



Sustaining Georgia's Green Legacy

November 9, 2019

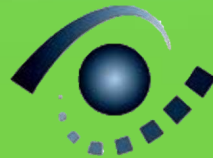
# The Importance of Urban Nature

Presented By:

Amanda D. Aragón

Eric Kuehler

Cassandra Johnson Gaither



U.S. FOREST SERVICE  
Caring for the land and serving people

United States Department of Agriculture

**Southern  
Research Station**



# Atlanta Greenspace Projects

**1** Atlanta BeltLine

**2** Urban Foraging

**3** Vacant Property

**Q&A** Discussion



# Atlanta's Commitment To **Green** Infrastructure

## City Involvement and Feedback

City is committed to developing sustainably while recognizing the importance of social justice

### > Why **This Research?**

- **City is expanding the number of public parks**
- **Atlanta BeltLine is on track to be completed by 2022**
- **Urban farms have proliferated across the city**



Record  
Housing  
Conditions



Survey  
Community



Conduct  
Ecological  
Assessment



Document  
Findings



# Overview of Atlanta BeltLine



01

## Atlanta BeltLine Survey

- A baseline housing survey to systematically record and quantify the structural conditions of homes adjacent to the Westside BeltLine.

Green Infrastructure  
Addressing Social Needs



# Atlanta Westside Beltline



Atlanta GA

## Urban Forestry and Green Spaces

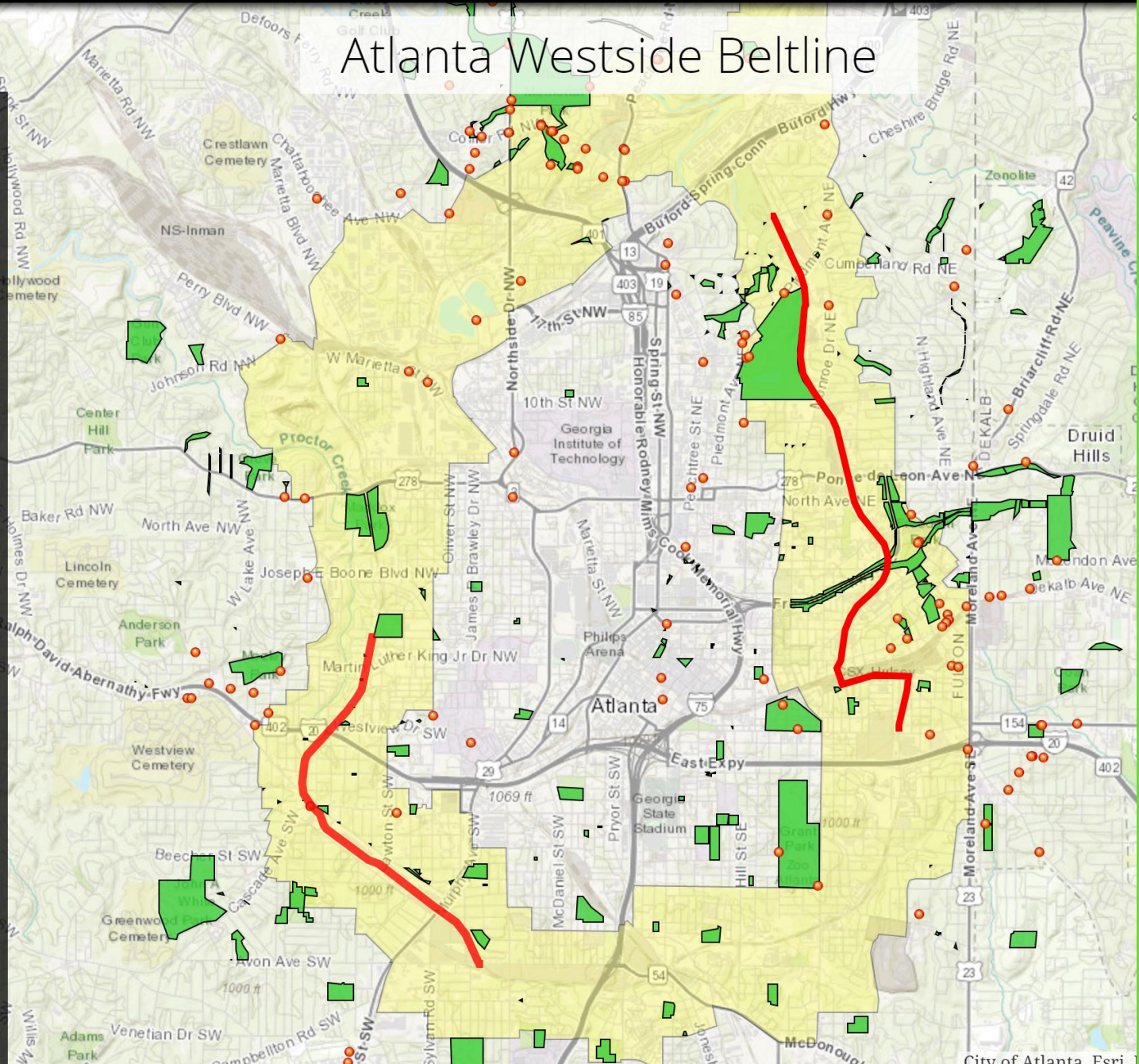
Atlanta is among one of the fastest growing cities in the nation with a booming increase in population and urban developments. There is a need for sustainable infrastructure that includes environmental, social economic, and transportation management. The installation of the Atlanta BeltLine provides walking and bicycling access to thousands of businesses and homes.



**Southern Research Station**

USDA FS Southern Research Station

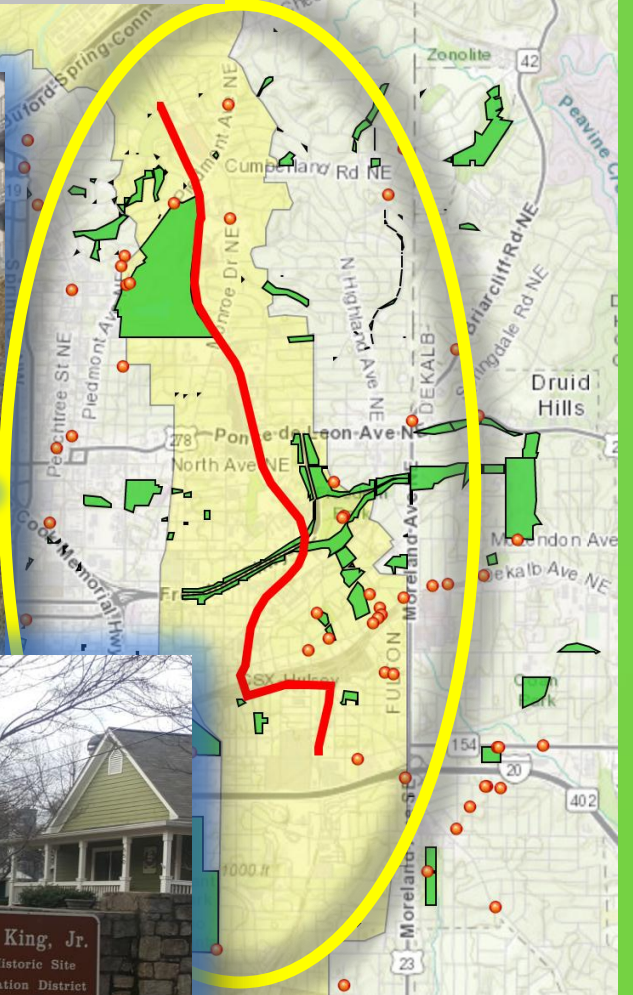
This is an ongoing USFS project partnered with UGA Center for Geospatial Research



# Atlanta Eastside BeltLine



**Eastside Beltline**  
With over a million visitors yearly on the Eastside trail, the BeltLine has proven to be a success to the original intent of the proposed project and planning. However, there also is the concern over the effects it has on social, health, business, and housing.



**Southern Research Station**

USDA FS Southern Research Station

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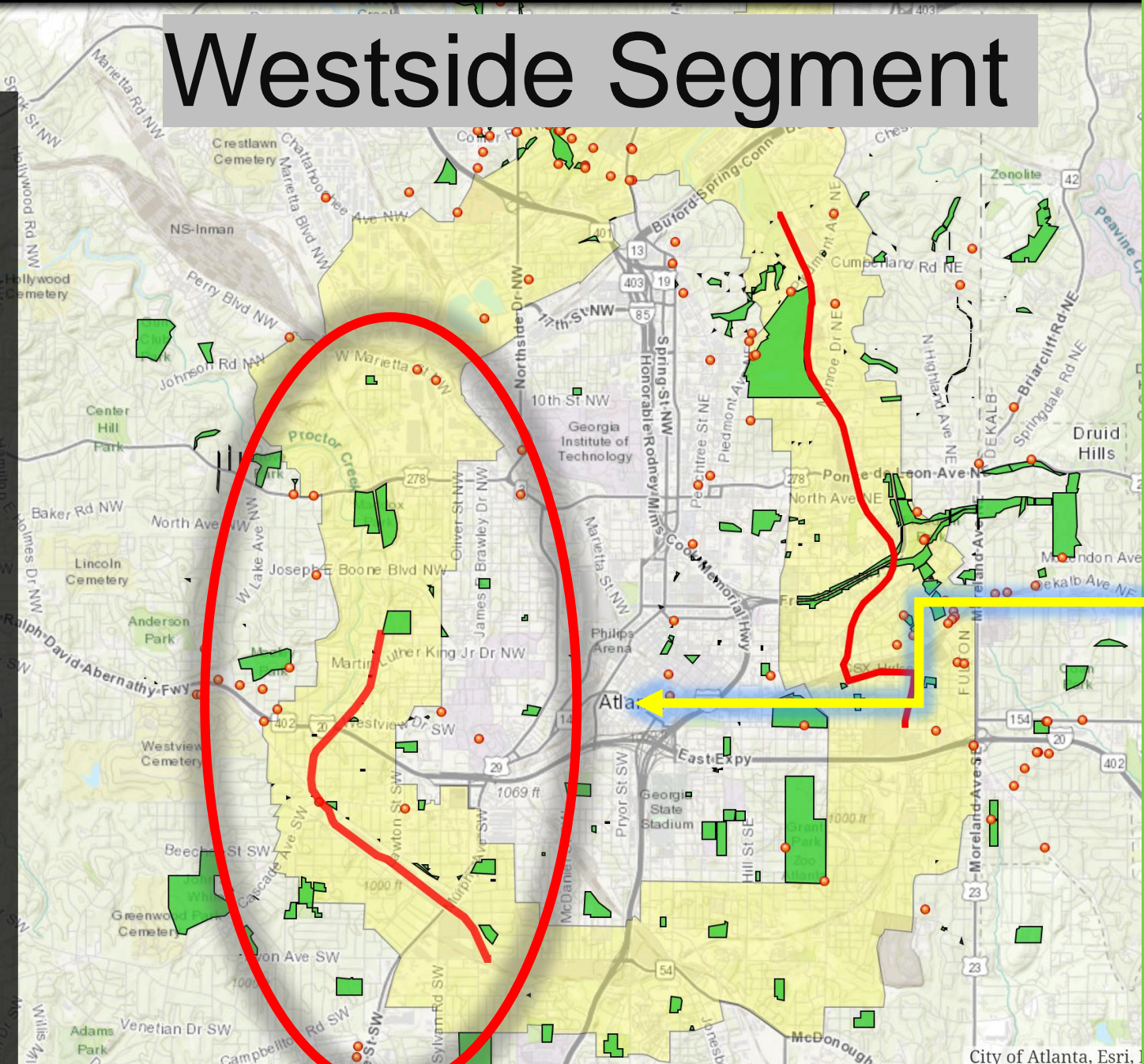


# Westside Segment



It is expected that the Westside segment will follow a similar pattern.

However, the social constraints of rapid growth pose an immediate concern to the local community and the fear of gentrification.

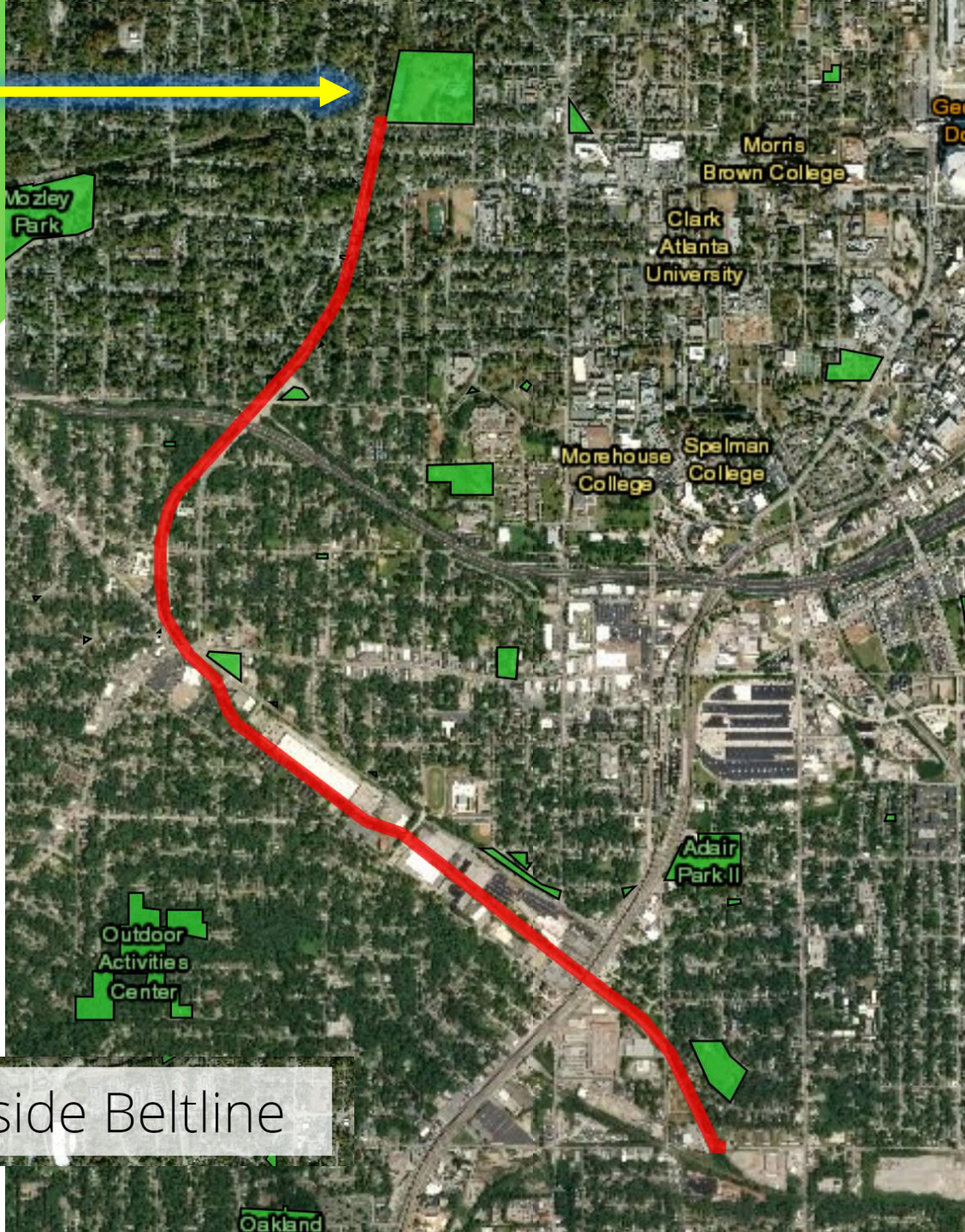


# Washington Park

1919 – first public park for African Americans



Atlanta Westside Beltline







# Atlanta BeltLine Housing Adjacent to the Westside Segment



## Sustainable Atlanta

- Need for sustainable green infrastructure to promote human wellbeing.
- Caution, such installations can be a gentrification catalyst.

## Housing Survey 2018

Visually inspected the front residential housing within 1-2 blocks of the BeltLine.

## Housing Revisit 2019

Westside BeltLine resurveyed in 2019 to evaluate changes in housing conditions.

## Satellite Evaluation

Earth Observation Satellite was used to compare the percentage of healthy vegetation for east and west BeltLine segments.

## Future Work

Asses change in housing value using:

- 2018/19 housing inventory
- Hedonic model to estimate BeltLine contribution to changes in housing values

# 2018 Survey



## Housing Criteria



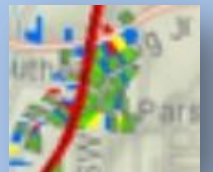
Uber driver was instructed to systematically tour streets boarding the BeltLine as researchers visually recorded conditions of homes based on:

- Landscape
- Windows
- Siding
- Roof



### Housing Conditions

0	Great Condition
10	Maintenance Needed
15	Repairs Needed
25	Dilapidated



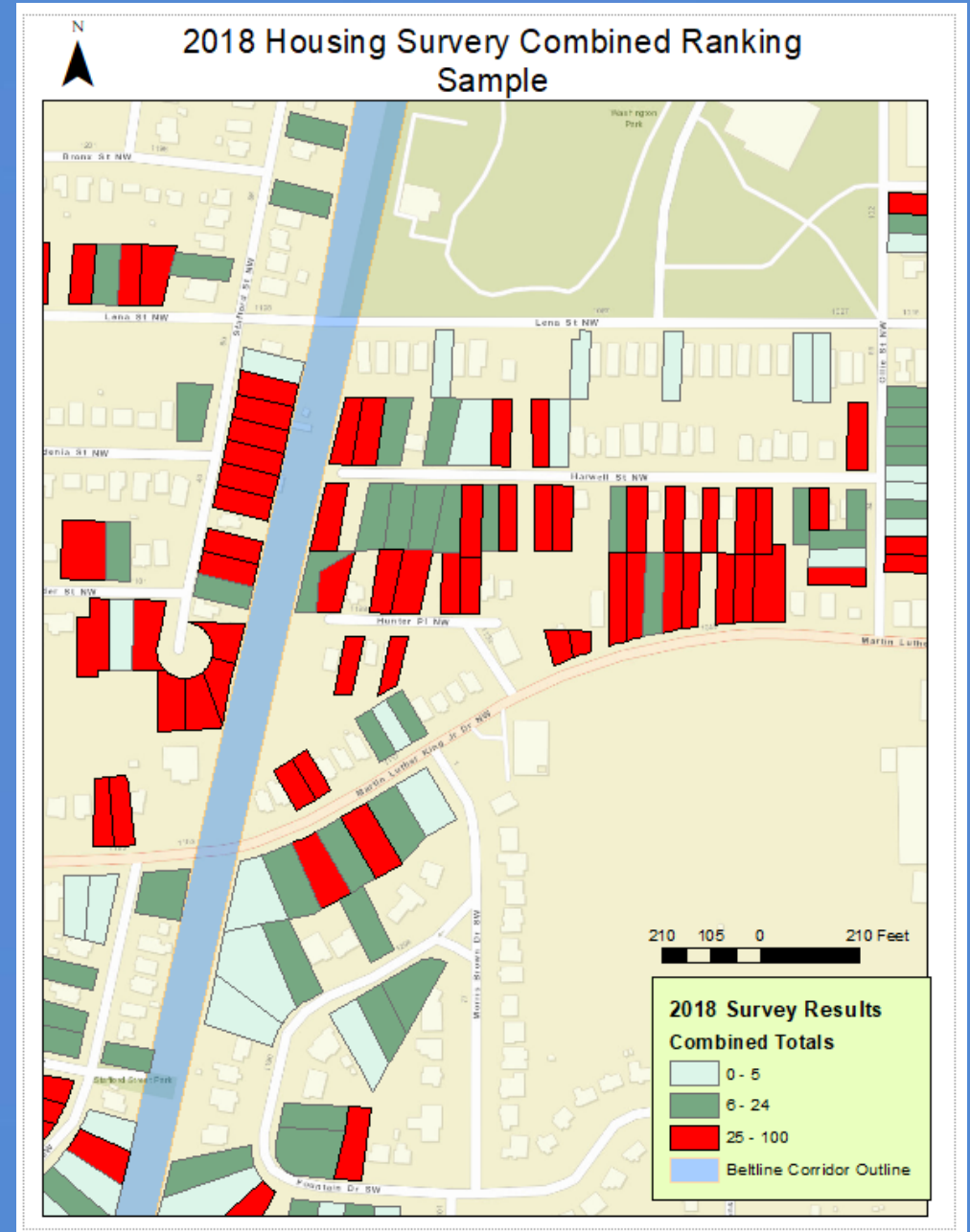
# 2018 Survey Results

**43%** of homes scored 25 or higher on the dilapidation Index.



**N = 417**

**Dilapidated = 170**



# Westside Beltline

## 2019 Revisit in Review:

### 2018 Initial Survey

House surveyed along the Beltline overgrown with Kudzu, an indicator of neglect.

### 2019 Revisit

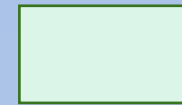
House is now part of Historic Trust Preservation and under renovation. Kudzu has been removed and new windows installed



# 2018/19 Survey Results



Good Condition



Livable condition



Dilapidated



Good Condition  
(Restored or undergoing restoration)



Livable condition



Dilapidated

**~ 60% either in  
good or livable  
condition.**

# 2018 Remotely Sensed Results

## Atlanta Westside Beltline

### Satellite Imagery Results

The areas for the classifications were calculated using the number of pixels. Each pixel of Sentinel-2 raster data is a 10m square. After the areas are classified, ArcMap automatically generates a pixel count in the attribute tables for each classification. This allows to calculate the area by the number of pixels 10x10m. By converting the area into meters and then to acres, a percentage of each field is then calculated.

Eastside Trail % Classifications

class	Sq meters	Hectares	Acres	%
Buildings	597,860	59,799 ha		
Parks	890,970	89,097 ha	220,163	23%
Trees	1,282,870	128,287 ha	317,004	32%
Roads	505,460	50,546 ha		
Houses	782,550	78,255 ha		
Total	4,059,510	405,951 ha		

Eastside Trail

Westside Trail % Classifications

class	Sq meters	Hectares	Acres	%
Buildings	238,200 m <sup>2</sup>	23,820 ha		
Parks	672,960	67,296 ha	166,292	23%
Trees	1,240,920	124,092 ha	306,638	42%
Roads	260,130	26,013 ha		
Houses	529,550	52,955 ha		
Total	2,941,760	294,176 ha	726,924	

Westside Trail

Westside	65%
Eastside	55%

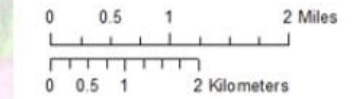
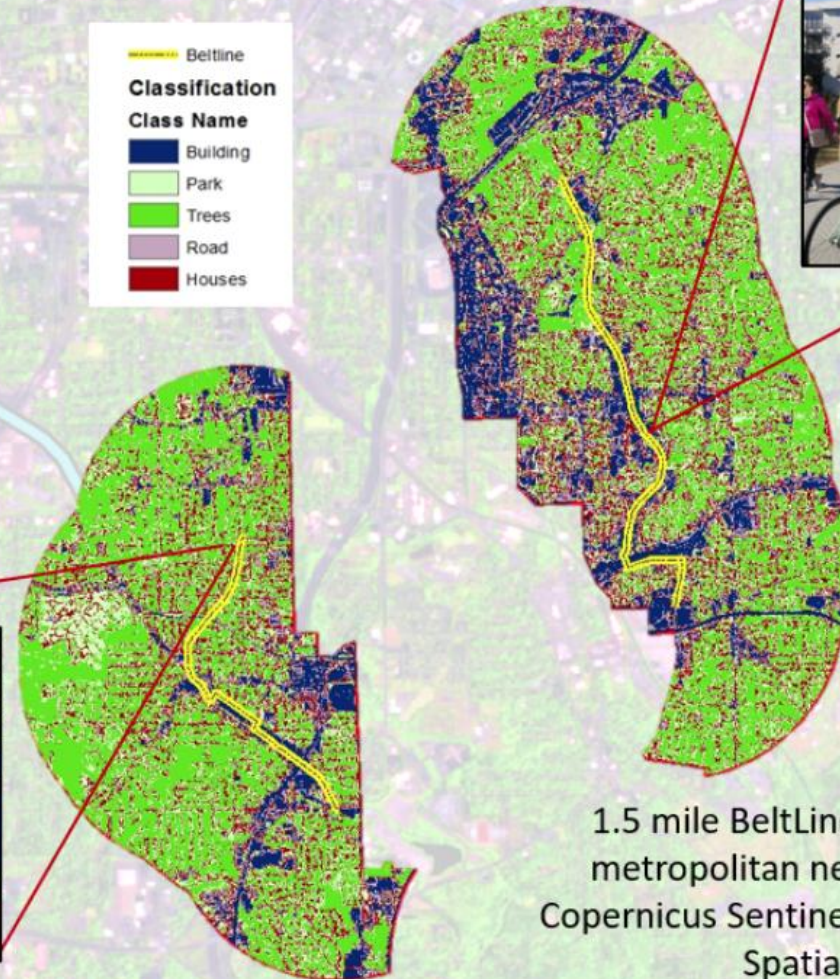
% Greenspace

### Greenspace Inventory Supervised Classification: % Greenspace Westside vs. Eastside

Westside	65%
Eastside	55%



Classification	Class Name
	Beltline
	Building
	Park
	Trees
	Road
	Houses



Domain:  
North America

1.5 mile BeltLine buffer with industrial metropolitan neighborhoods removed  
Copernicus Sentinel-2 Summer 2017 data  
Spatial resolution: 10 meters

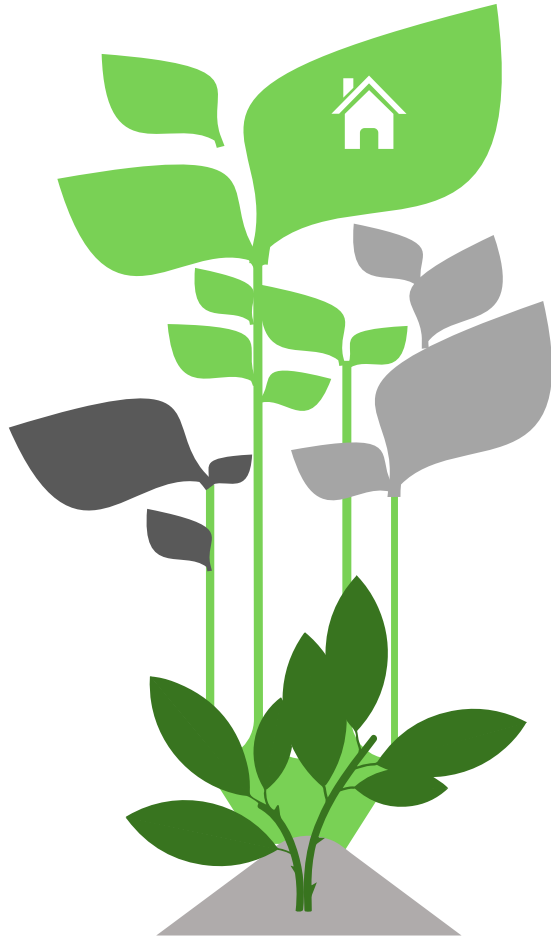
- **Our analysis is a cursory look at changes in housing quality adjacent to the BeltLine over one year**
- **More in-depth analysis (eg. Hedonic modeling) would be needed to look at the specific impact of the BeltLine on housing quality.**

# Urban Foraging

02

## Browns Mill Food Forest

- A baseline survey to record residents' attitudes about picking or collecting wild foods in their neighborhoods.



Green Infrastructure  
Addressing Social Needs



Urban Food Forest  
at Browns Mill

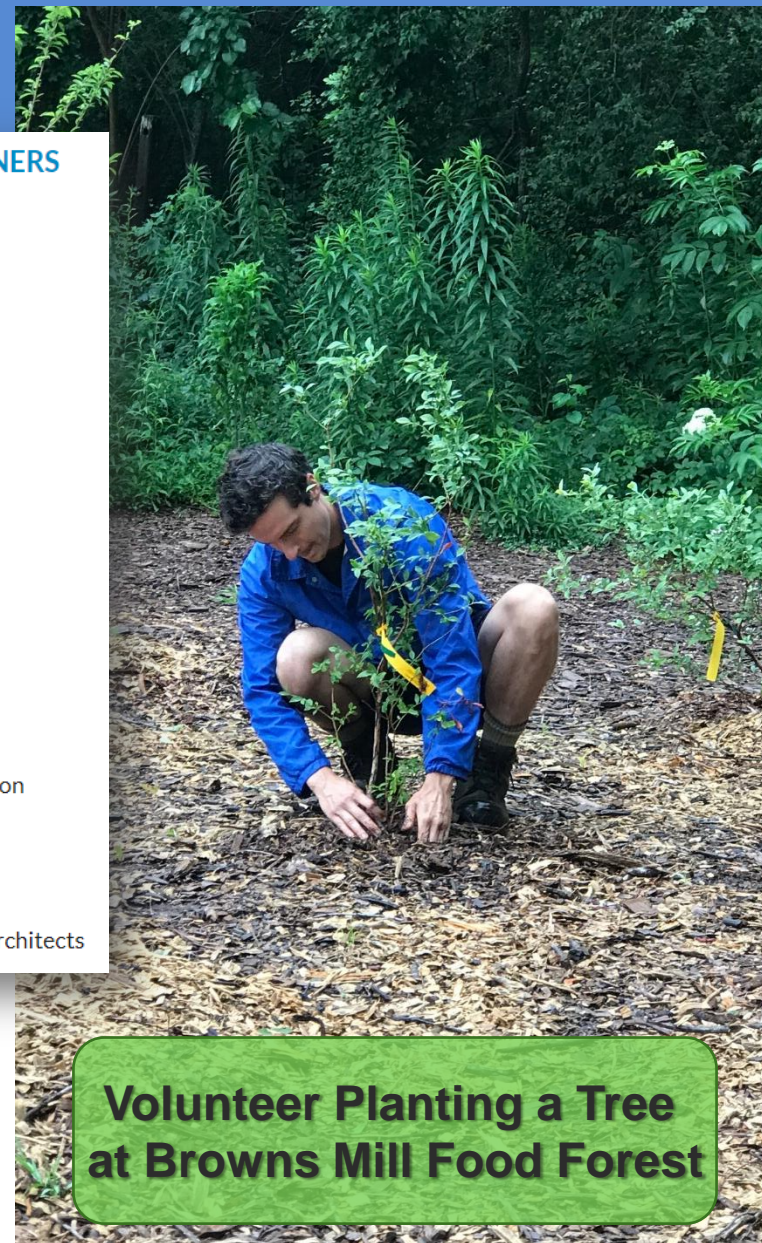




#### ADDITIONAL COMMUNITY PARTNERS

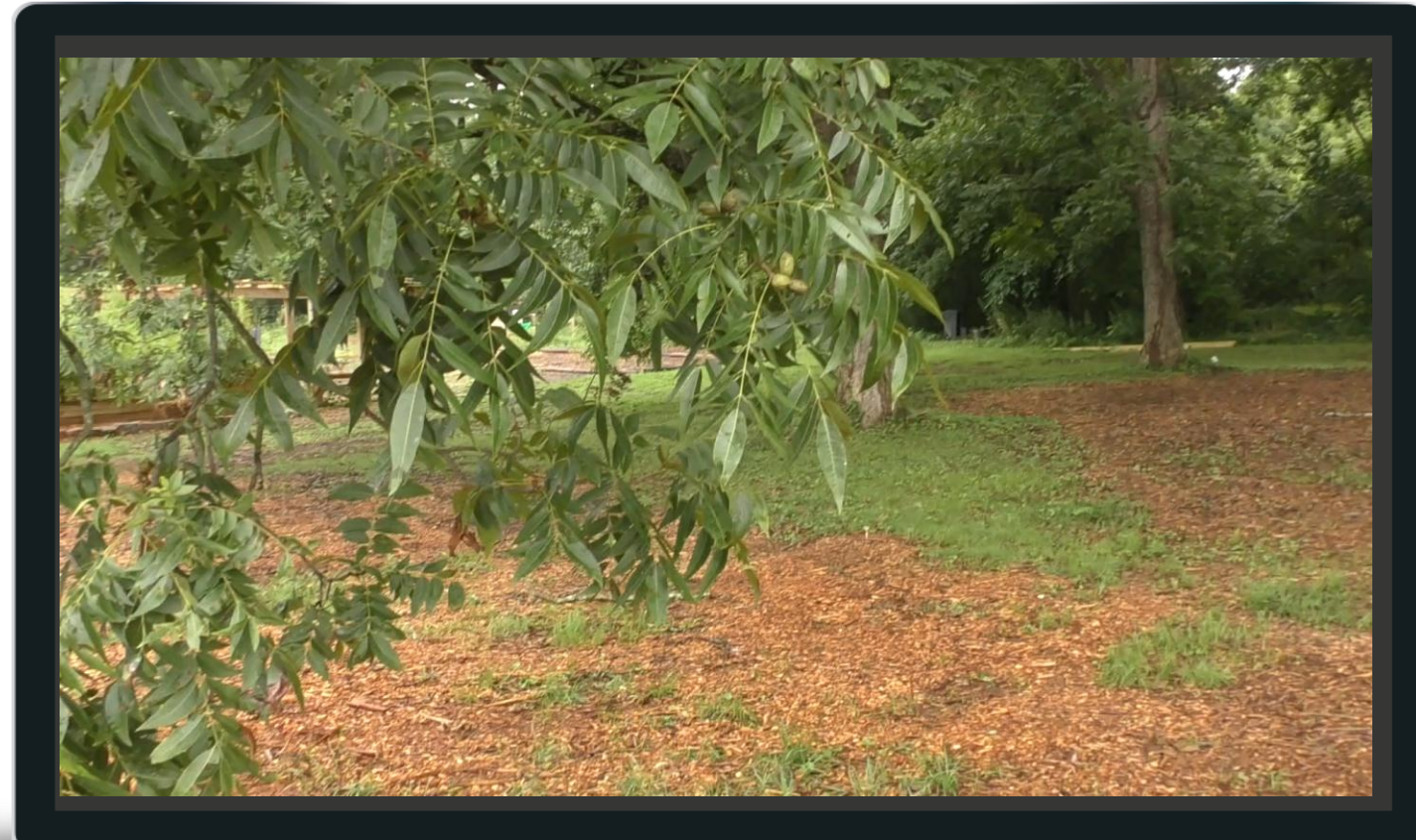
City of Atlanta  
City of Atlanta Parks and Recreation  
Trees Atlanta  
Aglanta  
US Forest Services  
National Park Service  
Greening Youth Foundation  
Concrete Jungle  
Food Well Alliance  
Fruit Forward  
Park Pride  
West Atlanta Watershed Alliance  
Atlanta Audubon  
EarthShare of Georgia  
Georgia Forestry Commission  
The Mary Alice and Bennett Brown Foundation  
The Turner Foundation  
National Fish and Wildlife Foundation  
American Family Insurance  
Sustenance Design and STAND Landscape Architects

- **Food desert in this community**
- **Green intervention focusing on wild food provision**
- **7 acres of forested land and garden**
- **Largest in the country**
- **Cities Goals: Make sure communities have fresh produce**



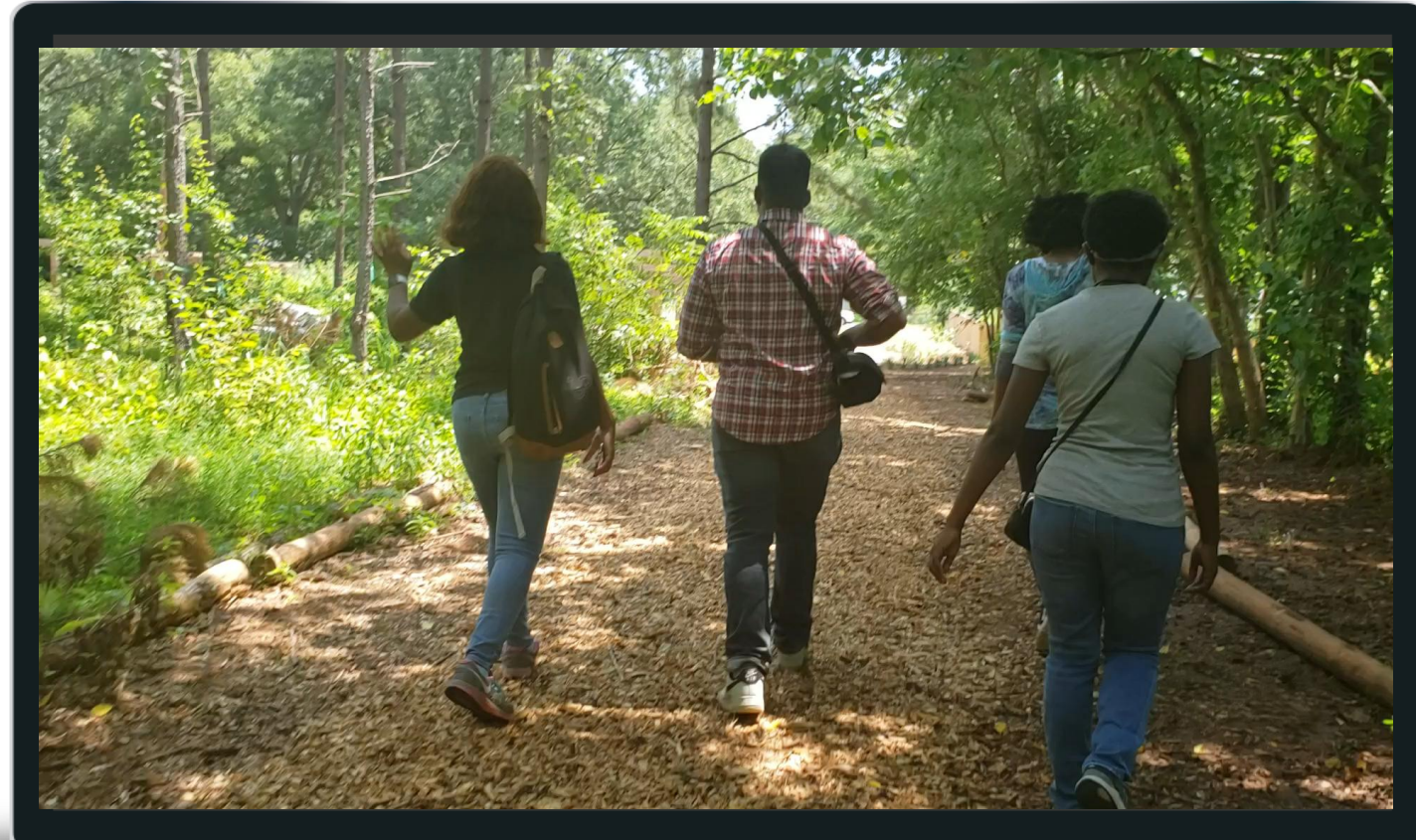
**Volunteer Planting a Tree at Browns Mill Food Forest**

# Browns Mill Food Forest



Green Infrastructure  
Addressing Social Needs

# Browns Mill Food Forest



Green Infrastructure  
Addressing Social Needs

# Project Overview



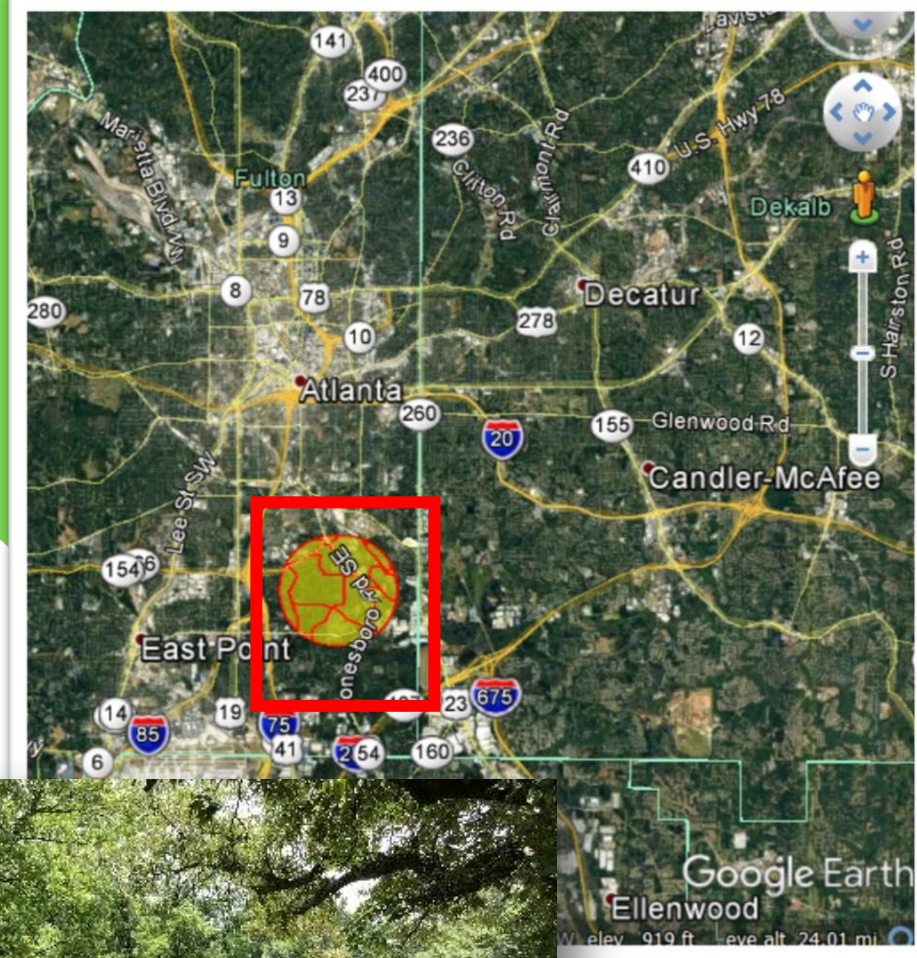
Photo credit AJC.com

- ❖ **Who** University of Georgia, in cooperation with the U.S. Forest Service
- ❖ **What** survey of residents' attitudes about picking things like berries or collecting nuts in their neighborhoods.
- ❖ **Why** This information will help us and the City of Atlanta to better understand people's interest in these kinds of foods.

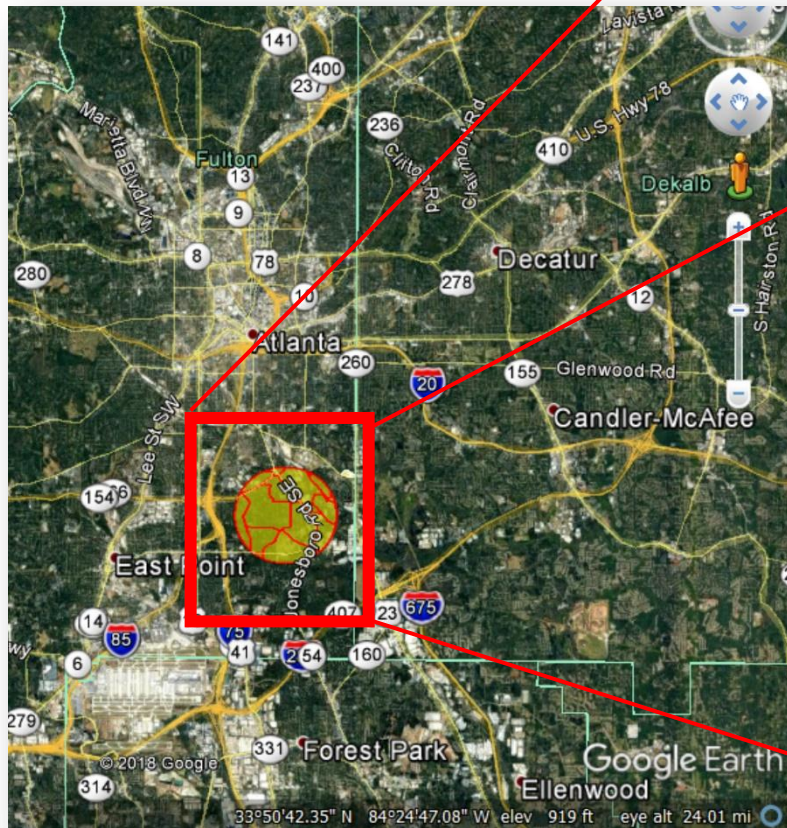


# Project

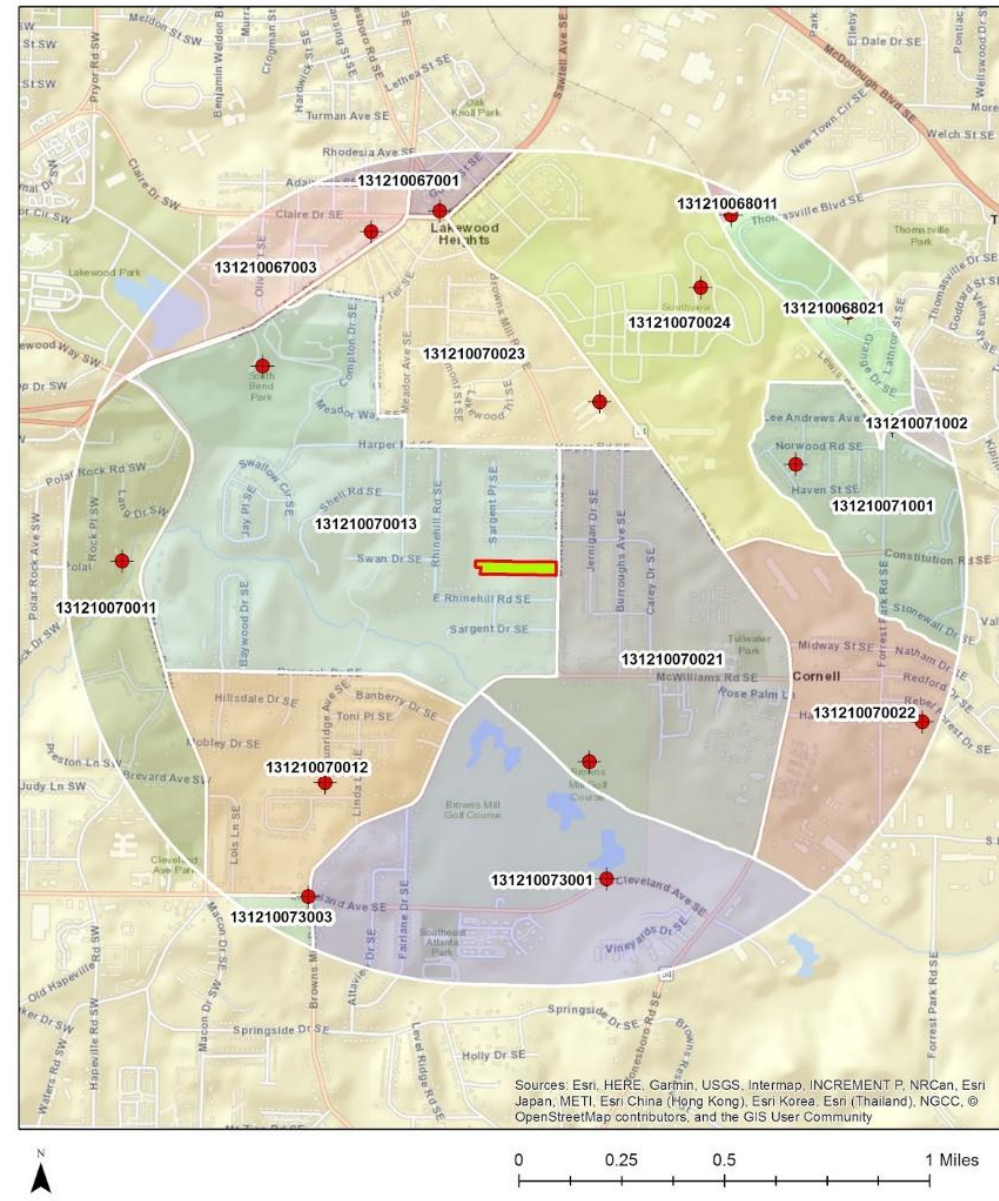
- Census guided proportionate sample
- 1 mile radius of Food Forest
- Target of 100
- Started on a street until quota for each census block group was reached
- Roughly 80 completed responses
- We have yet to calculate response rate



# Project Survey Methods



## Wild Food Collecting in Atlanta Communities



# Preliminary Finding



## Of about 80 Homes Survived:



Wild food is a good source of healthy food.

90% - Agree  
7% - Neutral  
3% - Disagree

Have you collected Wild Foods in the last 5 years?

25% - Yes  
75% - No

Don't know where any wild foods are

46%

# Preliminary Finding



Of about 80 Homes Survived:

**What are your views on the Browns Mill Food Forest?**



Response	%
Not interested in picking or gathering from that place.	8.0
Don't know enough about it to make a decision.	29.3
I would probably pick or gather food there.	62.7





# Team

Amanda Aragón  
(UGA PhD Student)



**Dr. Cassandra Gather Johnson**  
(USDA Forest Service)



Sheridan Alford  
(UGA Masters Student)



**Dr. Marguerite Madden**  
(Center for Geospatial Research  
UGA)



Nick Moon  
(UGA Volunteer)



Aza Wynn  
(UGA Undergrad Student)

# Former Atlanta Housing Project Sites as Socio-Ecological Nodes



03

Proposed Project: Leila Valley Housing Project

- Past 10-15 years, property has been vacant
- Examine changes in ecology of property after structures were removed
- This is an important consideration given that land uses influence community identity and people's sense of self in that place.

Green Infrastructure  
Addressing Social Needs



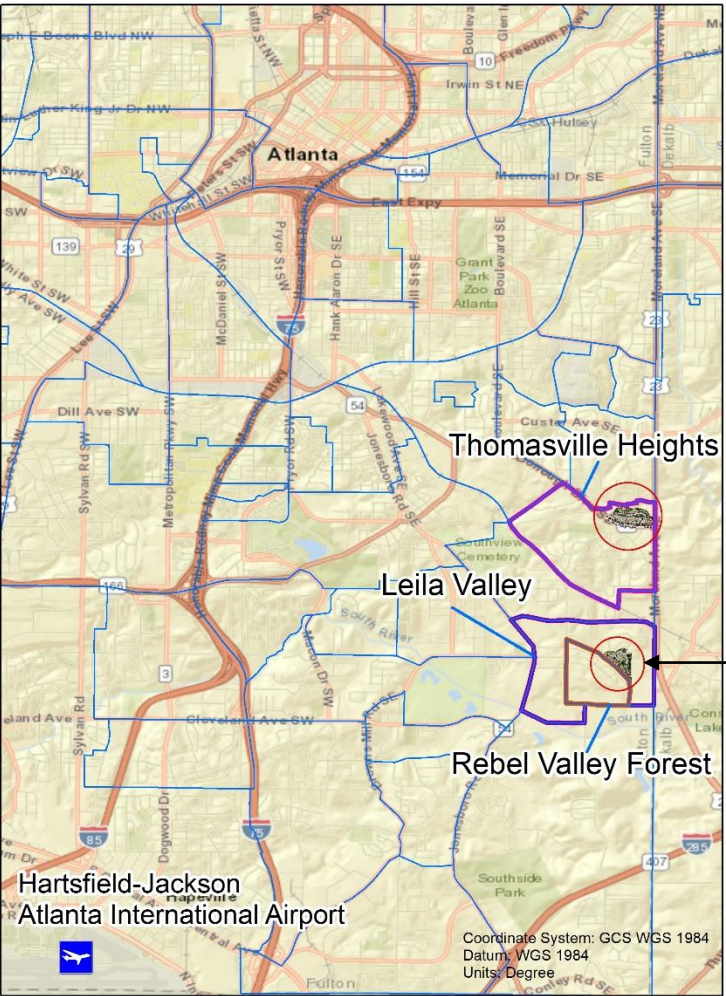
# Atlanta Housing

## Vacant Properties

Nov. 2018 Drone Survey

Nov. 2018  
i-tree assessment

- Atlanta-owned property
  - ATL Housing Authority
- Buildings razed in 2008
- Since then property has been left to regenerate
- Evidence of early stage forest succession



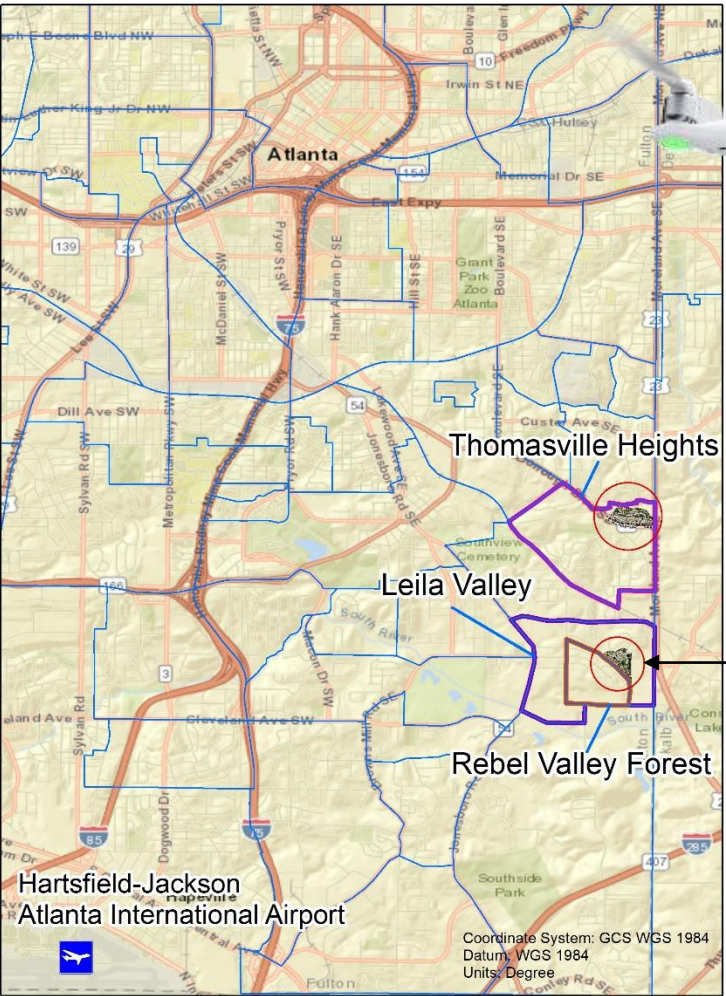
# Atlanta Housing

## Vacant Properties

Nov. 2018 Drone Survey

Nov. 2018  
i-tree assessment

- A drone was flown in 2018 to look at vegetation
- Measured vegetation change 2008 to 2018



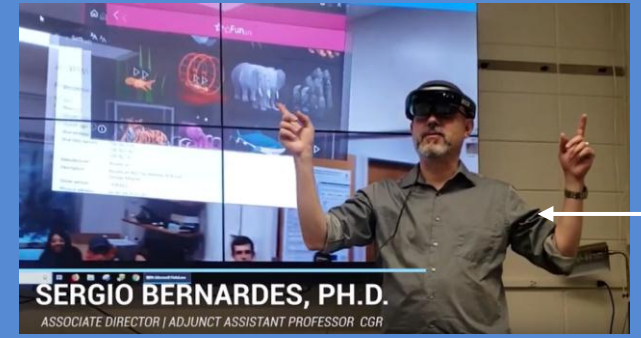
# Data & Sources

Google Earth Image

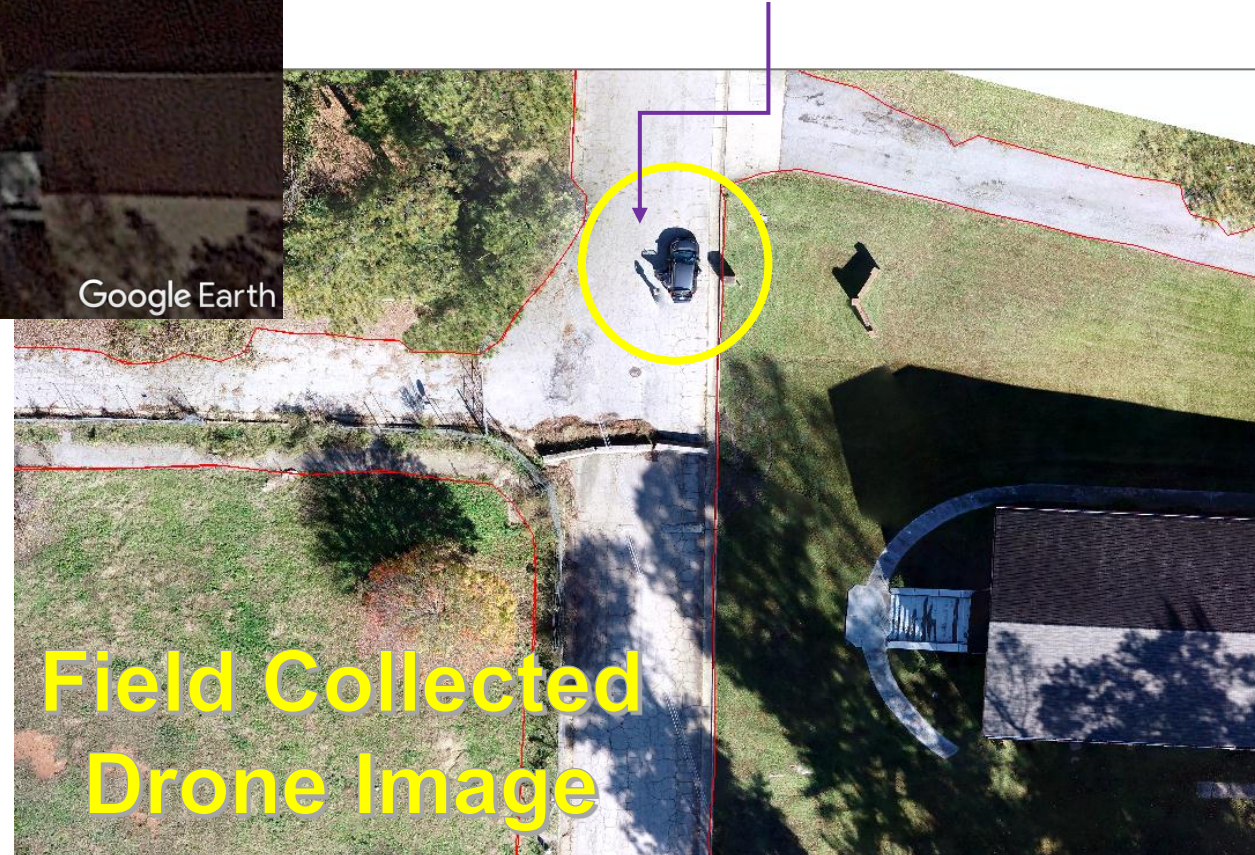


**November 17<sup>th</sup>, 2018.**  
**Approximant Flight Time: 10am**

Unknown to the researchers, the planned drone flight date and time happen to be on the exact date and time that aerial imagery was obtained and now visible in Google Earth.



**Drone Pilot**



**Field Collected  
Drone Image**

# How to Prepare **Before Flight** & **Safety** Precautions Around Airports

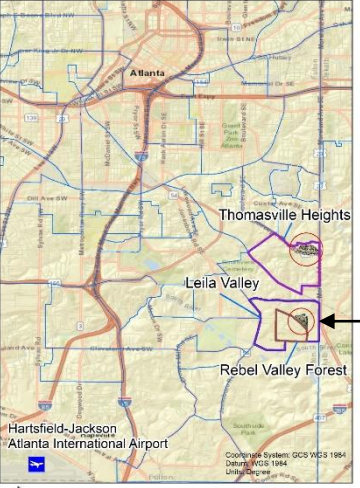
## Hartsfield–Jackson Atlanta International Airport

- **Air Map App**
  - Low Altitude Authorization and Notification Capability (LAANC)
  - Same day Authorization
- **Insurance**
  - Cost: \$35 single use
  - Up to 1 million dollars



# Atlanta Housing

## Leila Valley



- 1<sup>st</sup> Create a bounding box of location

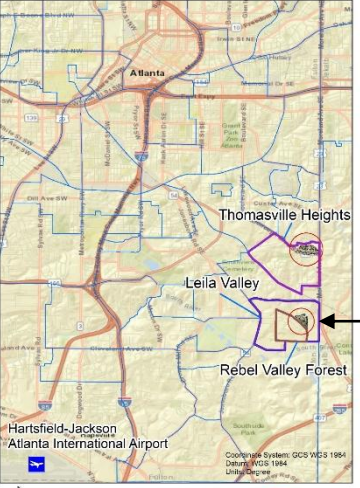


# November 2019



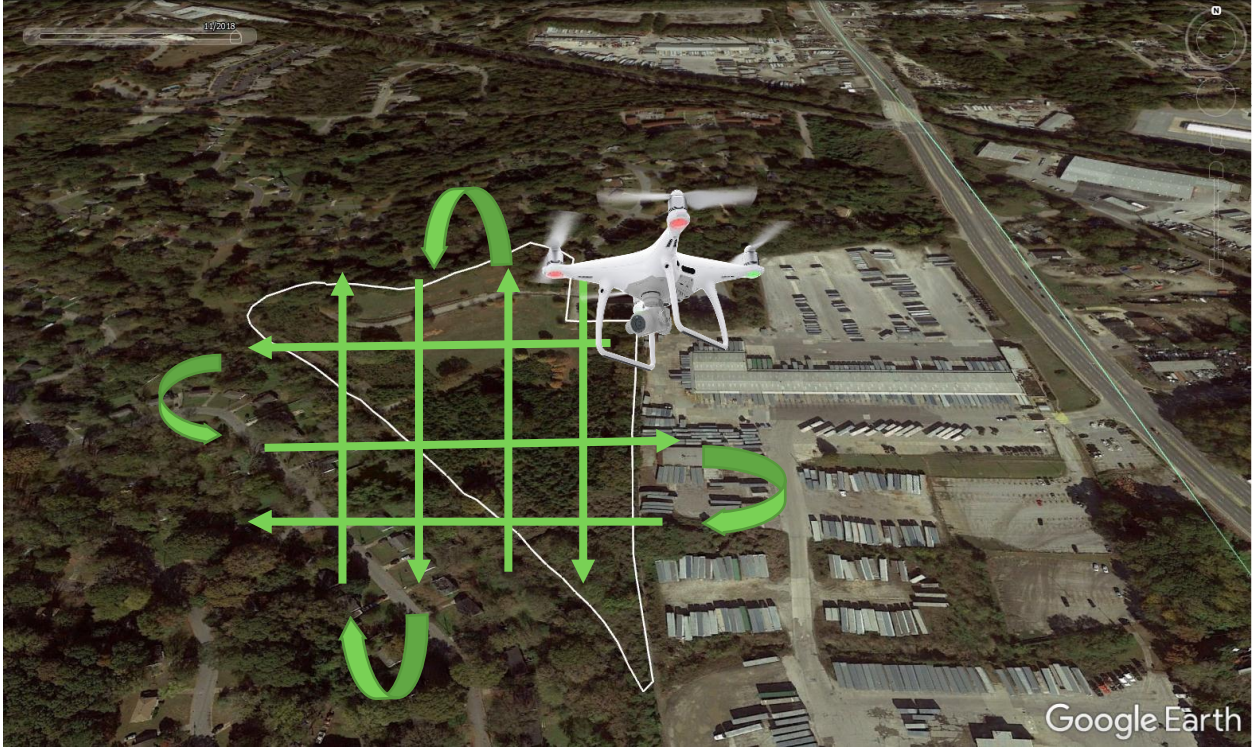
# Atlanta Housing

## Leila Valley



Drone Image

- Flying a grid patten to collect images



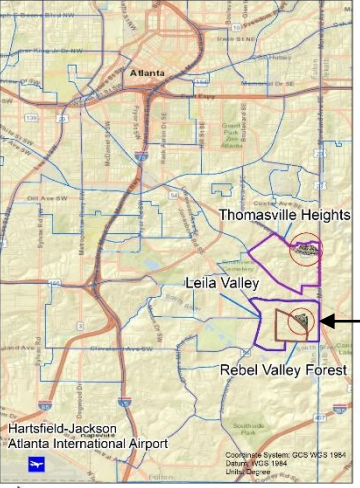
November 2018





# Atlanta Housing

## Leila Valley



Drone Image



2018 Drone Imagery  
Vegetation Classification  
Overlay

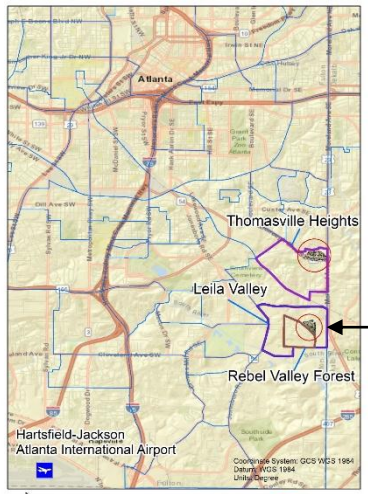


# November 2019



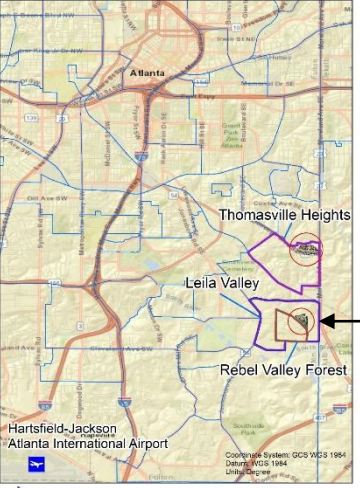
# Atlanta Housing

## Leila Valley 1993



# Atlanta Housing

## Leila Valley



2018 Drone Imagery  
Vegetation Classification  
Overlay



**62%**  
Vegetation Increase



# Atlanta Housing 1993



# Leila Valley Proposed Forest Assessment Project

- Minimal vegetative management
- Allowing return of forest cover to formerly developed land use
- Opportunities
  - How soon does measureable ES return?
  - DWM's Preservation Evaluation Tool
    - Scores over time
  - Multiple uses?
    - By multiple municipal departments?



# Leila Valley Proposed Forest Assessment Project

- Preliminary data
- Remote sensing (trees & shrubs)
  - 2008 = 17%
  - 2018 = 62%
- i-Tree Canopy ES estimate (trees only)
  - 33% canopy cover (2018)
    - Trees greater than 1" (best guess)
  - Annual pollution removal
    - $O_3$  = 224 lbs
    - $PM_{<10}$  = 75 lbs
  - Annual C sequestration = 23 tons



# Leila Valley Proposed Forest Assessment Project

- Reduced vegetation management over time
- Multiple strata to compare
  - 2019 – currently being mowed
  - 2016
  - 2012
  - Unmaintained



Strata	Acres	% UTC	O <sub>3</sub> /ac (lbs)	PM <sub>&lt;10</sub> /ac (lbs)	C seq/ac (tons)
2019	4.5	21%	10	3.3	1.1
2016	4.0	27%	14	4.3	1.3
2012	4.2	83%	42	12.6	4.0
unmaintained	0.8	100%	50	15.5	5.0

# Leila Valley Proposed Forest Assessment Project

- i-Tree Canopy assumes much
- Bottom/Up approach using i-Tree Eco
  - 70, 1/75<sup>th</sup> ac plots
    - 20 plots per maintenance stratum
      - 10 plots for unmaintained stratum
    - 10.2' radius plot
  - Random location within each stratum
  - Inventory woody vegetation  $\geq 1$ " dbh
    - $< 1$ " woody vegetation = shrubs
  - Also estimate percent shrub cover
- Results desired on per area basis
  - Species composition
  - Leaf surface area
    - Rainfall interception/pollution removal/C seq



# Leila Valley Proposed Forest Assessment Project

- Compare to unmaintained stratum
  - What are we giving up if we develop?
- Run Preservation Evaluation Tool
  - Parcel-wide
  - By Strata
- Ultimate goal
  - Method to assess all ATL Housing land
  - Opportunity for city departments to work together to accomplish goals
    - Affordable housing
    - Stormwater management
    - Recreation and human health
  - A planning process for sustainable urban development

Parameter	Score				Weighting Factor	Score Range
	0	1	3	5		
<b>Impervious Cover</b>	>20% of parcel(s) size	10-20% of parcel(s) size	5-10% of parcel(s) size	<5% of parcel(s) size	2	0-10
<b>% Tree cover in riparian buffer</b>	No 75-foot stream buffer on parcel(s)	<33% tree coverage within the 75-foot buffer	33-66% tree coverage within the 75-foot buffer	>66% tree coverage within the 75-foot buffer	0.75	0-3.75
<b>% Tree cover</b>	Less than 25% forested cover on parcel(s)	25-50% tree cover	50-75% tree cover	>75% tree cover	2.25	0-11.25
<b>Distance to stream</b>	Closest stream >1,000 feet away	Closest stream 500-1,000 feet away	Closest stream 200-500 feet away	Closest stream ≤200 feet away	1	0-5
<b>Location in the watershed</b>	Parcel(s) size <1% of upstream watershed area	Parcel(s) size 1-5% of upstream watershed area	Parcel(s) size 5-10% of upstream watershed area	Parcel(s) size >10% of upstream watershed area	2	0-10
<b>Forest patch size</b>	no-small forest patch (0-25% size quartile)	small-medium forest patch (25-50% size quartile)	medium-large forest patch (50-75% size quartile)	large forest patch (75-100% - size quartile)	2	0-10
<b>Total Score</b>						<b>0-50</b>





# Atlanta Greenspace Projects

**Georgia Tree**  
COUNCIL

Sustaining Georgia's Green Legacy

## Q&A Discussion



**U.S. FOREST SERVICE**  
Caring for the land and serving people

United States Department of Agriculture

**Southern  
Research Station**



Sustaining Georgia's Green Legacy

# Contact



Amanda D. Aragon

[Amanda.Aragon@UGA.edu](mailto:Amanda.Aragon@UGA.edu)

Cassandra Johnson Gaither

[cassandra.johnson@usda.gov](mailto:cassandra.johnson@usda.gov)

Eric Kuehler

[eric.kuehler@usda.gov](mailto:eric.kuehler@usda.gov)

