



Texas Tree Ordinances

City of Tomball Stakeholder Engagement:
Burditt Consultants
10-09-2023

Goals:

- To demonstrate and explain the various tree ordinances in use in the State of Texas; their pros and cons and their various functions
- To discuss the desired outcomes from a Tree Ordinance
- To determine the best approach for drafting a Tree Ordinance to achieve desired outcomes

Types of Tree Ordinances in Texas

- Public/Street Tree
- Tree Preservation
- Landscape
- Landscape & Tree Preservation
- Other: Technical Manuals, Oak Wilt & Diseased Trees, Obstruction & Clearance, Nuisance, Utility



Public/Street Tree Ordinance

- **Function-** to mandate care, removal, and planting of public trees located on rights-of-way, parks, and other public property
- To establish performance standards relating to tree planting and maintenance
- Violations for harm of public trees are usually associated
- Some cities, such as Austin, will even regulate the removal of trees on private properties whether they are hazardous or not
- Cities: Austin, Piney Point Village, Waco, Houston



Public/Street Tree Ordinance

Pros:

- Healthy public trees create more attractive cityscape
- Prevent hazardous tree incidents

Cons:

- City takes liability for hazardous trees
- Additional City Staff required for regulation/tree care

Tree Preservation Ordinance

- **Function-** to preserve existing native tree canopy and/or historical trees
- Permits are usually required to remove protected trees
- Mitigation may be required in the form of fees and/or plantings when removal of protected trees takes place either illegally or not
- May require buffers for streams or adjacent features
- City Forester sometimes employed to regulate enforcement
- Cities: Houston, Abilene, Cedar Hill



Tree Preservation Ordinance

Pros:

- Preservation of existing tree canopy which adds to overall health and happiness of citizens
- Creates more desirable development site which leads to higher attraction of patrons
- More trees is always a benefit

Cons:

- Limits certain types of development depending on how rigorous preservation requirements are
- Enforcement and regulation requires time and effort and best done by a professional

Tree Preservation Ordinance

Approaches to Tree Preservation Requirements:

- Require Tree Canopy Preservation (e.g.: 30% tree canopy preservation)
- Protect certain size trees (e.g.: 10" Diameter or greater)
- Protect certain tree species (e.g.: protected tree species list)
- Protect trees along buffers (e.g.: 18' buffer along frontage)

Landscape Ordinance

- **Function-** to ensure that planted trees and/or shrubs will be implemented for new developments
- This ordinance type also mandates species, size, and number requirements of planted landscape trees/shrubs
- May require landscape buffers for streams or adjacent features
- Landscape and irrigation plans will be reviewed by City Staff before building permits issued
- Cities: Houston, Abilene, Cedar Hill, Willis



Landscape Ordinance

Pros:

- New developments are more attractive
- Required plantings add to city tree canopy
- Parking lot plantings provide more shade and permeability

Cons:

- No regulation for existing canopy trees

Landscape & Tree Preservation Ordinance

- **Function-** to protect existing canopy trees **and** mandate landscape requirements for new developments
- A combined effort to preserve existing trees and plant new ones
- Cities: Conroe, Dallas, Georgetown, New Braunfels



Landscape & Tree Preservation Ordinance

Pros:

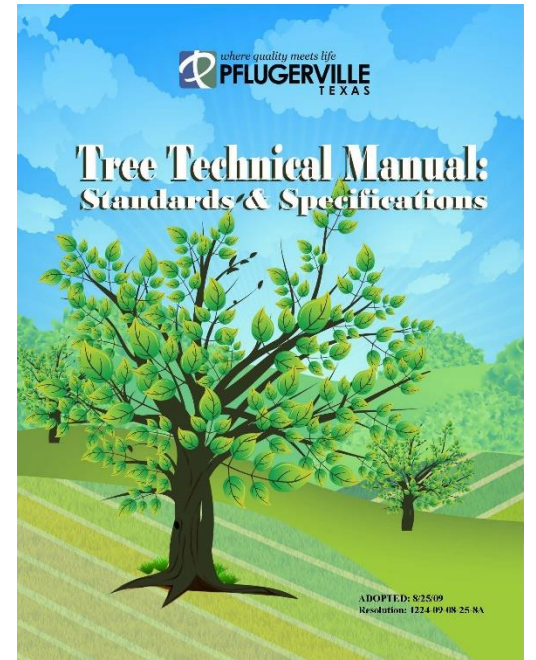
- Mandates and regulates not only existing canopy but also new trees
- Allows for more flexibility for developers
- Shade, beautification, diversity, energy saving...

Cons:

- Requirements can be demanding and cause potential project delays
- Enforcement and regulation requires time and effort and best done by a professional

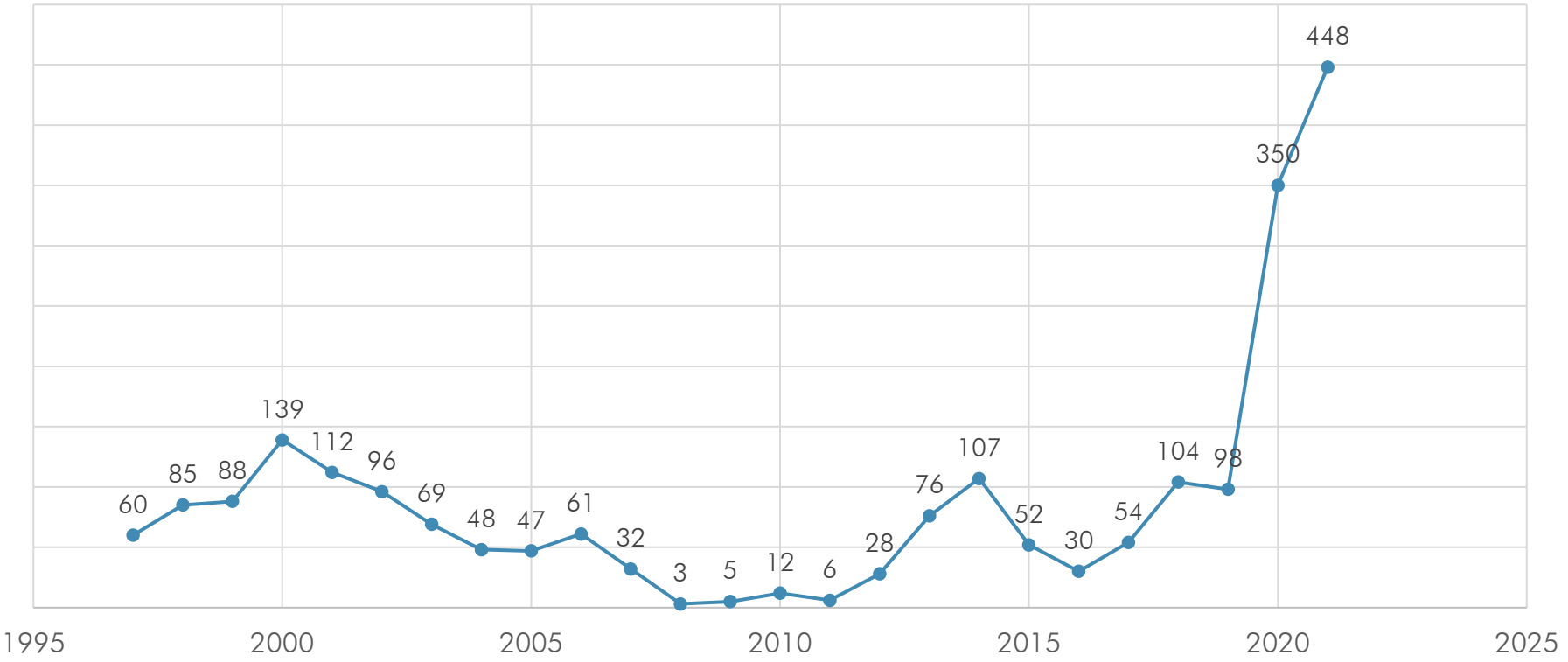
Other:

- Technical Manuals, Oak Wilt & Diseased Trees, Obstructions & Clearance, Nuisance, Utility
- Some cities include additional tree regulation measures for certain circumstances; these are usually supplemental to one of the main ordinances
- Example- Oak Wilt ordinances for central Texas cities that are heavily effected



Tomball's Growth

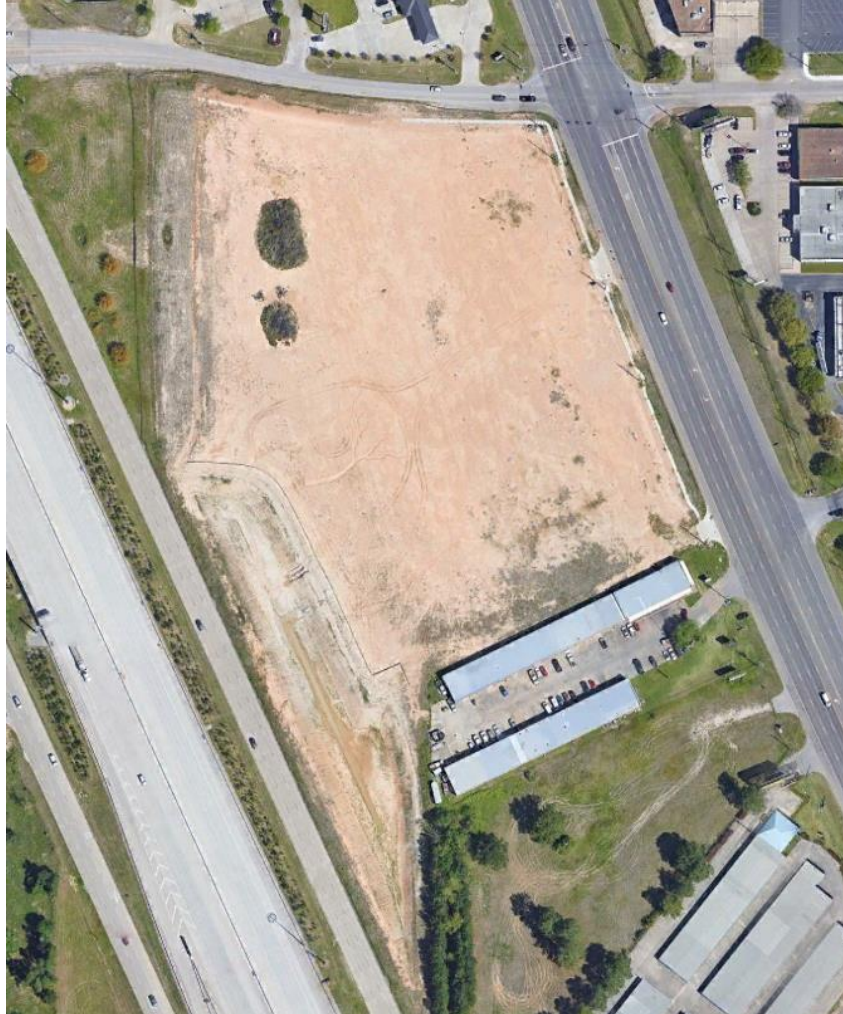
Tomball Single Family Home Building Permits



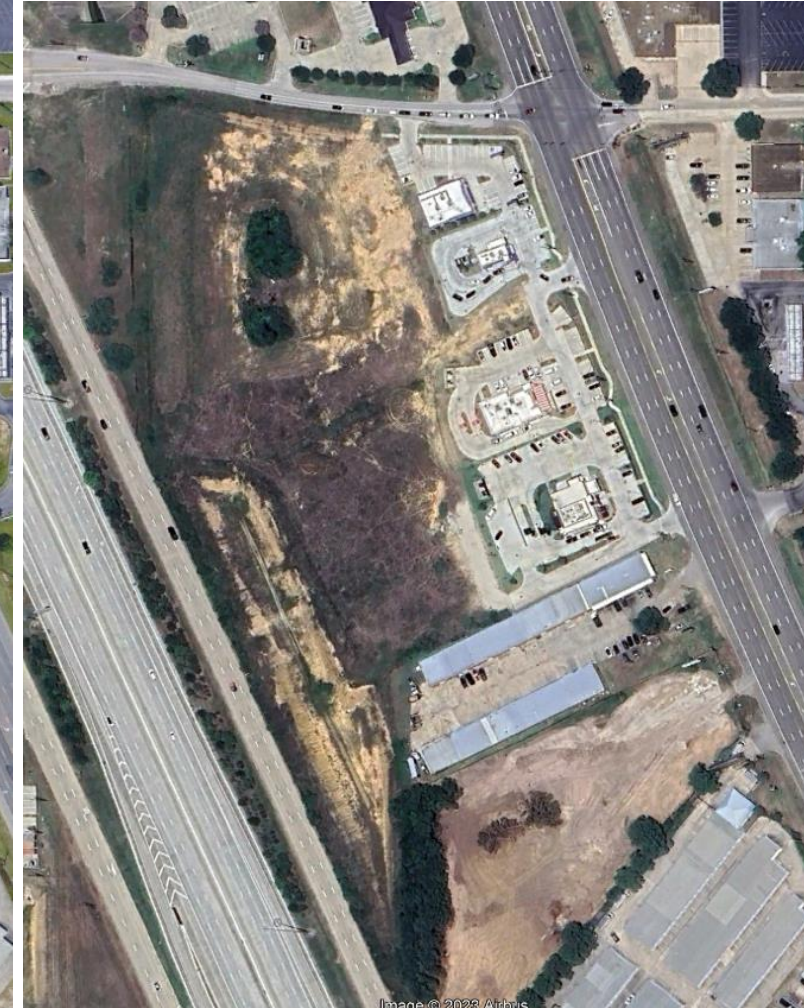
2017



2019



2023





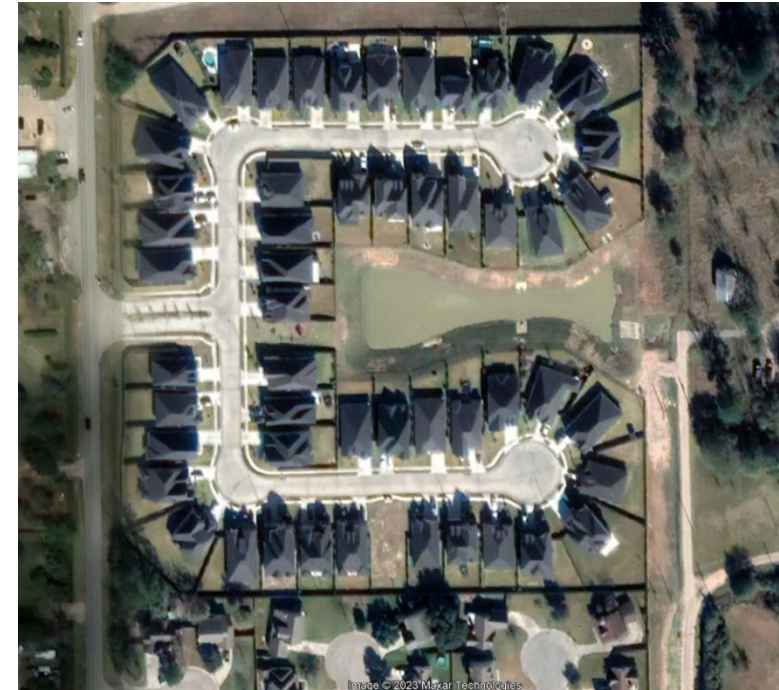
2017



2019



2022







2020

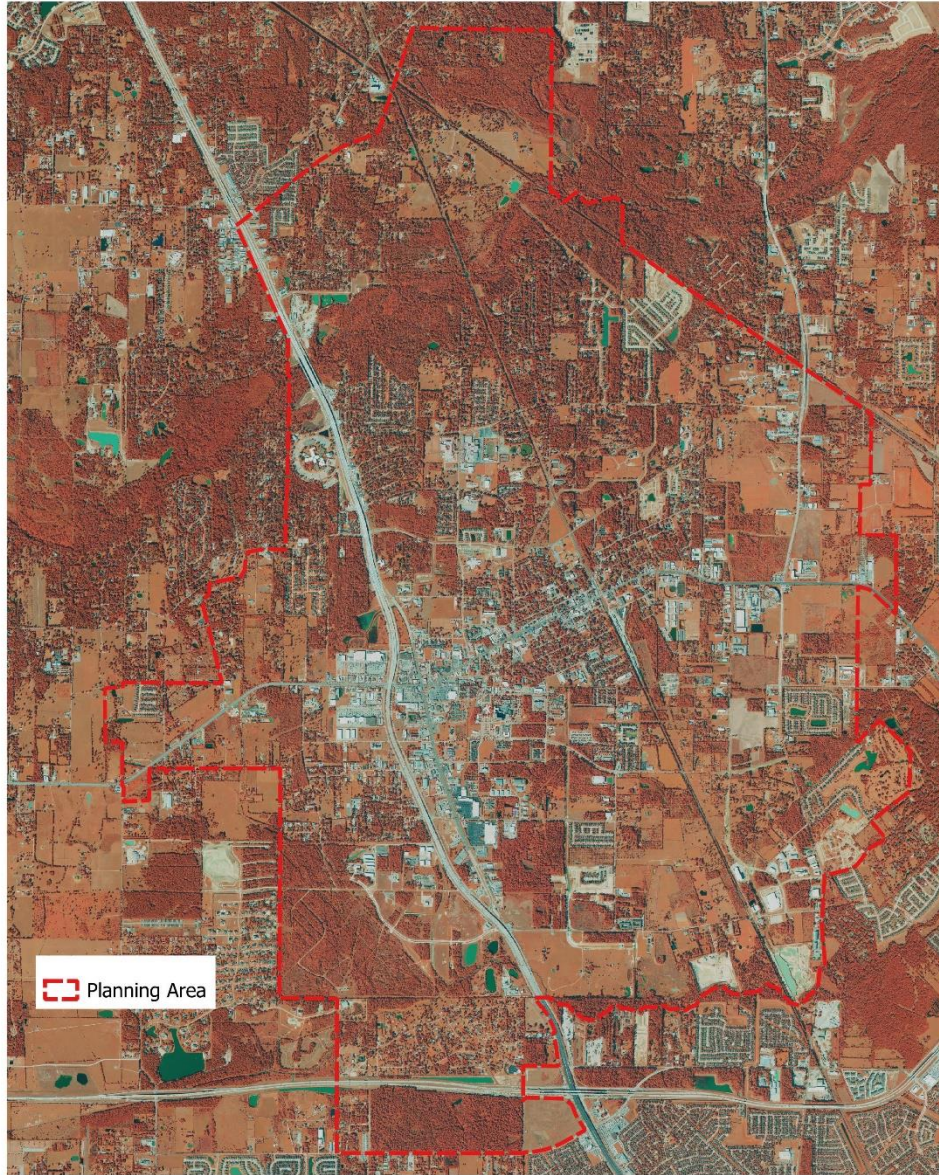


2023

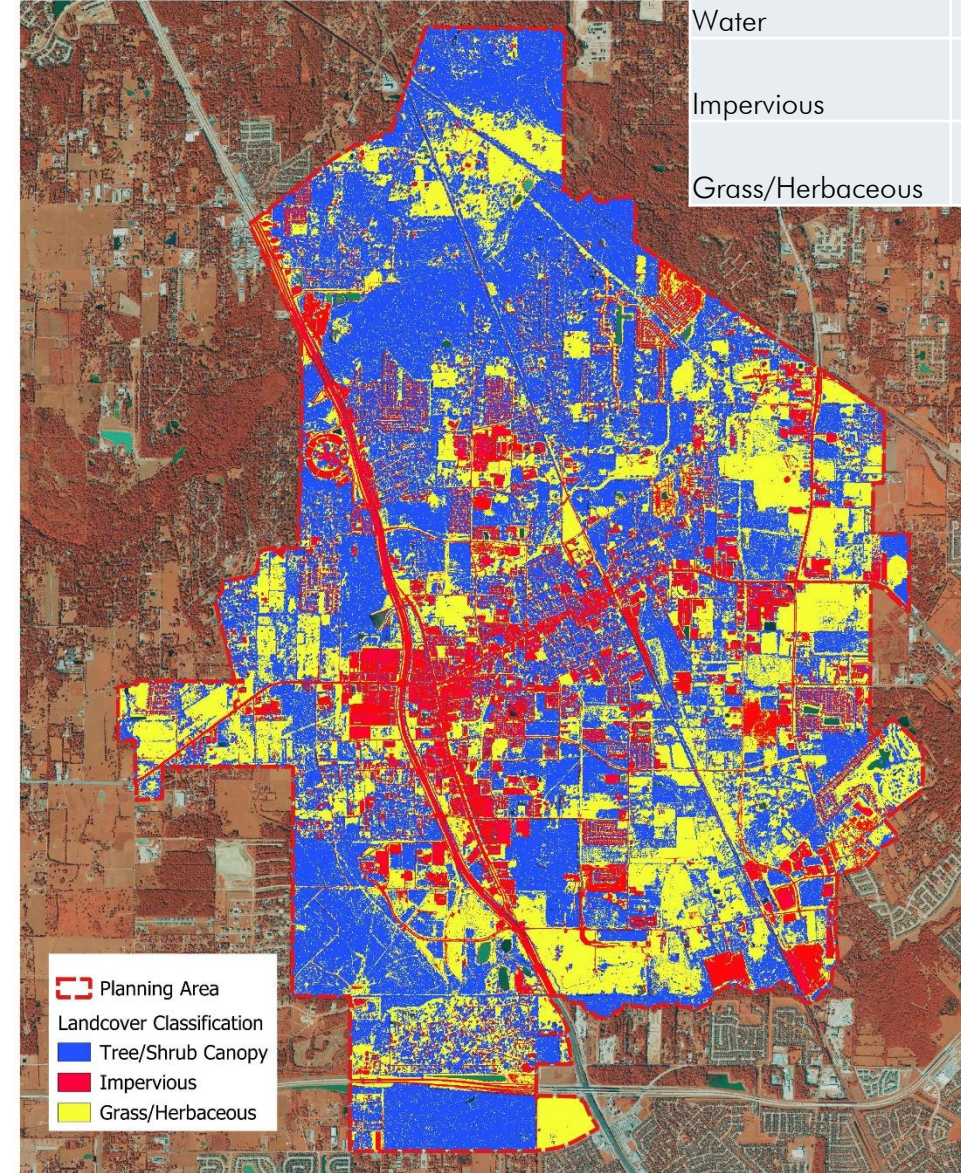


Baseline Landcover Classification Of Aerial Photography 2020

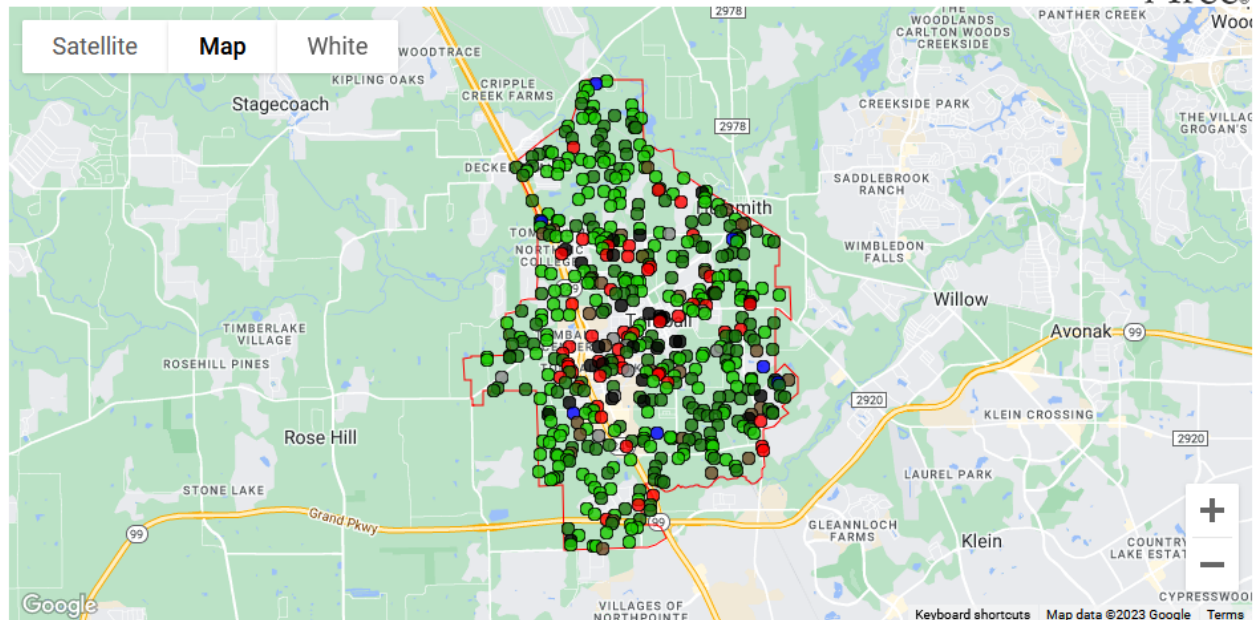
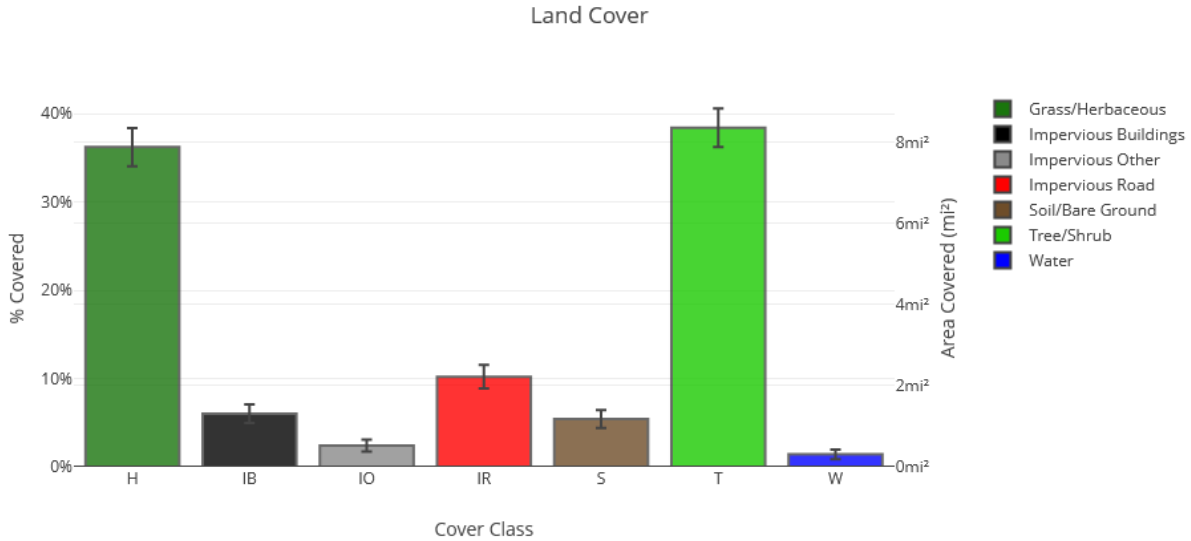
2020 Color Infrared Aerial Photography



Landcover Classification 2020 Color Infrared Aerial Photography



Tree/Shrub	47.78%
Water	2.75%
Impervious	16.38%
Grass/Herbaceous	33.08%



Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (mi²) ± SE
H	Grass/Herbaceous		181	36.20 ± 2.15	7.89 ± 0.47
IB	Impervious Buildings		30	6.00 ± 1.06	1.31 ± 0.23
IO	Impervious Other		12	2.40 ± 0.68	0.52 ± 0.15
IR	Impervious Road		51	10.20 ± 1.35	2.22 ± 0.30
S	Soil/Bare Ground		27	5.40 ± 1.01	1.18 ± 0.22
T	Tree/Shrub		192	38.40 ± 2.18	8.37 ± 0.47
W	Water		7	1.40 ± 0.53	0.31 ± 0.12
Total			500	100.00	21.80

38% Tree/Shrub Canopy

Ecosystem Services Provided by Tomball's Tree Canopy

Tree Benefit Estimates: Carbon (English units)

Description	Carbon (kT)	±SE	CO ₂ Equiv. (kT)	±SE	Value (USD)	±SE
Sequestered annually in trees	8.79	±0.50	32.25	±1.83	\$1,499,871	±84,956
Stored in trees (Note: this benefit is not an annual rate)	183.65	±10.40	673.37	±38.14	\$31,321,253	±1,774,103

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 1.051 kT of Carbon, or 3.852 kT of CO₂, per mi²/yr and rounded. Amount stored is based on 21.940 kT of Carbon, or 80.446 kT of CO₂, per mi² and rounded. Value (USD) is based on \$170,550.73/kT of Carbon, or \$46,513.84/kT of CO₂ and rounded. (English units: kT = kilotons (1,000 tons), mi² = square miles)

Tree Benefit Estimates: Air Pollution (English units)

Abbr.	Description	Amount (T)	±SE	Value (USD)	±SE
CO	Carbon Monoxide removed annually	3.41	±0.19	\$3,122	±177
NO2	Nitrogen Dioxide removed annually	25.07	±1.42	\$10,677	±605
O3	Ozone removed annually	156.30	±8.85	\$299,542	±16,967
SO2	Sulfur Dioxide removed annually	6.42	±0.36	\$1,026	±58
PM2.5	Particulate Matter less than 2.5 microns removed annually	8.36	±0.47	\$776,056	±43,957
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	58.93	±3.34	\$242,509	±13,741
Total		258.50	±14.64	\$1,333,021	±75,505

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in T/mi²/yr @ \$/T/yr and rounded: CO 0.408 @ \$914.78 | NO2 2.995 @ \$425.96 | O3 18.673 @ \$1,916.42 | SO2 0.768 @ \$159.63 | PM2.5 0.999 @ \$92,790.34 | PM10* 7.040 @ \$4,116.73 (English units: T = tons (2,000 pounds), mi² = square miles)

Ecosystem Services Provided by Tomball's Tree Canopy

Tree Benefit Estimates: Hydrological (English units)

Abbr.	Benefit	Amount (Mgal)	±SE	Value (USD)	±SE
AVRO	Avoided Runoff	88.27	±5.00	\$788,746	±44,676
E	Evaporation	398.32	±22.56	N/A	N/A
I	Interception	400.86	±22.71	N/A	N/A
T	Transpiration	1,034.37	±58.59	N/A	N/A
PE	Potential Evaporation	3,773.66	±213.75	N/A	N/A
PET	Potential Evapotranspiration	3,401.41	±192.66	N/A	N/A

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Hydrological Estimates are based on these values in Mgal/mi²/yr @ \$/Mgal/yr and rounded: AVRO 10.545 @ \$8,936.00 | E 47.586 @ N/A | I 47.890 @ N/A | T 123.573 @ N/A | PE 450.829 @ N/A | PET 406.358 @ N/A (English units: Mgal = millions of gallons, mi² = square miles)

About i-Tree Canopy

The concept and prototype of this program were developed by David J. Nowak, Jeffery T. Walton, and Eric J. Greenfield (USDA Forest Service). The current version of this program was developed and adapted to i-Tree by David Ellingsworth, Mike Binkley, and Scott Maco (The Davey Tree Expert Company)

Limitations of i-Tree Canopy

The accuracy of the analysis depends upon the ability of the user to correctly classify each point into its correct class. As the number of points increase, the precision of the estimate will increase as the standard error of the estimate will decrease. If too few points are classified, the standard error will be too high to have any real certainty of the estimate.



Additional support provided by:





Discussion