



Aerial Photography Ortho & Oblique Imagery

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September 16, 2019

During this session, we will cover:

- Aerial Photography – Orthogonal and Oblique Imagery overview, examples, and usage
- Change Detection – Change Finder and Sketch Check processes
- Public Access – Surry County example
- Change Finder example – Guilford County
- Open Discussion, Q&A

About Eagleview



98%

coverage in the U.S.
in terms of population



135

planes at
our disposal



130

domestic & international
patents granted



673

Eagleview
employees



1,800+

jurisdictions flown
in North America



2,362

terabytes of
imagery storage



3,750

terabytes of
data storage



25,000

reports delivered
per 24-hour period



34,500

hours spent
flying per year



350 Million

images in our
image library

Orthogonal Imagery Definition



Orthogonal Imagery Definition



Orthogonal Imagery A True Top-Down View

Orthogonal imagery provides a true top-down view and is aligned to a map grid. This imagery easily integrates into your GIS data for a comprehensive understanding of properties, land features, local topography, and more.

Orthogonal Imagery Definition



Oblique Imagery Definition



Oblique Imagery Definition



Oblique Imagery See The World From Different Angles

Pioneered by EagleView, oblique imagery is aerial imagery captured at an angle, providing a more natural perspective and making objects easier to recognize and interpret.

With Pictometry imagery captured from four simultaneous directions, you can see a 360-degree view of every property. Interact with, measure, and extract data from georeferenced images.

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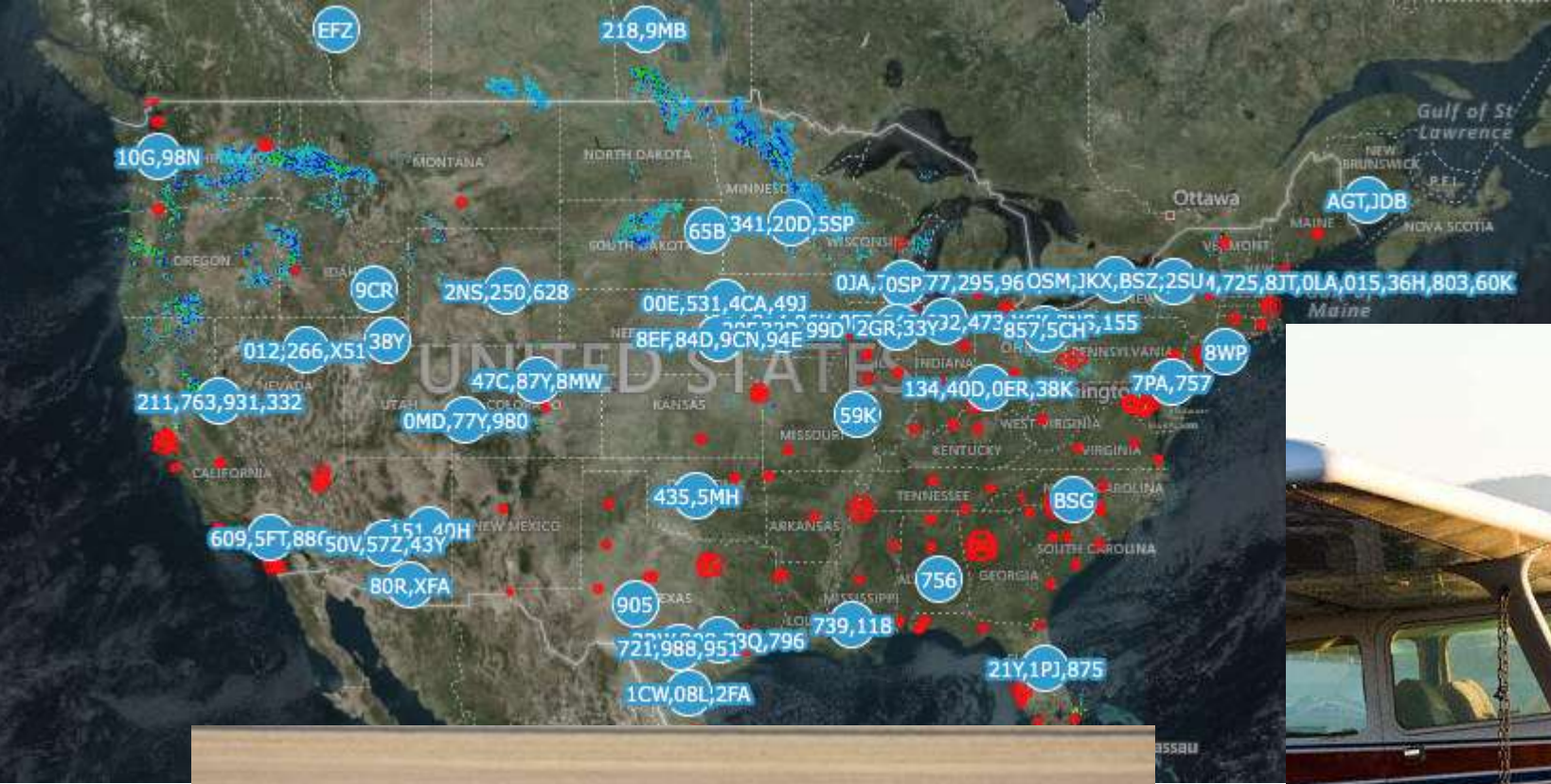
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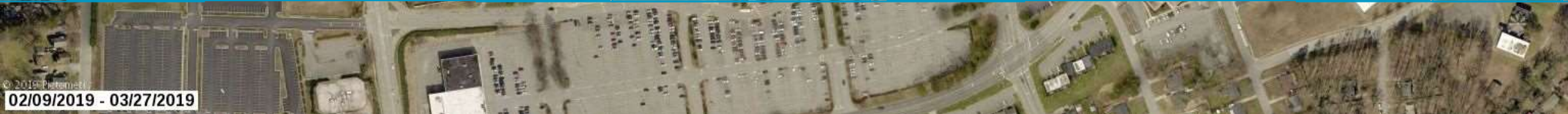
How is it done?



- Patented 5 camera system; invented, manufactured and maintained by EagleView.

How is it done?





5-way coverage

Standard Ortho Image



North facing Oblique



East facing Oblique



South facing Oblique



West facing Oblique



Specialized capture process

Focused on three key areas:

ACCURACY & CLARITY



- Low altitude capture to ensure clarity and natural color
- Geo-referenced for accuracy and data standards

DELIVERY TIME

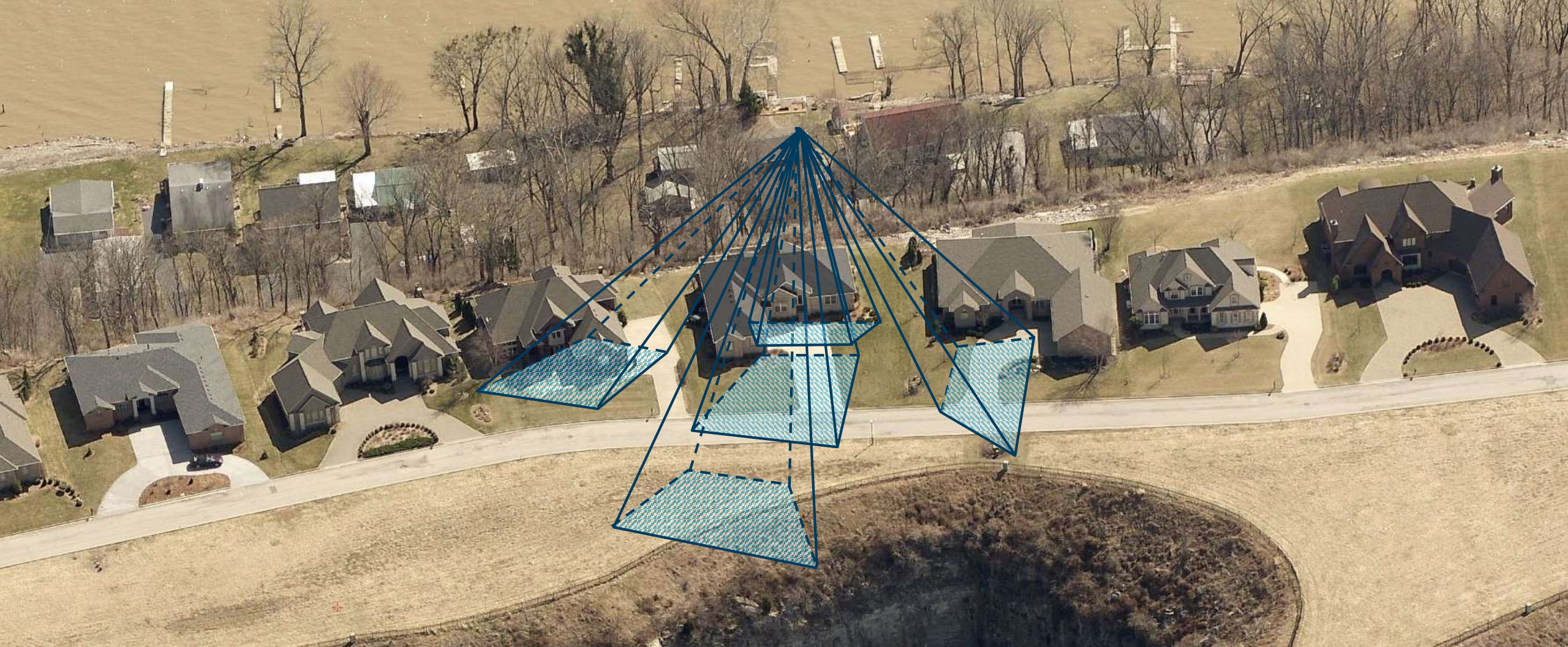


- Imagery delivered in less than 60 days
- Early access to imagery available in 2-3 days

IMAGERY PROCESSING



- Captured imagery is post-processed, QC'ed, and tested to ensure speedy delivery, image clarity, and accuracy.



Specialized Capture Process

So In Addition to orthos....



- **Ortho Imagery works great with GIS Layers, but can fail to identify:**
- **Oblique North**
- **Oblique South**
 - Key property details
- **Oblique East**
 - Livable Space
- **Oblique West**, especially areas with specific damage
 - Height

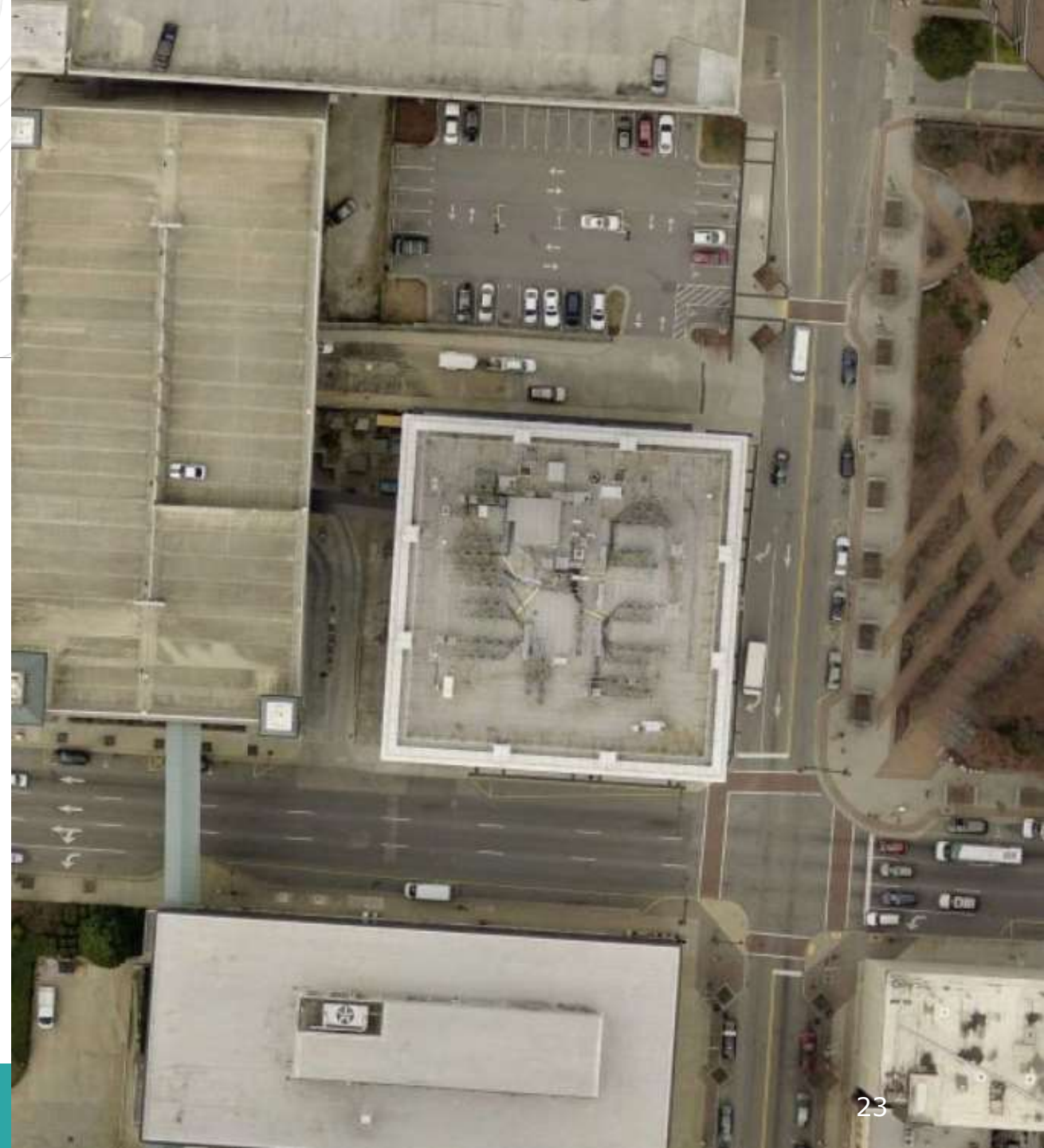


Traditional Ortho Imagery vs. Pictometry



What type of structure is this? How tall?

Traditional Ortho Image



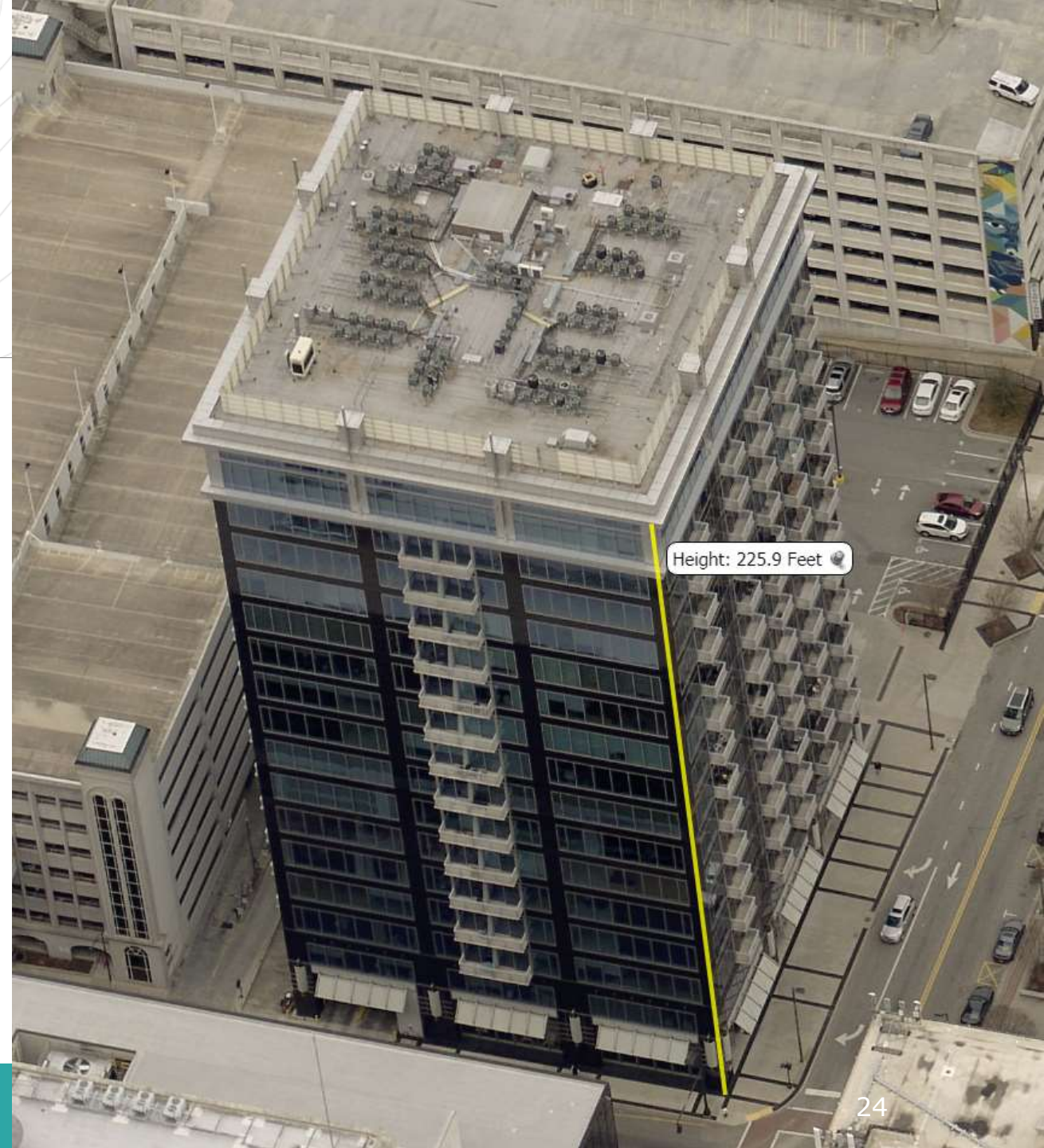
Traditional Ortho Imagery vs. Pictometry



Center Pointe Greensboro

Oblique imagery brings a natural perspective to a location that allows a user to view the environment as if they were there.

And it's not just a pretty picture... you can also measure height, distance, area, etc.





Measure/Annotate

Measure

- Select
- Location
- Distance
- Dist. Grnd.
- Area
- Circle Area
- Vert. Area
- Height
- Elevation
- Grnd. Slope
- Bearing
- Slope
- XYZ
- Link Portal
- Coverage
- EagleView

Annotate

- Shape
- Circle
- Line
- Text
- Marker

Delete all map annotations

Elevation Tool Options

Units: Feet

* Workspaces

More than Imagery...

Now that we are
all experts with
ortho and oblique
aerial imagery...

CHALLENGE #1





CHALLENGE #2

What is this?



Deodorant!



CHALLENGE #3







CHALLENGE #4 (JUST FOR FUN)





Views from 5 directions



How many county and city departments
are authorized users?

UNLIMITED



Key government applications

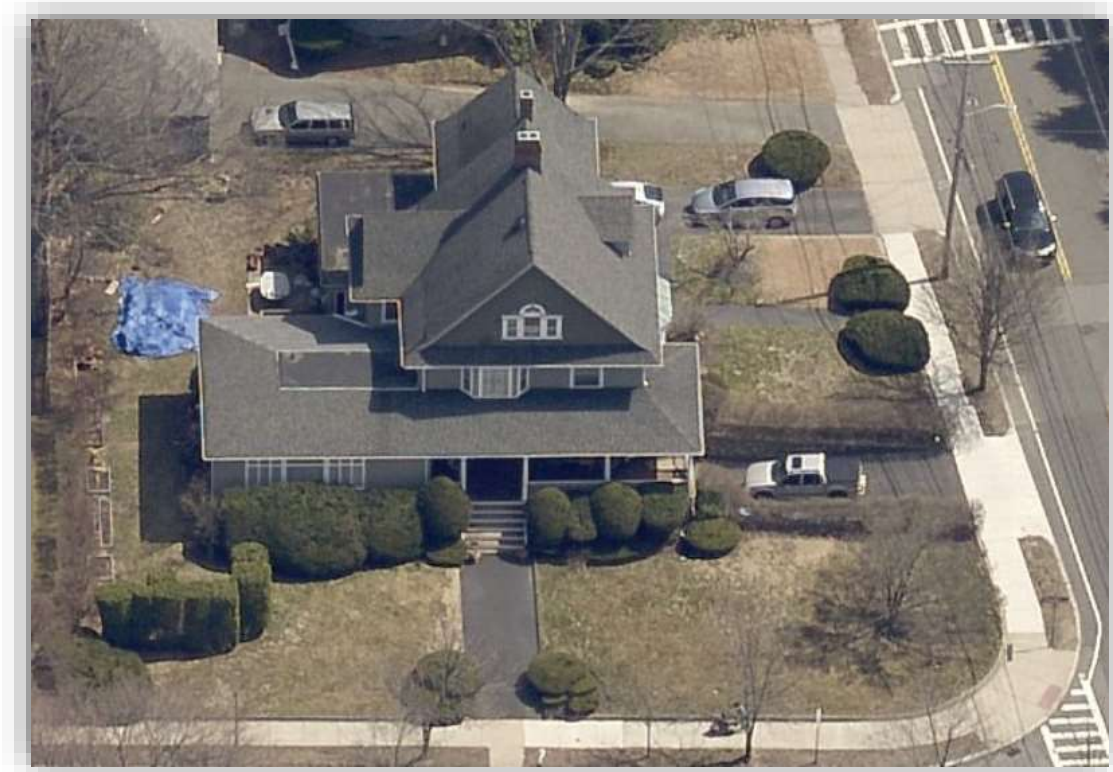
Agencies and departments within a county can access high-resolution imagery and integrate it into existing workflows.



Key Government Applications



- Remote inspection saves times and money
- View property details to assess accurate value and determine tax rates
- Rely on imagery when processing appeals and collections



When Do You Capture?

Imagery capture with **leaf-off conditions** and **no snow on the ground** (Late Fall through Early Spring)



January Flight

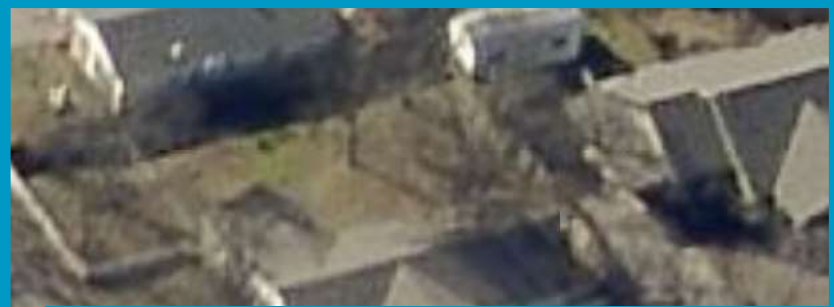


July Flight

Choice of Resolution

Choose the right resolution that is best for you

9 “



6 “



4 “



3 “



Sub-inch resolution now available...



Ultra-high resolution for more clarity and detail



4 Inch Resolution



REVEAL – sub 1”



12/01/2016

4"



Sub 1"



More clarity



View features never seen before in aerial imagery

More detail



Assess grade and relative condition without leaving the office

More certainty



Justify your decision regarding property valuation and asset condition with confidence



Roof Damage



Crack in Wall



Dog

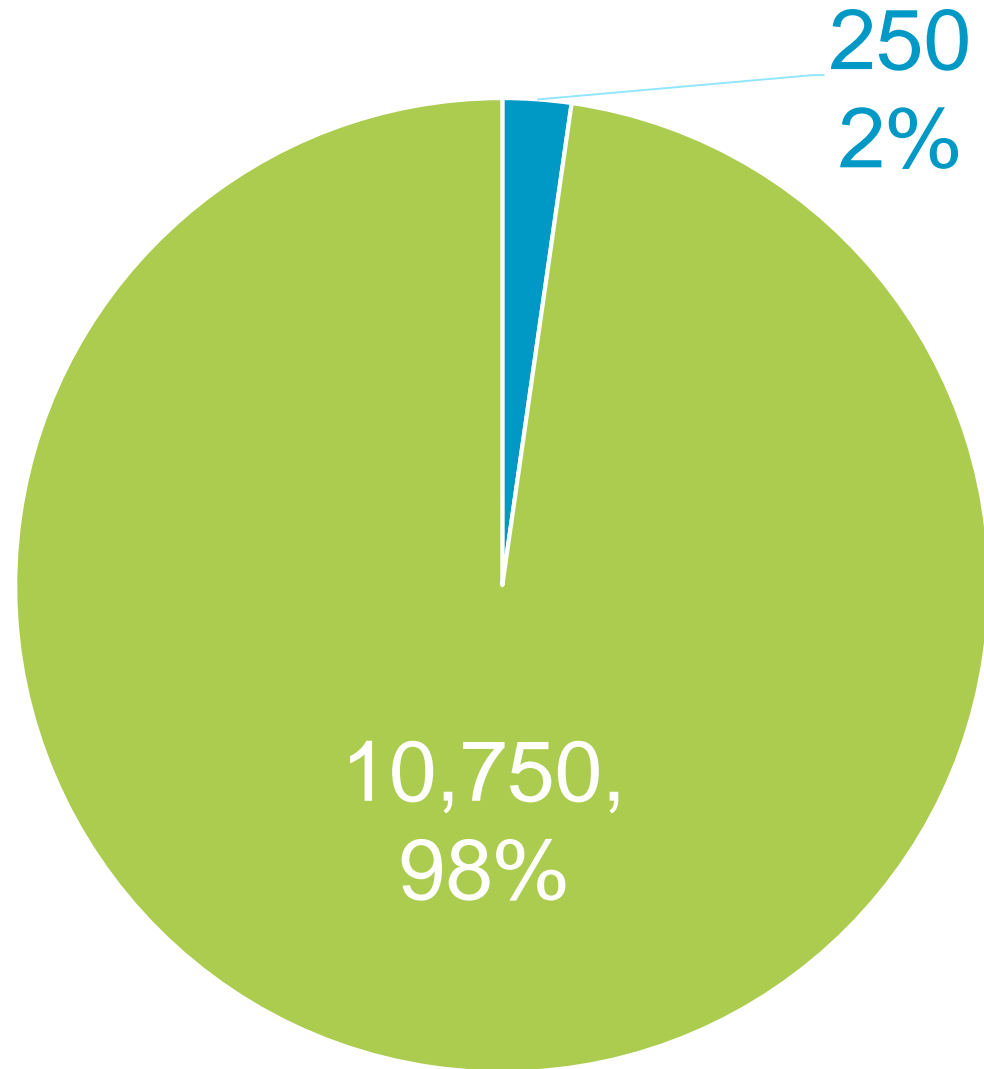
Pool Hose

Rock Formation

Why Oblique Imagery?

- Effective Use of Time
 - Sketch into CAMA system faster
 - Less Time Traveling for field inspections
 - Review more properties in shorter amount of time
 - Keep track of movable property
- Saves County Money
 - Salaries and Benefits of Full Time Employees
 - Hourly pay during field visits in distant locations
 - Cost of Fuel
 - Wear/Tear on Vehicles
 - Liability

Reviewed properties



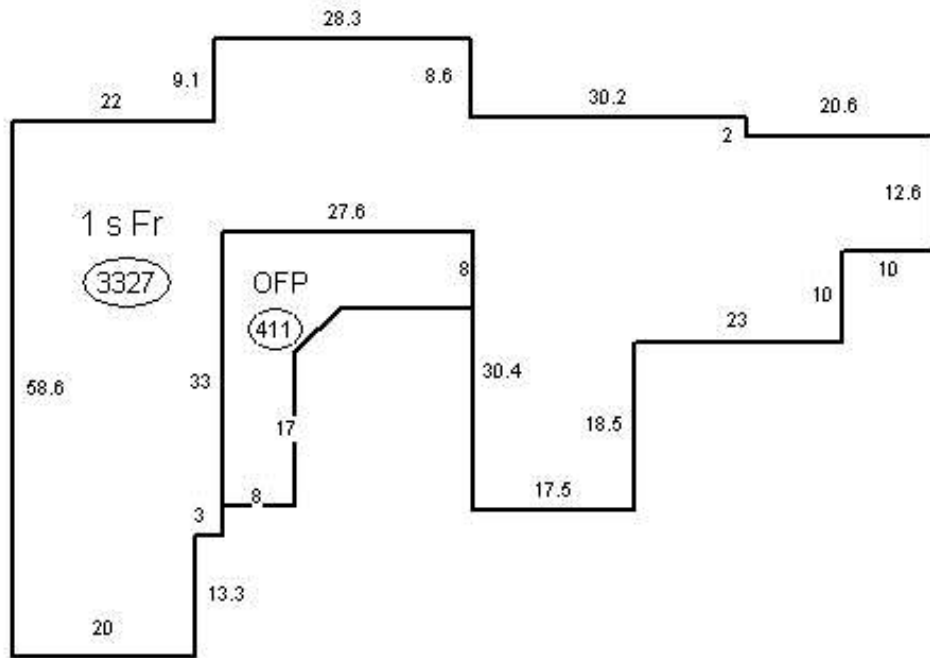
■ Field Visits

■ Pictometry

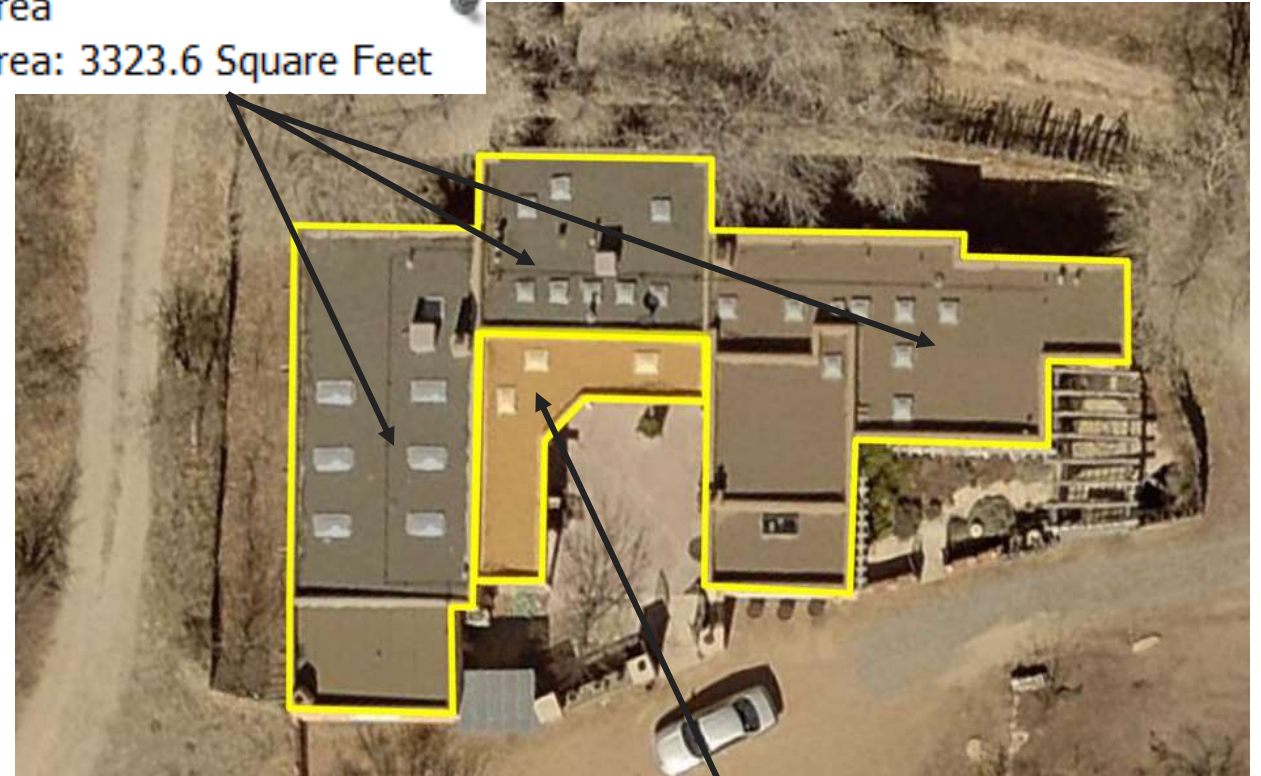
Benefits of Oblique Imagery

- Tools and Accuracy
 - Oblique Imagery
 - Distance
 - Search
 - Area
 - Bearing/Angle
 - Annotations
- Ability to measure structures in areas with gates
- Access to Structures When Not Physically Allowed on the Property

Measured on site vs Pictometry



Area
Area: 3323.6 Square Feet



Area
Area: 411.1 Square Feet



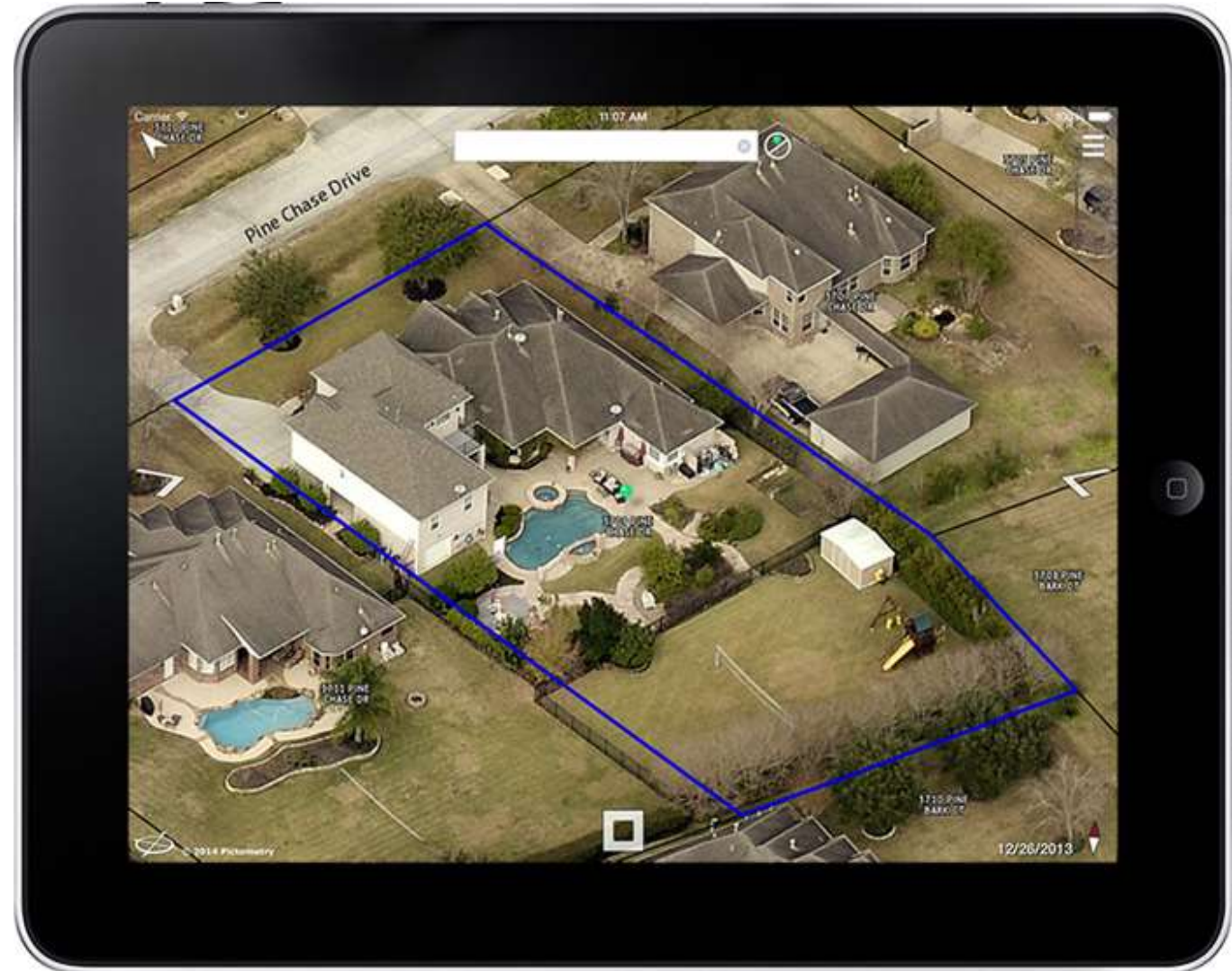
eagleview™

Access to Imagery

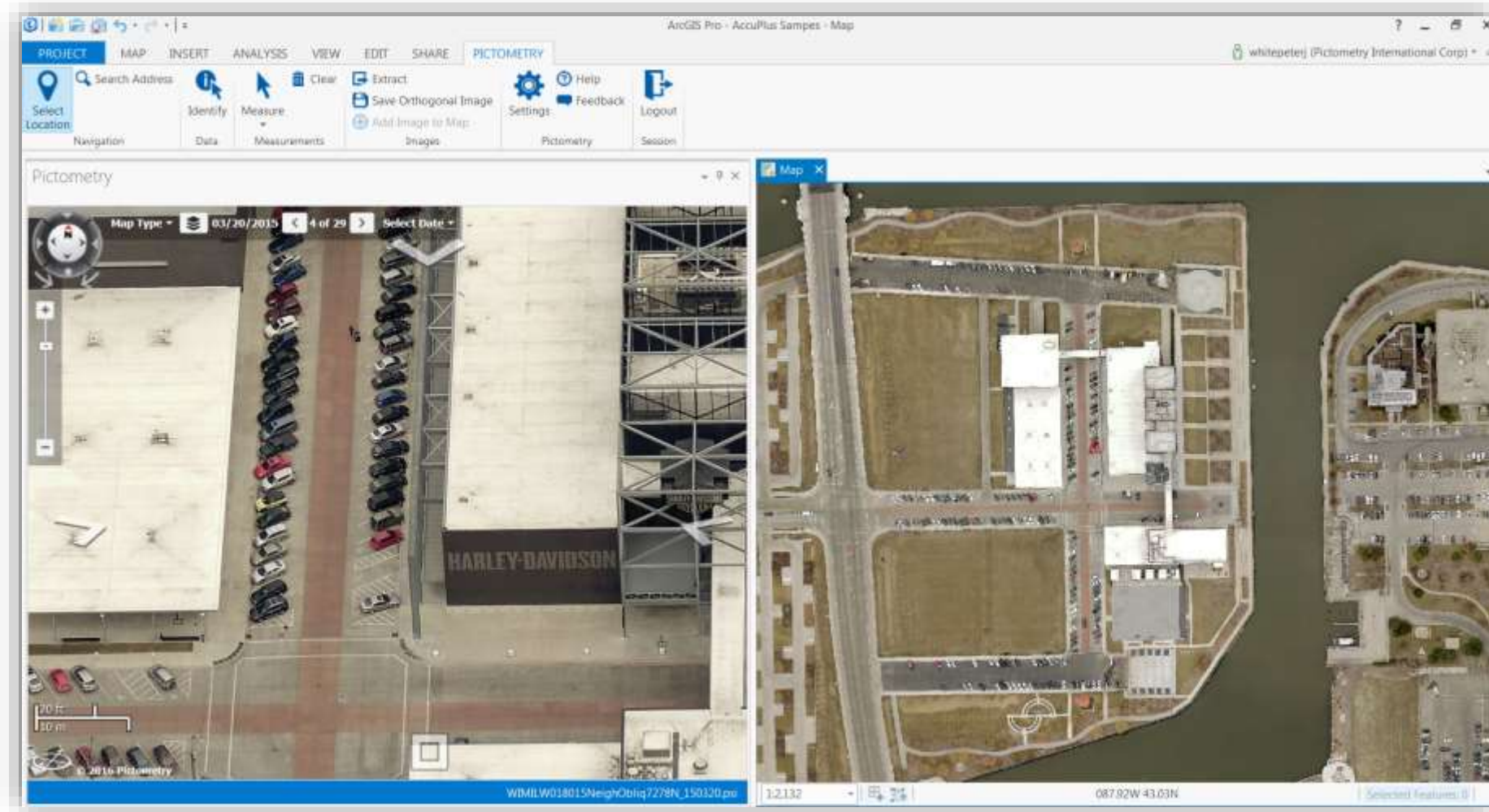
CONNECTExplorer - Demonstration



Mobile Apps



Pictometry for ArcGIS (Desktop & Pro)



Change Detection



ChangeFinder

Flags parcels that have undergone change and allows assessment teams to review and validate the information from the desktop, reducing the amount of field time

ChangeFinder

CONNECTASSESSMENT Enter pin [Search] pin Bookmarks Joe Odd

Review Info

Map Type: 01/19/2014 1 of 6 (2014)

Map Type: 12/17/2012 1 of 10 (2012)

Filters

Change Type: changed

pct_change: > 75%

isd_name: GEORGETOWN I.S.D

propType: Any

Review Status: Any

Matches: 32 Start

Actions

Highlight:

Matches: Back 7 of 32 Next

Status: Set Review Status ...

View/Add Comments Export Selected

Data

Review Status: Not Reviewed
Determination:
Est. Value Change:
Change Type: changed
percent change: 120.9301211543
pin: R042806
isd_name: GEORGETOWN I.S.D
propType: Residential
area: 4919.8085085073
previous area: 2226.8617942496

Activity History

20 ft 5 m

© 2013 Palantir

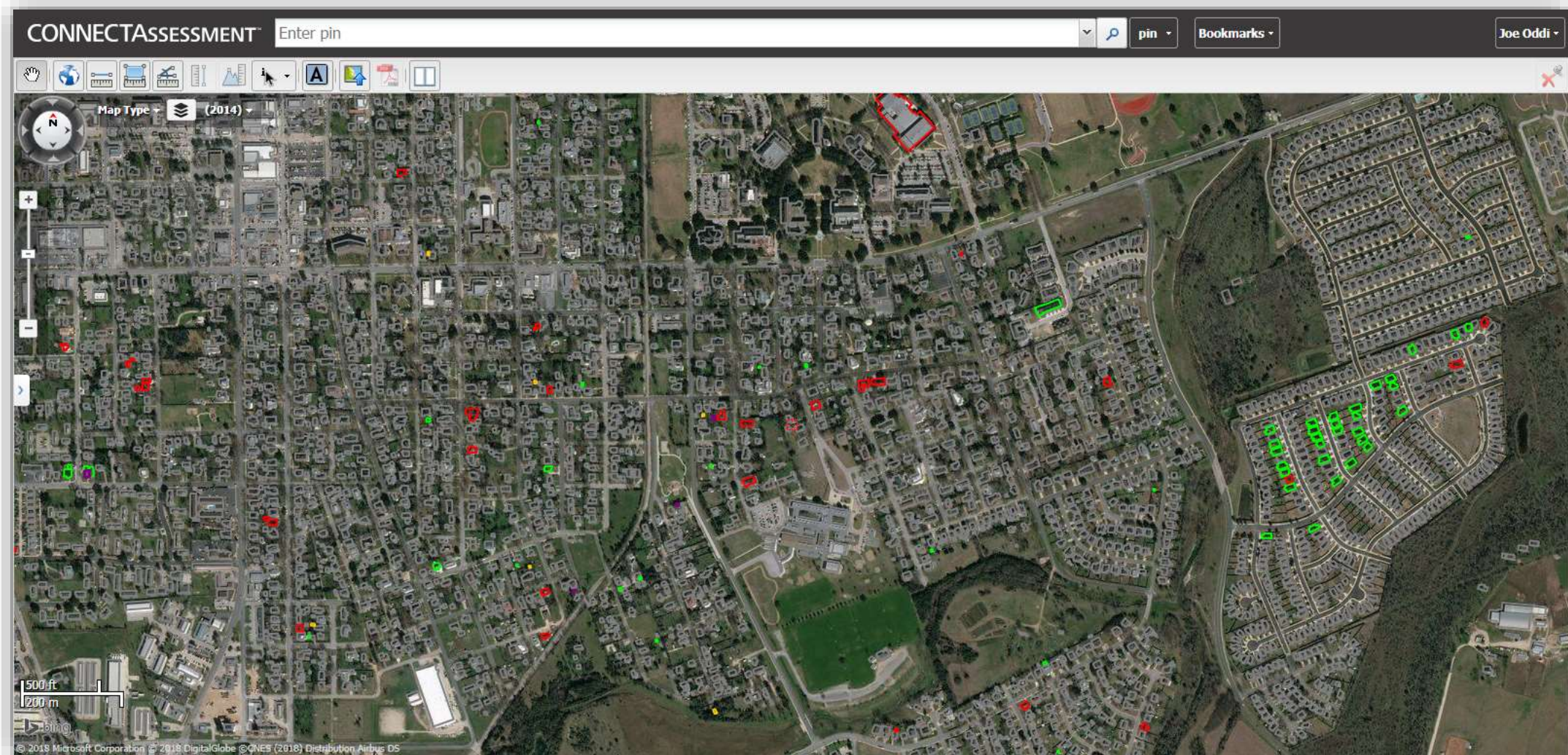
ChangeFinder

Picks up everything greater than 150 sq. ft.

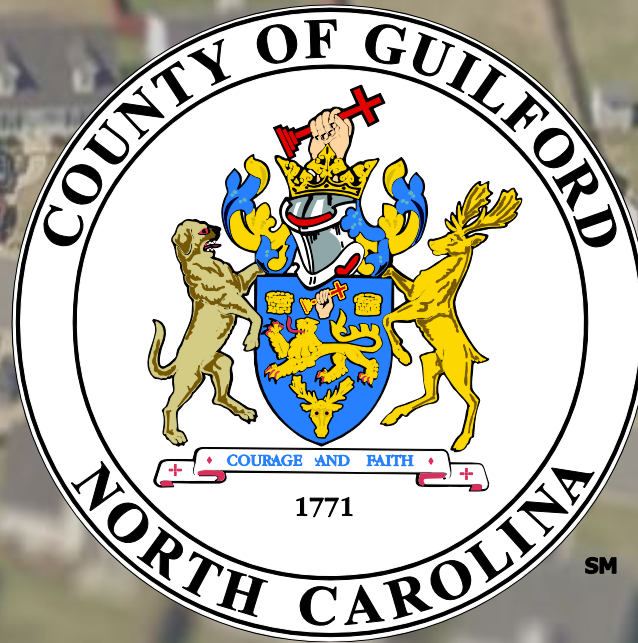


Pictometry ChangeFinder

Easily find change amidst a sea of unchanged buildings



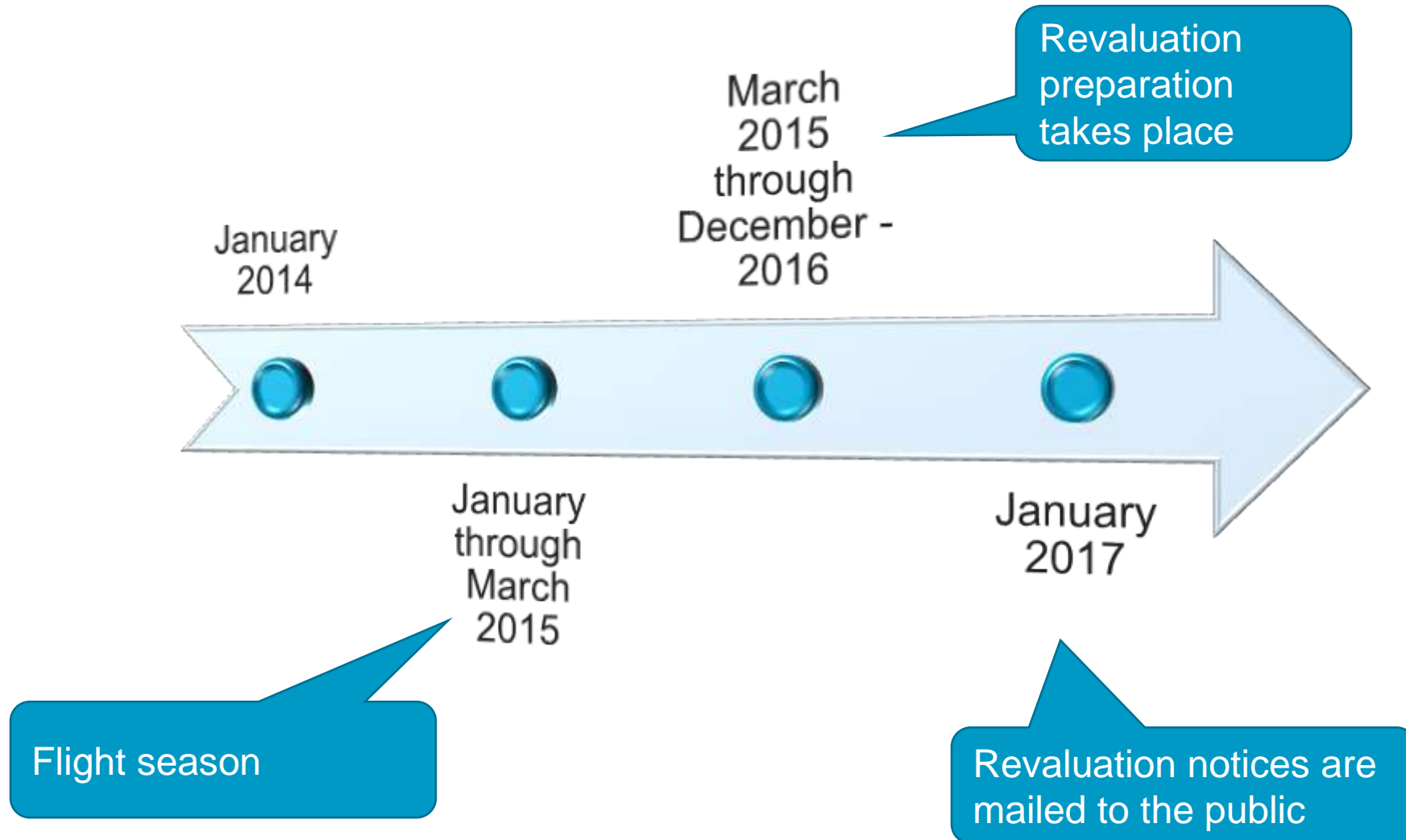
Tax Department



Ben Chavis, Tax Director
Alan Myrick, Real Property Supervisor

*Building Data Integrity
and the Tax Base
Utilizing Oblique Imagery*

2017 County Revaluation Timeline



Anticipated Benefits of Pictometry & ChangeFinder

- Discovery of previously unknown properties
- Increased tax revenue and accuracy of assessment records
- Reduced time & expense of field review
- Less appraisal staff needed to conduct Revaluation
- The 2013 IAAO Standard on Mass Appraisal of Real Property recommends that “a physical review including an on-site verification of property characteristics should be conducted at least every 4 to 6 years.”
- Recoup investment within two years

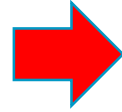
Oblique Photography



Change Detection Process



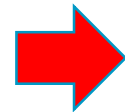
2015 Imagery



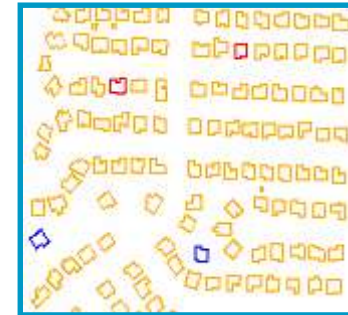
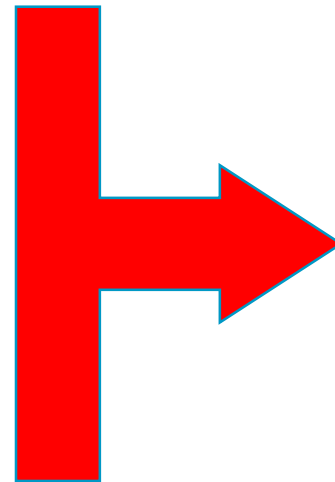
Generated Building Outlines



2007 Imagery

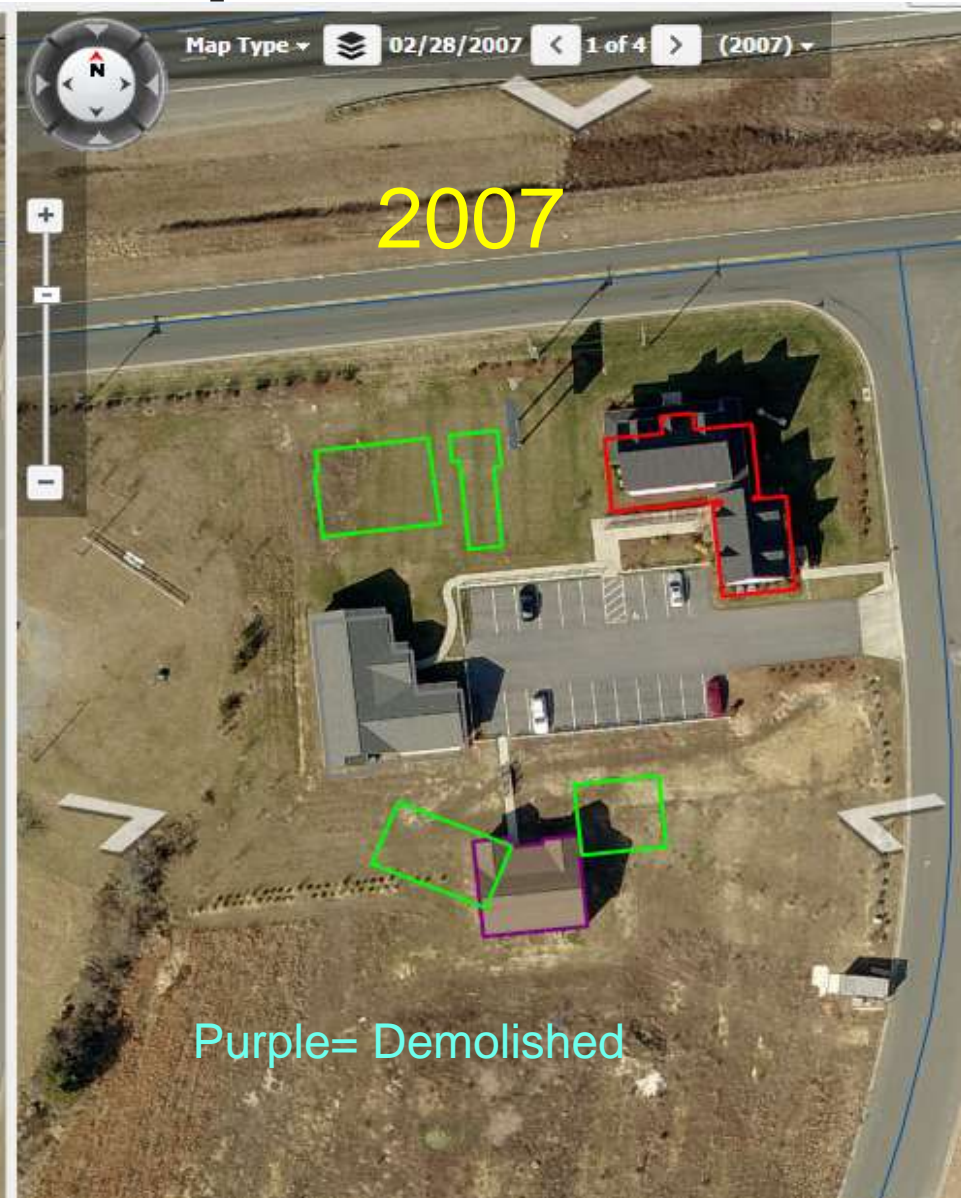
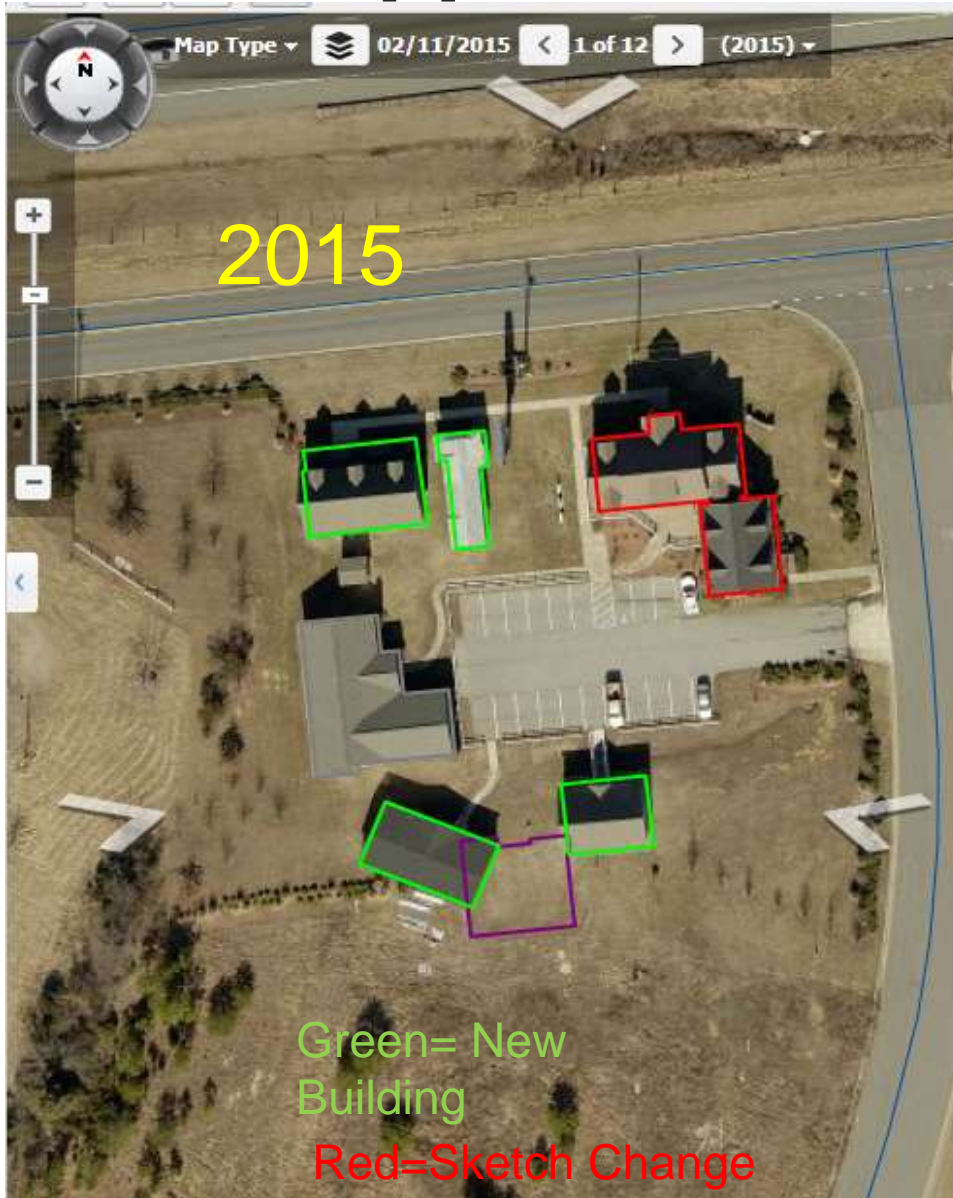


Generated Building Outlines

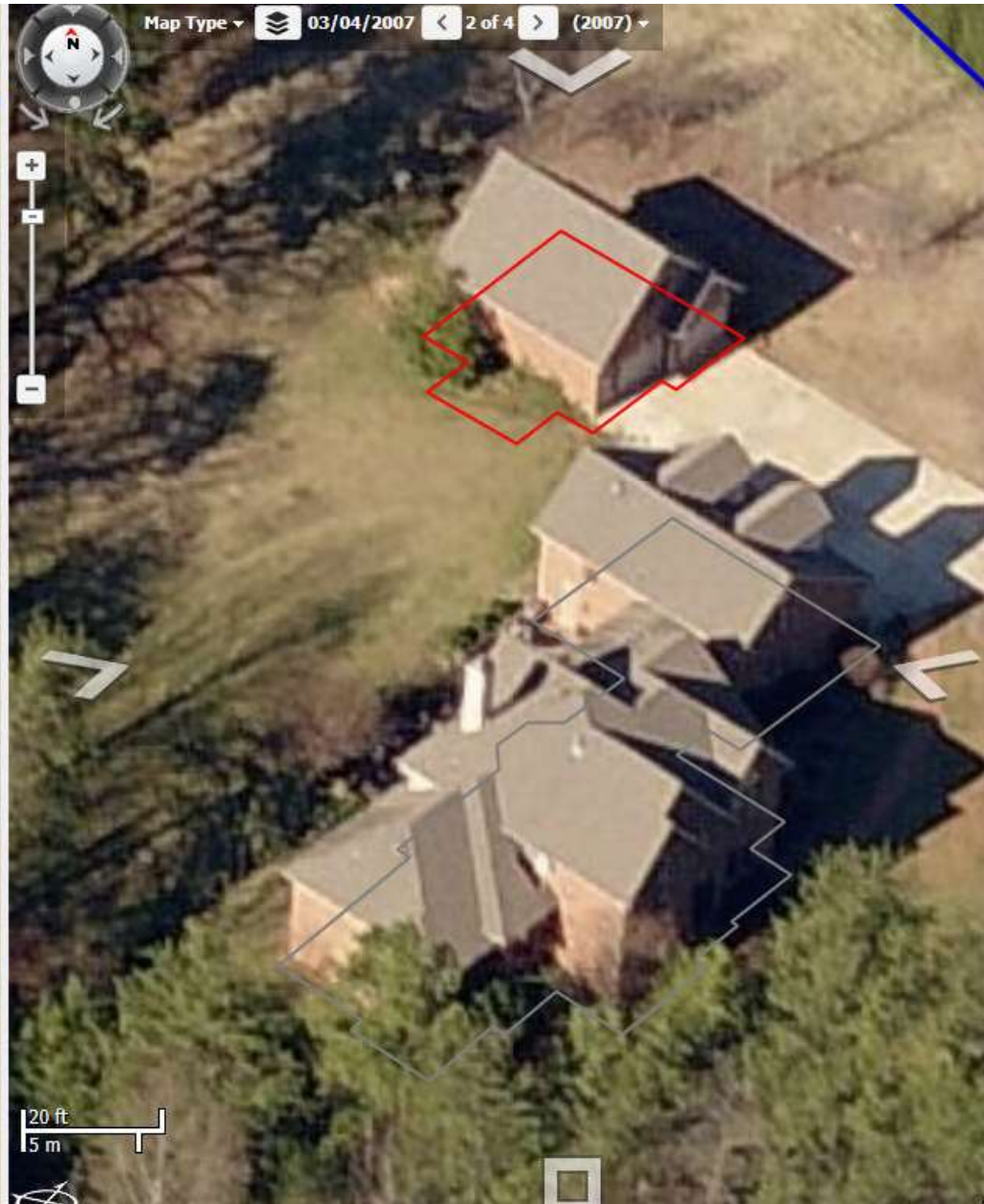


Change Candidates

Appraisers Desktop View



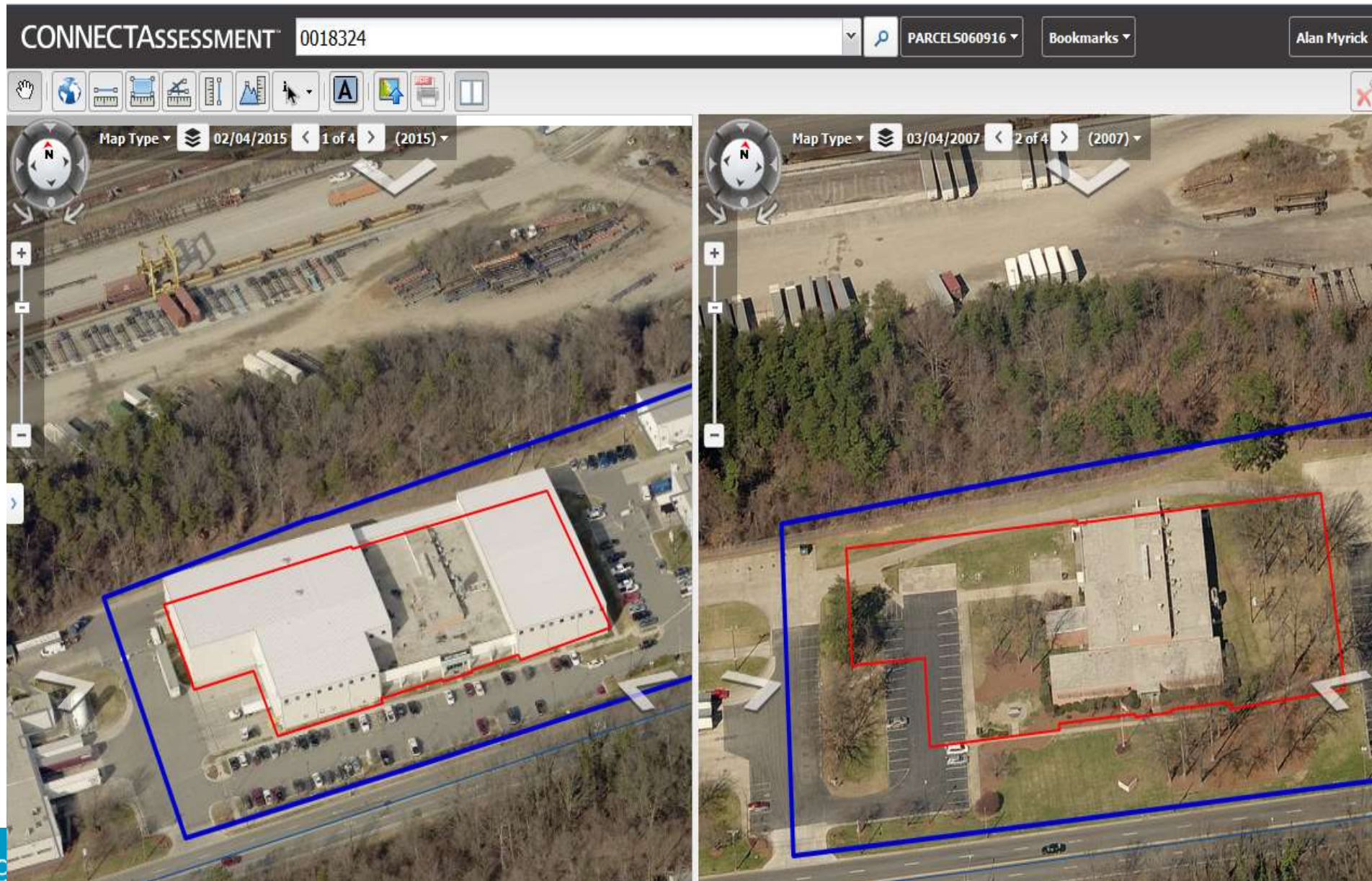
Things we found



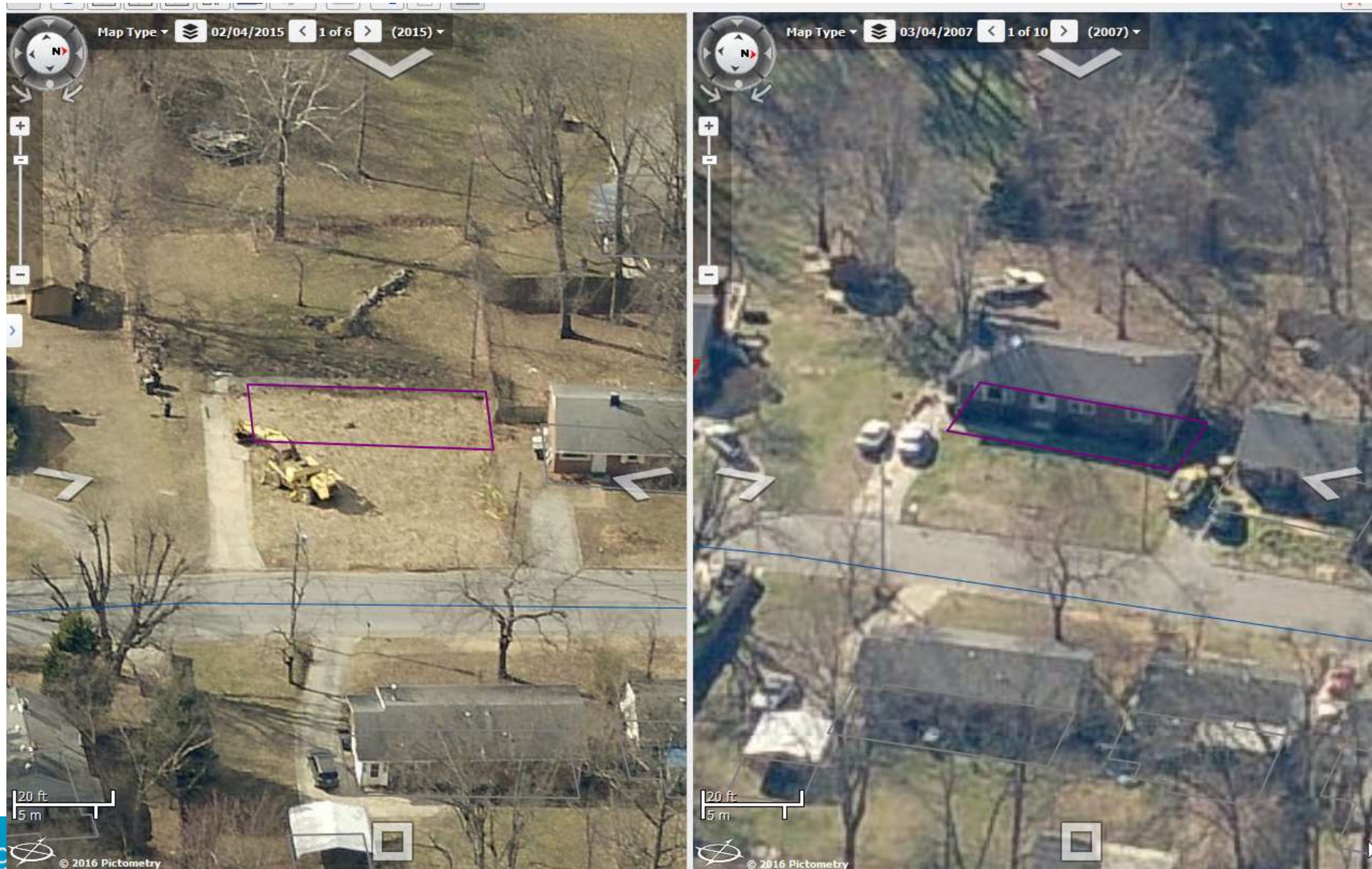
Things we found



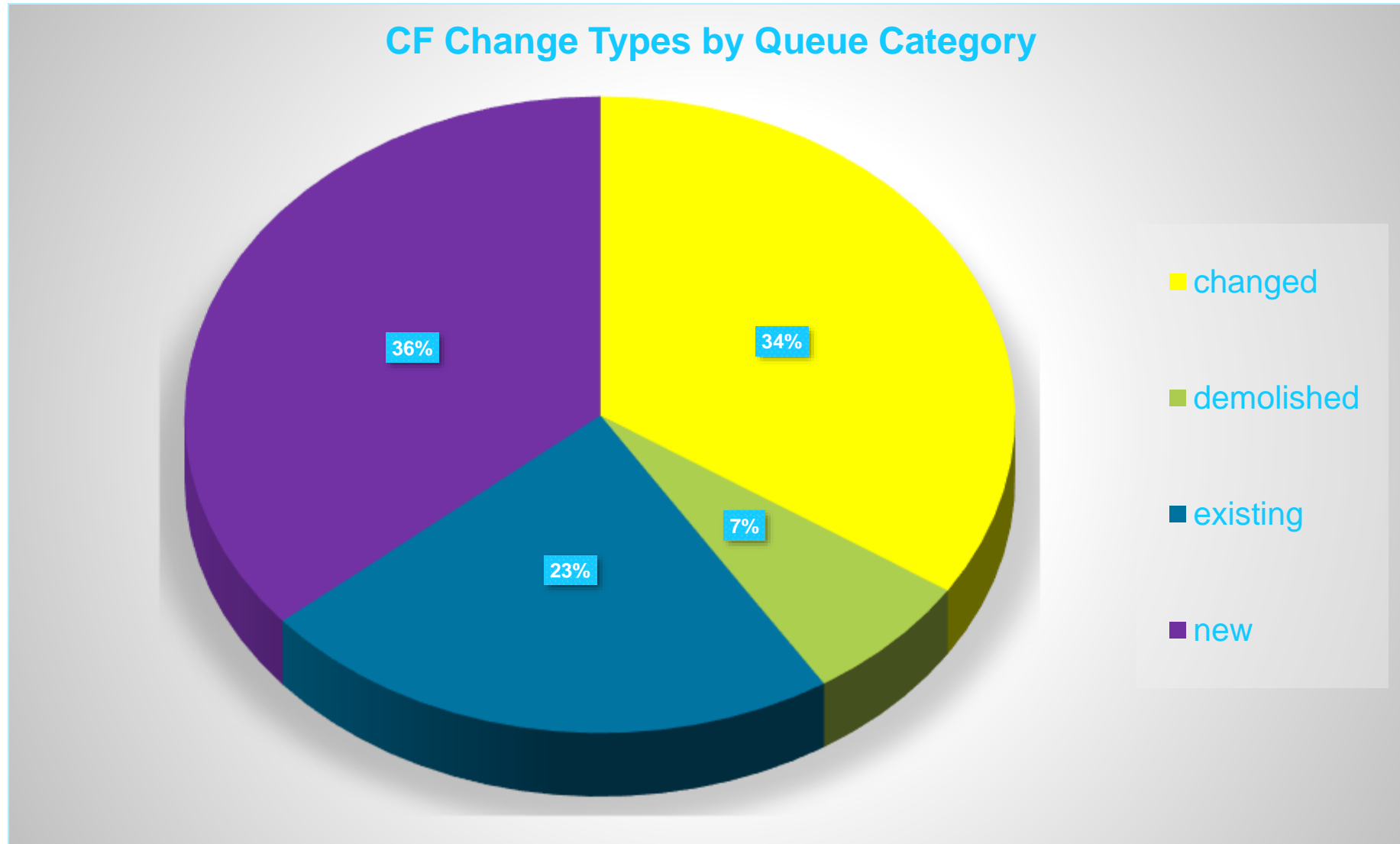
Things we found



Things we found Gone



Value of Changes per Category



Pictometry Changefinder

- Allows appraisal staff to do an electronic inventory of buildings & outbuildings that have been built, improved, or removed since 2007.
- Appraisal staff added or removed:

Building Value Added: \$53,962,991

Building Value Removed: \$3,504,822

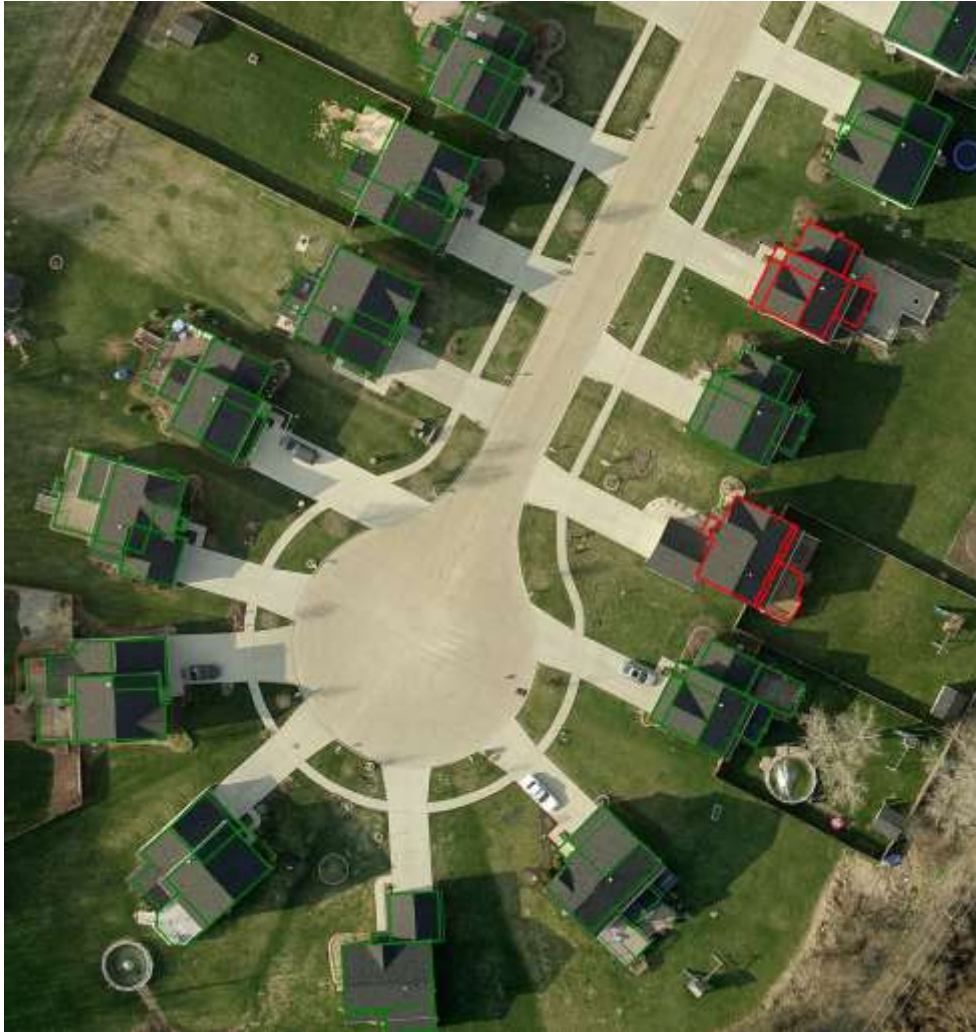
The Results

- Net discovered value:
\$50,458,169
- \$344,687 revenue to be realized per year at the current tax rate.

Realized Benefits of Pictometry Oblique Imagery & ChangeFinder

- Discovery of previously unknown structures – 2,688
- Removal of 861 demolished structures.
- **Increased tax revenue - \$344,687**
- Improved accuracy of assessment records – 5,611 updates / 280,326 total structures in County (98% accuracy rate)
- **Reduced time & expense of field review – \$1,575,000 in savings**
- Less appraisal staff needed to conduct Revaluation
- **Recouped investment in 1.3 years**
- Increased public confidence in the accuracy of the appraisal record

Change Detection



SketchCheck

Help assessors georeference and verify accuracy of CAMA sketches using high-res ortho imagery

Discrepancies between images and sketches are flagged and categorized by degree of inconsistency

Sketch Check

- Verify accuracy of your CAMA sketches from your desk
- Sketches are categorized by degree of consistency
 - Match
 - Minor Mismatch
 - Major Mismatch



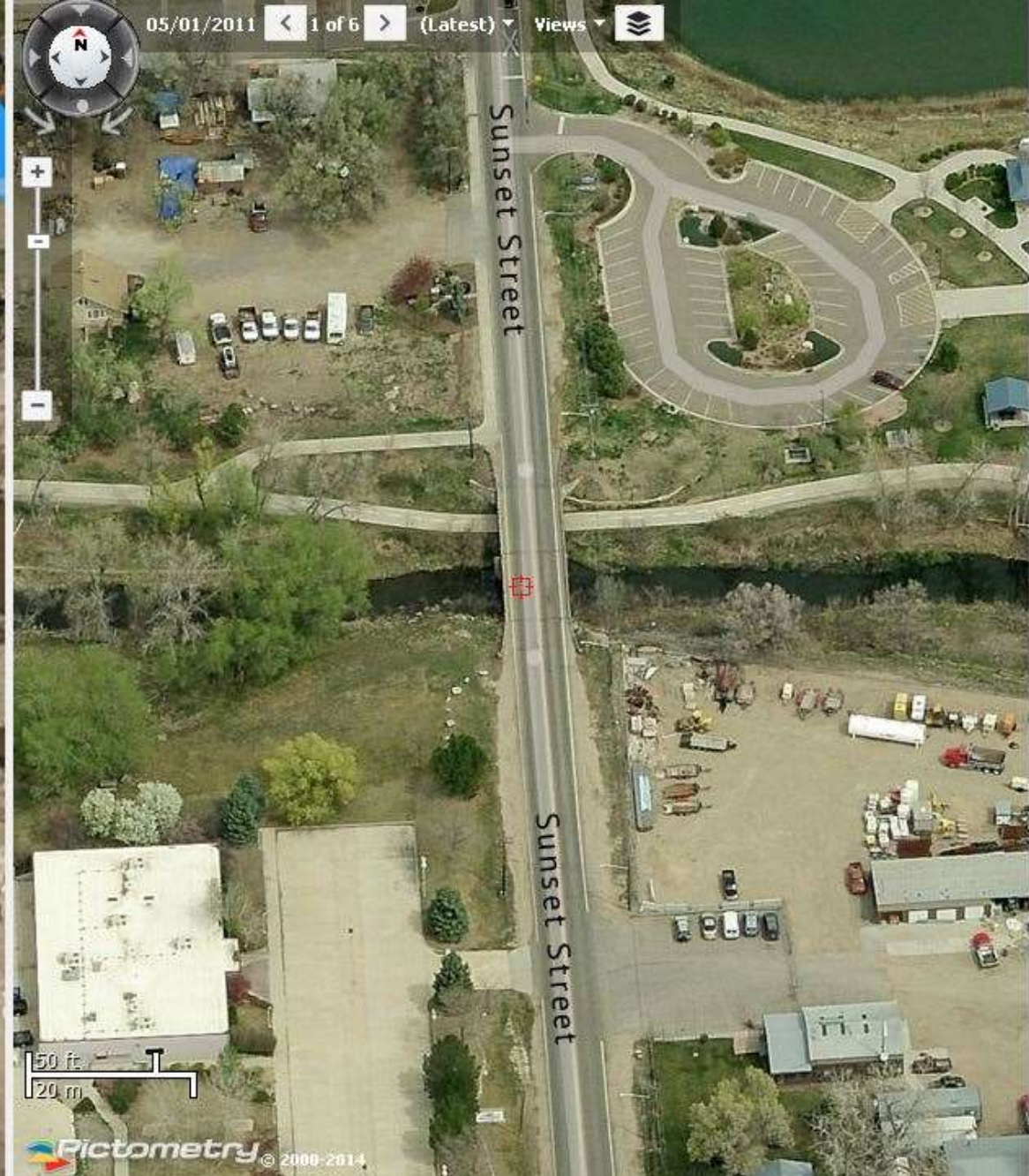
Disaster Response – Damage Assessment

CONNECTEXPLORER™



map: Auto (Ortho) ▾ Tag: Early Access ▾ < image 1 of 6 > 09/08/2019

map: Auto (Ortho) ▾ Dates: All ▾ < image 7 of 25 > 01/26/2018



CAMA Integration

(Tyler, Patriot, Bi-Tek, Farragut, Harris, Thompson Reuters, etc...)

The screenshot displays the EagleView software interface, which integrates various data sources for property management. The main window is divided into several sections:

- Property Data Panel (Top Left):** Contains fields for address (PIN: 10293-52015-00000), street, city, and various property details such as occupancy (Single-Family / Owner Occupied), year built (1996), and square footage (Main Area: 542, TLA: 1,801).
- Pictometry Viewer (Top Right):** Displays an aerial satellite view of the property with a street grid and surrounding neighborhood.
- Sketch [1] of 1 (Bottom Left):** Shows a 2D floor plan with labeled rooms and dimensions. Key areas include 'COMC PATIO (100)', '25 SF FR (VADK) (160)', '25 SF FR (VARD) (140)', and 'FR GAR (140)'. Dimensions like 12'0", 10'0", and 20'0" are visible.
- Structure Reference (Bottom Middle):** A tree view listing property components and their areas:
 - Res Bldg 1: 101-2 Story Frame; Area: Main Area (542), Basement Finsh (530)
 - Porch 1: 25 Frame Open Area: 52, Area (52)
 - Deck 1: Concrete Patio-Med (), Deck 2: Wood Deck-Low (160)
 - Veneer 1: 1 Story Brick LF: 26
 - Addition 1: 1 Story Frame; Yr: 1996, Area (283), Basement (283), Attic
 - Addition 2: 1 Story Frame; Yr: 1996, Area (63), Basement, Attic
 - Addition 3: 1 Story Frame; Yr: 1996, Area (10), Basement, Attic
 - Garage 1: Att Frame; Yr: 1996, Area (140), Qbs Area (352)
- PhotoVision (Bottom Right):** Displays a street-level photograph of the house. Metadata includes 'Date taken: 4/21/2011', 'Type: Picture', 'Sub Type: NONE', and 'Keywords'. It also shows a 'Photo 1 of 2' gallery at the bottom.

Public Access - Demonstration

The screenshot displays the Surry County GIS web application. At the top left is the Surry County logo with the text "THE GREAT SEAL OF SURRY COUNTY 1779" and "Surry County North Carolina". To the right of the logo are navigation icons and a "Show Pictometry" button. Below the header is a navigation bar with "Search", "Results", and "Layers" tabs. The left sidebar contains search filters for "Parcels":

- Owner Name:** A search box with "Enter Owner Name" and a "Search" button. Example: "ex. Smith, John".
- Parcel Number:** A search box with "Enter Parcel Number" and a "Search" button. Example: "ex. 499700465429".
- Deed Reference:** A search box with "Book/Page" and a "Search" button. Example: "Book/Page (00014/0062)".
- Search By Address:** A search box with "Enter Address" and a "Search" button.

At the bottom of the sidebar are "List" and "Advanced" options. The main map area shows a topographic map of Surry County, North Carolina, with major roads and airports marked. Neighboring counties are labeled: Grayson, VA, Carroll, VA, Alleghany, Stokes, Forsyth, Yadkin, and Wilkes. A scale bar at the bottom right indicates "Map Scale: 1 inch = 20,833 feet".



Questions?



Thank you!