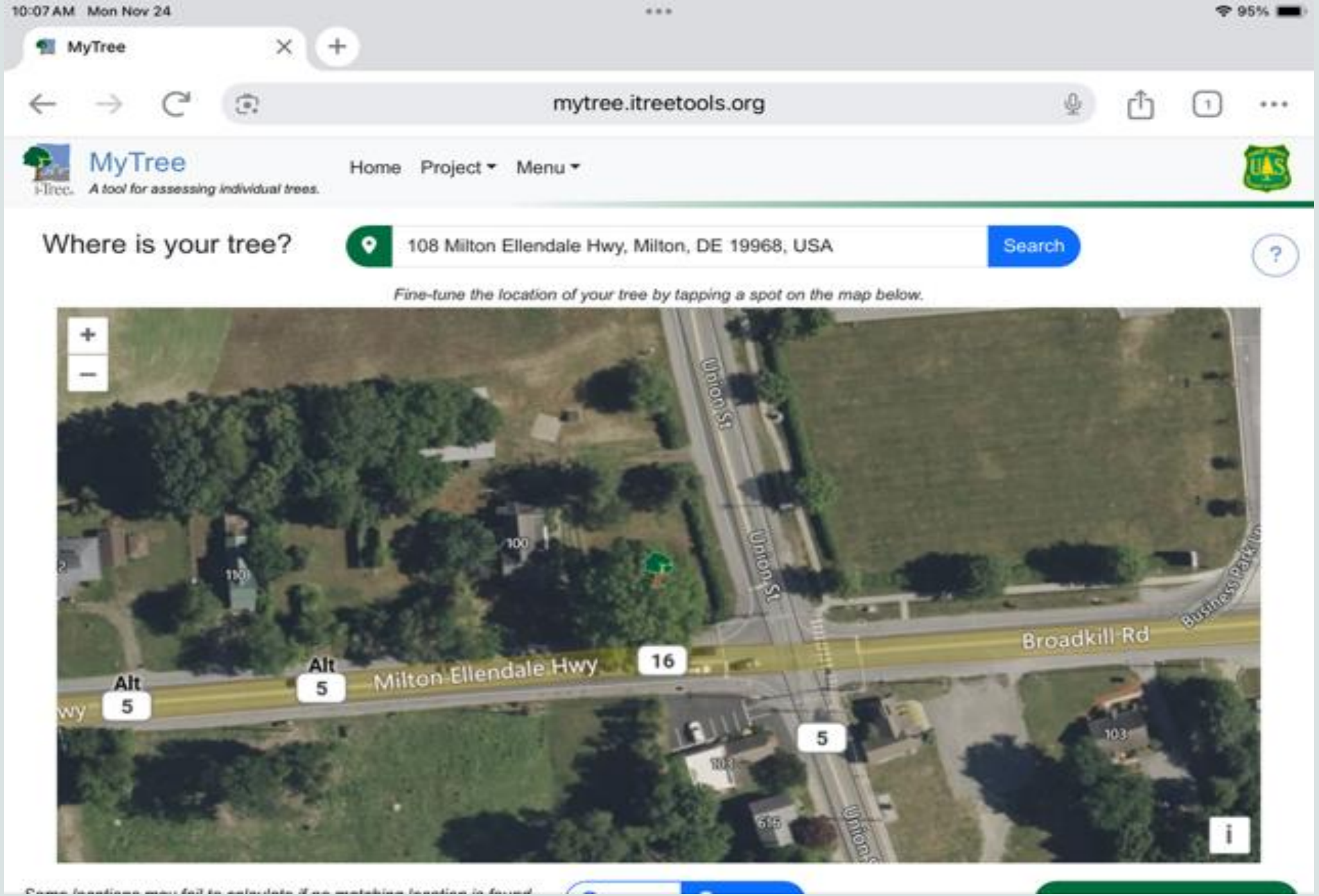
See the Project Menu for currency conversions.

▸ Read the fine print

Share

https://mytree.itreetools.org/#/bei

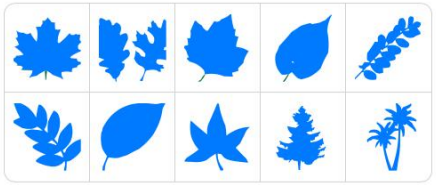
Save as image


10:07 AM Mon Nov 24
95%
MyTree
mytree.itreetools.org
MyTree
A tool for assessing individual trees.
Home
Project
Menu
Where is your tree?
108 Milton Ellendale Hwy, Milton, DE 19968, USA
Search
Fine-tune the location of your tree by tapping a spot on the map below.
Union St
Union St
Broadkill Rd
Business Park Dr
Alt
5
Alt
5
Milton-Ellendale Hwy
16
5
100
103

10:08 AM Mon Nov 24
95%
MyTree
mytree.itreetools.org

108 Milton Ellendale Hwy, Milton, DE 19968, USA
Lat: 38.78816, Lng: -75.31593

Tree Species (Stumped? Try a Name or Icon or type to search)*



Pecan

Common

Help with tree identification

Tree Condition*

Excellent

Trunk Size (in.)*

24

Diameter

Sun Exposure*

Full | Partial | Shade

Is it within 60 feet of a building?

MyTree Benefits

Over 20 years.

Pecan, *(Carya illinoinensis)*

Serving Size: 24.00 in. diameter
Condition: Excellent
Location: Milton, De, United States
Expected i-Tree benefits over 20 years: $484.87

Discover benefits of all your community trees!

Carbon Dioxide Uptake	**$468.24**
Carbon Sequestered[1]	2,164.1 lbs
CO_2 Equivalent[2]	7,935.02 lbs
Storm Water Mitigation	**$11.89**
Runoff Avoided	1,331.01 gal
Rainfall Intercepted	62,784.86 gal
Air Pollution Removal	**$4.74**
Carbon Monoxide	6.28 oz
Ozone	405.14 oz
Nitrogen Dioxide	45.58 oz
Sulfur Dioxide	2.6 oz
$PM_{2.5}$	7.36 oz

Benefit estimates are based on USDA Forest Service research and are meant for guidance only. Visit www.itreetools.org to learn more.

10:08 AM Mon Nov 24
95%
MyTree
mytree.itreetools.org

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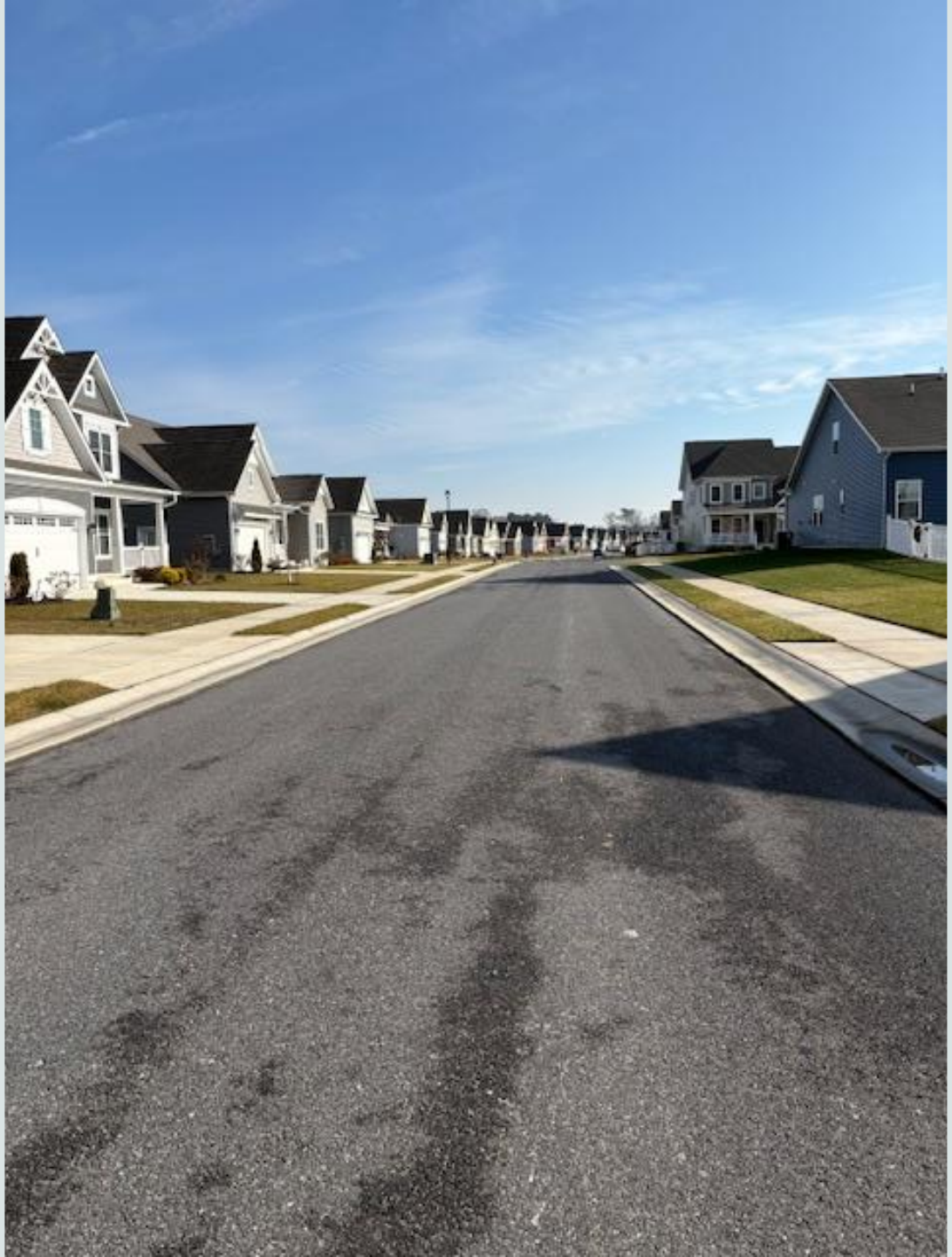

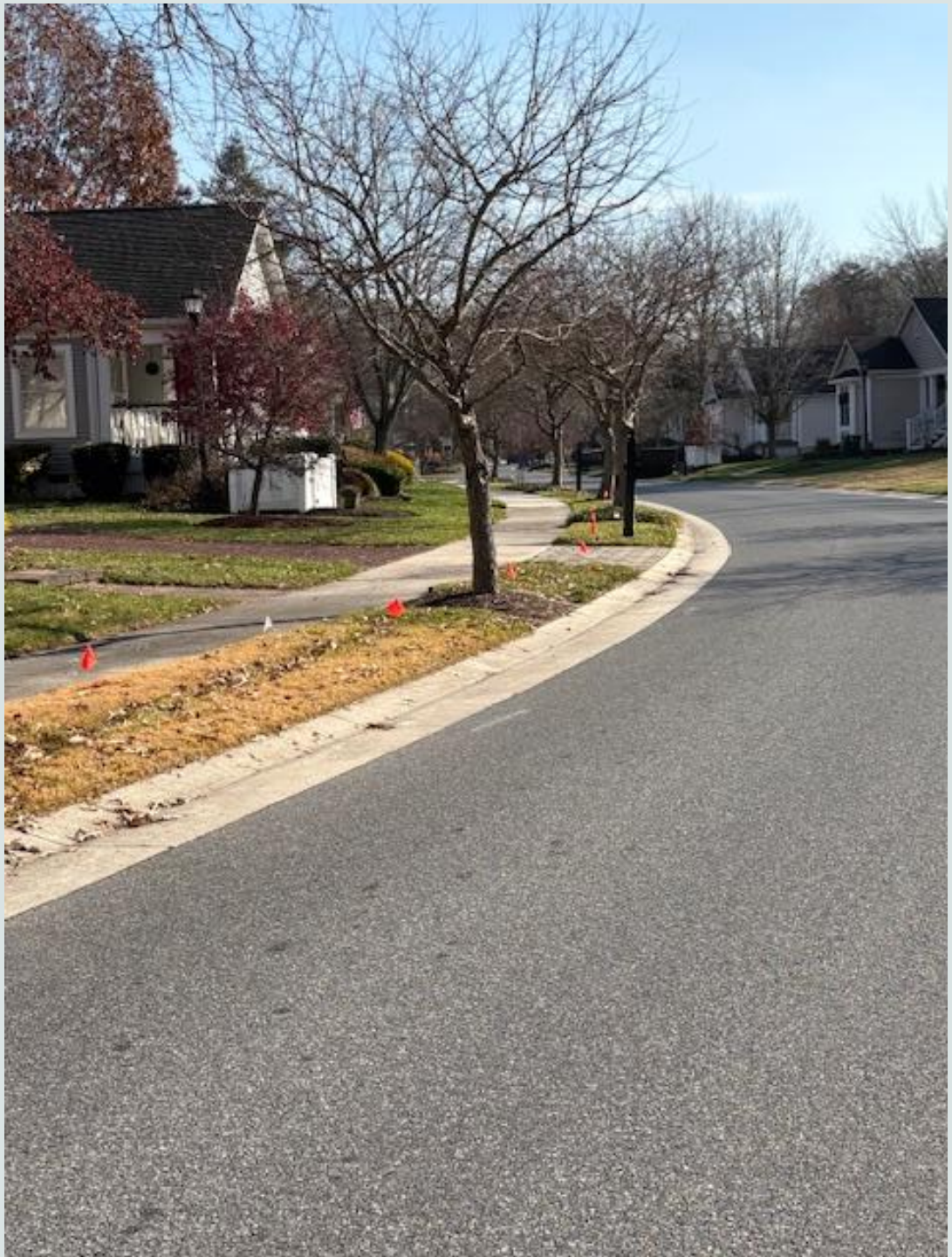


Image: Getty Images

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A Forest Journey- The Role of Wood in the Development of Civilization, John Perlin

Thank You

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