



PlanIT GeoTM

developers of TreePlotter

Tree Canopy Data Analysis, Software, and Incorporation into Management Planning & Policy

August 2023

How We See Our Role in the Cycle of Urban Greening





Vision, Strategy, Roadmap

PlanIT Geo's comprehensive and cohesive technology and data solutions will expedite nature-based urban greening for cities, communities, private sector, and property owners to equitably increase resilience to the effects of climate change, reduce extreme heat, and improve health and well-being.

Data Partnerships for Remote Sensing and Imagery Availability



AI and machine learning (ML) for national, off-the-shelf products:

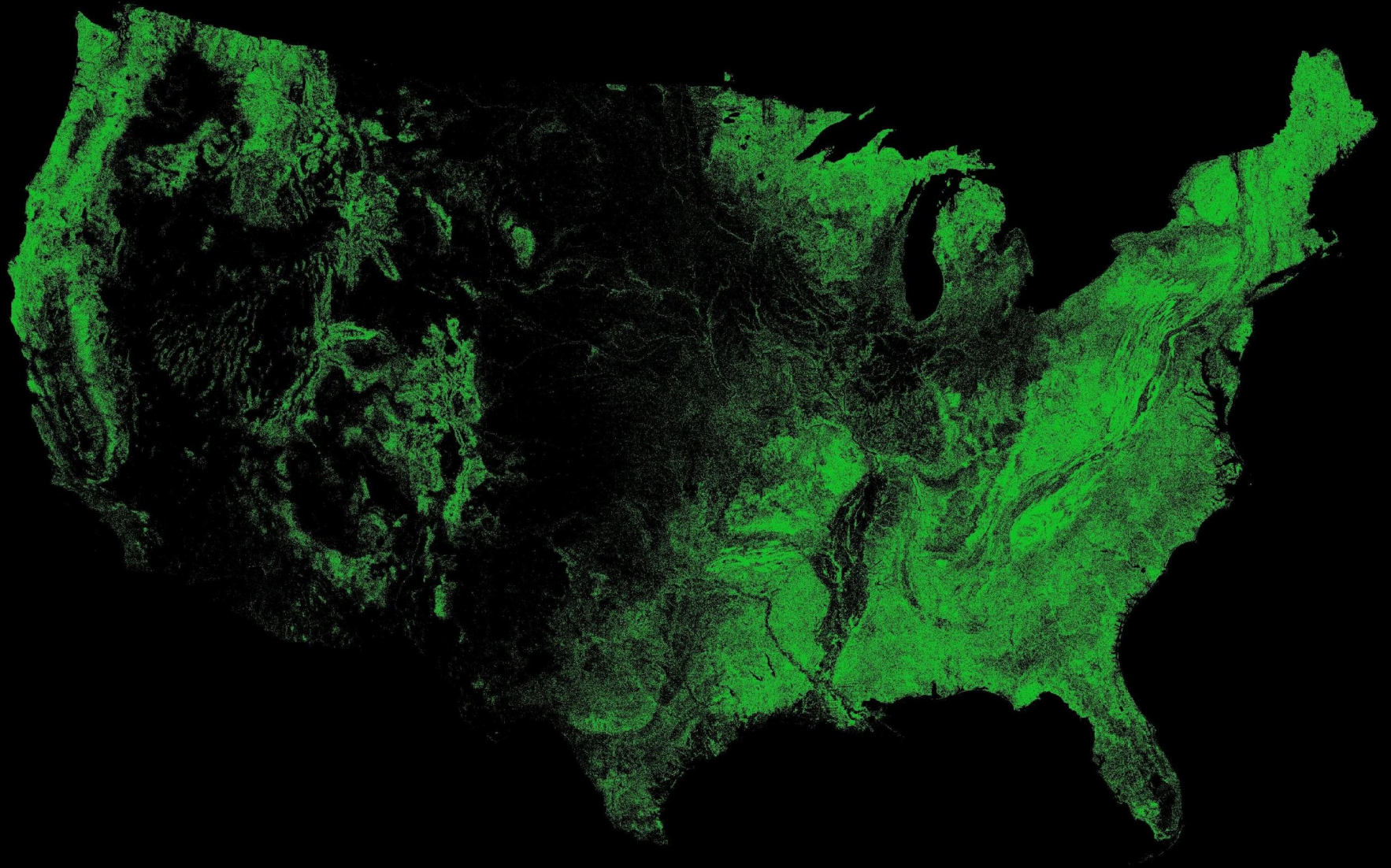
- 3D Building Footprints
- Tree Map
- Impervious Map
- Parking Lots
- Developed at 60cm or higher resolution
- NAIP + LiDAR



US Impervious Map (60 cm) / 3D Building Footprints / Parking Lots



US Tree Map (60 cm)

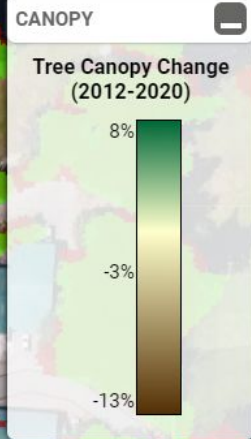


High Resolution Online Tree Canopy Change Over Time



- ESRI World Imagery
- Google Hybrid
- Google Satellite
- OpenStreetMap Light
- 2012 Tree Canopy (Red)
- 2020 Tree Canopy (Green)
- NAIP Aerial Imagery
- Land Cover (Add-On)
- Non-Canopy Vegetation (Add-On)

[Advanced](#)

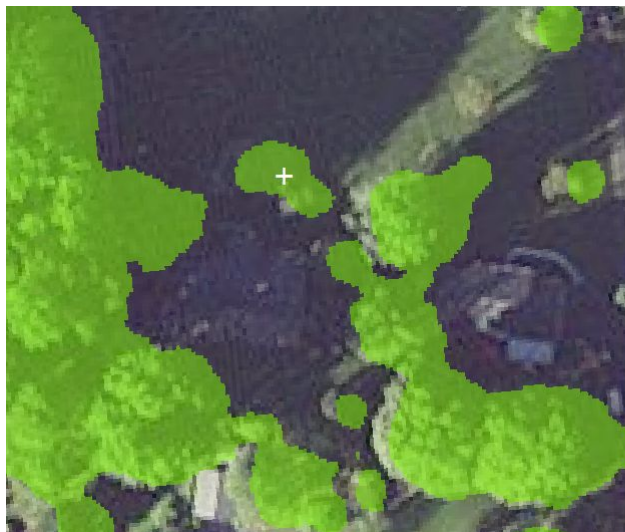


High Resolution Online Tree Canopy Change Over Time

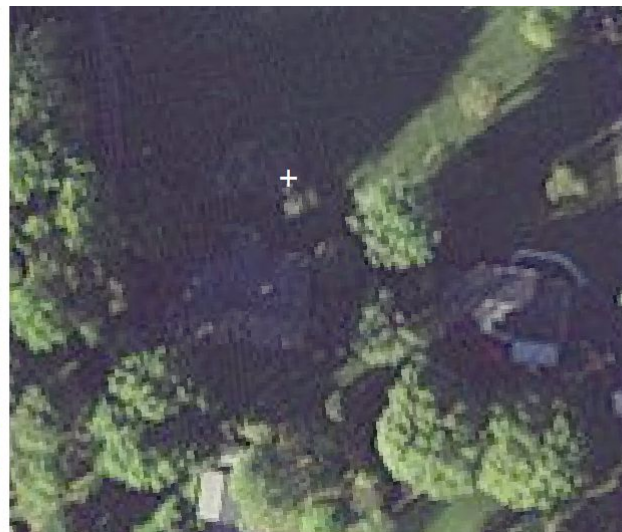


Seeing the Forest and the Trees

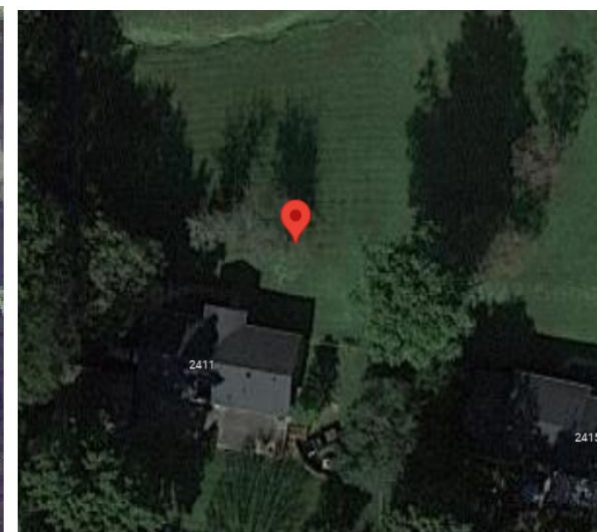
Tree Canopy



NAIP



Google Maps



Increasing Data Availability and Richness

- Tree canopy
- Full land cover
- Tree heights
- Plantable areas

Land cover including tree canopy updated continuously (every two years per NAIP)



Bentonville, AR: 1-meter NAIP and AI

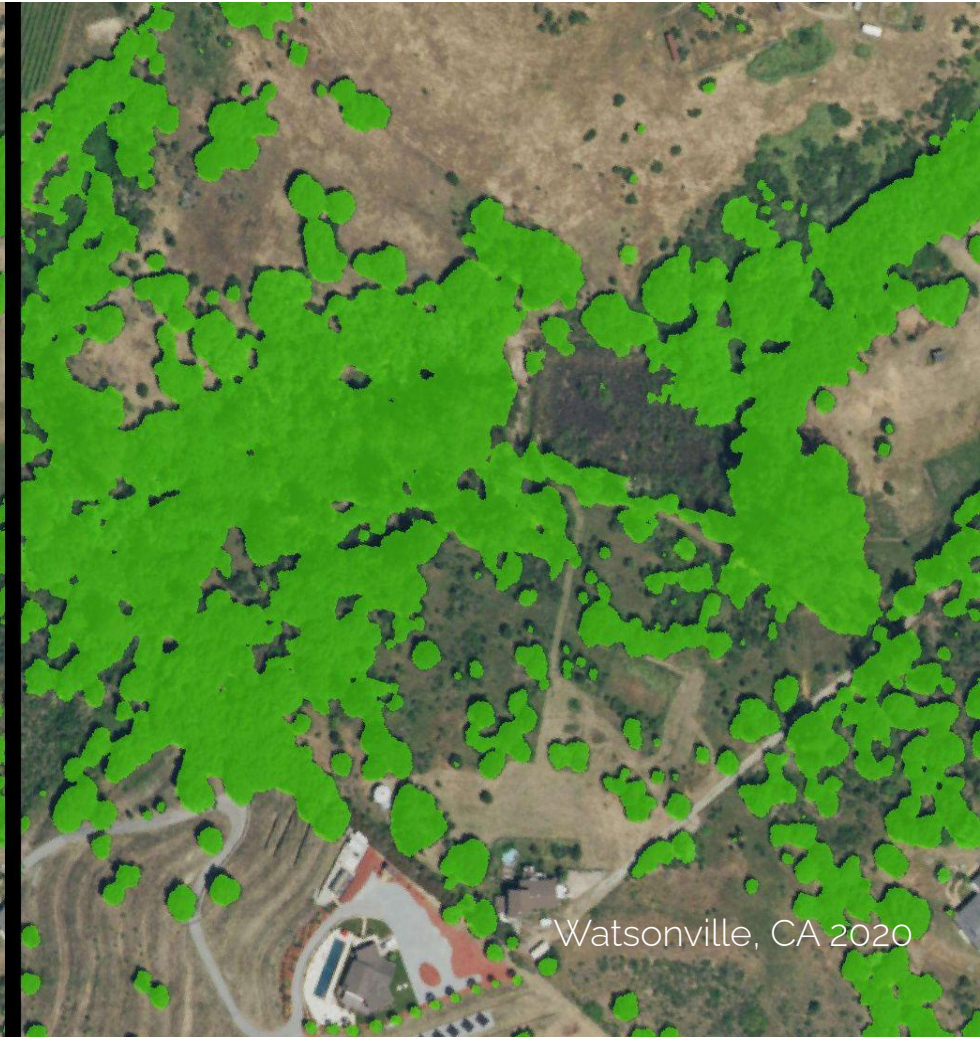


Bentonville, AR: 60cm NAIP and AI



AI

LiDAR



Watsonville, CA 2020

AI



LiDAR



Old Orchard Beach, ME 2021

Example Uses and Applications

1. Baseline for future trends analysis and projection of IRA funding impacts
2. Incorporate data into other tools and models
3. Overlay with socioeconomic/demographic data, schools, and more
4. Trends analysis by state, by city, by climate region
5. Create story maps
6. Prioritize funding, outreach, and messaging based on hard data (existing canopy, gain or loss in canopy, impervious area, etc.)
7. Much more...

Local and National Project Examples

City of Vienna, VA Tree Inventory

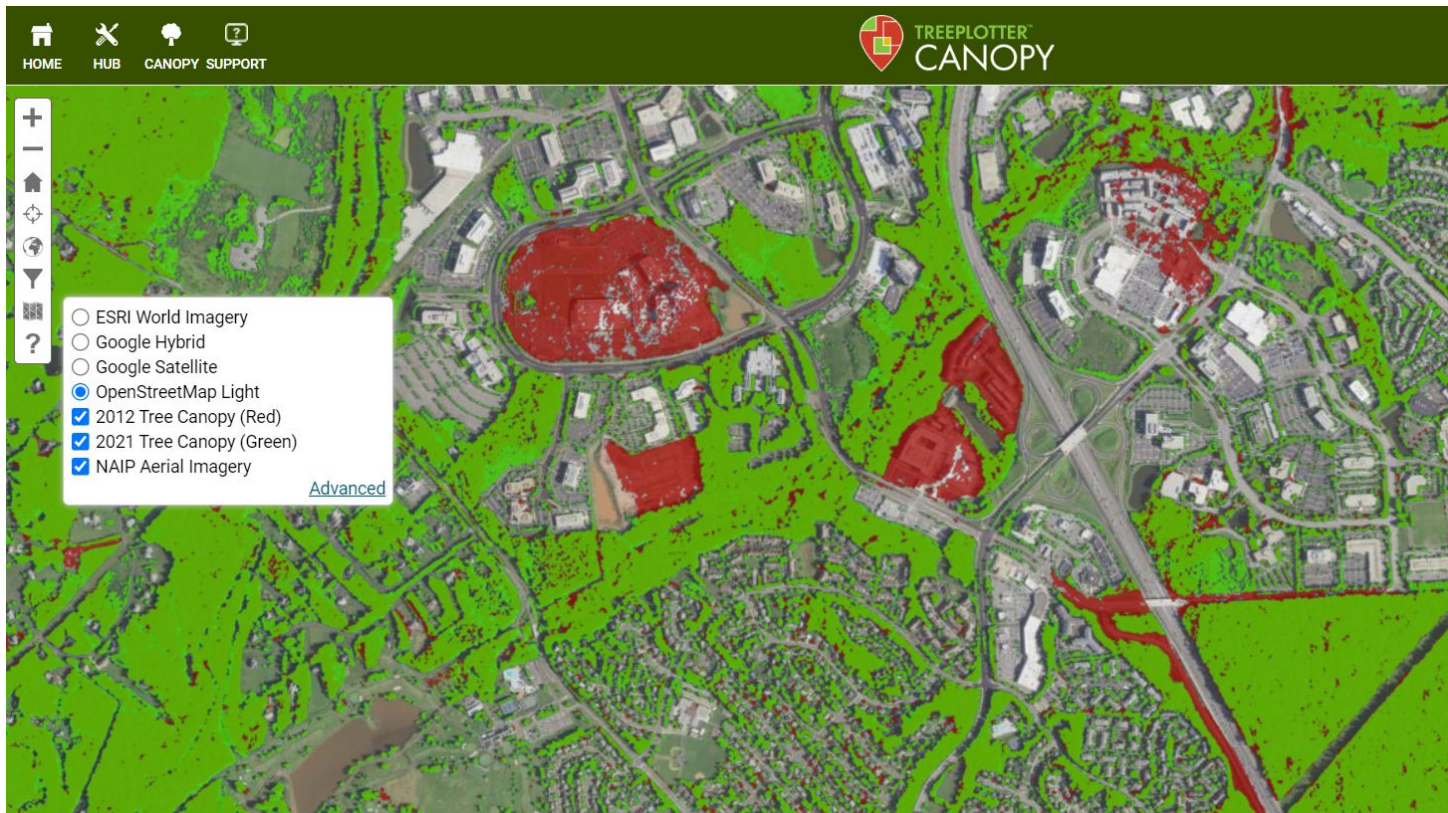
- Explore species, size, land use, and more
- <https://pg-cloud.com/ViennaVA/>

The screenshot displays the Treeplotter Inventory web application interface for Vienna, VA. The interface is divided into several sections:

- Navigation Bar:** Located at the top, it includes icons for 'HUB', 'DATA', and 'SUPPORT', and the 'TREEPLOTTER INVENTORY' logo.
- Map:** The central area shows a map of Vienna, VA, with tree locations marked as colored dots. The dots are color-coded by land use: Multi Family (green), Park/ Vacant/ Other (light green), Single Family (orange), Small Commercial (red), and Not Specified (white). The map is overlaid with a blue boundary and a grid of quadrants.
- Advanced Filter Panel:** Located on the left, it allows users to apply filters to various tools. It includes an 'APPLY' button, a 'Global Filter Settings' link, and a 'TREES' filter section. The 'TREES' filter is currently active, and the 'DBH' field is selected for filtering. The 'DBH' filter is set to 'RANGE' with a minimum value of 1 and a maximum value of 68. There are also 'ADDRESS' and 'COMMON NAME' filters, which are currently not selected.
- Legend Panel:** Located on the right, it provides information about the current view. It shows the 'Layer' is 'Trees', 'Display by' is 'Land Use', and 'Symbology' is 'None'. It also indicates that 2,000 of 9,251 sites are shown. The legend includes a 'Toggle All' button and a list of categories with their respective counts: Multi Family (215), Park/ Vacant/ Other (3,510), Single Family (5,064), Small Commercial (455), and Not Specified (4).
- Charts Panel:** Located at the bottom right, it provides a visual representation of the data. It includes a 'Layers' section with a list of categories and their counts: Parcels, Road Centerlines, Town Boundary, Sidewalks, Quadrants, Right of Way, Trails, and Non Residential Buildings.

Fairfax County, VA and Prince George's County, MD (underway)

- Countywide 60cm land cover analysis, tree canopy change analysis (2-year repeat cycle), and decision support tools
- Contact the counties for further information



Fairfax County, VA Research by Virginia Tech

- >1,000 parcels being studied for effectiveness of tree preservation ordinance over a 10-year period.



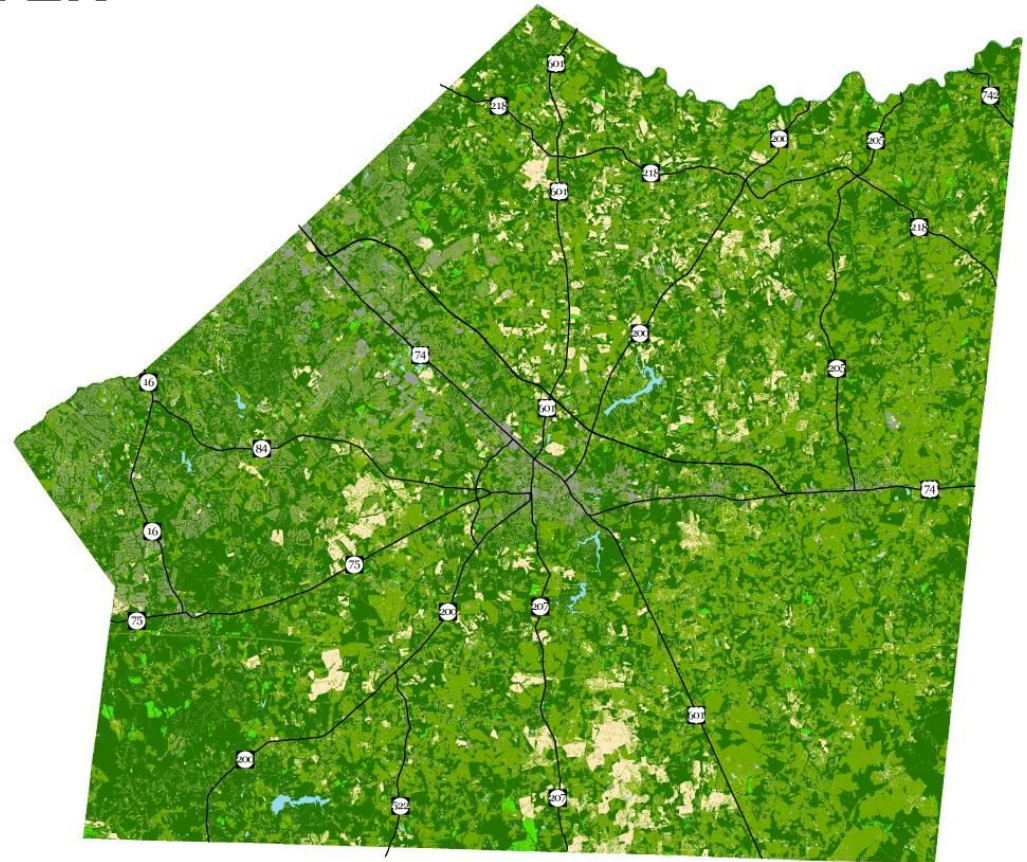
Union County, NC



Union County Land Cover Analysis

CANOPY & LAND COVER ANALYSIS

- County planners conducted further internal analysis of the data using age of development and lot size.



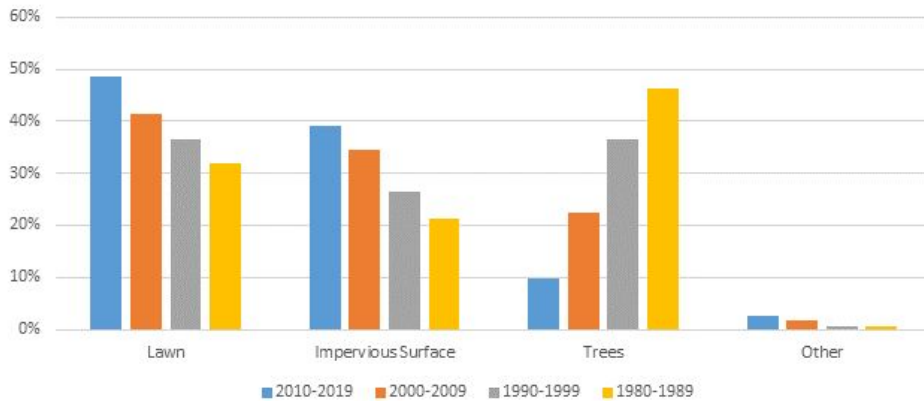
Percent Change in Canopy

Union County, NC

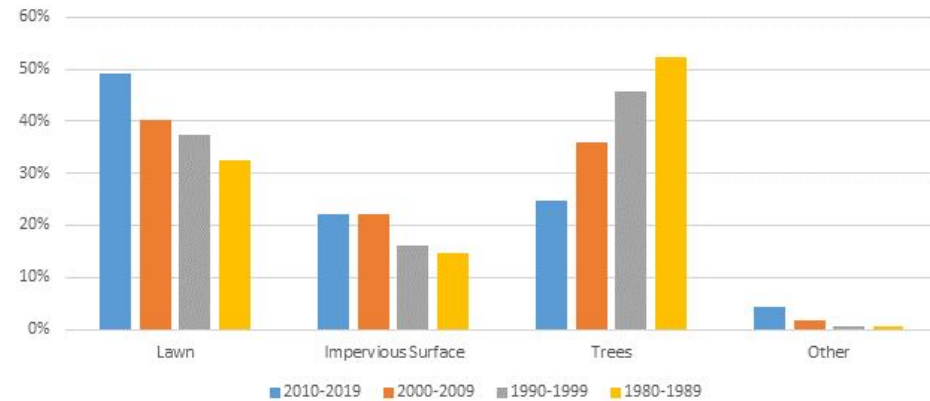


Union County Land Cover Analysis

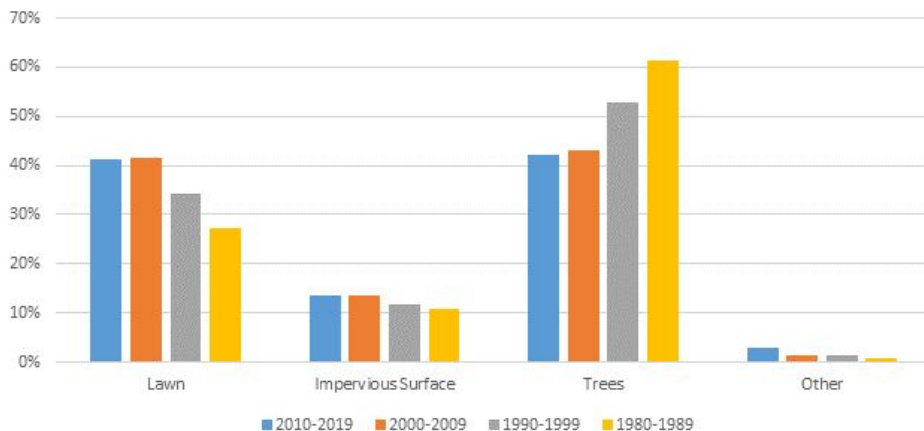
Land Cover on Residential Lots up to a Half Acre by Year Built (32,935 Lots)



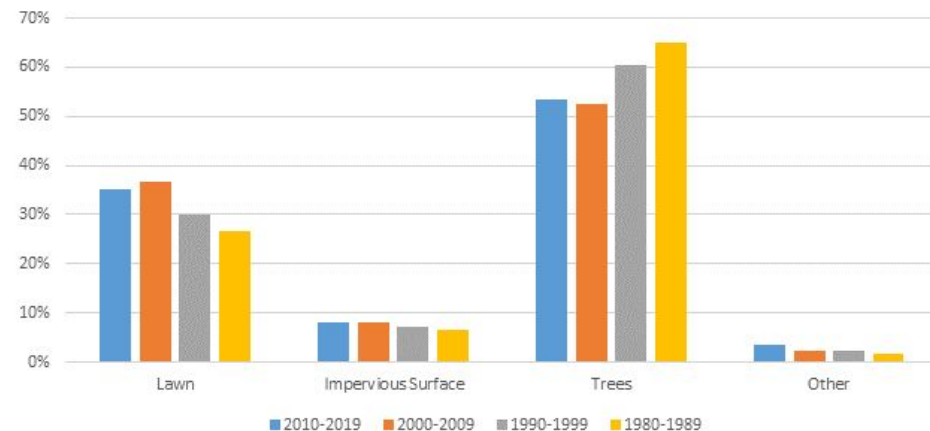
Land Cover on Residential Lots Between a Half and One Acre by Year Built (12,167 Lots)



Land Cover on Residential Lots Between One and Two Acres by Year Built (7,219 Lots)



Land Cover on Residential Lots Between Two and Five Acres by Year Built (4,450 Lots)

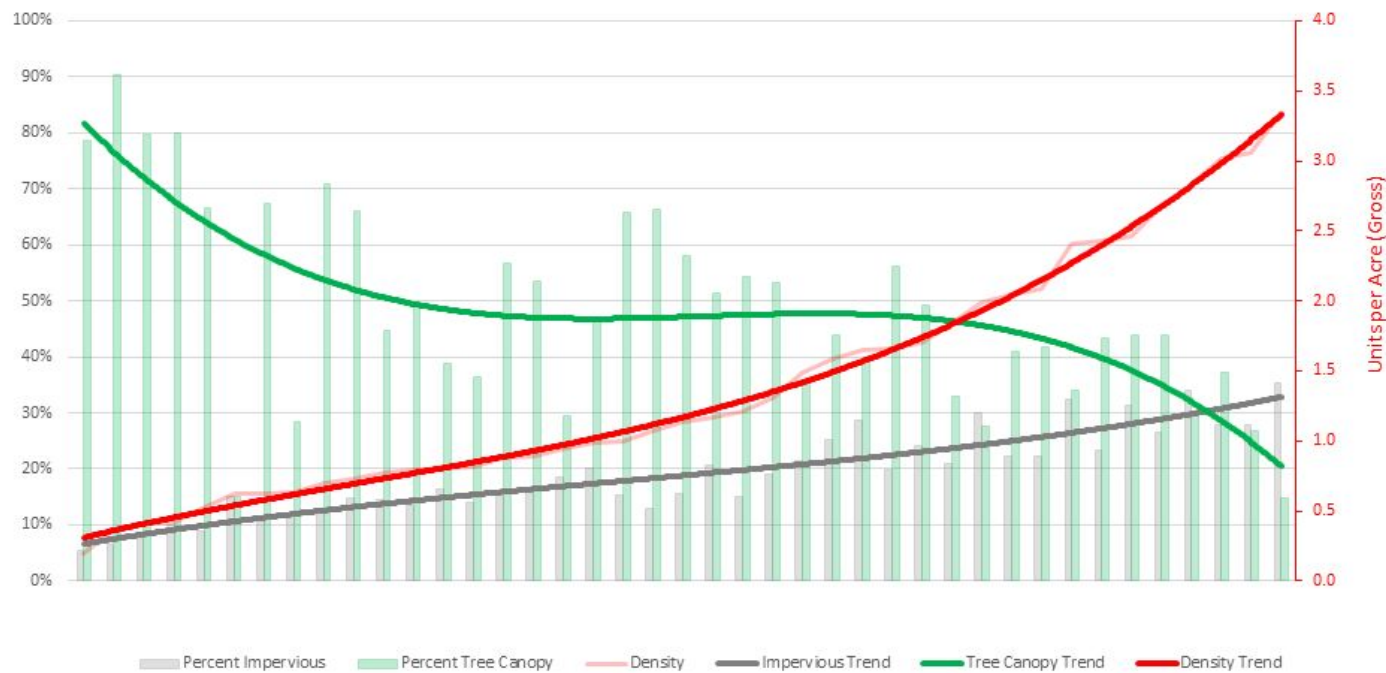


Union County, NC



Union County Land Cover Analysis

Relationship Between Density and Landcover in Union County Residential Subdivisions of 25 or More Lots and 20 Years or Older



Lots: 4,639
Subdivisions: 41
Largest: Brandon Oaks (1,300+ units)
Oldest: College Grove (1969)
Newest: Several (2000)

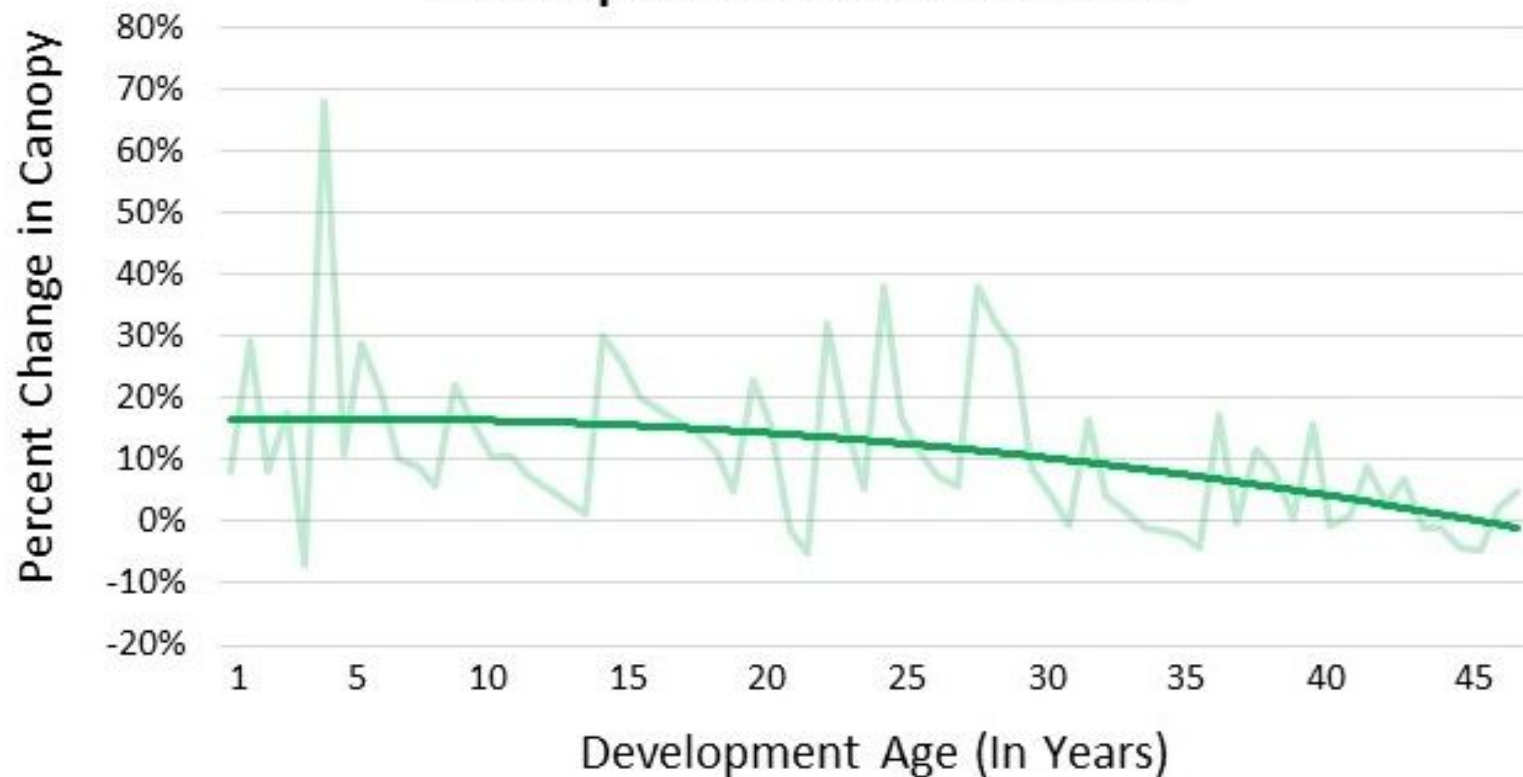
Density Increases

Union County, NC



Union County Land Cover Analysis

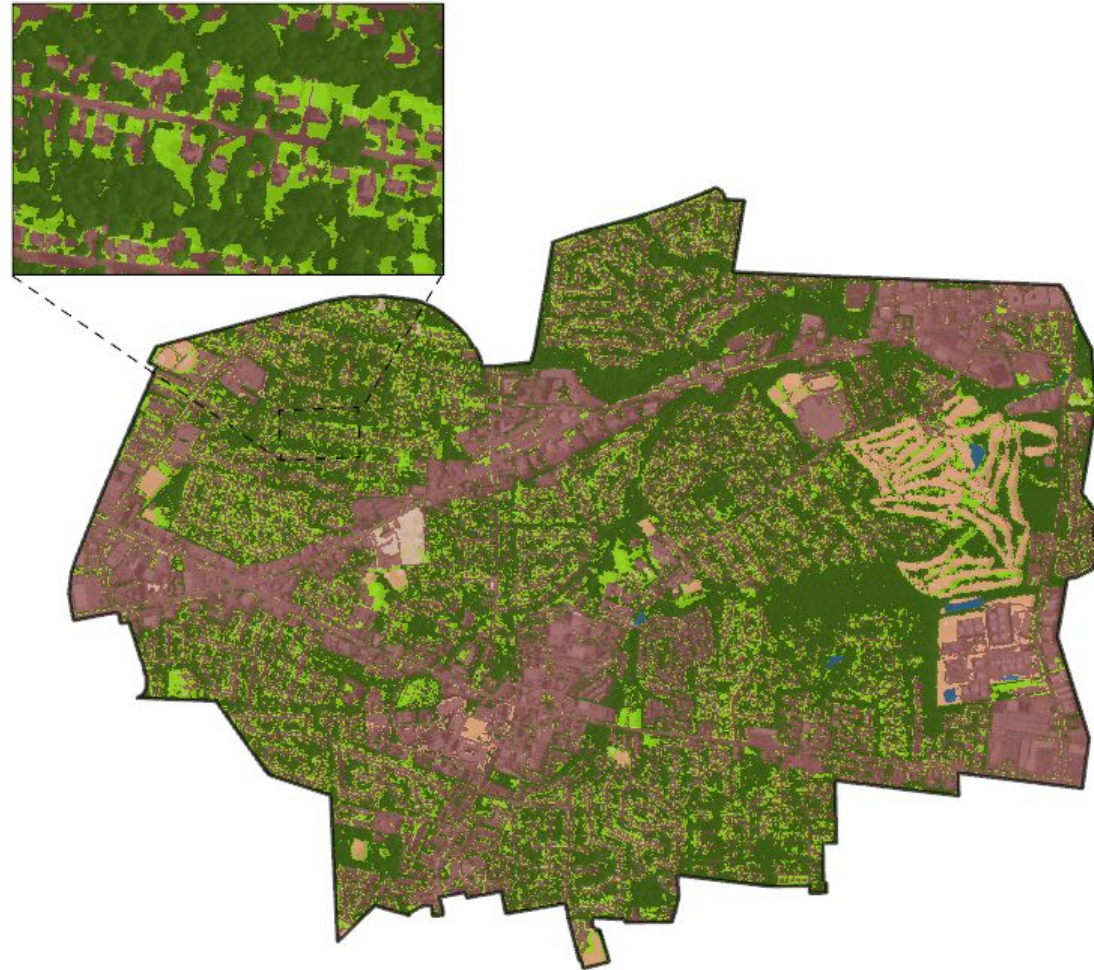
Change in Percent Tree Canopy for Residential Developments from 2014-2020



City of Fairfax, VA



- Urban tree canopy assessment
- Provided UTC, PPA, and Change
- 5% increase from 2012 to 2021
- Highlights concerns for the “quality” of canopy cover

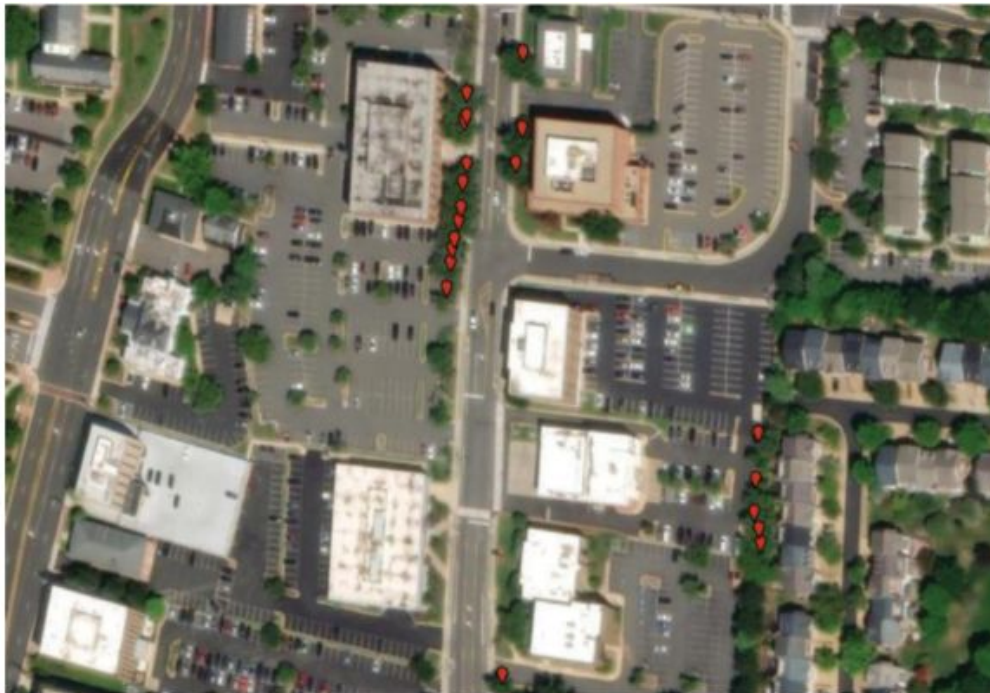


City of Fairfax, VA



QUALITY OF TREE CANOPY IN FAIRFAX

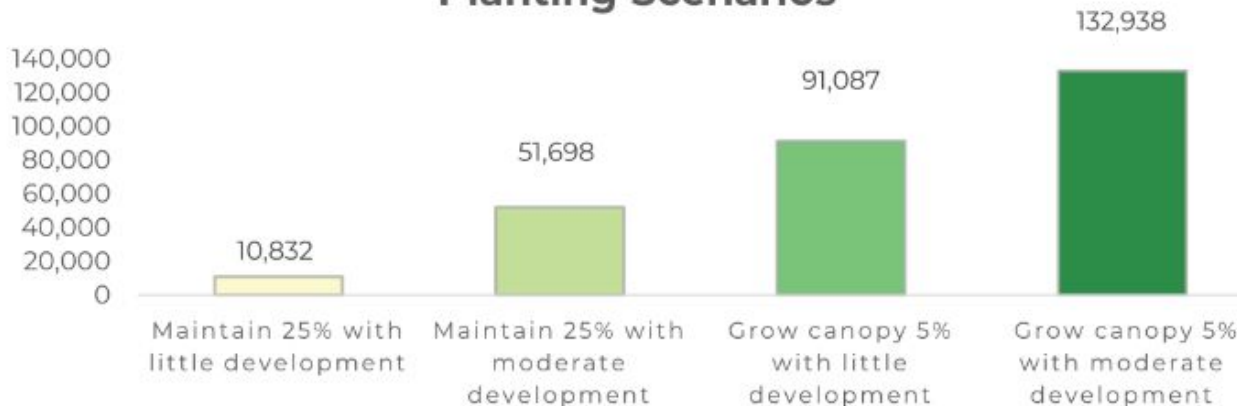
- Inventory data can help to identify “canopy quality”



CANOPY GROWTH SCENARIOS AND GOAL SETTING

- Results can be used to paint a picture of the future and forecast potential planting needs.

Total Number of Trees Required for Possible Planting Scenarios



Planting **1,915 trees per year** will maintain the citywide canopy cover if there is moderate development, and any additional plantings will increase citywide canopy.

Charlottesville, VA



CANOPY GROWTH SCENARIOS AND GOAL SETTING

Scenario	Goal	Estimated Citywide UTC % in 2023	Planting Required		Net Tree Canopy Change		Citywide UTC % in 2050	
			Total	Annual	Acres	%	Acres	%
Business as Usual Planting Trends	Calculate the citywide canopy % in 2050 if the City continues to plant approx. 500 trees a year for the next 27 years.	38%	13,492	500	-889	-13%	1,761	25%
Maintain Existing UTC %	Calculate the number of tree plantings required to maintain 38% canopy cover over the next 27 years.	38%	69,431	2,572	5	0%	2,655	38%
Attainable Growth	Calculate the number of tree plantings needed to grow the citywide canopy to 45% by 2050.	38%	99,806	3,697	491	7%	3,141	45%
Aggressive Growth	Calculate the number of tree plantings needed to grow the citywide canopy to 50% by 2050.	38%	121,504	4,500	837	12%	3,487	50%



CHARLOTTESVILLE, VIRGINIA



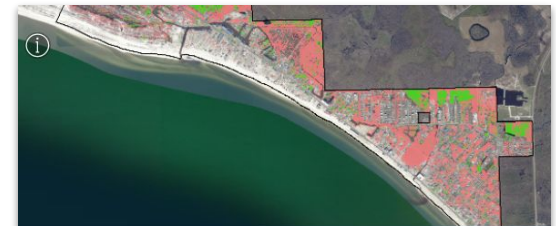
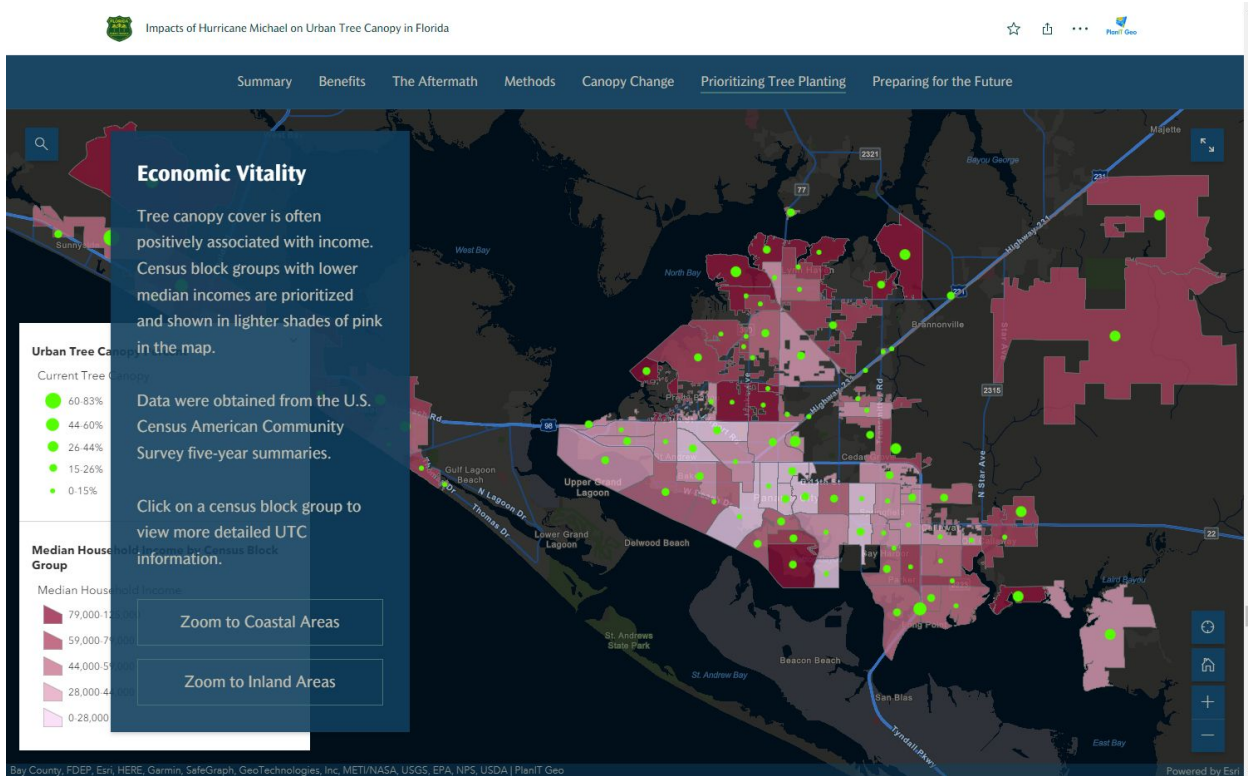
7,006	TOTAL ACRES
6,980	LAND ACRES
46,553	RESIDENTS

ANNUAL TREE PLANTING REQUIRED FOR EACH SCENARIO



500	BUSINESS AS USUAL
2,572	MAINTAIN EXISTING UTC %
3,697	ATTAINABLE GROWTH
4,500	AGGRESSIVE GROWTH

Related Example - Story Map: Hurricane Michael Canopy Loss



Mexico Beach, FL

Mexico Beach had 42% tree canopy cover in 2017 and 15% in 2019. This represents a 27% decrease due to Hurricane Michael and other natural or development impacts. \$2,313,645 of ecosystem service benefits provided by trees were lost. Mexico Beach has 35% possible planting area.

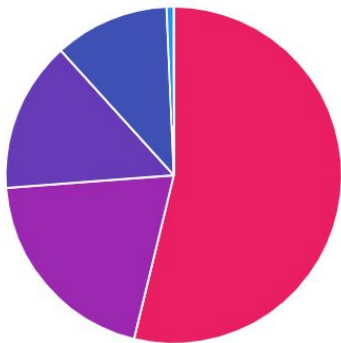
On-the-Ground Examples

Process Driven Canopy Management Plans

✓ Identify Issues, Create Management Plans

145 Trees / Low Species & Age Diversity

Common Name	Count	Percent
Honeylocust	106	73.10%
Tree of Heaven	14	9.66%
Mulberry	9	6.21%
Siberian elm	5	3.45%
Eastern redbud	3	2.07%
Desert willow	3	2.07%
Callery pear, Bradford Pear	2	1.38%
Russian olive	2	1.38%
New Mexico olive	1	0.69%

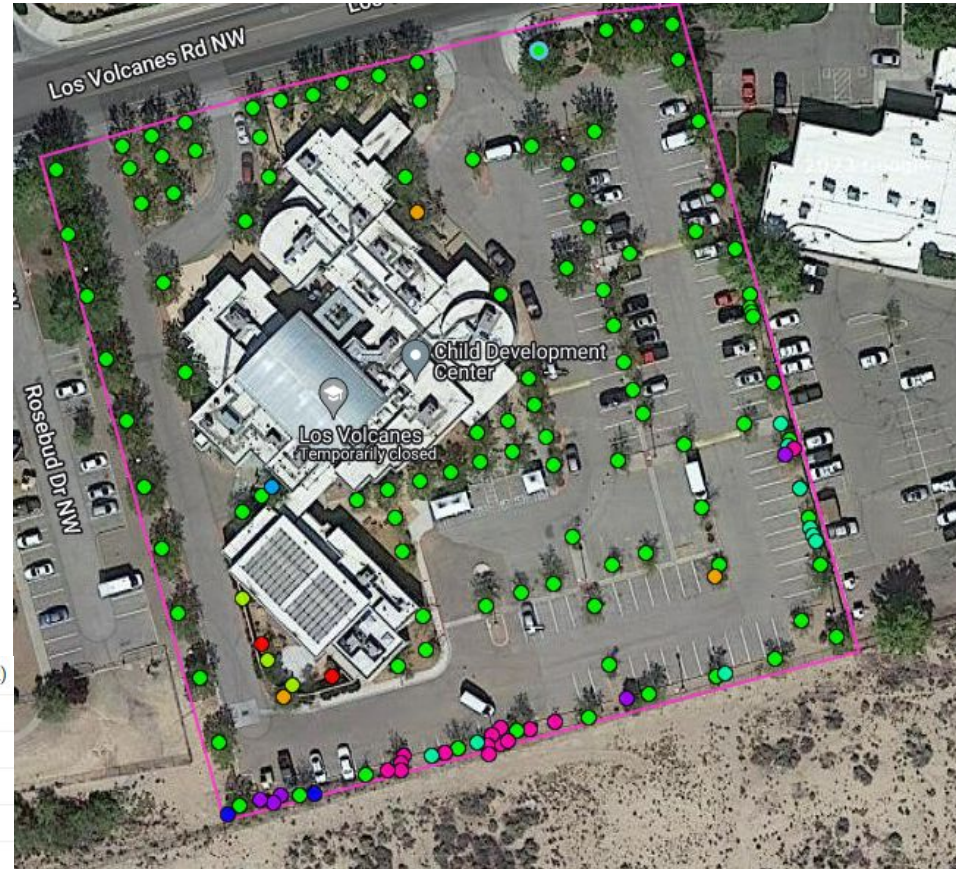


DBH Range

6-12in	53.8%
0-3in	20.0%
12-18in	14.5%
3-6in	11.0%
18-24in	0.7%

Species

Callery pear, Bradford Pear (2)
Desert willow (3)
Eastern redbud (3)
Honeylocust (106)
Mulberry (9)
New Mexico olive
Russian olive (2)
Siberian elm (5)
Tree of Heaven (14)



Process Driven Canopy Management Plans



Data Drive Planting Plans: Richland Hills Park



Parks: Richland Hills	
Urban Tree Canopy (2011)	0%
Urban Tree Canopy (2016)	0%
Urban Tree Canopy (2018)	9%
Urban Tree Canopy (2020)	17%
Tree Canopy Change (2011-2016)	0%
Tree Canopy Change (2011-2018)	9%
Tree Canopy Change (2011-2020)	17%
Tree Canopy Change (2016-2020)	17%
Tree Canopy Change (2018-2020)	8%
Tree Canopy Change (2016-2018)	9%
Total Possible Planting Area	58%

Parks: Richland Hills	
Urban Tree Canopy (2011)	0%
Urban Tree Canopy (2016)	0%
Urban Tree Canopy (2018)	9%
Urban Tree Canopy (2020)	17%
Tree Canopy Change (2011-2016)	0%
Tree Canopy Change (2011-2018)	9%
Tree Canopy Change (2011-2020)	17%
Tree Canopy Change (2016-2020)	17%
Tree Canopy Change (2018-2020)	8%
Tree Canopy Change (2016-2018)	9%
Total Possible Planting Area	58%
Hypothetical Canopy	27%
Trees needed	14

Desert willow	62.3%
Honeylocust	15.1%
Arizona ash...	7.5%
Eastern red...	5.7%
Purple Leaf ...	1.9%
Bur oak	1.9%
Black locust	1.9%
Callery pear...	1.9%
Common c...	1.9%

Assumptions:

- 1) Increase Canopy 10%
- 2) Average Crown Diameter 30 ft
- 3) Mortality Rate 3%

Process Driven Canopy Management Plans



Data Drive Planting Plans: Richland Hills Park



***54 Trees / 34 Potential Planting Locations ***

Climate-Ready Trees for Albuquerque



Species

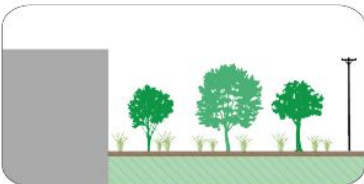
- Arizona ash, Velvet ash (4)
- Black locust
- Bur oak
- Callery pear, Bradford Pear
- Common chokecherry
- Desert willow (33)
- Eastern red cedar (3)
- Honeylocust (8)
- Invalid Label
- Purple Leaf Plum
- Not Specified (34)



Location Type 3 - Public Recreation, Residential, or Commercial Places
- Lawn or High Irrigation -



Location Type 4 - Public Recreation, Small-Large Residential, or Commercial Places
- Xeriscape or Low to Medium Irrigation -



Where does the community want trees?

Community Engagement

Downtown Albuquerque Volunteer Tree Inventory Efforts

October 2022 - Present

2,917 Trees / Possible Planting Sites Identified

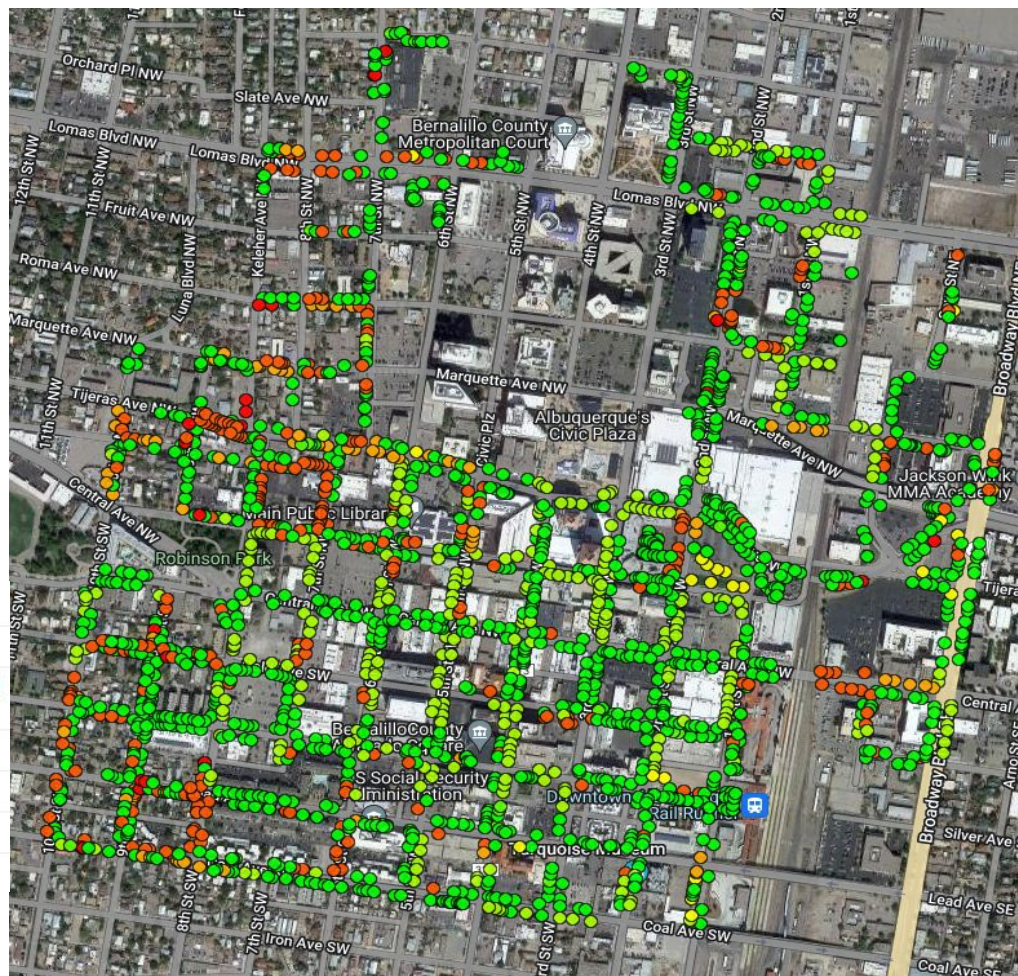
Add Tree Type

Choose a Type

No Template
Volunteer Use: Tree
Volunteer Use: Stump
Volunteer Use: Planting Site - Large
Volunteer Use: Planting Site - Medium
Volunteer Use: Planting Site - Small
Volunteer Use: Dead
City Use: Tree
City Use: Stump
City Use: Planting Site - Large
City Use: Planting Site - Medium
City Use: Planting Site - Small
Volunteer Use: Planting Site with Concrete Removed

Status

- Alive (1,794)
- Dead (25)
- Possible Planting with Concrete Removed (483)
- Proposed Site - Large (37)
- Proposed Site - Medium (117)
- Proposed Site - Small (420)
- Stump (41)



Questions? Thank you!

Ian Hanou

CEO & Founder

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Warning: Shameless Plug! (1 of 2)



planitgeo.com/treesandtech/

Warning: Shameless Plug! (2 of 2)

The screenshot shows the CommuniTREE Collective website interface. At the top left is the logo, a stylized tree with green and orange leaves, next to the text "CommuniTREE Collective". To the right of the logo is a user profile for "IanHanou" with a dropdown arrow, a "+ Create" button, and notification icons for 2 and 1 items. Below the header is a navigation menu with links for Directory, Connect, Forum, Education, Blogs, Resource Library, and Events, along with a "More" menu icon. A search bar is located on the right side of the navigation menu. The main content area is divided into several sections: a "Home" breadcrumb, a "Unread Content" indicator, a "Next Step: Complete CommuniTREE Public Profile & Set your Display Name" notification with a "Complete My Profile" button and a "Dismiss" button, and a "Member Statistics" section showing 986 Total Members and 91 Most Online. The "Member Statistics" section also features a "NEWEST MEMBER" badge for Bob Love, who joined Saturday at 09:33 PM. Below the statistics is a "Forums" section with a "Start new topic" button. On the right side, there is an "Activity Stream" section featuring a post titled "Tree Equity: Resident-focused Urban Forestry - Jake Simon" with a profile picture of Jake Simon and a post image of a tree with circuitry. The post was made 16 hours ago in the "Trees + Tech Summits" category.

communitree.planitgeo.com/