



AUSTIN

Independent School District

**TREE
INVENTORY**

OVERVIEW

- What it is
- How
- Why
- Outcomes
- Recommendations



WHAT IT IS



Collecting data on individual trees to have information about the condition and diversity of urban forest



- 1. Visit all schools and facilities**
- 2. Identify the species, DBH, estimated height and canopy size**
- 3. Map their location**
- 4. Photograph them**
- 5. Indicate the health status (condition) and maintenance needs of each tree**



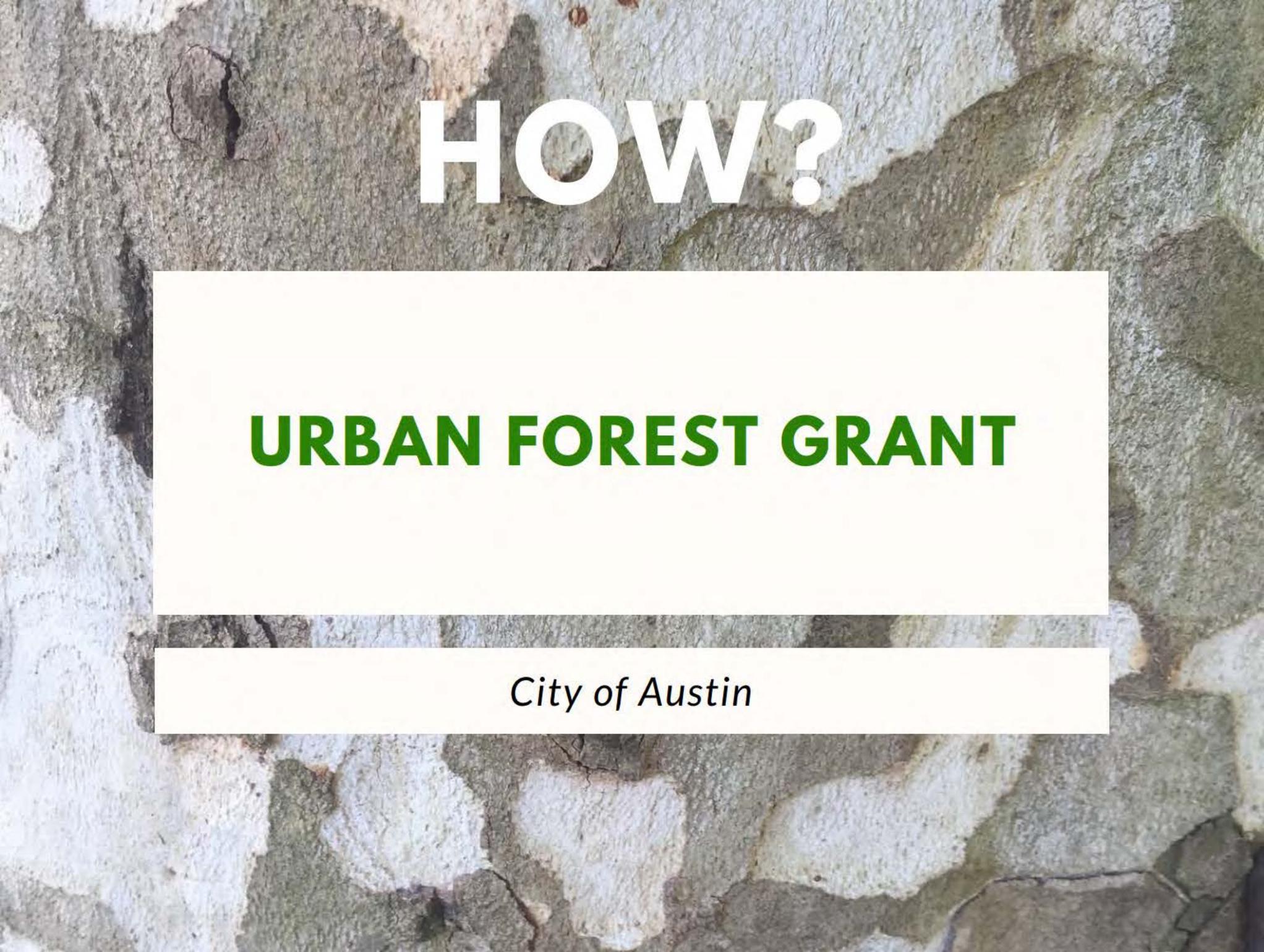


PRIORITIZED ALL TREES OVER 8" DBH

DBH = Diameter at Breast Height

PLUS NEWLY PLANTED TREES

Usually 0-3" DBH



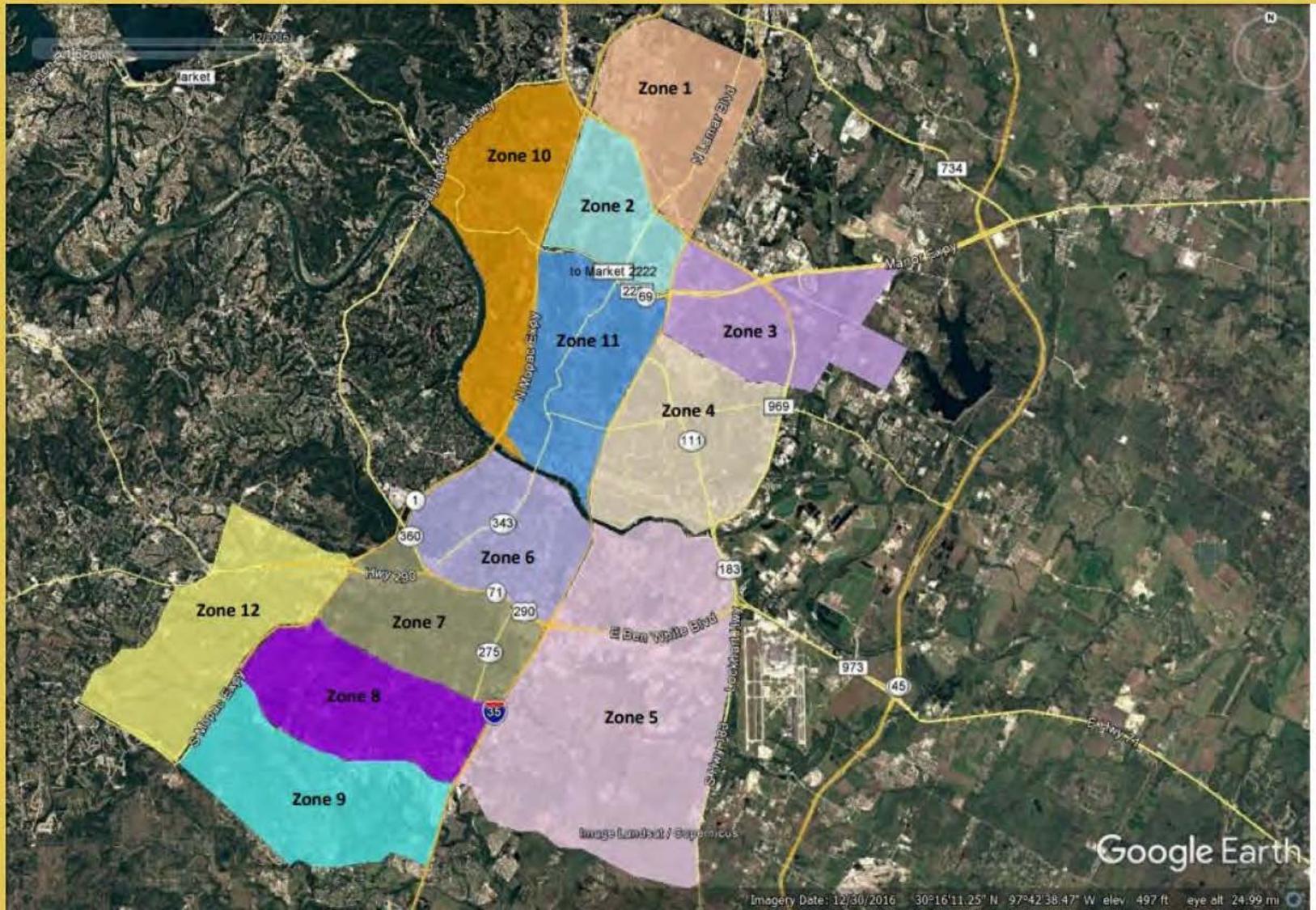
HOW?

URBAN FOREST GRANT

City of Austin

TIMELINE

- Oct 2017 - Start Phase I - Zones 1-5
- Dec 2018- Start Phase II - Zones 6-12
- Oct 2019 - Finished





15,500

Total Trees Inventoried

130

Total Properties



212
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Texas Rowing Center

Colorado River

North Shore Overlook

Austin High Track

The Austin Stone Community Church

Austin High School

Stephen F. Austin High School

Ext. MIA Care For Kids

Austin High Tennis Center

JLL Austin

BBVA Bank

Mean Eyed Cat

The Bar Method

Ho Ho Dry Bar

Sushi Zushi

Corridor Title Co

5th Street

W Cesar Chavez St

Tree Detail

Site Details | Work History | Sales

Tree Tag: Site ID: 212
 Status: Active Tree
 Condition: Good
 Rec Maint: No Work
 Hardscape: No
 DBH: 19-24 Exact: 20
 Height: 15-30 Exact: 25
 Crown: 17 ft Trunks: 2
 Site #: 85 Value: \$
 Asset ID:
 Observations: co dominant trunk
 Clearance Req: 8 foot clearance over
 Target Rating: Select One
 Species: Cedar Elm Ulmus crassifolia Code: 689
 Replacement Species: Code:
 Notes: In heavily used pathway/bench area

Lon: Lat: Inspected: 11/12/2019 by:

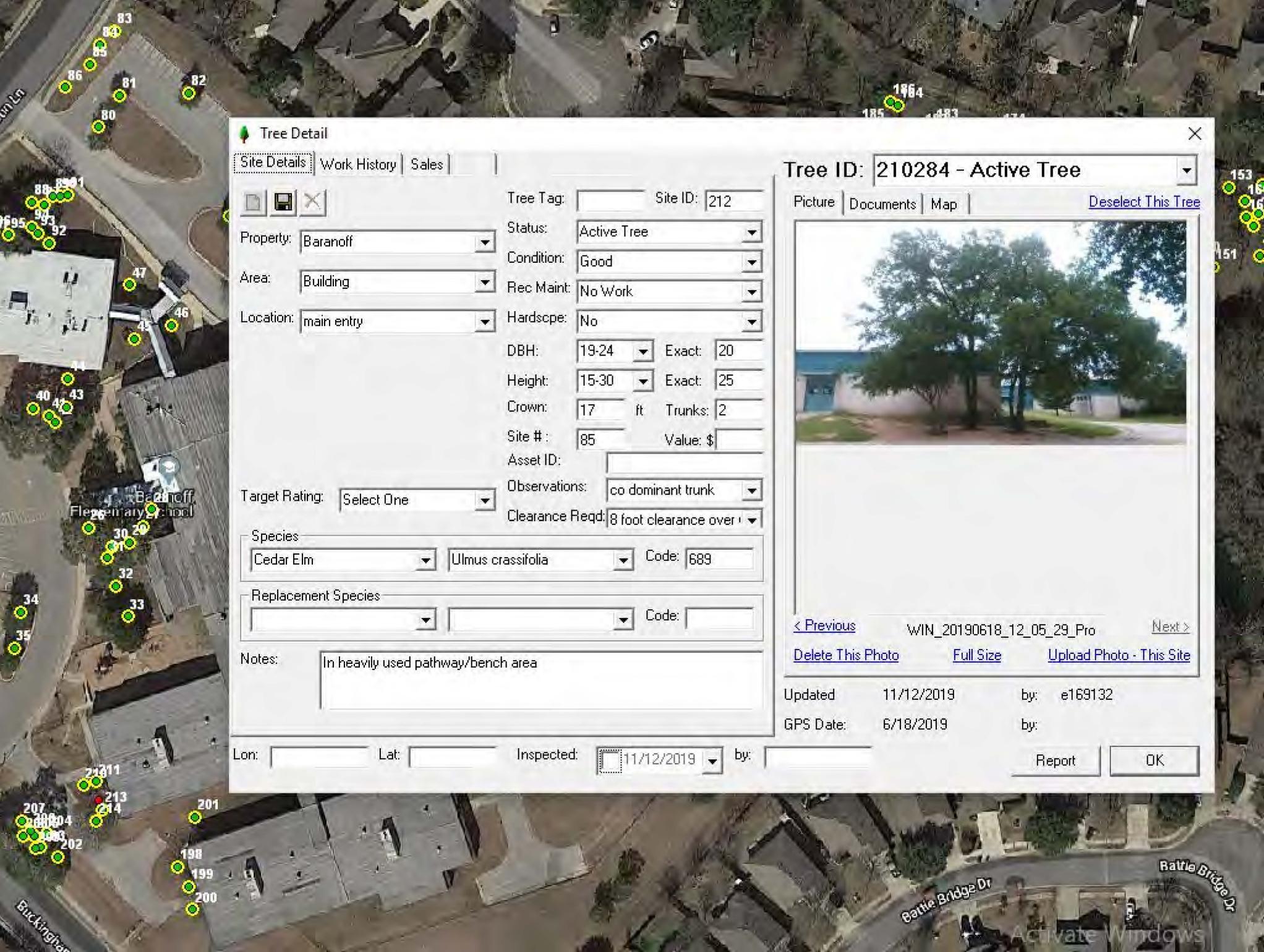
Tree ID: 210284 - Active Tree

Picture | Documents | Map [Deselect This Tree](#)



[< Previous](#) WIN_20190618_12_05_29_Pro [Next >](#)
[Delete This Photo](#) [Full Size](#) [Upload Photo - This Site](#)

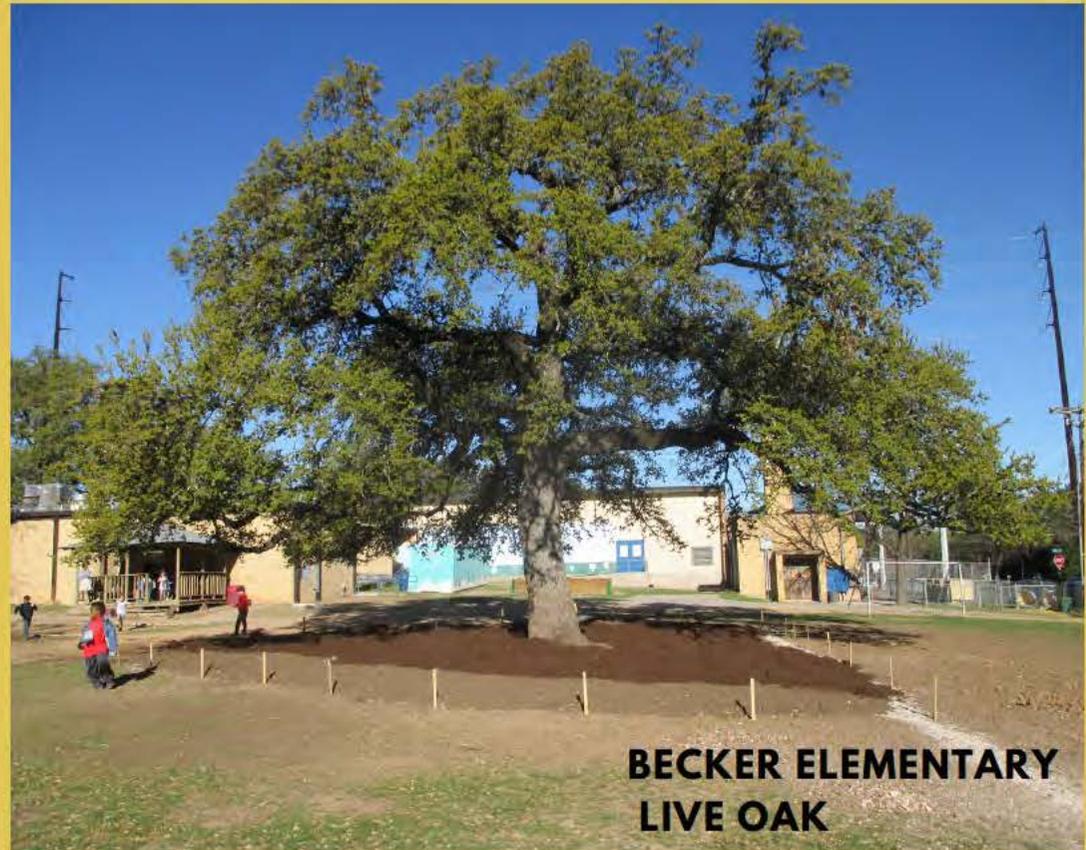
Updated 11/12/2019 by: e169132
 GPS Date: 6/18/2019 by:



WHY?

First step in managing an *asset* is to know what you have

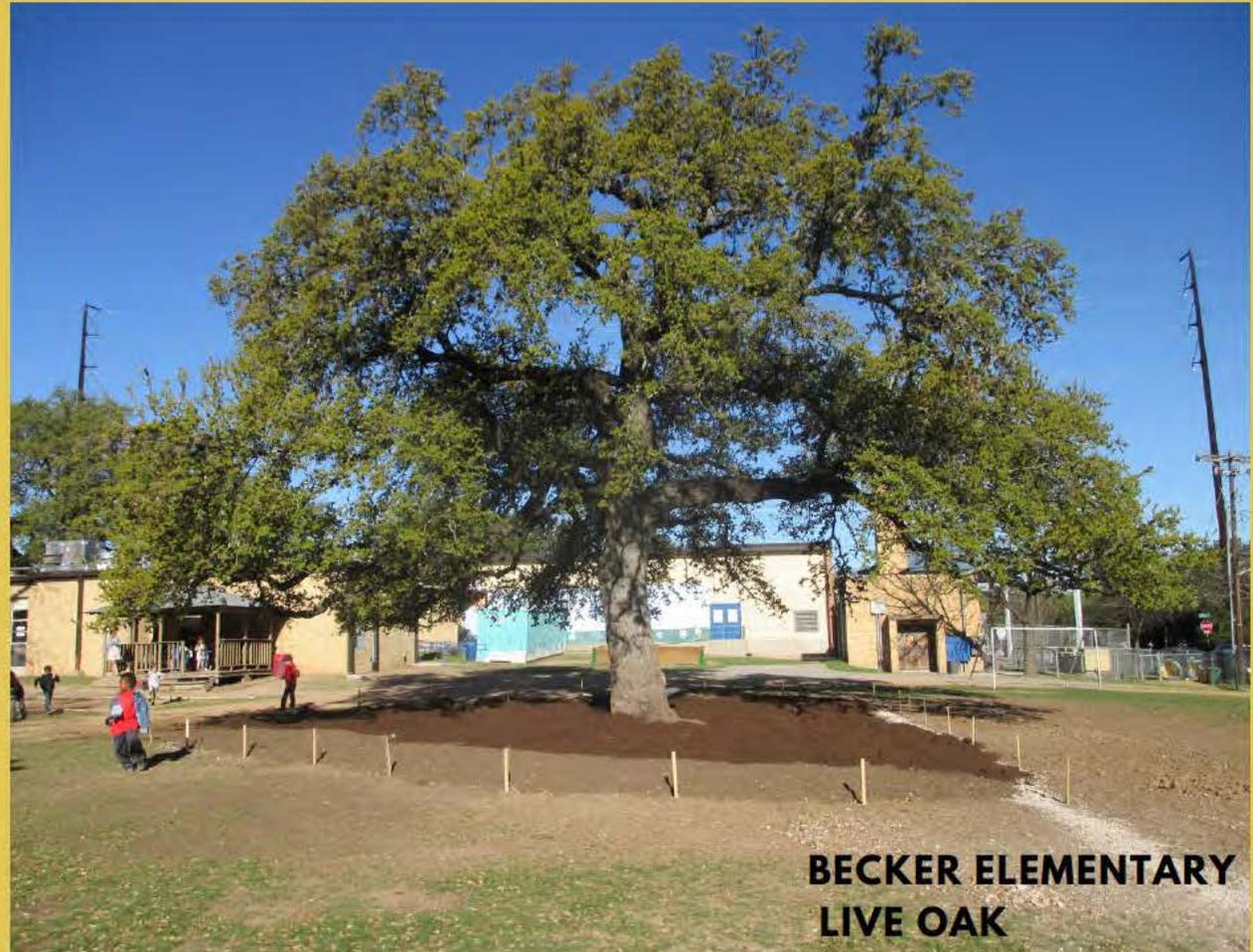
- \$Financial asset\$
- Environmental Benefits
 - Air Pollution
 - Provide Oxygen
 - Store Carbon Dioxide
 - Reduce Stormwater Runoff
 - Cool Buildings (energy savings\$)
 - Shade Playgrounds
 - Windbreaks
 - Reduce Heat Island Effect
 - Prevent Erosion
 - Wildlife Habitat
- Aesthetic and Social Benefits
- Physical/Mental Health Benefits
- Learning Benefits



WHY?

First step in managing an *asset* is to know what you have

- Assists in the planning, management, and maintenance of our urban forest
- Having actual numbers is useful in creating awareness and outreach
- Creating educational materials





**BLACKSHEAR
ELEMENTARY
UNKNOWN DATE**



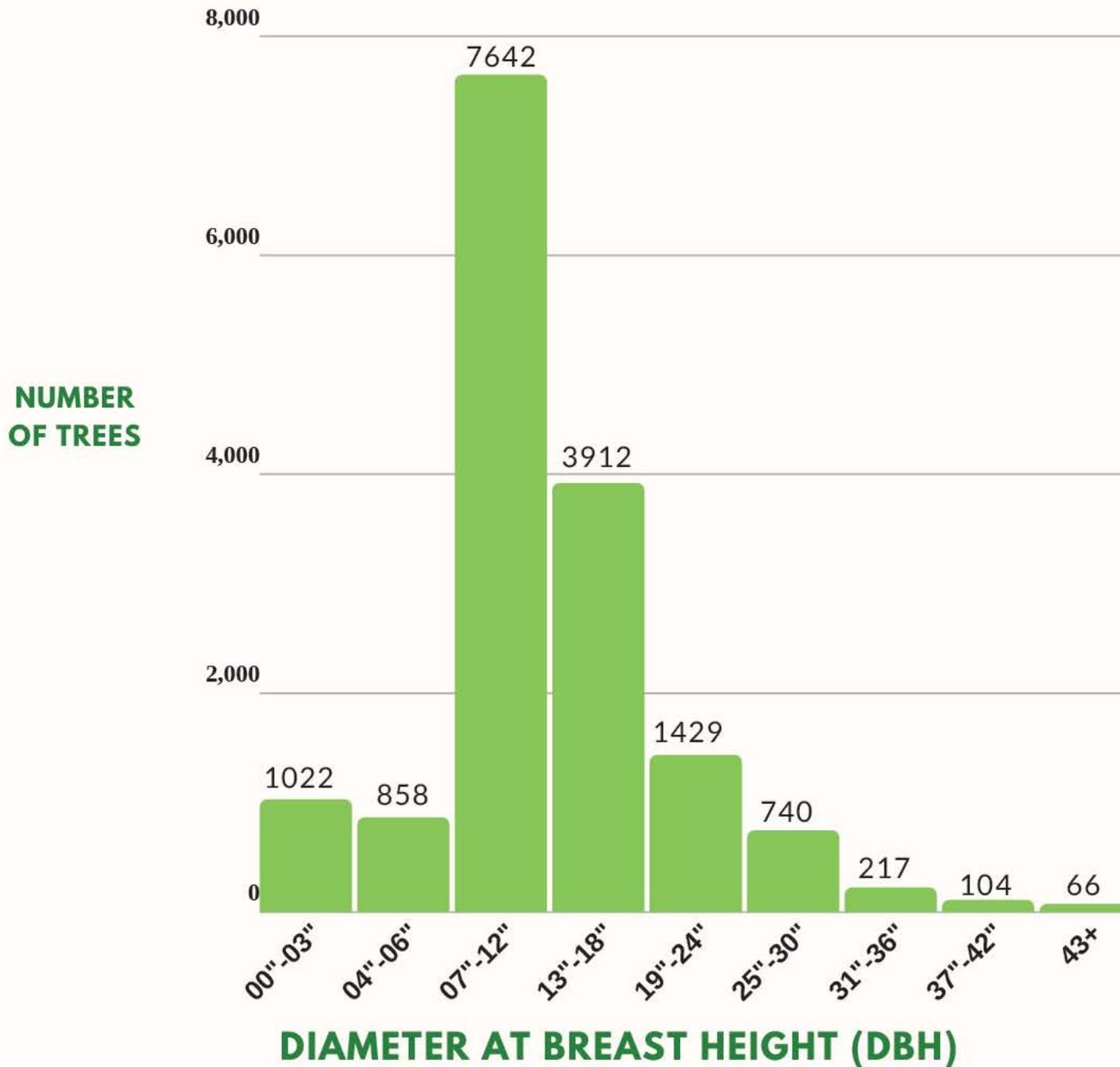
**BLACKSHEAR
ELEMENTARY
2019**

OUTCOMES



- Identified tree care needs
- Prioritized hazard tree risk mitigation
- Assisted in planning for schoolyard and construction projects
- Identified tree deficient schools for future plantings
- Enables the district to strategically plan for the long term

SIZE DIVERSITY



BIGGER=BETTER

Large diameter trees generally have larger tree crowns than small diameter trees. Thus, large diameter trees contribute significantly to the ecosystem services provided by the urban forest primarily because leaf area has a positive correlation with environmental benefits (Nowak et al. 2014, US Forest Service).



Protected Trees

Any tree >19"
DBH

2,504

17%

Heritage Trees

Texas Ash

Bald Cypress

Live Oak
Red Oak
Lacey Oak
Bur Oak

Oaks

Monterey Oak
Post Oak
Blackjack Oak
Chinquapin Oak

Walnut

American Elm

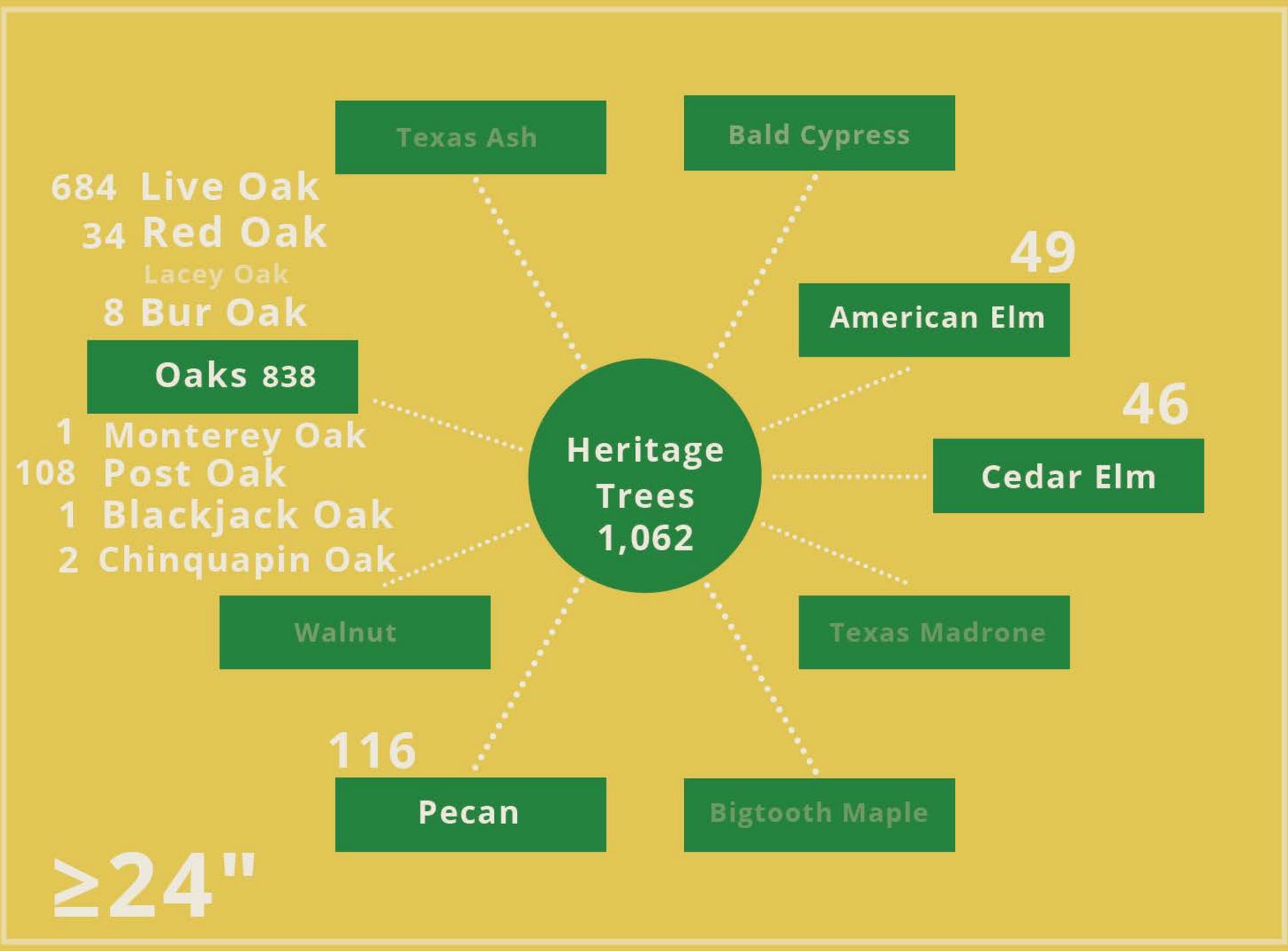
Cedar Elm

Texas Madrone

Pecan

Bigtooth Maple

≥24"



684 Live Oak
 34 Red Oak
 Lacey Oak
 8 Bur Oak

Oaks 838

1 Monterey Oak
 108 Post Oak
 1 Blackjack Oak
 2 Chinquapin Oak

Walnut

116
Pecan

Bald Cypress

49
American Elm

46
Cedar Elm

Texas Madrone

Bigtooth Maple

≥24"

7%

Texas Ash

Bald Cypress

684 Live Oak
34 Red Oak
Lacey Oak
8 Bur Oak

Oaks 838

1 Monterey Oak
108 Post Oak
1 Blackjack Oak
2 Chinquapin Oak

Walnut

American Elm

49

46

Cedar Elm

Texas Madrone

116

Pecan

Bigtooth Maple

≥24"

Trees sequester carbon – the process of removal and long-term storage of carbon dioxide (CO₂) from our atmosphere.

Table 22. – Average tree effects by tree diameter class, Austin, 2014

Diameter^a	Carbon storage			Carbon sequestration			Pollution removal	
	<i>lbs</i>	<i>\$</i>	<i>miles^b</i>	<i>lbs/yr</i>	<i>\$/yr</i>	<i>miles^b</i>	<i>lbs/yr</i>	<i>\$/yr</i>
2	5	0.34	22	1.3	0.08	5	0.02	0.02
4	26	1.62	102	3.0	0.19	12	0.05	0.05
6	67	4.20	266	5.2	0.33	21	0.07	0.08
8	126	8.00	507	7.3	0.46	29	0.11	0.12
10	207	13.08	829	10.4	0.66	42	0.15	0.17
12	337	21.34	1,352	15.6	0.99	63	0.22	0.24
14	492	31.11	1,971	20.3	1.28	81	0.26	0.29
16	706	44.65	2,828	25.6	1.62	103	0.35	0.38
18	949	59.96	3,799	31.1	1.97	125	0.42	0.46
20	1,218	76.97	4,876	39.3	2.49	158	0.36	0.40
22	2,054	129.83	8,224	63.4	4.01	254	0.42	0.47
24	1,771	111.97	7,093	43.3	2.74	174	0.59	0.66
26	3,000	189.64	12,014	67.0	4.23	268	0.40	0.45
28	3,240	204.82	12,975	79.5	5.02	318	0.48	0.53
30+	6,453	407.93	25,842	67.1	4.24	269	0.58	0.65

^a Diameter classes are designated by their midpoint (e.g. 2 is actually 1.0 to 2.9 inches).

Diameter measurements were taken at breast height (d.b.h.) or root collar (d.r.c.) for woodland species.

^b miles = number of automobile miles driven that produces emissions equivalent to tree effect

(one hundred 2" trees = one 14" tree)

(US Forest Service)

7,745.77 tons

\$1,321,047.78

Carbon Storage

311.42 tons/yr

\$53,113.05/yr

Carbon Sequestration

5.23 tons/yr

\$13,093.07/yr

Pollution Removal

371,013.66 cubic ft/yr

\$24,800.72/yr

Avoided Runoff

\$52,264,173.55

Structural Value

(Value of Size)

Data Source: USDA Forest Service. 2019 i-Tree Eco V6.0 Software accessed on Nov 6, 2019 at <https://www.itreetools.org/tools/i-tree-eco>

CANOPY COVER

CITY OF AUSTIN

30.8%

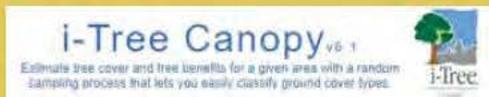
TWO AISD SAMPLES

**HARRIS
ELEMENTARY**

7.23%

**OAK HILL
ELEMENTARY**

32.9%



Data Source: USDA Forest Service. 2019 i-Tree Eco V6.0 Software accessed on Nov 8, 2019 at <https://canopy.itreetools.org/>

HARRIS ELEMENTARY



7.23%

OAK HILL ELEMENTARY



32.9%



Small Middle School

Ashford Montessori

Patton Elementary School

Kratom Pros

Westcreek Dr

Brush Country Rd

Monterey Oaks Blvd

Brush Country Rd

Monterey Oaks Blvd

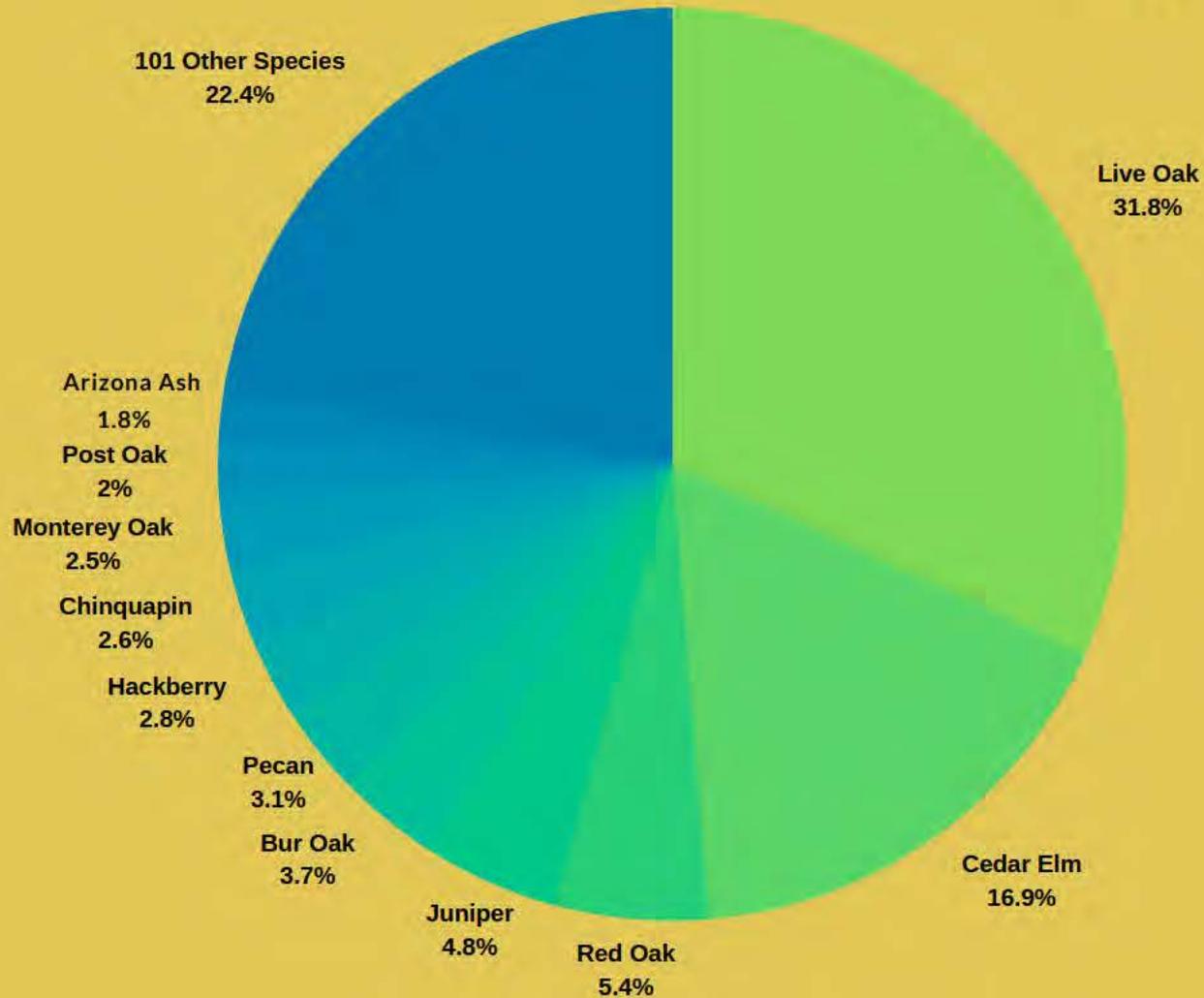
Brush Country Rd

Westcreek Dr

activate window

SPECIES DIVERSITY

**2 MOST COMMON TREES
MAKE UP 48.7%**

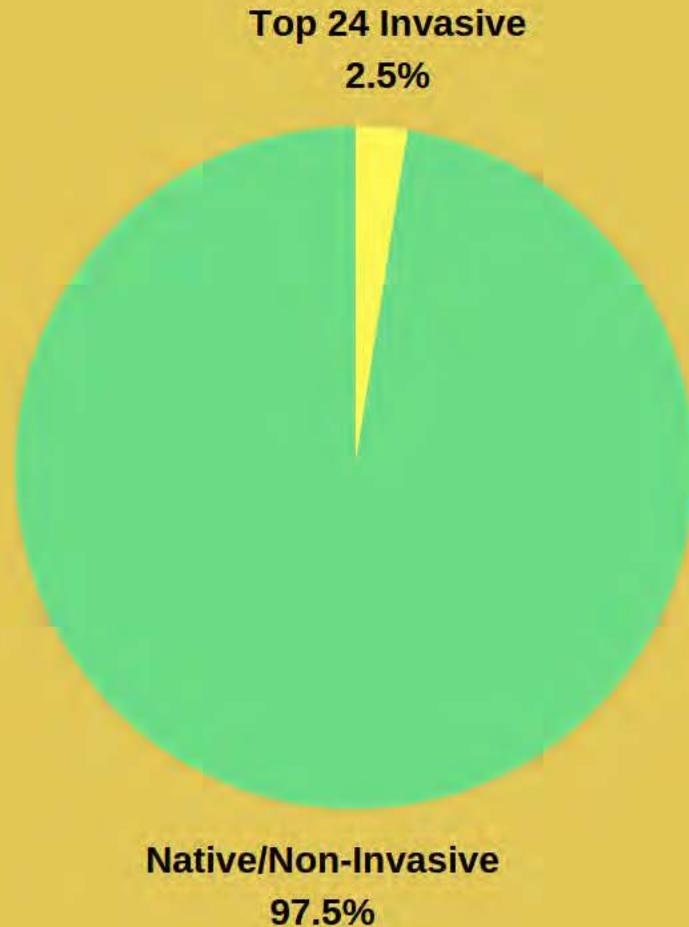


113 SPECIES

INVASIVES

Based on COA Top 24 Invasives

https://www.texasinvasives.org/plant_database/coa_results.php



Chinese Pistache	121
Chinaberry	55
Chinese Privet	57
Chinese Parasol Tree	8
Paper Mulberry	3
Chinese Tallow Tree	142

IDENTIFIED TREE CARE PRIORITIES





EXTRA FINDS









ALSO FOUND ALL THE REALLY GREAT ONES...



CASS ELEMENTARY
TEXAS RED OAKS



MAPLEWOOD ELEMENTARY
LIVE OAK





**LEE ELEMENTARY
LIVE OAK**

A large, leafless tree with a thick trunk and many thin, bare branches dominates the foreground. The tree is silhouetted against a cloudy sky. In the background, a city skyline is visible, featuring several tall skyscrapers. The sky is filled with soft, white clouds. The overall scene is captured in a wide-angle shot, with the tree's branches spreading across most of the frame.

**AUSTIN HIGH SCHOOL
CEDAR ELM**



**BOWIE HIGH SCHOOL
LIVE OAK**



OUR CHAMPIONS



PEASE ELEMENTARY LIVE OAK



58" DBH, 1 TRUNK

BECKER ELEMENTARY LIVE OAK



66" DBH, 2 TRUNKS



OUR CHAMPIONS



TRAVIS HEIGHTS ELEMENTARY

LIVE OAK



59" DBH, 1 TRUNK

LIVELY MIDDLE SCHOOL

LIVE OAK



57" DBH, 1 TRUNK



OUR CHAMPIONS



**ANITA FERRALES COY FACILITY
(FORMERLY ALLAN ELEMENTARY)**

AMERICAN ELM



52" DBH, 1 TRUNK

DAVIS ELEMENTARY

PECAN



43.5" DBH, 2 TRUNKS



OUR CHAMPIONS



MCCALLUM HIGH SCHOOL

RED OAK



45" DBH, 1 TRUNK

MATTHEWS ELEMENTARY

POST OAK



36" DBH, 2 TRUNKS

ENGAGEMENT OUTCOMES



WEBSITE CREATED

[HTTPS://WWW.AUSTINISD.ORG/SUSTAINABILITY/URBAN-FOREST](https://www.austinisd.org/sustainability/urban-forest)

The screenshot shows the website for Austin ISD's Urban Forest initiative. At the top, there is a navigation bar with links for 'OUR DISTRICT', 'OUR SCHOOLS', 'DEPARTMENTS', 'CAREERS', and 'COMMUNICATIONS'. Below this is a header image of a school campus with trees. The main content area is divided into a left sidebar and a main text area. The sidebar contains a menu with categories like 'Sustainability', 'Energy & Water', 'Food & Nature', 'Transportation & Air Quality', 'Urban Forest', 'Waste & Procurement', 'Our Commitment', 'Sustainability Plan', 'Get Involved', 'Earth Week 2019', and 'Schoolyard Improvements Projects'. The main text area features an introductory paragraph about the importance of the urban forest, followed by a section titled 'AISD Urban Forest Priorities' with a bulleted list of three points. Below that is a section titled 'AISD Urban Forest Strategies' which includes a sub-section for 'TREE CARE' with a photo of a tree being pruned and a 'Tree care tips' button, and another sub-section for 'REFORESTATION' with a photo of people planting trees. A Windows watermark is visible in the bottom right corner of the screenshot.

Austin ISD
Independent School District

OUR DISTRICT OUR SCHOOLS DEPARTMENTS CAREERS COMMUNICATIONS

Home / Sustainability / AISD Urban Forest

Sustainability

Energy & Water

Food & Nature

Transportation & Air Quality

Urban Forest

Waste & Procurement

Our Commitment

Sustainability Plan

Get Involved

Earth Week 2019

Schoolyard Improvements Projects

Austin ISD recognizes the importance of the urban forest as an asset that provides public health, environmental and social benefits to students and the public. With thousands of acres of land, AISD has a rich and varied tree canopy that includes some of Austin's most notable heritage trees. The AISD Urban Forest Initiative ensures that our trees stay healthy and safe, and that they are able to grow and thrive as valuable assets to our schools and community.

AISD Urban Forest Priorities

- Maintain a rich and varied tree canopy that includes and preserves some of Austin's most notable Heritage Trees.
- Keep our trees healthy and safe and ensure that they are able to thrive and grow as valuable assets to our schools and community.
- Reforest our urban canopy through partnerships with local organizations.

AISD Urban Forest Strategies

TREE CARE

A Healthy Tree is a Safe Tree!

AISD's tree care program includes proper pruning and plant health practices that adhere to the International Society of Arboriculture standards to promote tree health and ensure the safety of our schoolyards.

[Tree care tips](#)

REFORESTATION

AISD is committed to continued reforestation efforts on our campuses to ensure that there is a thriving urban forest that will continue to grow with

Activate Windows
Go to Settings to activate Windows.

Campus Forest Map

Clayton Elementary School

Date Exported: 10/14/2019



SCHOOL TREE MAPS



- | | |
|---------------------|---------------------|
| ● American Sycamore | ● Post Oak |
| ● Blackjack Oak | ● Southern Live Oak |
| ● Cedar Elm | ● Texas Red Oak |
| ● Juniper species | ▲ Texas Redbud |

0 62.5 125 250 Feet





	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Map ID	Tree ID	Common Name	Botanical Name	DBH (diameter)	Height (in feet)										
2		2	102 Post Oak	Quercus stellata	29	40										
3		3	103 Post Oak	Quercus stellata	28	20										
4		4	104 Post Oak	Quercus stellata	31	40										
5		5	105 Arborvitae	Platycladus orientalis	20	20										
6		6	106 Southern Live Oak	Quercus virginiana	11	20										
7		7	107 Southern Live Oak	Quercus virginiana	15	0										
8		8	108 Southern Live Oak	Quercus virginiana	10	25										
9		9	109 American Elm	Ulmus americana	19	25										
10		10	101005 Post Oak	Quercus stellata	32	50										
11		11	101022 Post Oak	Quercus stellata	28	25										
12		12	101023 Post Oak	Quercus stellata	26	30										
13		15	201420 Arborvitae	Platycladus orientalis	15	15										
14		16	201421 Arborvitae	Platycladus orientalis	16	15										
15		17	201422 Post Oak	Quercus stellata	27	40										
16		18	201423 Post Oak	Quercus stellata	25	35										
17		19	201424 Chinquapin Oak	Quercus muehlenbergii	8	10										
18		20	201425 American Elm	Ulmus americana	18	20										
19		21	201426 Pecan	Carya illinoensis	19	25										
20		22	201427 Pecan	Carya illinoensis	18	25										
21		23	201428 Monterey Oak	Quercus polymorpha	2	5										
22		24	201429 Red Oak	Quercus rubra	2	7										
23		25	201430 Chinquapin Oak	Quercus muehlenbergii	2	5										
24		26	201431 Chinquapin Oak	Quercus muehlenbergii	2	5										
25		27	201432 Mexican Sycamore	Platanus mexicana	2	5										
26		28	201433 Chinquapin Oak	Quercus muehlenbergii	2	5										
27		29	201434 Chinquapin Oak	Quercus muehlenbergii	2	5										
28		30	201435 Chinquapin Oak	Quercus muehlenbergii	2	5										

Protected Tree
 - All trees 19" DBH and greater
 - Requires tree permit for work

Heritage Tree
 - All trees 24" DBH and greater of the following species:
 Texas Ash
 Bald Cypress
 American Elm
 Cedar Elm
 Texas Madrone
 Bigtooth Maple
 All Oaks
 Pecan

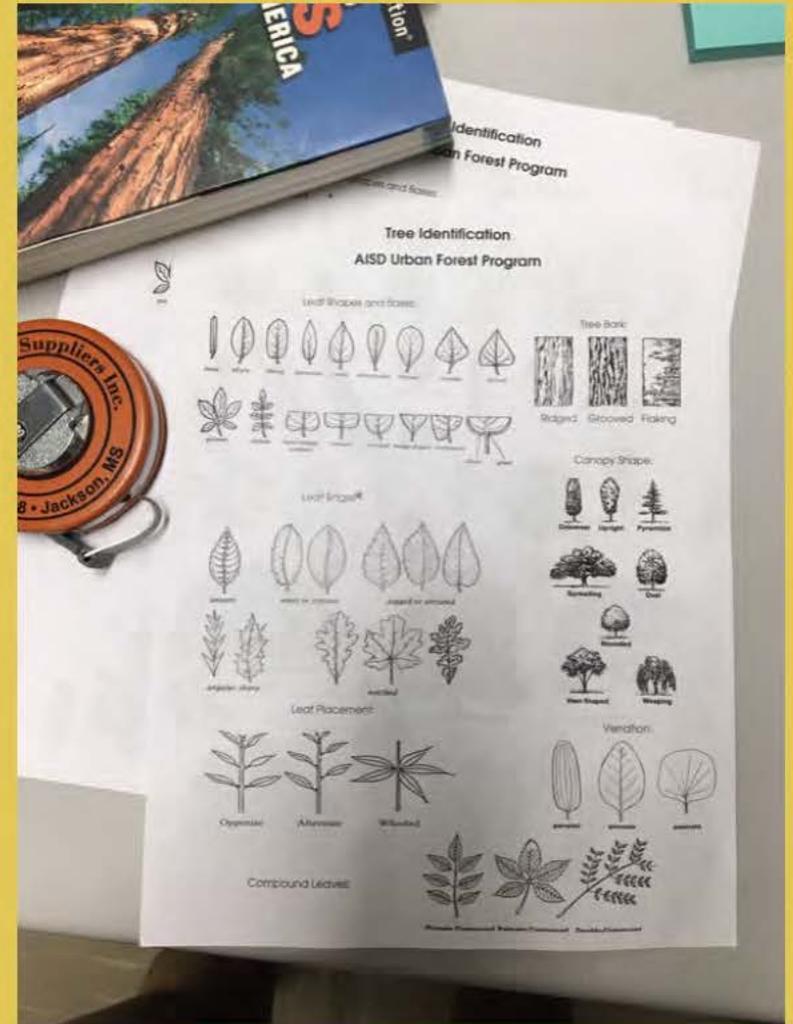
For more information on Austin tree ordinances see:
https://library.municode.com/tx/austin/codes/environmental_criteria_manual?nodeId=S3TRNAARPR
<http://austintexas.gov/department/community-tree-preservation>

Tools to calculate value of a tree:
<https://mytree.itreetools.org/>
<http://www.trebenefits.com/calculator/>

A close-up photograph of tree bark, showing various shades of grey, brown, and white. The bark has a rough, textured appearance with some cracks and small holes. A white rectangular box is overlaid in the center, containing the URL [TINYURL.COM/AISDTREEMAPS](https://tinyurl.com/AISDTREEMAPS) in green, bold, sans-serif font.

[TINYURL.COM/AISDTREEMAPS](https://tinyurl.com/AISDTREEMAPS)

SCHOOL TREE TALKS



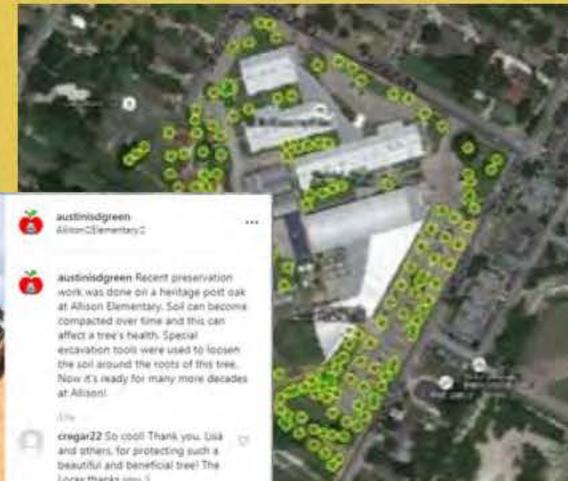
PROMOTION ON SOCIAL MEDIA

#AISD Green Austin ISD Green @AustinISDGreen · Nov 1, 2018

Say hello to 10 new trees at @RidgetopRattler Elementary thanks to an Urban Forest Grant from the City of Austin! @naturecityATX @AISD_Science @CityArboristATX #aisdoutside

Ridgetop Elementary

1 7



austinisdgreen

Check out the Fickle Elementary School tree map! Each dot represents a tree that was recently added to AISD Tree Inventory. We've got a total of 203 trees at this school - now that's green! @CityArboristATX #AISDgreen #naturerocksAustin @PickleECP

Liked by blueindexaustin and others

November 26, 2018

Add a comment...



austinisdgreen Allison Elementary

Recent preservation work was done on a heritage post oak at Allison Elementary. Soil can become compacted over time and this can affect a tree's health. Special excavation tools were used to loosen the soil around the roots of this tree. Now it's ready for many more decades at Allison!

Lisa cregar22 So cool! Thank you, Lisa and others, for protecting such a beautiful and beneficial tree! The Loree thanks you!

Liked by ghislacycling and others

November 19, 2018

Add a comment...

#AISD Green Austin ISD Green @AustinISDGreen · Nov 13, 2018

Brr, it's definitely fall outside today! Take a look around your campus and you may be surprised at how much color Central Texas trees can display for us. #aisdoutside @NatureCityATX #aisdtrees #urbanforest

1 3

#AISD Green Austin ISD Green @AustinISDGreen · Dec 19, 2018

Erosion control is important for controlling soil loss and water pollution. Check out this new ground covering at @Ohenryms that will help us control runoff from rain and allow water to go into the ground where we need it to be! #aisdoutside

6

Austin ISD Green @AustinISDGreen · Feb 8

Your tree facts for the day from @TravisHeights1 Elementary: Translation: "The pecan tree is native in all of the Southeast United States. It is a refuge for many animals such as owls, spiders, squirrels, and ants. It can live up to 300 years." #aisdoutside

Nature in the City and 2 others

3 12

RECOMMENDATIONS: MAINTENANCE

PROACTIVE INSTEAD OF REACTIVE



Tree removal and successive planting replacement plan
Now we know which and how many will need to be removed in the near future and we can allocate budget to remove and replace those each year

Preventative maintenance on a cycle

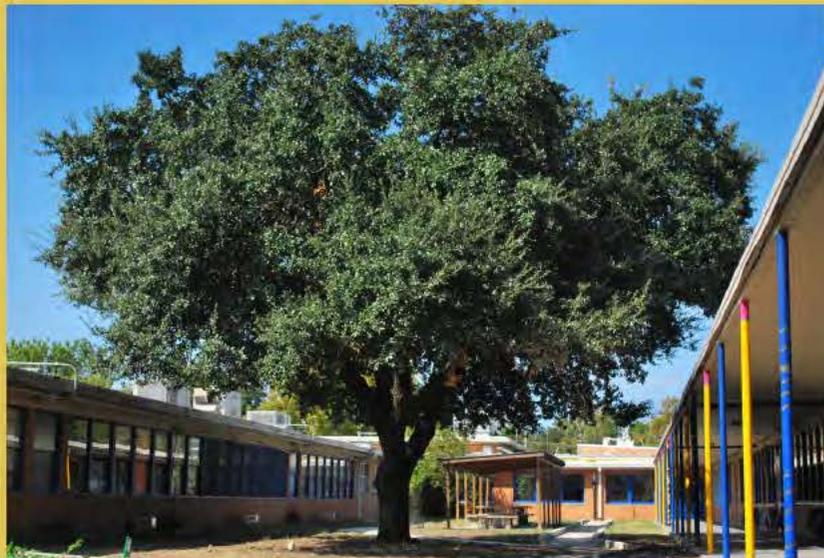
Clearance pruning/regular maintenance can be arranged in a cycle to also help with budgeting

RECOMMENDATIONS: OUTREACH

General Tree Awareness: Continue to engage schools and community members with downloading tree maps, more planting events, tree talks, tree care events and education

Celebrate Our Trees: We have great trees! Let's highlight them online, in publications and with events

Energy Conservation: can use the data in iTree to show savings and importance



ENERGY SAVINGS

BECKER ELEMENTARY LIVE OAK



Serving Size: 66.00 in. diameter

Condition: Good

Total benefits for this year:

\$67.97

Carbon Dioxide (CO₂) Sequestered	\$45.15
Annual CO ₂ equivalent of carbon ¹	< 0.10 lbs
Storm Water Runoff Avoided	\$7.38
Runoff Avoided	825.9 gal
Rainfall Intercepted	4,773.31 gal
Air Pollution Removed Each Year	\$0.00
Carbon Monoxide	0.57 oz
Ozone	28.85 oz
Nitrogen Dioxide	1.88 oz
Sulfur Dioxide	0.41 oz
PM _{2.5}	0.4 oz
Energy Usage Per Year²	\$12.14
Electricity Savings (A/C)	122.35 kWh
Fuel Savings (natural gas, oil)	-0.12 MMBtu
Avoided Energy Emissions	\$3.30
Carbon Dioxide	141.95 lbs
Carbon Monoxide	1.96 oz
Nitrogen Dioxide	0.3 oz
Sulfur Dioxide	4.18 oz
PM _{2.5}	0.2 oz
CO₂ Stored To Date³	\$2,802.10
Lifetime CO ₂ equivalent of carbon ³	120,484.72 lbs



Data Source: USDA Forest Service. 2019 i-Tree Eco V6.0 Software accessed on Nov 20, 2019 at <https://mytree.itreetools.org>

RECOMMENDATIONS

Reforestation:

- **Replacement and growth of number of building, street, playground trees**
- **Restore disturbed sites** (construction areas)
 - De-compact soil, restore nutrients, replant, revegetate quickly afterwards
- **Include "no-mow" zones**
 - Restoration of natural landscape
 - Connecting habitat corridors
 - Creates outdoor learning space where we don't have any (equity)
 - Meditation, hiking trails, nature/ecology/biology educational opportunities
 - Improves learning capabilities, health, stress, etc.



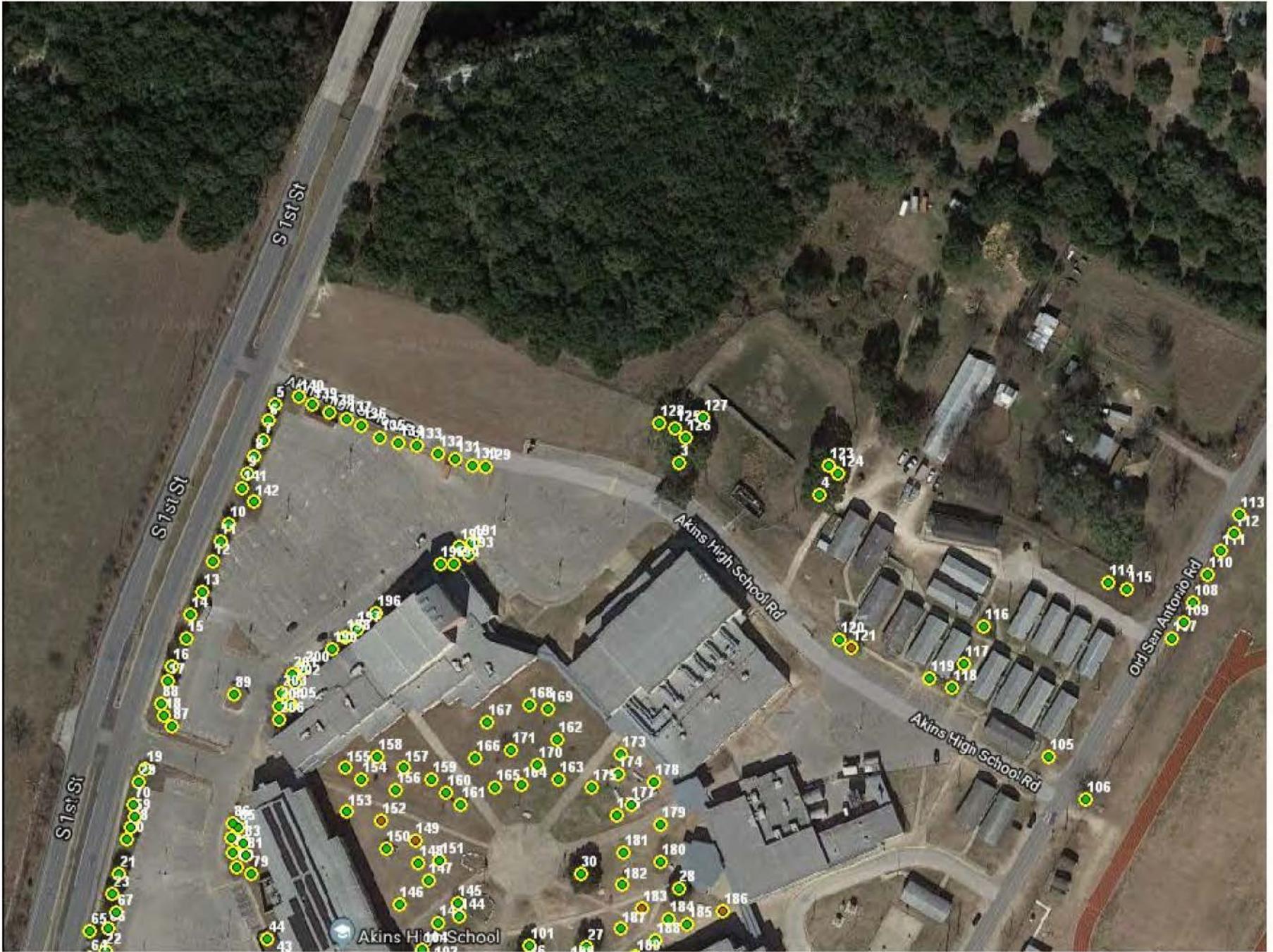
BRENTWOOD ELEMENTARY 1952



PICA 26131 Austin History Center, Austin Public Library

CASEY ELEMENTARY 2019







Johnny Morris Rd

Johnny Morris Rd

Barbara Jordan
Elementary School

Carwill Dr

Johnny Morris Rd

Loyola Ln

Loyola Ln

Cardtronics ATM

Sand

Private Windows

Google

CLIMATE CHANGE IMPACT

Austin becoming hotter and drier

- Plant more species that are more likely to adapt
 - Texas Mountain Laurel, Honey Mesquite, Retama, Monterey Oak
 - Data Source: Northern Institute of Applied Climate Science and US Forest Service modeling
- Reduce stressors, restore soils, nutrients, and hydrology
- Promote diverse age structure
- Maintain habitat corridors
- Prioritize at risk species



<https://forestadaptation.org/>

THANKS TO PARTNERS

City of Austin Urban Forest Grant Program

AISD Grounds and Maintenance

AISD Construction Management

AISD Office of Innovation and Development

AISD Urban Foresters

AISD Sustainability Department



A large, leafless tree silhouette is centered against a light gray background. The tree's branches are intricate and spread out, creating a complex, dark shape. The word "QUESTIONS" is overlaid in the center of the tree's canopy.

QUESTIONS