

IAAO Mass Appraisal Standard and How Our World Has Changed

Presented to:

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by

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IAAO Mass Appraisal Standard

Section 3.3.5

- Jurisdictions may employ a set of digital image technology tools to replace a routine cyclical field inspection with a computer assisted office review. This tool set should include:
 - High-resolution street-view images (at a sub-inch pixel resolution that enables quality grade and physical condition to be verified, updated at least every 6 years)
 - Orthophoto images (minimum 6" pixel resolution in urban/suburban and 12" resolution in rural areas, updated every 2 years in rapid growth areas, or 6–10 years in slow growth areas).
 - Low level oblique images capable of being used for measurement verification (four cardinal directions, minimum 6" pixel resolution in urban/suburban and 12" pixel resolution in rural areas, updated every 2 years in rapid growth areas or, 6–10 years in slow growth areas).
- Effective tool sets validate CAMA data and incorporate change detection software that compares building dimension data (footprints) in the CAMA system to georeferenced imagery or remote sensing data from sources (such as LiDAR [light detection and ranging]) and identify potential CAMA sketch discrepancies for further investigation.
- Changes to interior characteristics may be monitored on a regular and cyclical basis (such as every 6 years).
- This alternative should be used in conjunction with information obtained through the permitting process, where available. In addition, appraisers should visit assigned areas on an annual basis to observe changes in neighborhood condition, trends and property characteristics.
- A physical review is recommended when significant construction changes are detected, a property is sold, or an area is affected by catastrophic damage.



What Does Section 3.3.5 Say?

“Jurisdictions may employ a set of digital image technology tools to replace a routine cyclical field inspection with a computer assisted office review.”

Why was Section 3.3.5 needed?

1. Remote sensing
2. Advent of NEW technology
3. Efficiency
4. Work flow
5. Good results
6. **Cost, Cost, Cost**



Prerequisites and limitations?



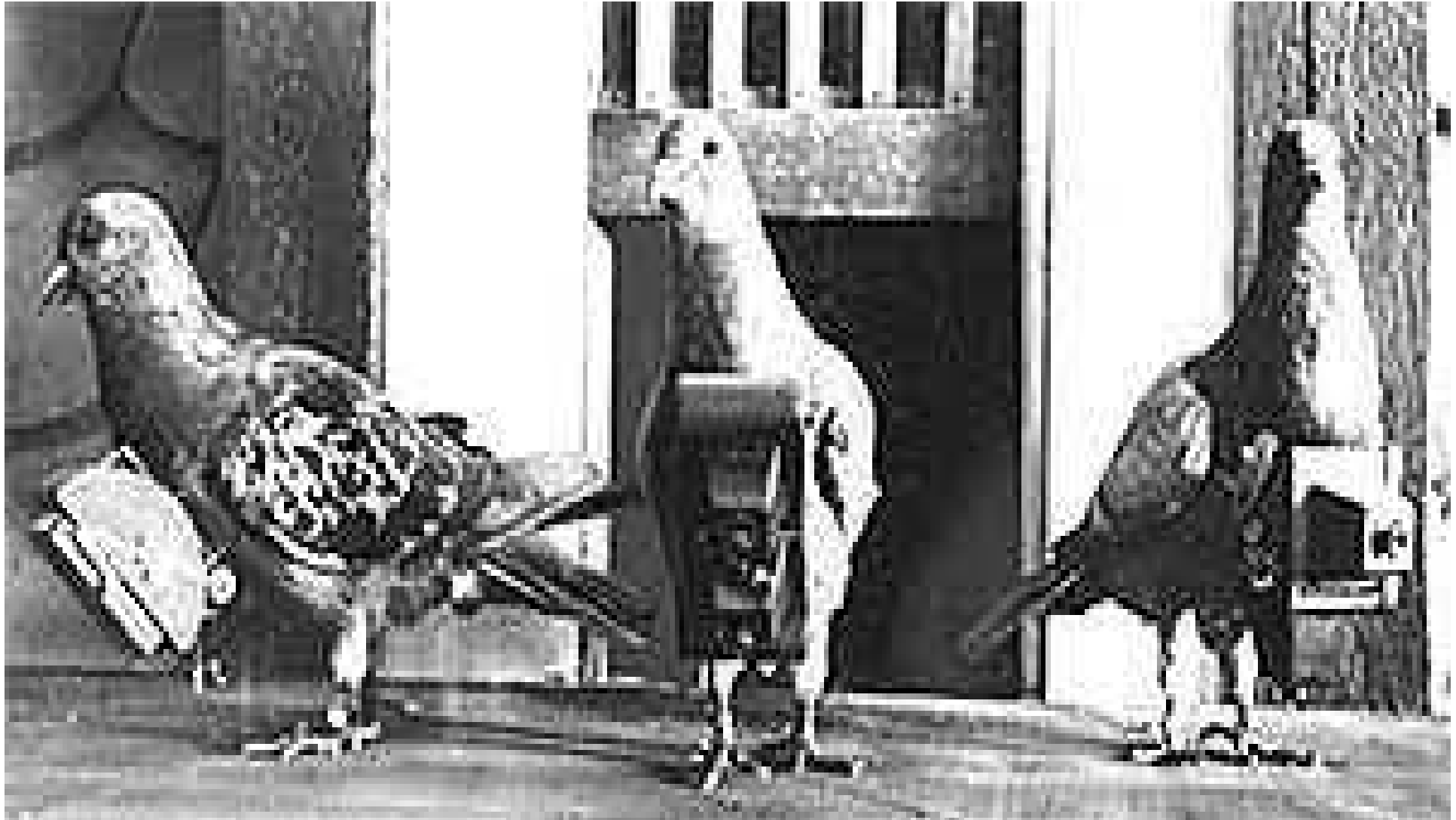
1. Must have something to verify
2. Embrace workflow
3. Maintenance plan
4. Don't try to do too much
5. Still have to do field reviews
6. Interior information is always a problem

What is Remote Sensing?

“Remote sensing is the stand-off collection through the use of a variety of devices for gathering information on a given object.”



State of the Art Camera Systems



What are the IMPORTANT remote sensing tools?



43-11-23-100-140.000-033 09/01/2010



Oblique Image



Ortho Photo

- 6" pixel resolution in urban/suburban
- 12" resolution in rural areas
- updated every 2 years in **rapid growth areas** (urban areas)
- 6–10 years in slow growth areas (rural areas)

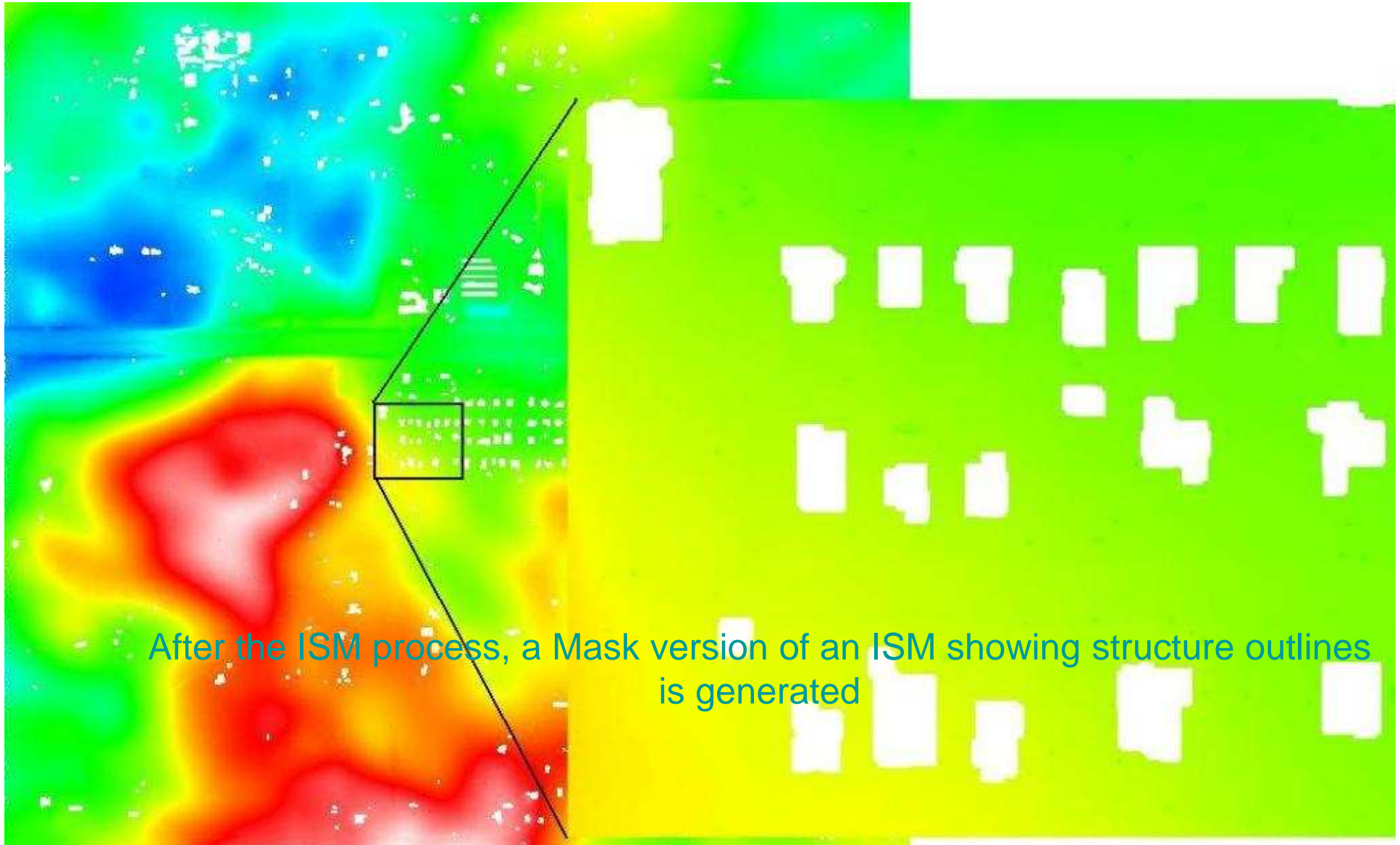


Change Detection

“Effective tool sets validate CAMA data and incorporate change detection software that compares building dimension data (footprints) in the CAMA system to georeferenced imagery or remote sensing data from sources (such as LiDAR [light detection and ranging]) and identify potential CAMA sketch discrepancies for further investigation.”

IAAO

LiDAR



Two Change Detection Methodologies in Current Use

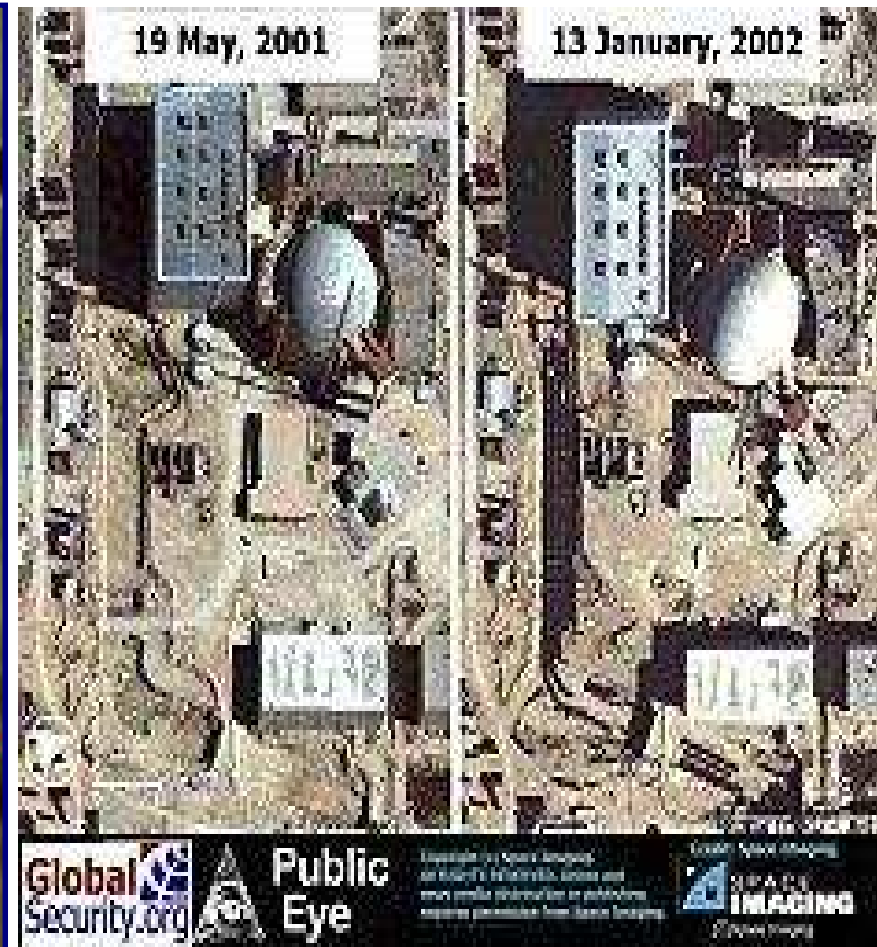


Photo to Photo

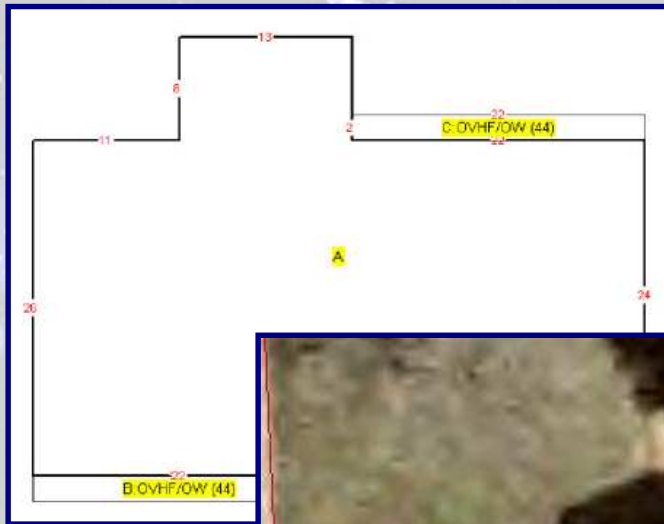
“Change detection for GIS (geographical information systems) is a process that measures how the attributes of a particular area have changed between two or more time periods. Change detection often involves comparing aerial photographs or satellite imagery of the area taken at different times.”

Wikipedia

ChangeFindr



CAMA/Photogrammetric Analysis



CAMA Sketch Comparison

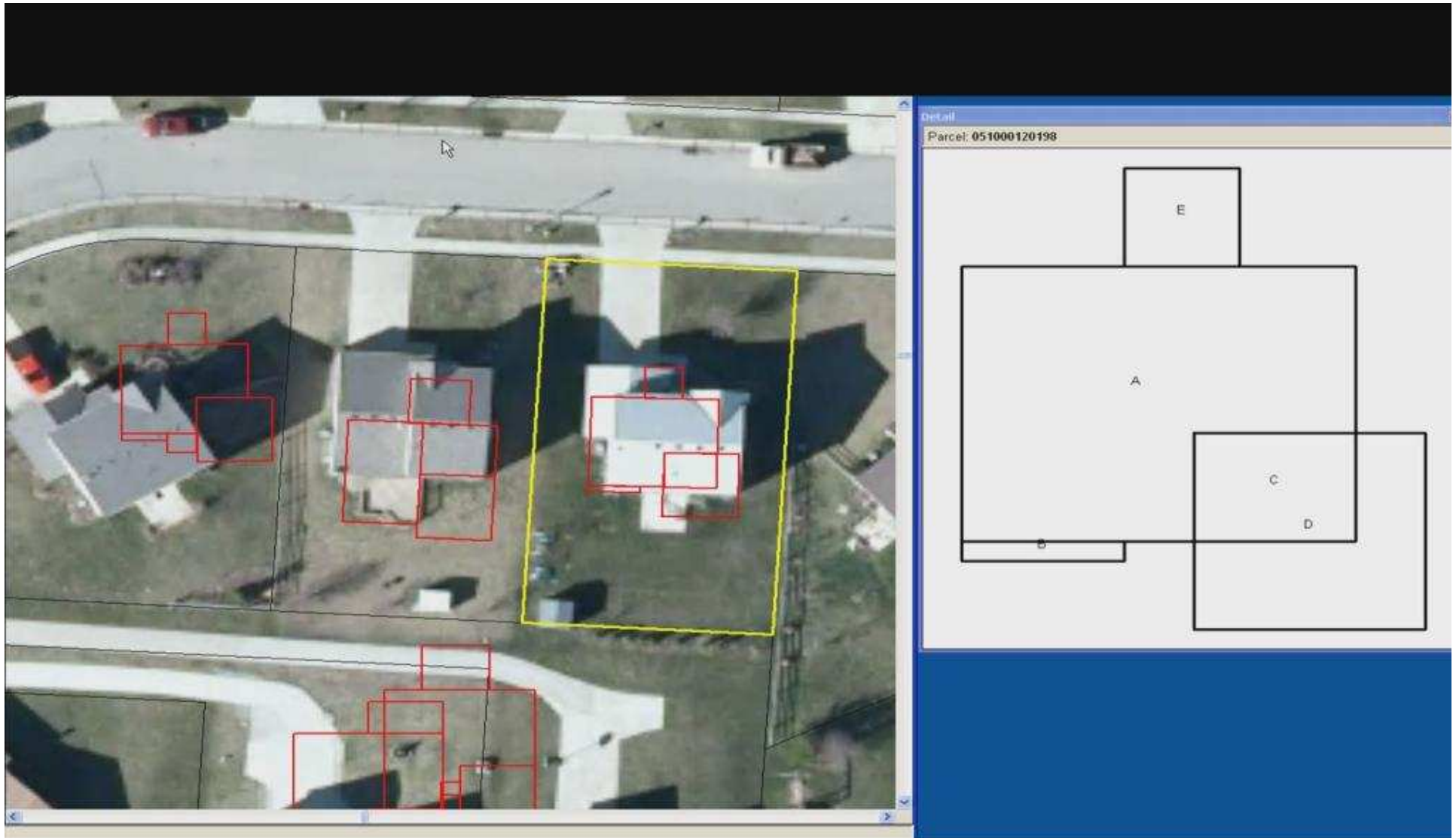
- Unique way of looking at assessment data
- Compare CAMA with today's reality
- Your sketch and your ortho
- Base line of information
- Multiple products
- Low investment



The Process

- Sketch is converted to shape file
- Moved to paracentroid
- Visually rotated and placed over ortho
- Anchored and georeferenced
- Exception noted
- Returned as a GIS layer
- Further analysis

Not a Good Fit



Yotta SketchRight

Appraisal Review 1.02.0000

File Database Reports Options

Parcel	Address	MV Map	Appraiser	Re	Source	Desc	Save Date
217201	2737 S 55TH ST	036	DEMO	DE	Residential	2737 S 55TH ST	01/03/04
					OutBldg	RT4 - MASONRY STOOP OR TERRACE	01/03/04
					OutBldg	RT1 - WOOD DECK	01/03/04
					OutBldg	RT2 - CONCRETE DECK OR PATIO	01/03/04
					Permit	RE	12/18/08
					Sales		12/18/08
					Inspection	8-3-1999 - 45 - 5	12/18/08

Save (F1) Verify (F2) Discard (F4)

Field Review: (N/A)
Sketch Review: NEW ADDITION

Land Use Code: 111 - Single Family Reside
Year Built: 1979
Grade: C+
Condition: 3: Average
CDU: GD: Good
Style: 15: RAISED RANCH
Ext Wall: 1: Wood Frame
Story Height: 1
Attic Type: 1: None
Roof: 01: Asphalt Shingle
AC Type: 4: Central/AC

Land Value: \$25,400.00
Impr Value: \$89,100.00
Total Value: \$114,500.00
FinSqft: 1200.0

Notes:

Sketch Images Map

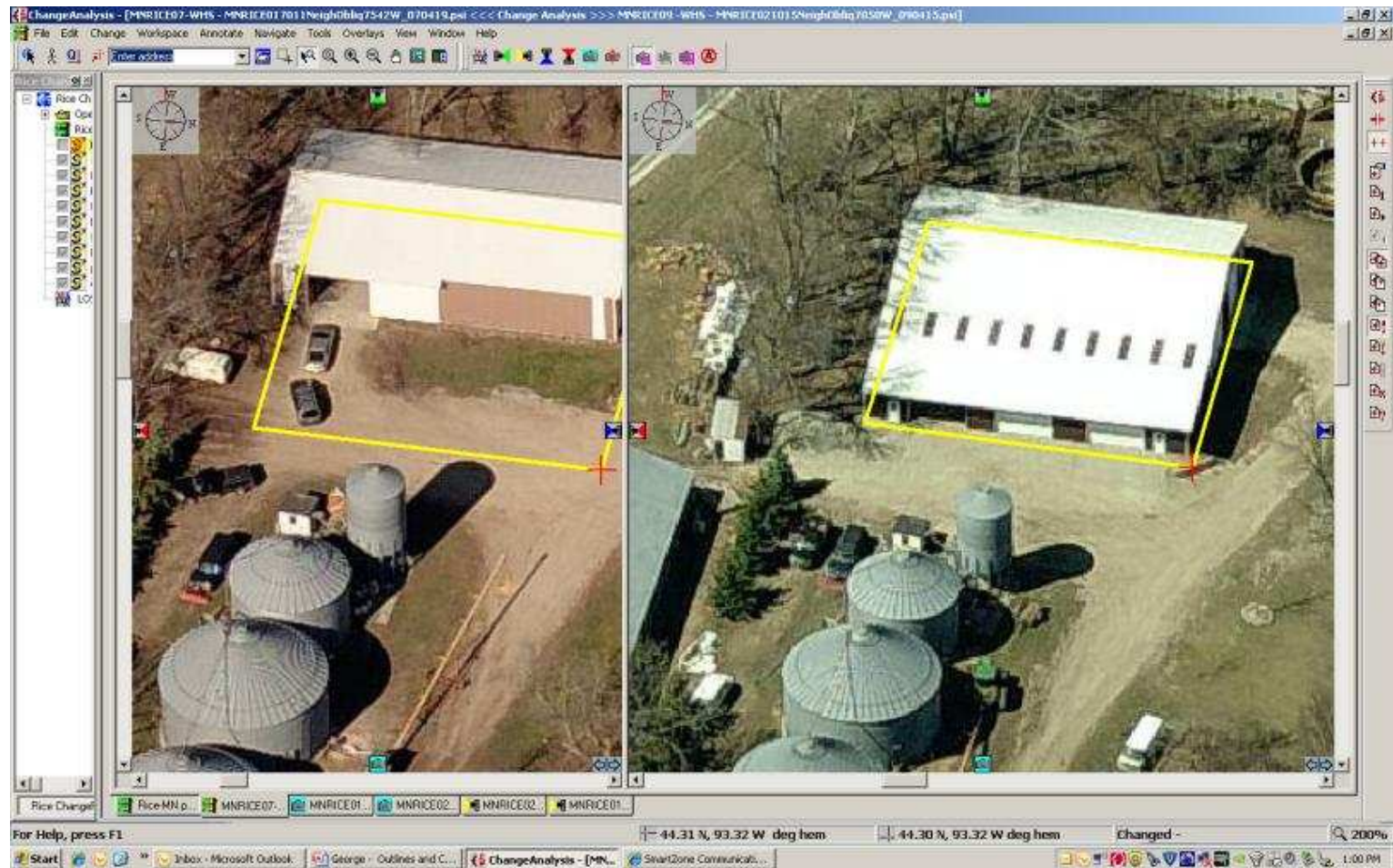
Background: Map Tip: [None] Render Restore Drag a zoom region box.

☒ MAP036
☒ MAPGRID
☒ STREETS
☒ CURBS
☒ BUILDINGS
☒ ORTHOGRID
☒ K_2245_2800_H05

X: 224812.49-4617
Y: 278687.780557

SGUNLOCK ● = Not Saved ● = Partial or Previous Save ● = Saved

Pictometry ChangeFindr



Apex Sketch



Sketch Validation



Stats From Geauga Co. OH Project

• Parcels Matched	13791	96.0%
• Minor Problem	293	2.0%
• Major Error	107	.7%
• Obstructed View	93	.6%
• New construction	24	.2%
• Questionable	5	.1%

Note: Second time project done in 5 years

Stats from Pasco Co. FL Project

• MATCHED	8352	83%
• UNMATCHED (1)	988	10%
• OBSTRUCTED VIEW (2)	354	4%
• QUESTIONABLE	136	1%
• UNABLE TO PROCESS	242	2%

(1) 70-80% of the unmatched can be solved with obliques and PRC

(2) 80% of obstructed view can be solved with oblique image

Note. This was a 10,000 parcel pilot and county gave us the most difficult area to test. Propety Appraiser said that he had perfect data....no errors!

Match w/ Foliage

Appraisal Review 2.01.0000

File Database Reports Options

Parcel	Address	MV Map	Appraiser
1625280140000000430	8632 CONGRESS ST	1	
1625280140000000440	8638 CONGRESS ST	1	
1625280140000000450	8644 CONGRESS ST	1	
1625280140000000460	8650 CONGRESS ST	1	
1625280140000000470	8702 CONGRESS ST	1	
1625280140000000480	8708 CONGRESS ST	1	
1625280140000000490	8714 CONGRESS ST	1	
1625280140000000500	8720 CONGRESS ST	1	
1625280140000000510	8726 CONGRESS ST	1	
1625280140000000520	8732 CONGRESS ST	1	

Source	Desc	Save Date
Sketch Data	CARD: 1	

Save (F1) Verify (F2) Discard (F4)

Card: 1

Review Status: N/A

Sketch Status: MATCH

SecAbbr: 0-BAS

SecAbbr1: 1-FOP

SecAbbr2: 2-FGR

SecAbbr3: 3-FEA

SecAbbr4:

SecAbbr5:

SecAbbr6:

SecAbbr7:

SecAbbr8:

Notes:

Sketch Images Map

Background: Map Tip: (None) Render Restore Drag a zoom region box.

- ☒ MAP1
- ☒ BUILDINGS
- ☒ ORTHOGRID
- ☒ 1282516 (Image)
- ☒ 1032616 (Image)
- ☒ 1222518 (Image)
- ☒ 1352518 (Image)
- ☒ 1102621 (Image)

X: 428580.539717
Y: 1436583.701511

Verify the property attributes or change and save values.

JWILSON ● = Not Saved ● = Partial or Previous Save ● = Saved

AppraisalReview FileZilla version 2.2... Appraisal Review 2... UnMatched exampl...

10:43 PM

No Match

Appraisal Review 2.01.0000

File Database Reports Options

Parcel	Address	MV Map	Appraiser
162528006000B000180	8335 HARDY ST	1	
162528006000C000020	8342 AFTON LN	1	
162528006000C000040	8414 AFTON LN	1	
162528006000C000170	8339 FORMEL AVE	1	
162528006000D000060	8415 AFTON LN	1	
162528006000E000050	8349 AFTON LN	1	
162528006000E000060	8339 AFTON LN	1	
16252801000000000201	6140 OLD RIDGE RD	1	
16252801200000002250	8852 EILEEN DR	1	
16252801400000002160	9747 HENLOCK LN	1	

Source	Desc	Save Date
Sketch Data	CARD: 1	
Sketch Data	CARD: 2	

Save (F1) Verify (F2) Discard (F4)

Card: 1

Review Status: N/A

Sketch Status: UNMATCHED

SecAbbr: 0-AOF

SecAbbr1: 1-UGR

SecAbbr2: 2-CAN

SecAbbr3: 3-CAN

SecAbbr4:

SecAbbr5:

SecAbbr6:

SecAbbr7:

SecAbbr8:

Notes:

Sketch Images Map

Background: Map Tip: (None) Render Restore Drag a zoom region box.

- ☒ MAP1
- ☒ BUILDINGS
- ☒ ORTHOGRID
- ☒ 1282516 (Image)
- ☒ 1032616 (Image)
- ☒ 1222518 (Image)
- ☒ 1352518 (Image)
- ☒ 1102621 (Image)

X: 426736.727215
Y: 1435574.147093

Verify the property attributes or change and save values.

JWILSON ● = Not Saved ● = Partial or Previous Save ● = Saved

AppraisalReview FileZilla - Connect... Appraisal Review 2... UnMatched exampl...

10:39 PM

Obstructed View

Appraisal Review 2.01.0000

File Database Reports Options

Parcel	Address	MV Map	Appraiser
2126100010067000000	5349 JENNIFER LN	1	
2126100010069000040	5336 LANTANA DR	1	
2126100010069000041	5336 LANTANA DR	1	
2126100010073000010	5441 HILL DR	1	
2126100010073000020	5415 HILL DR	1	
2126100010073000030	5449 HILL DR	1	
2126100010073000040	5433 HILL DR	1	
2126100010087000070	5306 BOLTON DR	1	
2126100010087000130	5245 BOLTON DR	1	
2126100010088000020	6340 MEL DR	1	

Source Desc Save Date

Sketch Data CARD: 1

Save (F1) Verify (F2) Discard (F4)

Card: 1

Review Status: N/A

Sketch Status: OBSTRUCTED VIEW

SecAbbr: 0.FOA

SecAbbr1: 1.FOA

SecAbbr2: 2.BAS

SecAbbr3: 3.FCA

SecAbbr4: 4.FEA

SecAbbr5: 5.FSA

SecAbbr6: 6.UST

SecAbbr7: 7.FCB

SecAbbr8:

Notes:

Sketch Images Map

Background: Map Tip: (None) Render Restore Click the map to load the ortho.

☒ MAP1

☒ BUILDINGS

☒ ORTHOGRID

☒ 1282516 (Image)

☒ 1032616 (Image)

☒ 1222518 (Image)

☒ 1352518 (Image)

☒ 1102621 (Image)

☒ 1232618 (Image)

X: 485633.451976
Y: 1402873.245081

Verify the property attributes or change and save values.

JWILSON ● = Not Saved ● = Partial or Previous Save ● = Saved

CAMA/Photogrammetric Feature List

THIS IS WHAT YOU
WANT TO RECEIVE!

- Viewing software
- Measure on ortho
- Exception list
- Data analysis
- Report features
- Shape file



Metrics

1. Rapid high volume delivery
2. 400 plus parcels per day production
3. 10-20 % error rate
4. Cost less than ONE Dollar per parcel
5. **1:5 and HIGHER ROI \$\$\$\$\$**

Sub Inch Pixel High Resolution Street View



237424 04/22/2008

Grade and Condition

Harris Co. TX Appraisal Manual

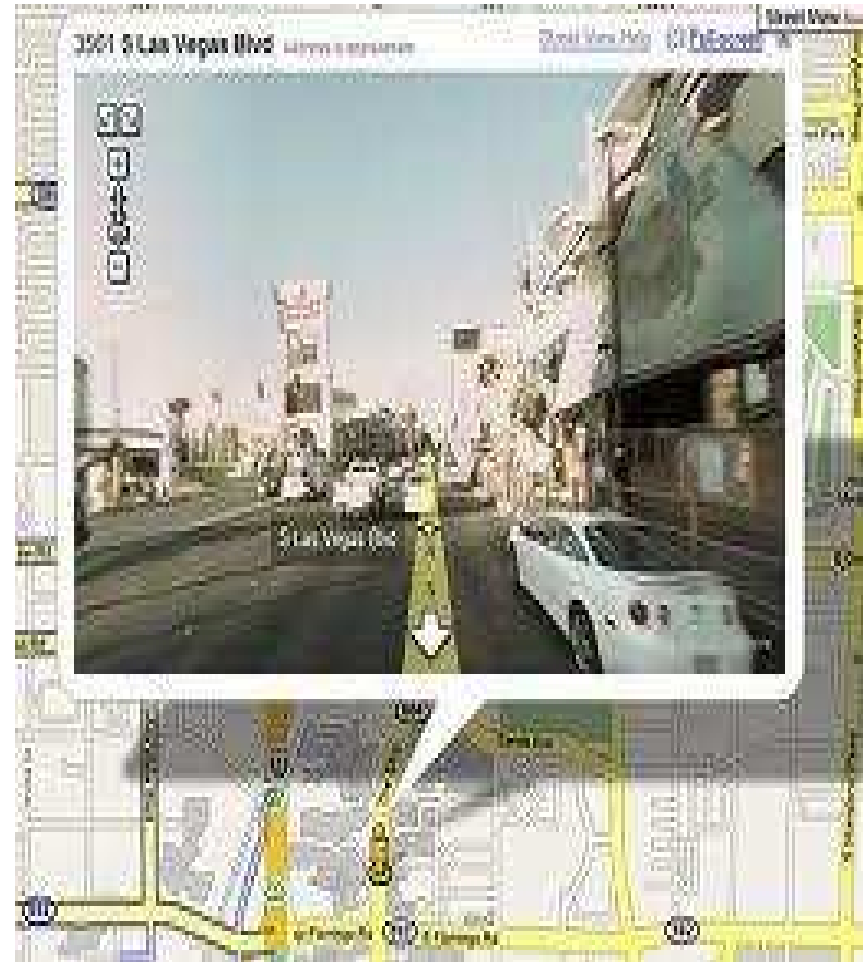
“The grade is a factor that is intended to reflect an overall judgment of the quality of workmanship and materials evident in a dwelling.”

“The physical condition is a rating which is intended to reflect a judgment of the overall physical condition of the dwelling relative to its age and considers the level of maintenance that you would normally expect to find in a dwelling of a given age.”

Types of Imagery



046-154-17-0-40-02-003.00-0 03/29/2011



Yotta



0600830010023 07/14/2006

Lookabout



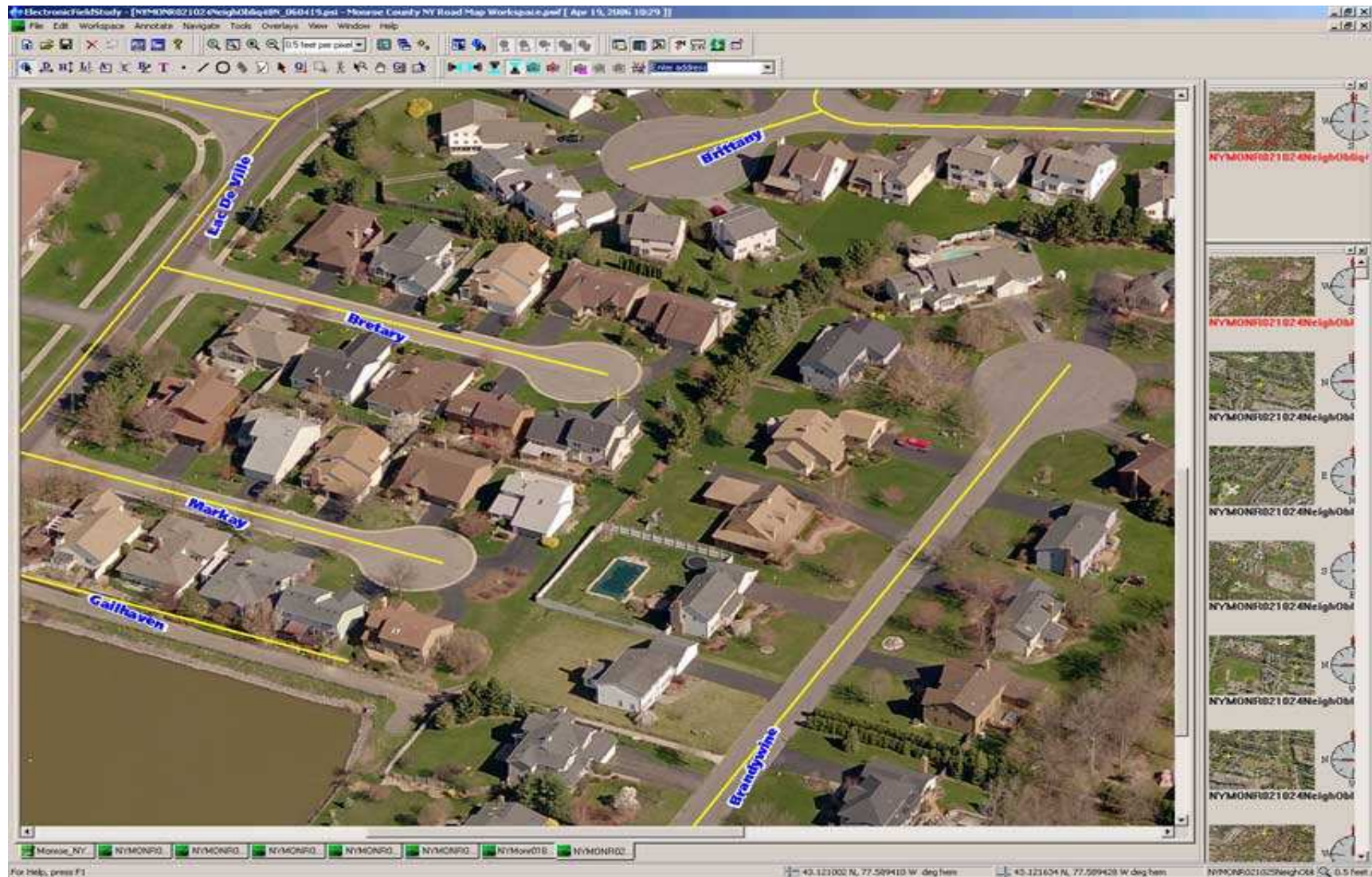
Facet



010-103438-00 04/13/2010



Pictometry Screen



The screenshot displays the PentaView software interface. The main window is divided into several panes. The central pane shows a 3D aerial view of a property with a large house, a driveway, and surrounding trees. To the left, there are smaller panes showing different views of the property, including a 'North View' and a 'West View'. On the right side, there is a vertical toolbar with various icons for navigation and measurement, including a compass, a ruler, and a protractor. Below the toolbar, there are several small circular maps showing the property's location within a larger context. The bottom of the interface features a status bar with various icons and text, including 'PentaView1' and 'NJBURLO1'.

Image Capture Vehicles







Street View Imagery

1. Vehicle Stops at Each Structure
2. Address Verified
3. X,Y Coordinate Placed
4. Images are Labeled
5. Attribute Data Added



Other Deliverables from Street View Imagery



237424 04/22/2008

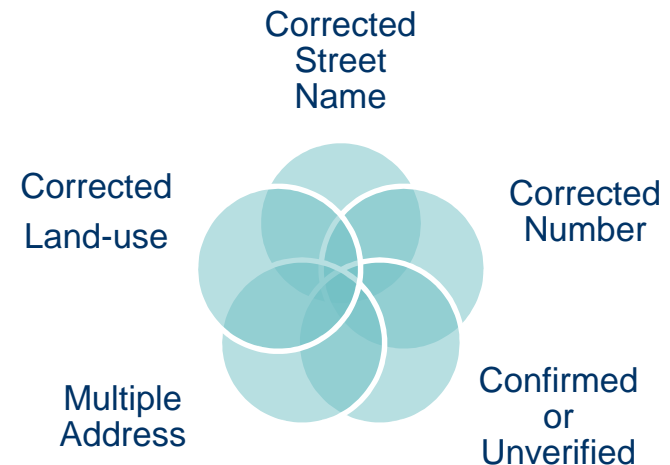
- Construction data
- Yard improvements
- Address verification
- Street center line
- Cadastral review
- X,Y Coordinate placement
- Personal property location
- Viewer/analysis

Address Verification

- Site address and street centerline field verified
- Collected in NENA or custom format
- XY coordinate placed to customers specification



Identify / Verify / Correct



Business Personal Property

Find New Tax Revenue

Unlicensed Businesses

Non-Filing Businesses

Secondary Addressing for
Commercial Parcels

Located with XY Coordinate

Cross Reference to BPP List

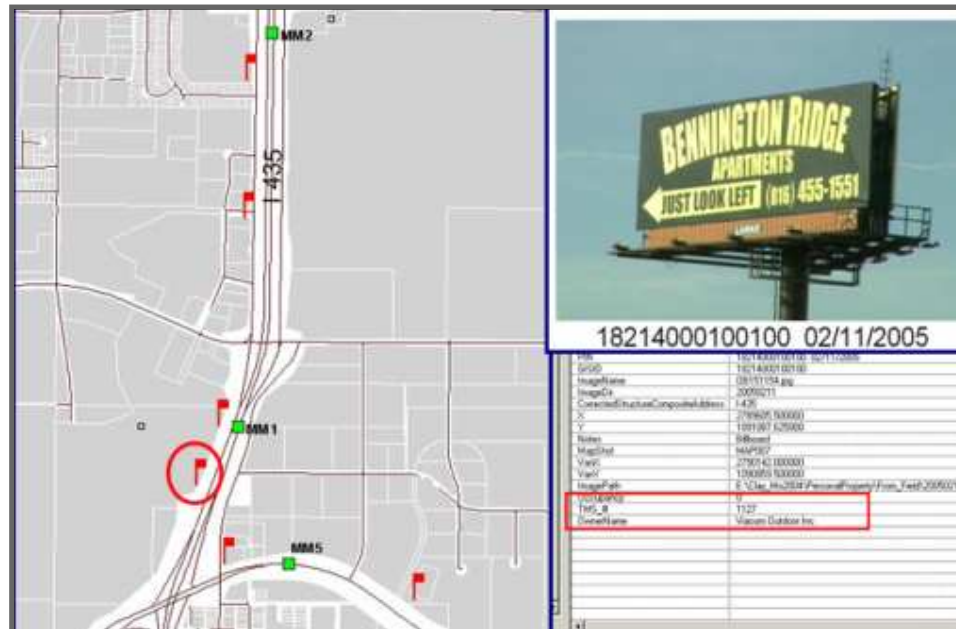
Identify for Audit



Location and ID of Special Structures

Billboards – Locate with XY Coordinate, Identify Real Estate or Business Personal Property, and Planning and Zoning Enforcement

Cell Towers – Property Tax Administration, Location for Emergency Services and Phase II Wireless Compliance



Secondary Unit Addressing

Washington DC Condominium Complex

Multiple Family Addressing

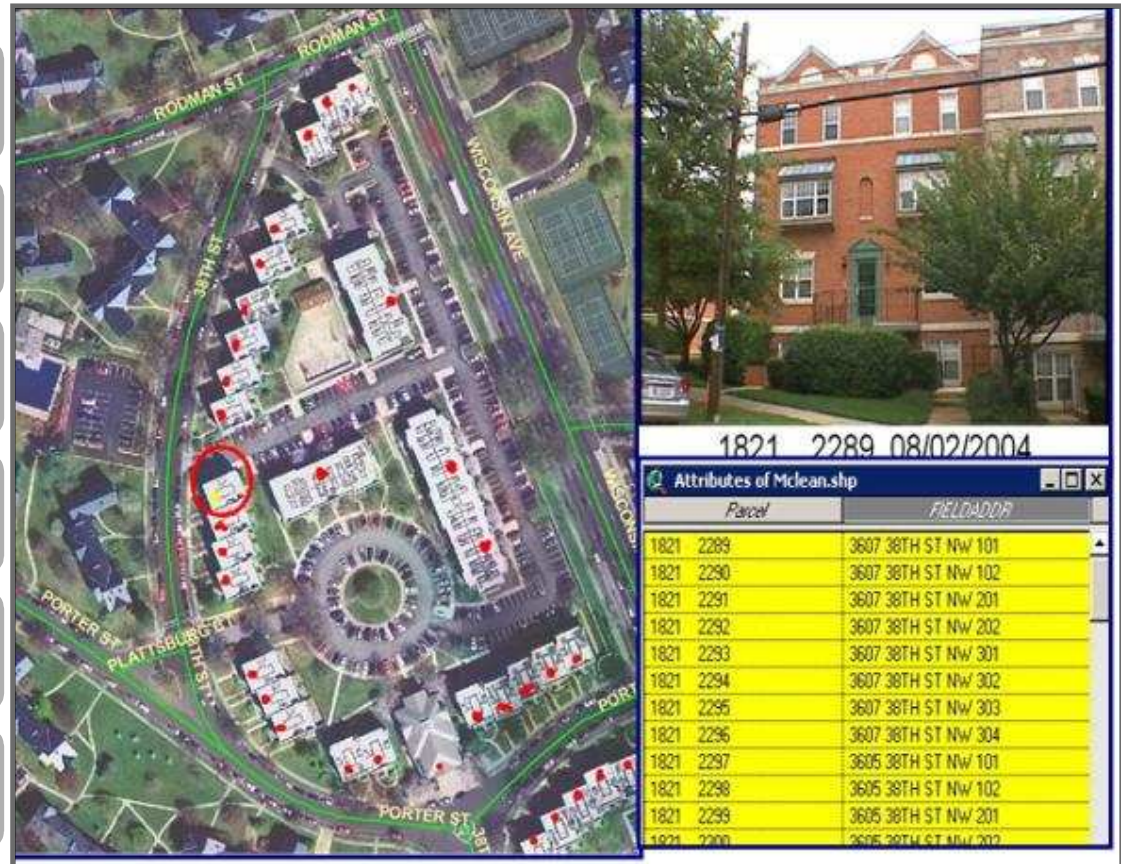
Address and XY Coordinate for Each Unit

Site Map Obtained from Property Management

Map Not Available - Others are Walked to Confirm

Mobile Home Park – Each space is collected

Commercial – Each street level address



Highways - Roadway Asset Inventory and Mapping

Record & Measure Roadside Assets

GASB 34 Implementation

3D Measurement of Objects

Asset Condition Assessment

Map - Speed Limits, Number of Lanes, Traffic Signals, Roadway Restrictions

Visual Record & Review Tools



Emergency 911 Planning

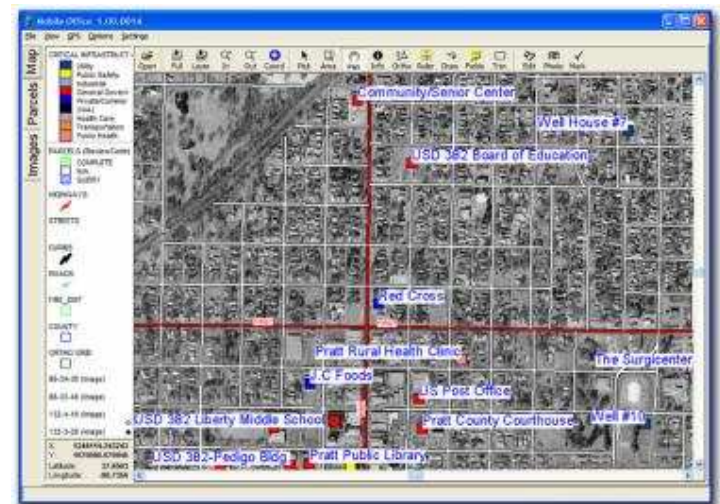
XY Points for Every Business and Residence

Street View

Address in NENA Format

Address Linked to Centerline

Identify Critical Infrastructure



Frequency of Update

“High-resolution street-view images (at a sub-inch pixel resolution that enables quality grade and physical condition to be verified, updated at least every 6 years.”

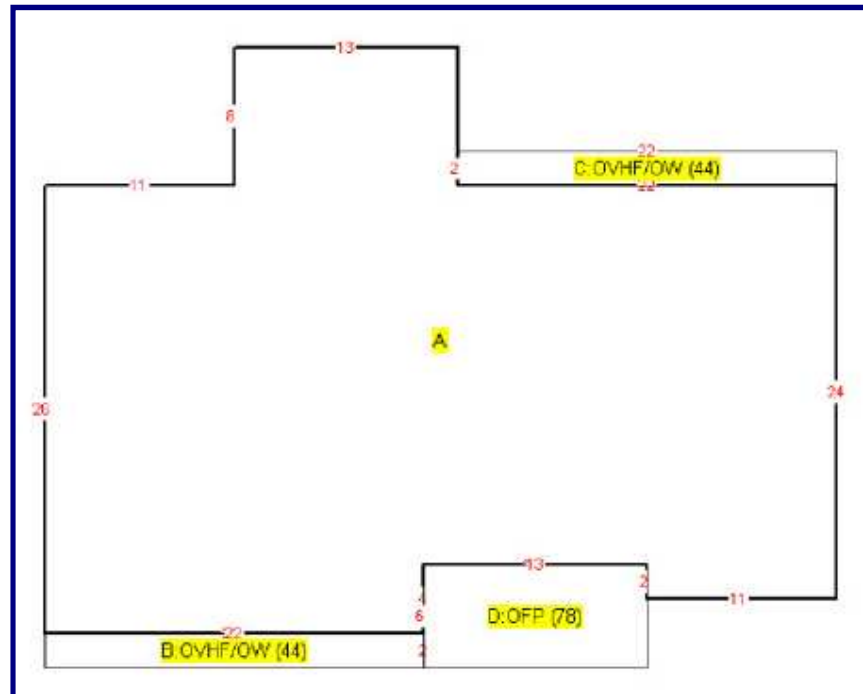


Quality Control

Is it or isn't it?

1. Must be able to see the structure
2. Sun angle
3. Clarity
4. People
5. Front and one side
6. Sub-inch pixel

How do I Measure Sub Inch Pixel?



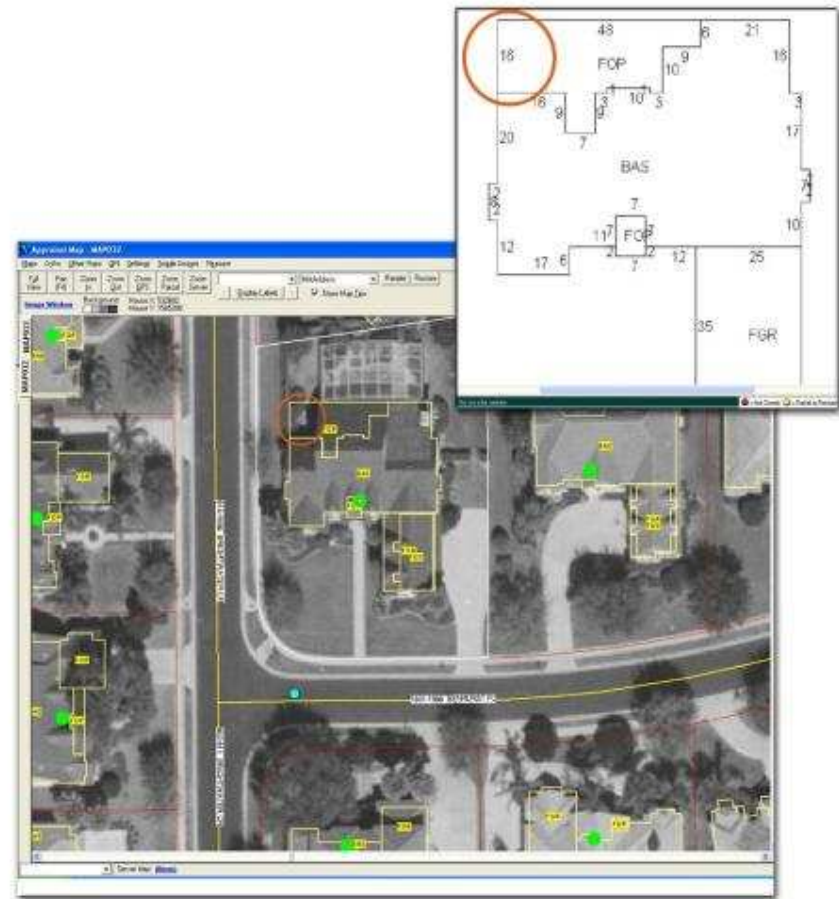
The Calculations

- Canon 10 mp camera
- 3648 x 2736 pixel screen resolution
- Building is 47' long (from plat)
- Building front takes up 80% of screen or 2198 pixels ($.80 \times 3648$)
- 2198 pixels equal (47' * 12") 564"
- 1 pixel equals .192" ($564'' / 2198$ pix)



Street View Image Feature List

- Photo
- Address verification
- Exception list
- Viewing software
- Data analysis
- Measurement tool
- Report writer



What You Must Think About?

- Cost...."You get what you pay for."
- Quality.....Must be sub-inch pixel
- You pick and choose
- Tax payers in image...especially children
- Foliage, sun, obstructions
- Additional information
- **Partners**

Street View Image



237424 04/22/2008

Oblique Imagery

“The GAME Changer”

“Aerial photography is the taking of photographs of the ground from an elevated position.

Photographs taken at an angle are called *oblique photographs*.”

Wikipedia



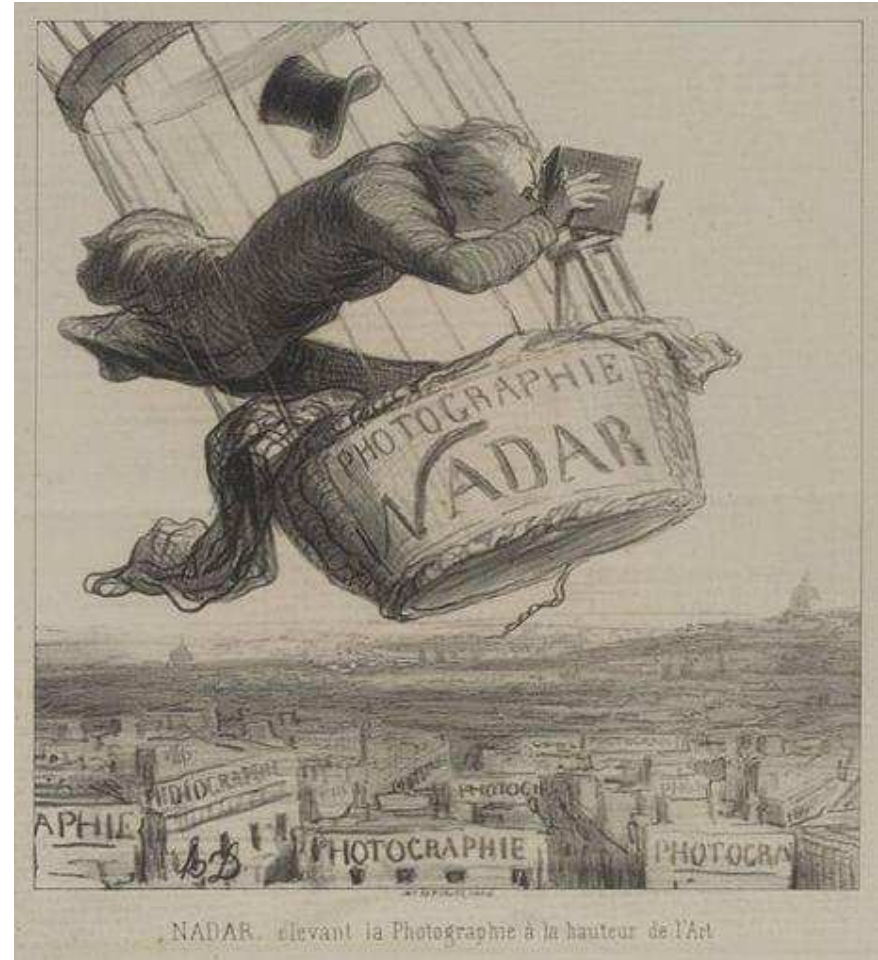


IAAO Oblique Imagery Requirement

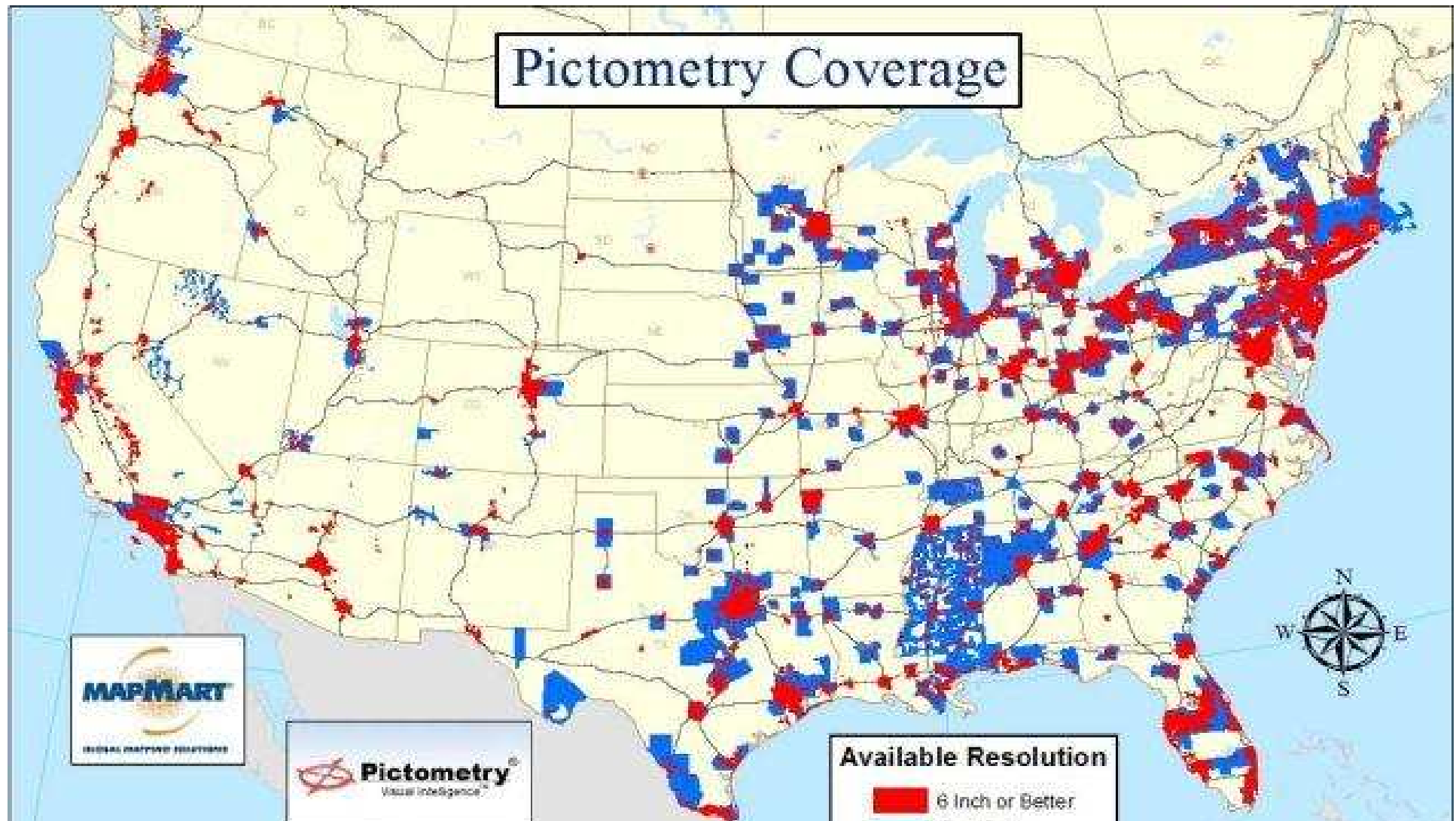
- Updated every 2 years in rapid growth areas
- *Low level oblique images capable of being used for measurement verification (four cardinal directions)*
- *Minimum 6" pixel resolution in urban areas and 12" pixel resolution in rural areas*

“The GAME Changer”

1. Inexpensive
2. High resolution
3. Digital color
4. Readily available
5. Measure, measure, measure!

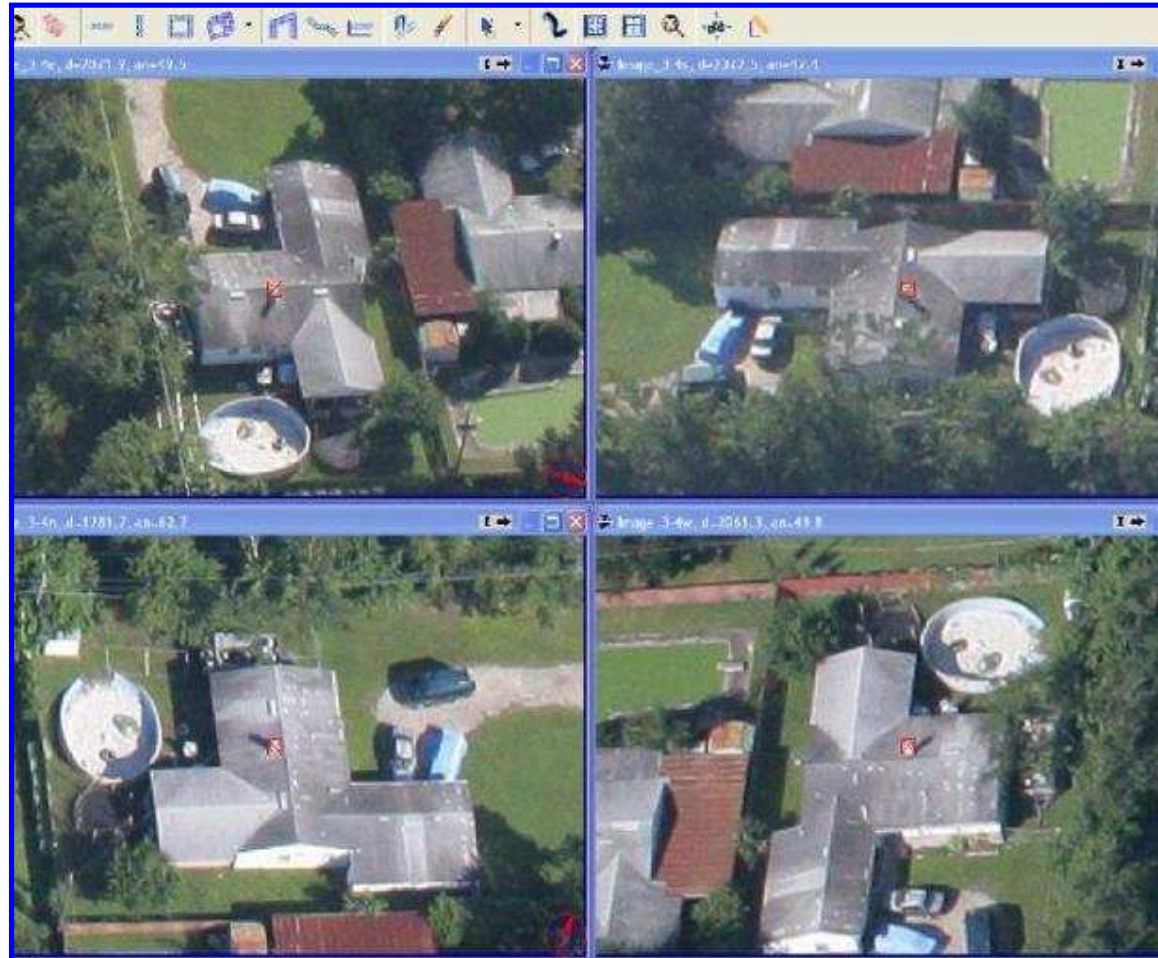


Oblique and Ortho Imagery Pictometry International





Oblique Four Cardinal Directions



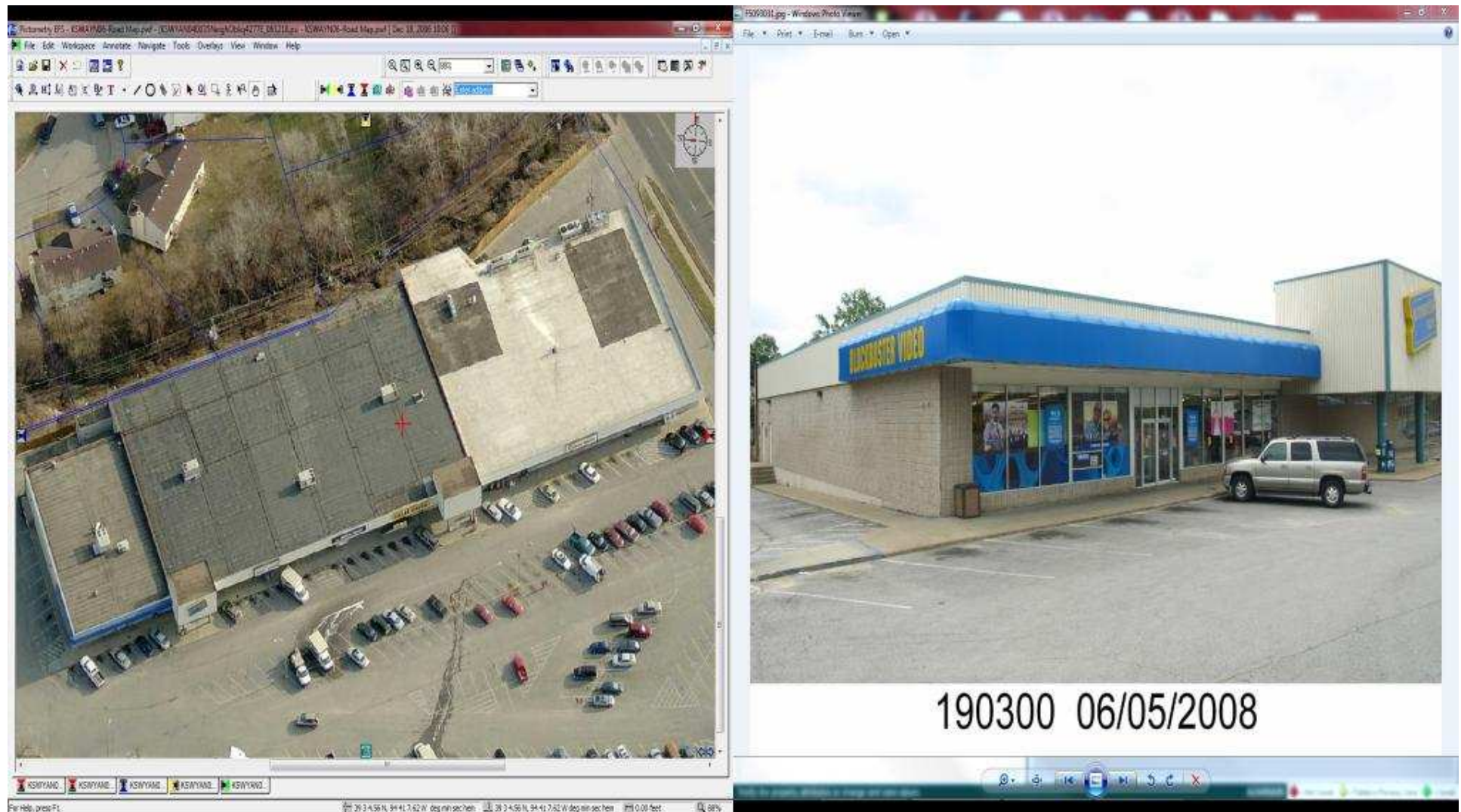




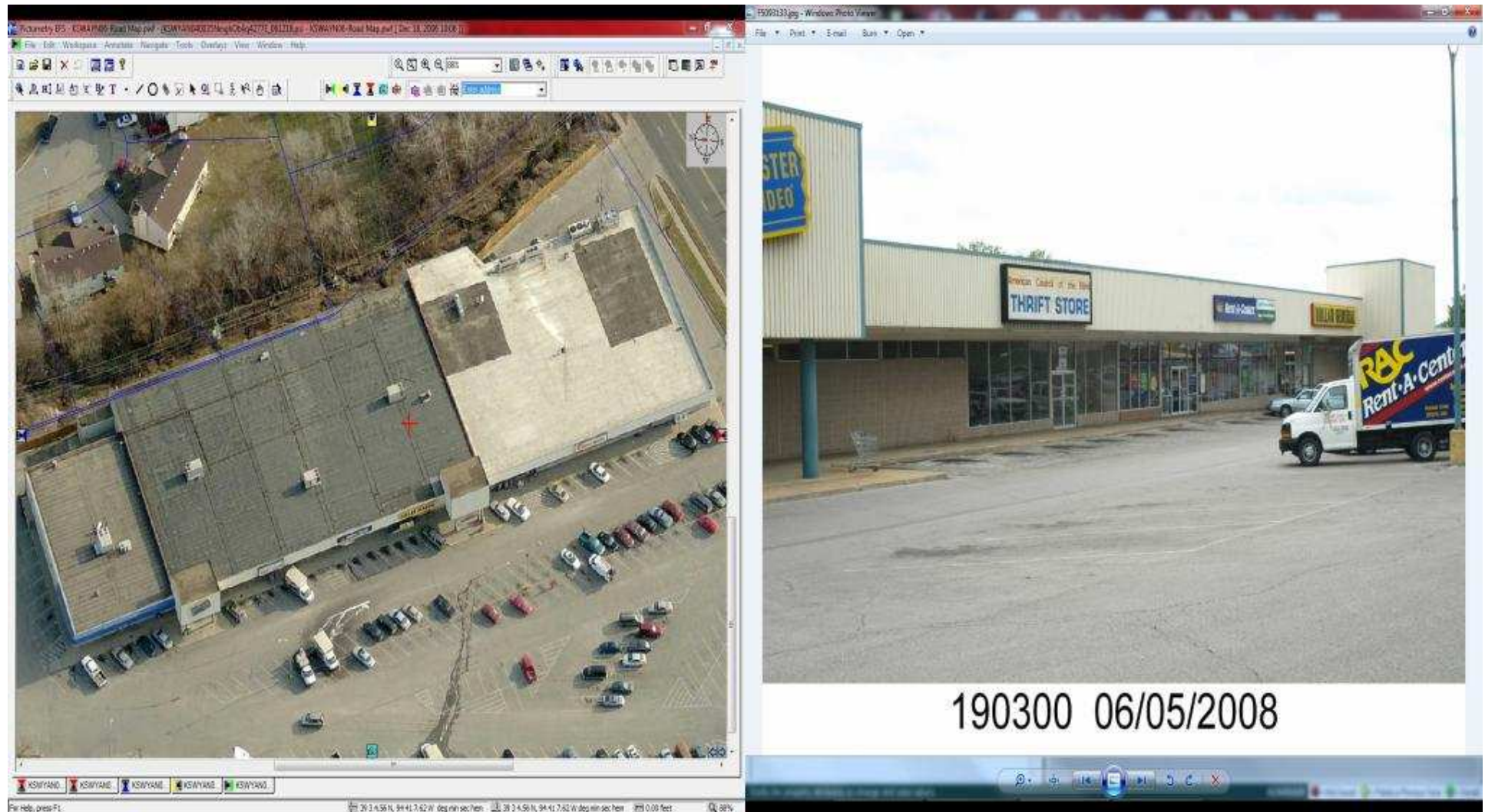
Pictometry Measuring Tools



Commercial Streetview and Oblique



Commercial Streetview and Oblique



IAAO Oblique Imagery Requirement

- Updated every 2 years in rapid growth areas
- Low level oblique images capable of being used for measurement verification (four cardinal directions)
- Minimum 6" pixel resolution in 12" pixel resolution in rural areas

What Constitutes Rapid Growth Areas?

“In my OPINION, rapid growth should be defined as five(5) or more times normal growth for the area while taking all factors into consideration.”



Official Statement from Pictometry Concerning Accuracy

Pictometry provides a visualization system and therefore does not certify image accuracy. However, some Pictometry customers have done their own certification on the Pictometry data after delivery and have shared their results. On average, customers have been seeing better than 1.0-meter RMS error at a 95% confidence level (NMAAS 1:1200) for orthogonal imagery over relatively flat terrain or in areas with accurate elevation data, and 2.0-meter RMS error at a 95% confidence level (NMAAS 1:2400) for more varied terrain or in areas with poor elevation data. However, Pictometry does not guarantee these accuracies and your results may vary.

Quality Control

Measurement Accuracy

QC measurement accuracy by comparing photo identifiable feature measurements with the metrics given by the software tools, using a plus or minus three (3) pixel tolerance. Use a football field, baseball diamond, or structures with accurate drawings from CAMA or your GIS file.



Quality Control

Locational Accuracy

Locational accuracy is generally based upon the accuracy of the DEM or DTM used to rectify the oblique and pixel size of the imagery. In most cases the oblique provider uses your existing ground control. Compare photo identifiable points with known coordinates with the same point on the oblique. **Plus or minus three percent (3%) can be expected.**



Desktop Review Process Bringing It All Together “Ultimate System”



How Does It All “Come Together”



DTR is comprised of the following functions:

- Sketch Georeference and Verification or “Change Detection”
- High Resolution Street View Imagery
- Oblique Imagery
- Ortho Photography
- Field Review and Maintenance Tools

CAMA DATA

CAMA - Valuation 2012.mxd - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Tools Window Help

Editor Task: Create New Feature Target: Farms

CAMA Data management Sales data analysis Valuation and reconciliation Objection and appeals treatment Valuation roll Workflow CAMA administrator support

Layers

- ☒ Farms
- ☐ Neighbourhood
- ☒ Carrying Capacity zone
 - CC_LSU_MA
 - 0.001001 - 0.0020
 - 0.002001 - 0.0100
 - 0.010001 - 0.0416
 - 0.041668 - 0.0555
 - 0.055557 - 0.0833

Sales data analysis

Analysis name Analysis

Screening Validation

☒ From 31/12/2006 Until 01/01/2010

☐ Min. extent 0 Max. extent 0

☐ Min. sale price 0 Max. sale price 0

☐ Use selected polygons

Search

List of sales

Farm ID	Extent (Ha)	Status	Selected	Date
FMA/00001	5 151.75	Inspected	<input checked="" type="checkbox"/>	0
FMA/00002	5 891.98	Not inspected	<input type="checkbox"/>	0
FMA/00003	5 171.52	Not inspected	<input type="checkbox"/>	0
FMA/00004	5 317.11	Not inspected	<input type="checkbox"/>	0

Page(s) 1 de 430

Select catalogue cata1

Select time adjustment factor TimeCata

Select valuation period 2007-2012 February 1st

Farm description

Farm query

☐ Registration division ☐ Region ☐ Title deed number ☐ Farm number ☐ Owner name

☐ U.P.I. ☐ Farm id ☐ Farm name ☐ Owner id

Search Zoom to farm Reporting

Farm N°	Farm ID	Farm name	Extent Ha	Region name	Registration division	Title Deed Number	U.P.I.	From	Until
10	FMA/00015	BEATRICE	4534.8507	Kurene	A	T_UNDE			
100	FMA/00109/00	STEINECK	4588.4028	Kurene	A	T_UNDE			
1000	FMA/00100/00	MANNHEIM	25	Dudakote	B	T_UNDE			

Page(s) 1 de 430


OWNERSHIP | LAND | IMPROVEMENTS | INSPECTIONS | OBJECTIONS & APPEALS | TRANSACTIONS HISTORY | VALUATION HISTORY | SKETCHES

SKETCHES

Name	Browse	Delete
*		

PHOTOS

Name	Browse	Delete
Photo.jpg		Delete
*		

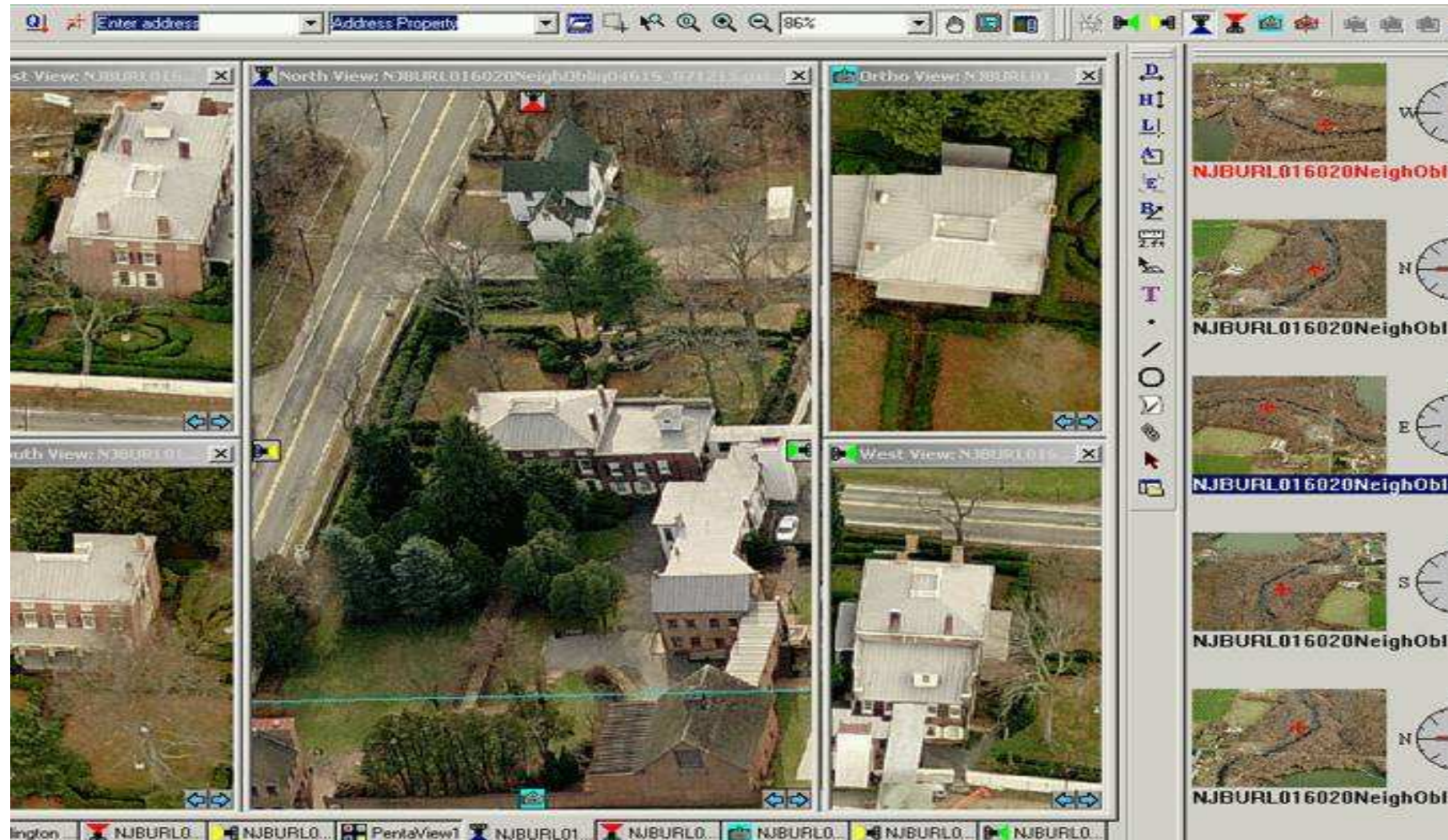


Street View Image



262600 04/21/2008

Oblique Image



You all know about opinions....

“In my opinion the ultimate use of the IAAO Standard on Mass Appraisal is the Desktop Review System (DTR)”

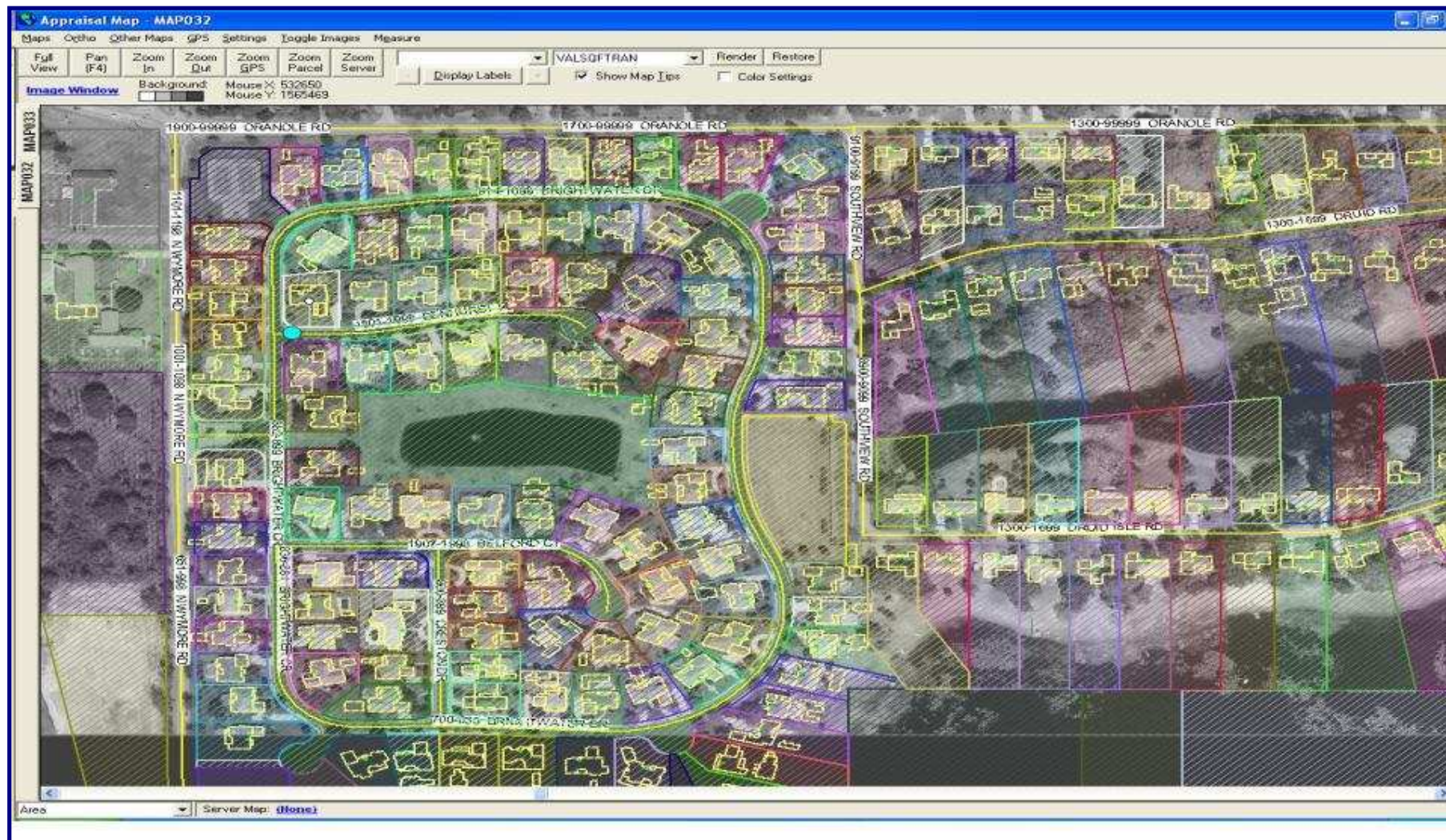
George Donatello, CMS



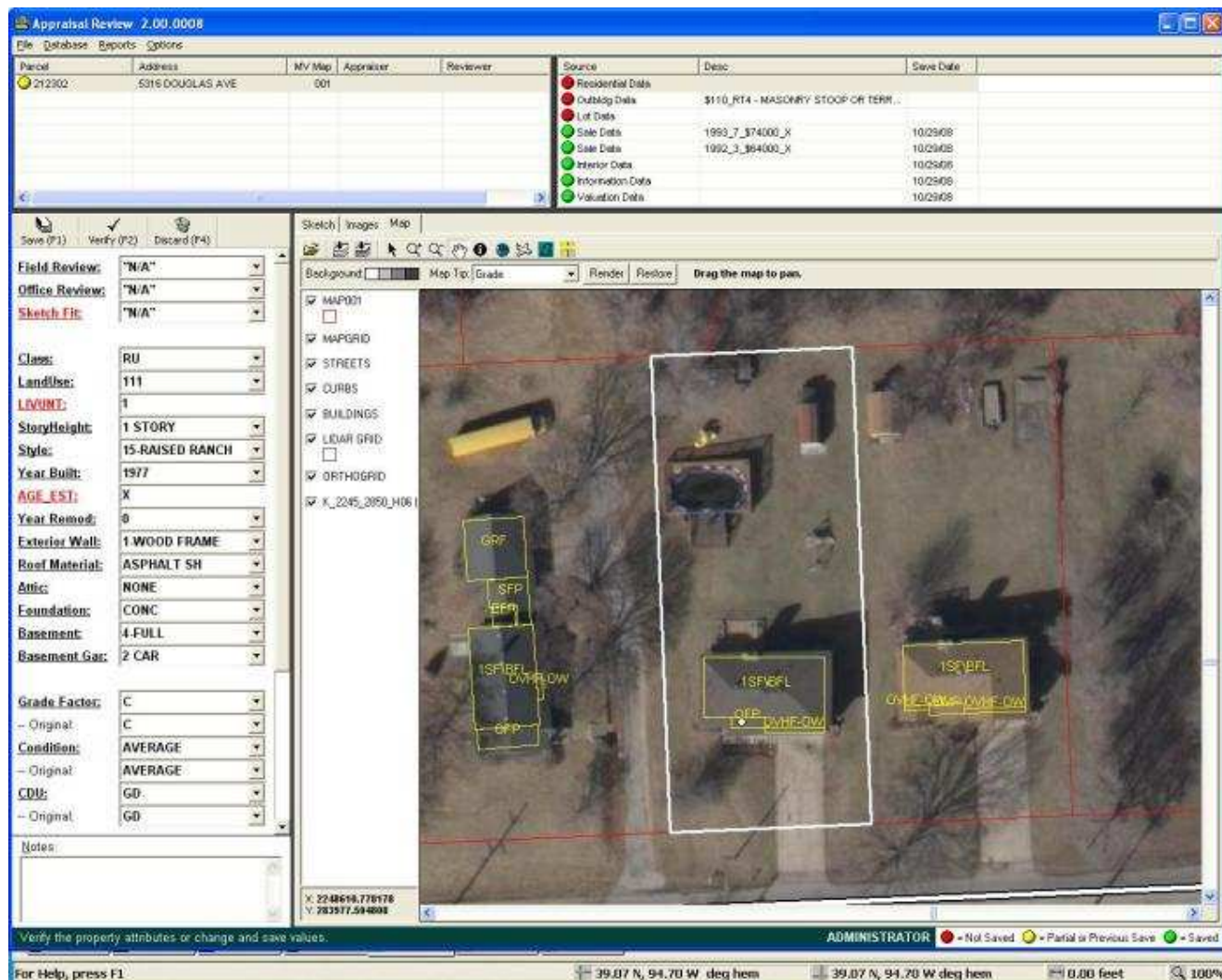
Desktop Review Software

- Complete desktop review
- Review multiple datasets
- Verify property characteristics sketch
- Confirm features and outbuildings
- Create export list for field review

Data Analysis

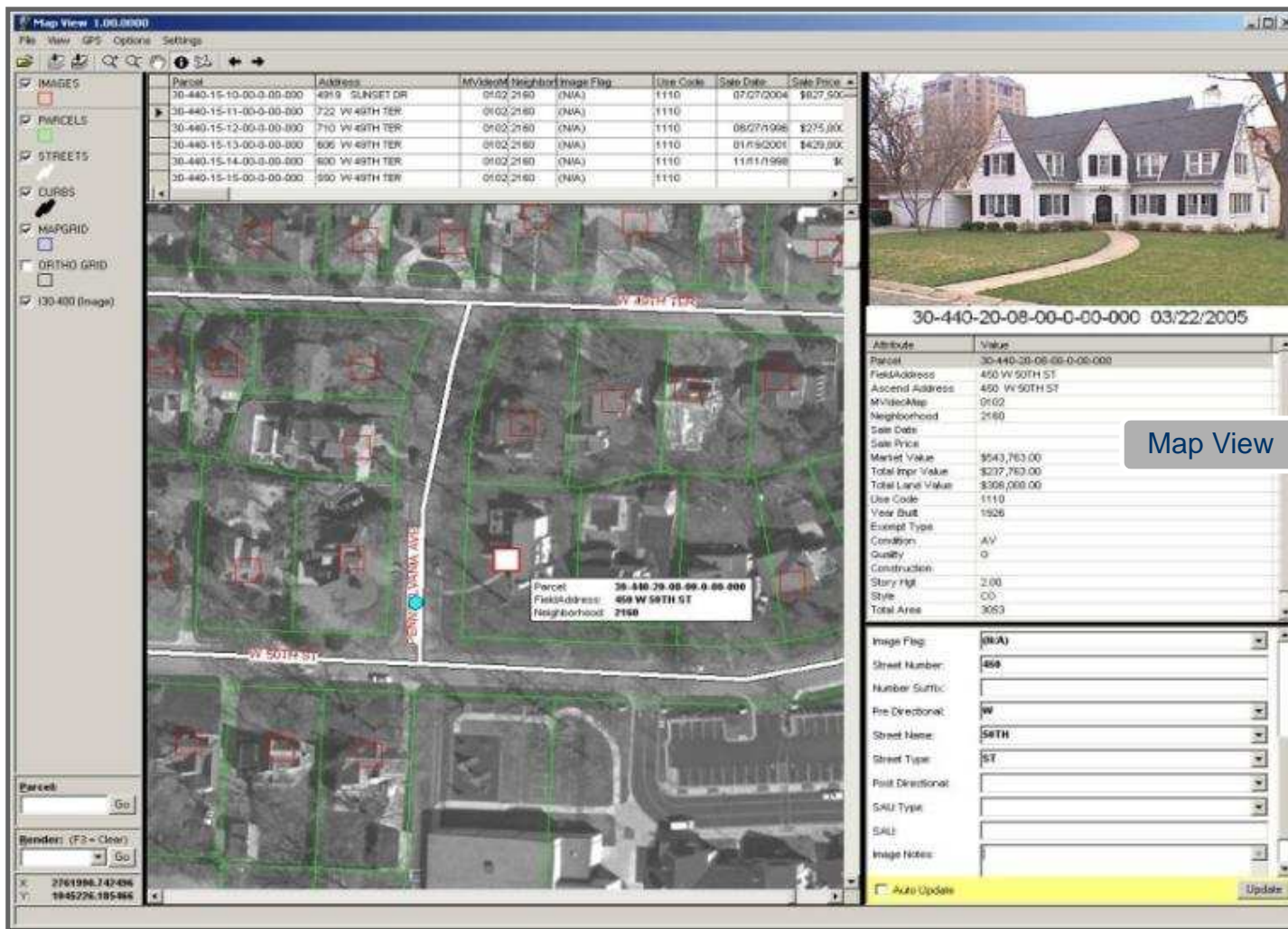


Appraisal Review Software



Data and Imagery files are structured for import into CAMA Systems

Map View Software



Data and Imagery files are structured for import into CAMA Systems

Data Review

Parcel Image Twain Voice Help

Number: 01679767 R01 Search

Characters: Label

Number: 0 Save

er: Pre Dir: Street: Type: Post Dir:

SE VISTA SUNRISE CT


Type: SAU #: City: State: Zip:

MILWAUKIE OR

Image: Image Location: Image File:

of 1 20010626 BQ151751.JPG

Contrast Brightness



Attributes:

- ☒ Primary Image
- ☐ Vacant
- ☐ Not Accessible
- ☐ Construction
- ☐ Questionable
- ☐ Foliage
- ☐ UnrecordedStructure
- ☐ NoMapRecord
- ☐ NoTaxRecord

Other Information:

X Coord: 7660642

Y Coord: 643165.68

Image Notes:

15448 SE VISTA SUNRISE CT

CAMA Information:

Field	Value
parcel_number	01679767
Property Class	101
Year Built	1996
Square Feet	2784
Improvement Value	221660
Grade	55
Neighborhood	15271
Bedrooms	4
Full Baths	3
Map	22e07
Improvement Type	Dwell
Finished Square Feet	2784
Occupancy Code	1
Legal Description	3206 OETKIN Heights lot 7

Data Review Screen

Appraisal Review 1.01.0002

File Database Reports Options

Parcel	Address	Source	Desc	Save Date
192110	5328 VISTA DR	Residential	5328 VISTA DR	01/03/04
192114	2913 S 54TH ST	Outlot	RT4 - MASONRY STOOP OR TERRACE	01/03/04
297201	2737 S 95TH ST	Outlot	RT1 - WOOD DECK	01/03/04
		Permit	NEW DECK	01/01/07
		Sales	1998	01/01/07
		Inspection	1-22-2004 - 68-6	01/01/07

Save (F10) Verify (F12) Discard (F14)

Field Review: (N/A)

Sketch Review: (N/A)

Land Use Code: 111 - Single Family Residential

Year Built: 1978

Grade: C+

Condition: 3: Average

CDI: GD: Good

Style: 01: Bi Level

Ext Wall: 1: Wood Frame

Story Height: 1

Attic Type: 1: None

Roof: 01: Asphalt Shingle

AC Type: 4: Central A/C

Land Value: \$20,500.00


Impr Value: \$195,600.00

Total Value: \$116,500.00

FinSft: 520.0

Notes:

Images: 20040103/03062937.jpg



192110 01/03/2004

Verify the property attributes or change and save values.

AZARRABI ● Not Saved ● Partial or Previous Save ● Saved

Edit Screen

Map View 1.06.0000

File View GPS Options Settings

IMAGES
☐ PARCELS
☒ STREETS
☐ CURBS
☐ MAPGRID
☐ ORTHO GRID
☐ 3D-400 (Inop)

Parcel	Address	MVideo/Neighbor Image Flag	Use Code	Sale Date	Sale Price
30-440-15-10-00-0-00-000	4910 SUNSET DR	0102/2160 (N/A)	1110	07/07/2004	\$827,500
30-440-15-11-00-0-00-000	732 W 48TH TER	0102/2160 (N/A)	1110		
30-440-15-12-00-0-00-000	710 W 48TH TER	0102/2160 (N/A)	1110	08/27/1996	\$275,000
30-440-15-13-00-0-00-000	906 W 48TH TER	0102/2160 (N/A)	1110	01/15/2001	\$429,000
30-440-15-14-00-0-00-000	900 W 48TH TER	0102/2160 (N/A)	1110	11/11/1998	\$1
30-440-15-15-00-0-00-000	550 W 48TH TER	0102/2160 (N/A)	1110		

Parcel: 30-440-20-08-00-0-00-000
 Field Address: 450 W 50TH ST
 Neighborhood: 2160

30-440-20-08-00-0-00-000 03/22/2005

Attribute	Value
Parcel	30-440-20-08-00-0-00-000
Field Address	450 W 50TH ST
Assessed Address	450 W 50TH ST
MVideo/Map	0102
Neighborhood	2160
Sale Date	
Sale Price	
Market Value	\$543,763.00
Total Imp Value	\$237,763.00
Total Land Value	\$306,000.00
Use Code	1110
Year Built	1926
Exempt Type	
Condition	AV
Quality	0
Construction	
Story Hgt	2.00
Style	CO
Total Area	3053

Image Flag: (N/A)

Street Number: 450

Number Suffix:

Pre Directional: W

Street Name: 50TH

Street Type: ST

Post Directional:

SALI Type:

SALI:

Image Notes:

☐ Auto Update Update

Parcel: Go

Renderer: (Y3 = Close) Go

X: 2781990.742484
 Y: 1645226.185466

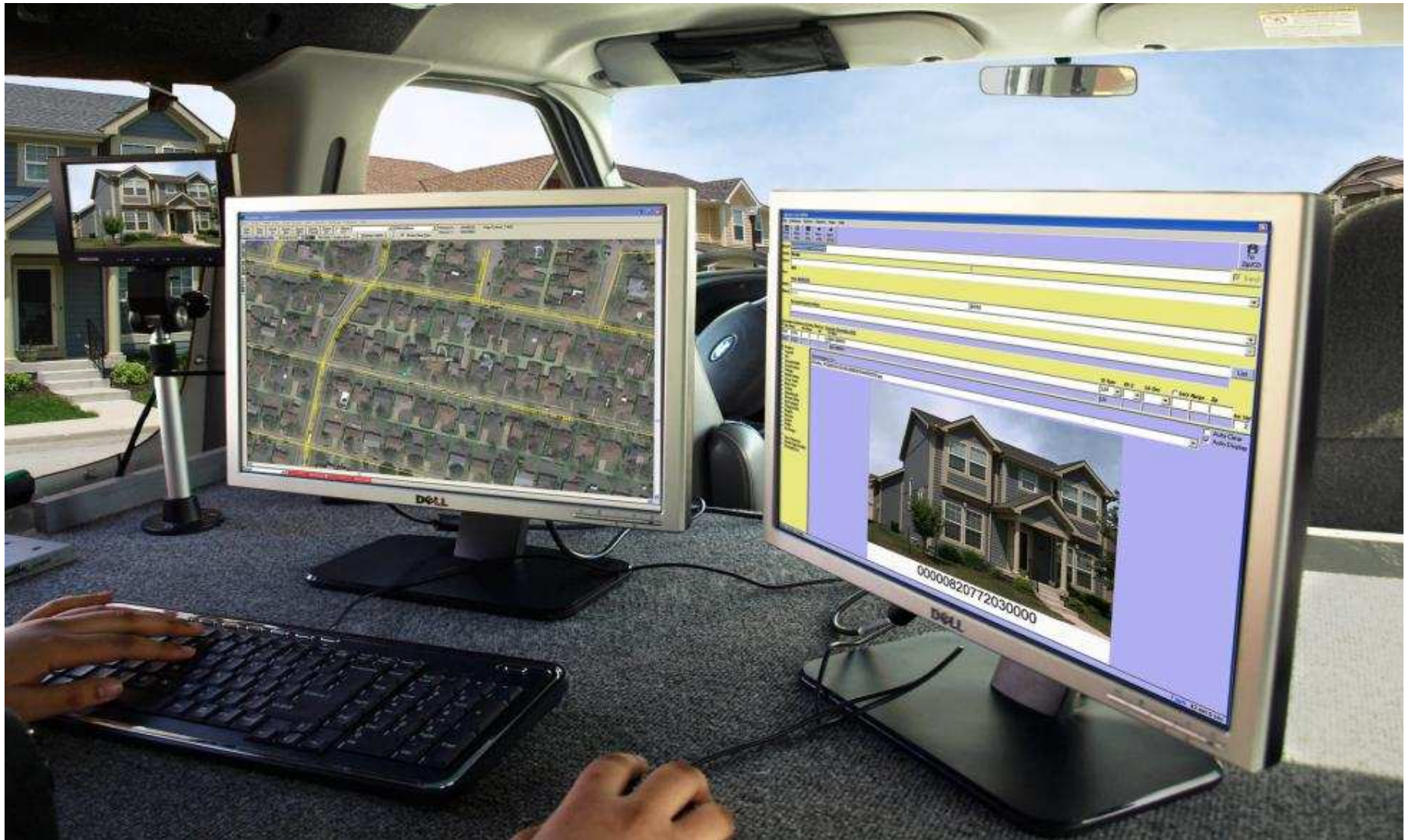
Three Screen Configuration



In Field Review-ADV

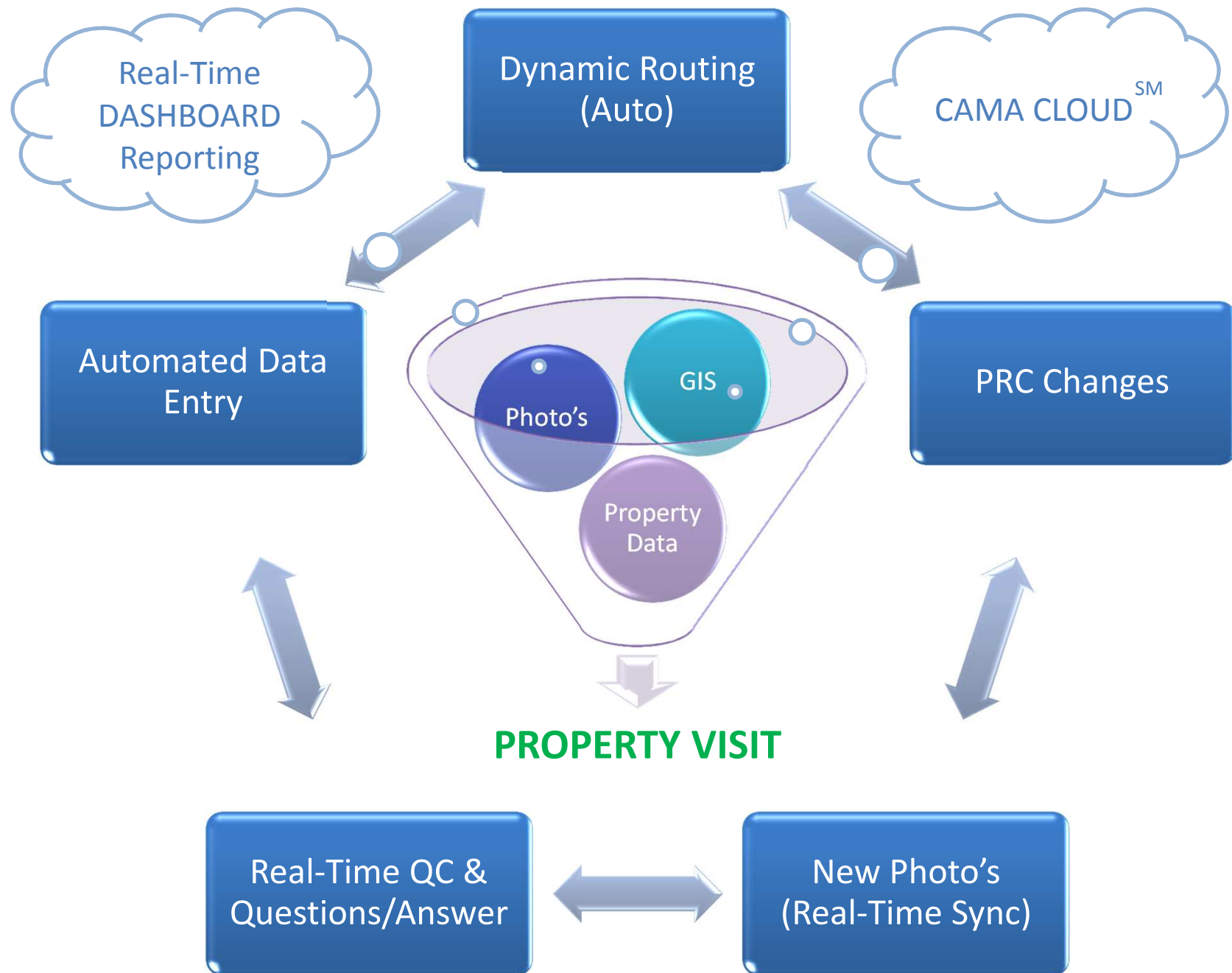


Street View Image



Mobile Field Review





Bring the Field to the Office

“Ultimate System”





What Does It All Cost????

Budget Numbers Only

1. Sketch conversion...less than \$3 per parcel
2. Change detection... Less than \$1 per parcel
2. Street View Image....\$2-3 per parcel
3. Ortho less than \$100 per square mile
4. Oblique Image.....12" \$150, 4" \$400 per square mile

Return on Investment (ROI)

Literally the Million Dollar Question

- Large Florida county---10:1
- Medium-size Texas county---16:1
- Washington DC---11:1
- Small rural Ohio county---7:1
- Small Missouri county---6:1
- Small N. Carolina county---10:1
- Medium-size Kansas county---13:1

4" Oblique	100	\$ 400.00	1.5	\$ 40,000
Sketch Geo-reference	16,267	\$ 1.00	1	\$ 27,760
Mobile Office	1	\$ 10,000.00	1	\$ 10,000
Annual Maintenance	1	\$ 2,220.00	4	\$ 8,880
Software Licenses	4	\$ 1,600.00	1	\$ 6,400
Updates	500	\$ 5.00	4	\$ 10,000
Consulting/Training	5	\$ 1,250.00	5	\$ 31,250
Hardware	4	\$ 3,000.00	1	\$ 12,000
Misc.	1	\$ 30,000.00	1	\$ 30,000
Desktop Review	77,699	\$ 2.20	1	\$ 170,938
Project Carrying Cost (3% annual)				\$ 77,782
			Total Cost	\$ 709,311
			Per Parcel Cost	\$ 1.83

Flagler Co. FL (5 yr cost)

Description	Number	Unit Cost	Years	Total
High resolution street level images	46,267	\$ 3.00	1	\$ 138,801
12" Oblique and Ortho	485	\$ 150.00	2	\$ 145,500
4" Oblique	100	\$ 400.00	1.5	\$ 40,000
Sketch Geo-reference	46,267	\$ 0.60	1	\$ 27,760
Mobile Office	1	\$ 10,000.00	1	\$ 10,000
Annual Maintenance	1	\$ 2,220.00	4	\$ 8,880
Software Licenses	4	\$ 1,600.00	1	\$ 6,400
Updates	500	\$ 5.00	4	\$ 10,000
Consulting/Training	5	\$ 1,250.00	5	\$ 31,250
Hardware	4	\$ 3,000.00	1	\$ 12,000
Misc.	1	\$ 30,000.00	1	\$ 30,000
Desktop Review	77,699	\$ 2.20	1	\$ 170,938
Project Carrying Cost (3% annual)				\$ 77,782
			Total Cost	\$ 709,311
			Per Parcel Cost	\$ 1.83

Flagler County

Cost and Revenue

Years	1	2	3	4	5	Total
Single Progress Payment	\$ 631,529					\$ 631,529
No Pmt. First Year	\$ -	\$ 177,328	\$ 177,328	\$ 177,328	\$ 177,328	\$ 709,311
Government Capital	\$ 70,931	\$ 159,595	\$ 159,595	\$ 159,595	\$ 159,595	\$ 709,311
Revenue Enhancement						
Additional Revenue	\$ 297,911	\$ 446,866	\$ 496,518	\$ 546,169	\$ 595,821	
Cumulative Additional Revenue	\$ 297,911	\$ 744,777	\$ 1,241,294	\$ 1,787,464	\$ 2,383,285	

Some Projects Using Desktop Review

- **US Jurisdictions**
 - Washington D.C.
 - Gaston County – North Carolina
 - Orange County – Florida
- **Canadian Provinces/Cities**
 - British Columbia



Washington, D.C.

 **X-Y Coordinates**

Intelligent points linking each structure's x-y coordinate to its parcel number, verified address, CAMA file and street-view photograph



11:34 AM 11/1/2002 Click a Base map circle to display the associated image

Washington, D.C.

Address Verification

- Site Address Verified to Address on Face of Structure
- Data Segments Collected in National Emergency Numbering Association (NENA) Format
- x,y Coordinate for each Primary Address
- Corrections Identified with Attributes
 - Corrected Street Name
 - Correct Number
 - Confirmed or Unverified
 - Multiple Address



Washington, D.C.



Washington, D.C.

Data Entry and Processing

Resolution of Field and Sketch Review Parcels

Appraisal staff can investigate and resolve data exceptions at the desktop with software applications. Data exceptions are linked to GIS or Pictometry through address x,y points.

Office Action

<u>Count</u>	<u>Description</u>
2,932	Building Razed
2,948	Minor Addition (deck/porch/garage)
1,064	Correct Sketch Measurements/Labels
<u>308</u>	Verify Use
7,252	

Field Action

<u>Count</u>	<u>Description</u>
664	Additional Sq. Ft. Not on Sketch
509	New Construction
<u>1,774</u>	Field Verify (significant variation)
2,947	



Washington, D.C.



What Is the Payoff?
Return on Investment

	<u>DC</u>	<u>Other</u>
Total Parcels	125,000	40,000
Market Value Discovered	\$948M (1)	\$89M (2)
Effective Tax Rate	.91%	1.4%
Tax Revenue	\$8,729,900	\$1,372,635
Contract Amount	\$800,000	\$200,000
ROI (minimum)	11:1	7:1

NOTE:
(1) From only three data elements (parking, grade and condition)
(2) Figure does not include effective age changes

CAMA Data

Appraisal Data 1/04/0000

File Options Window

Parcel	Source	Desc	Status	Spec Date	Key
157572.001	Primary	1316 CLEVELAND AV			
157575.001	Primary	1324 CLEVELAND AV			
157576.001	Primary	1328 CLEVELAND AV			
157572.001	Primary	1316 CLEVELAND AV			

Address: 1316 CLEVELAND AV

Field Review: (N/A)

Sketch Review: (N/A)

Land Use: 111 - Single Family Residential

Year Built: 1915

Story Height: 1.0

Style: Bungalow

Exterior: Asbestos

Roof: Asphalt Shingle

Grade: D+

Condition: Fair

CDU: Poor

Attic: Unfinished

Foundation: Stone

Basement: Full

Heat/Cool: Central

Heat Fuel: Gas

Heat Sys: Warm Air

GFLA: 912

Land Value: \$2,300.00

Impr Value: \$15,100.00

Total Value: \$17,400.00

Notes:

Save (F1) Discard (F2) Map SS Perimetry (Hold F5 to toggle voice command)

Sketch Images History

Key	Use	1st	2nd	3rd	Area
B	TSF (1 Story Frame)				110
C	EPF (Enclose Frame Porch)				85

Gaston Co. N.C.



Gaston County, N.C.

- Pictometry
- Mobile Video-Yotta
- Desktop Review
- Street Front Images
- Online Information – field cards
- Web Integration

Gaston County, N.C.

City/County Permits

County Neighborhood Inquiry

The selected parcel summary shows the type of permit and the inspections that have been completed. The parcel would be archived at this point and would be excluded from the active list.

9:01:27/2007

Archive

Permit Number: 700003903
 Street Number: 4500
 City: GASTONIA
 Status Code: CO
 Pid: 206902
 Owner: CP MORGAN
 NBH Pid: 206902
 NBH Number: SAE38
 NBH Name: MOUNTAIN VIEW

Type: COUNTY
 Pre Direction:
 State: NC
 Status Desc: C.O. ISSUED
 Work Desc Code: R1
 Create Date: 03/14/2008

Issue Date: 12/11/2007
 Street Name: STONE MOUNTAIN
 Zipcode: 28054
 Medway: 0
 Work Desc: NEW SINGLE FAM. DWELLING
 Change Date: 03/20/2008

CO Date:
 Suffix: DR

Address Key: 37263
 UserID: STAFF

Return

Year	Num	Per	Type	Code	Type Code	Code Desc	Seq Num	Res Stat	Code	Res Century	Res Date	Req Cent	Req Date	Fin Flag
7	3903	81		BEFL		BUILDING ELECTRICAL FINAL	2	AP		1	80319	1	80319	N
7	3903	81		BMFL		BUILDING MECHANICAL FINAL	2	AP		1	80319	1	80319	N
7	3903	81		BPFL		BUILDING PLUMBING FINAL	1	AP		1	80314	1	80314	N
7	3903	81		BMFL		BUILDING MECHANICAL FINAL	1	DA		1	80314	1	80314	N
7	3903	81		BRIN		BUILDING FINAL	1	AP		1	80314	1	80314	N

Gaston County, N.C.

Gaston County, North Carolina GIS *Tool: Select Rectangle* Active

Full Extent Clear Previous View Measure Overview Map

Search Layers Legend Welcome Help



107765 107782 107783 107815 107816

107766 107781 107780 107779 107778

107774 107775 107776 107777 107869

Gaston County, NC



107779

Tax Field Name	Tax Information
PID #	107779
PIN #	3545-45-7538
NEIGH. HOOD #	5A055
NEIGH. HOOD NAME	WELDON ST

contact us | county | Data Sales | tax rates | FAQ | additional help | Neighborhood Sales

Current Scale 1: 546 or 1 inch = 46 feet or



Orange County, Florida

- Full GIS Integration
- Pictometry
- Mobile Video - Yotta
- Desktop Review
- WEB Enabled
- Full Disclosure
- Many Users of the Data

File Edit View Theme Graphics Zoom Window Help SEARCH More Themes Thematic Maps Create Plots Labels Reports Pin Map Comp Sales Buffer Scanned Plats
ProMap Notes ReEng Images CAMA Sets Sales Analysis Tangible

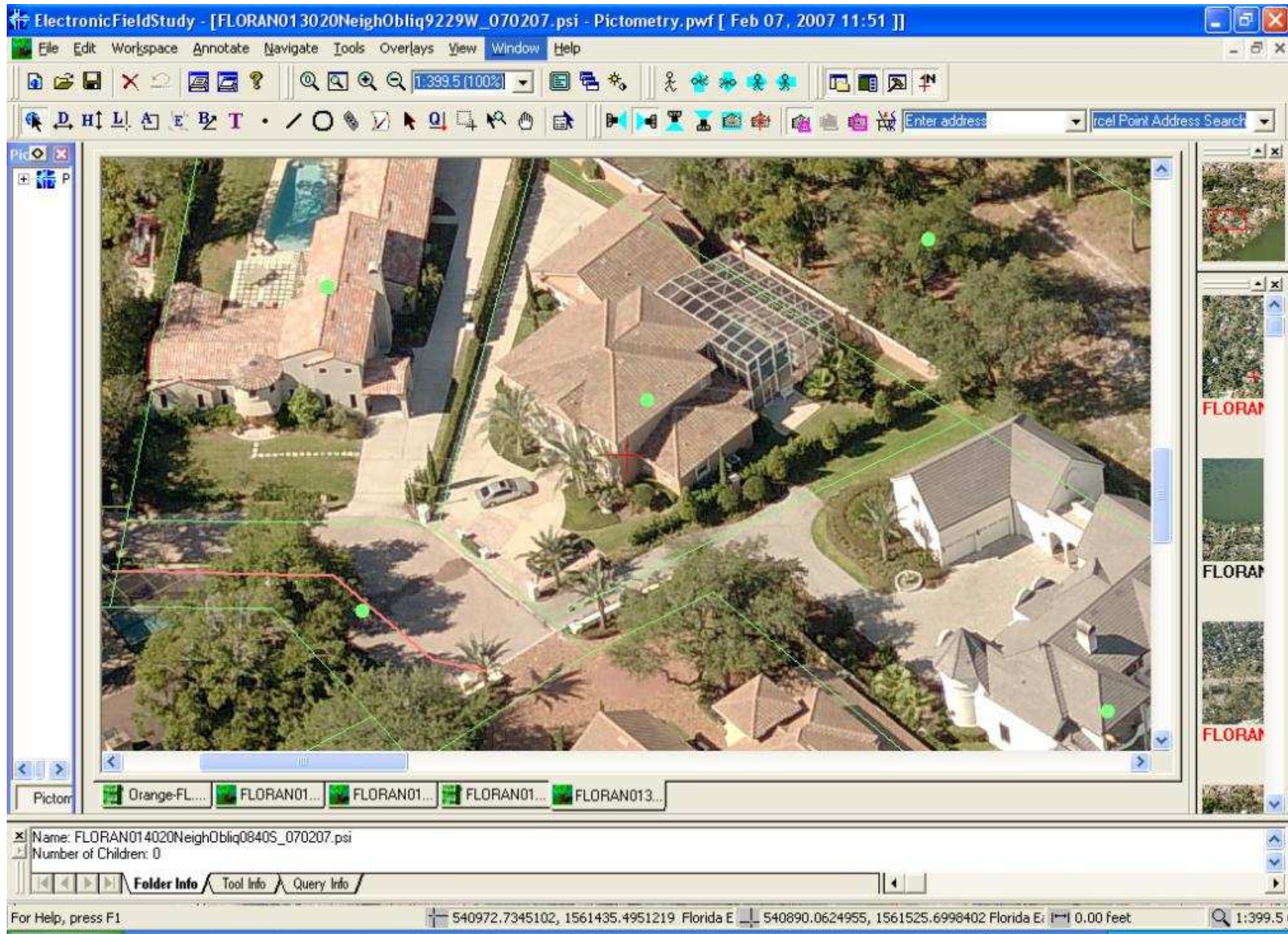


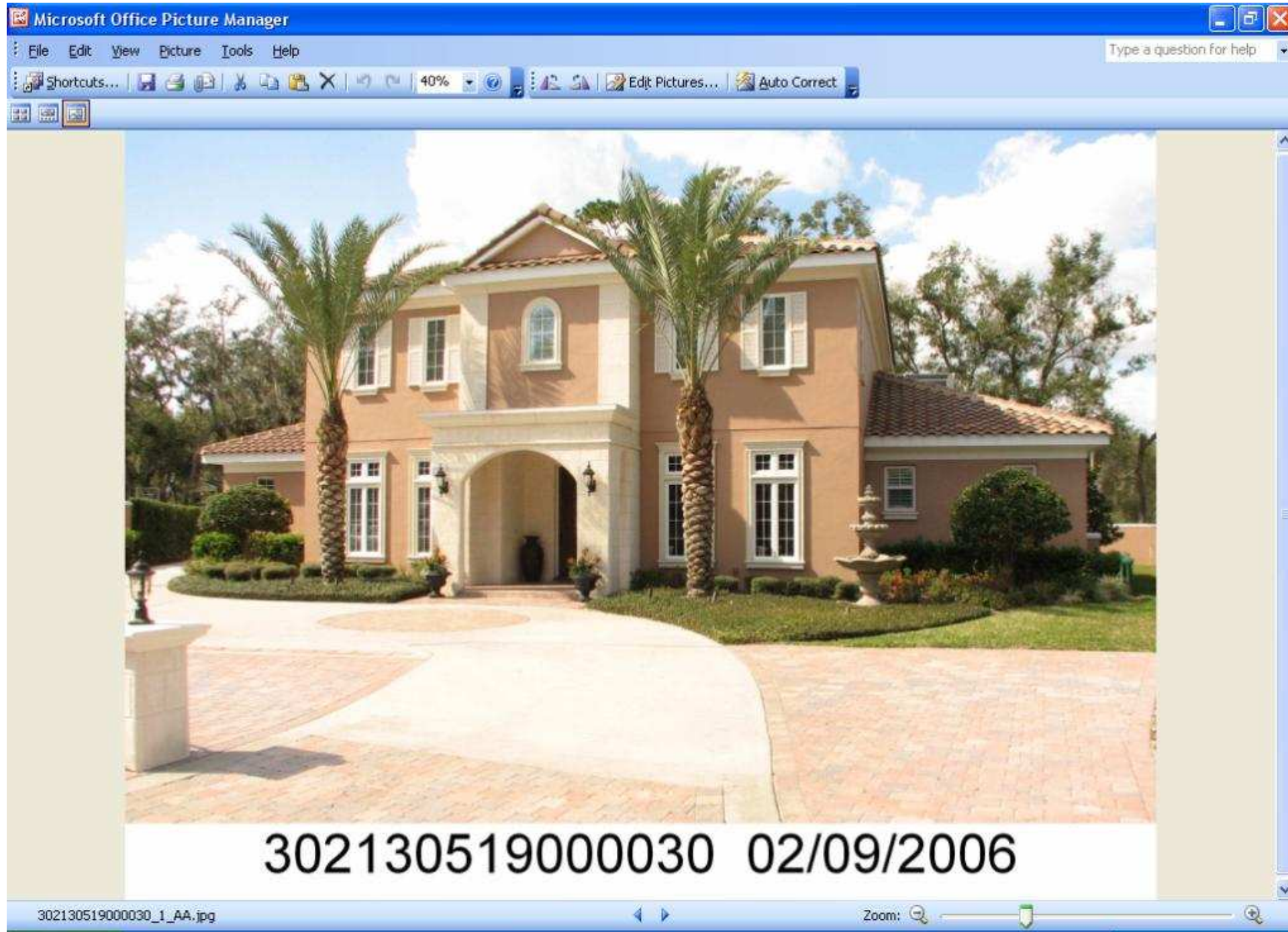
Scale 1:1,168 541,083.72 1,561,563.41

Orange County

- ☐ Street X
- ☒ Street names
Text
- ☒ Parcel Dim.
Text
- ☒ Misc Anno
Text
- ☒ Block Number
Text
- ☒ Lot Number
Text
- ☒ Parcel Anno.
Text
- ☒ Sub. Number
Text
- ☒ Map Name
Text
- ☒ Subdivision
Text
- ☒ County Ref
Text
- ☒ Misc
Text
- ☒ Blocks
Text
- ☒ Lots
Text
- ☒ Parcels
Text
- ☒ Mrsid2921.sid
Text
- ☐ mrsid2921.sid







ROI METRICS

1Billion @ 20 mills =
\$20 Million in taxes
from a \$ 2 Million
technology investment,
plus there were 100's
of Other benefits:



Summary – U.S. Jurisdictions

- Heavy “Web” Presence
- GIS Integration
- Not much for “new data collection”
- Less Residential Data collected
- Excellent Reassessment Programs
- Use all forms of technologies
- Full disclosure – Web
 - Field Cards
 - Comp Sales
 - Revaluation Manuals
 - Formulas

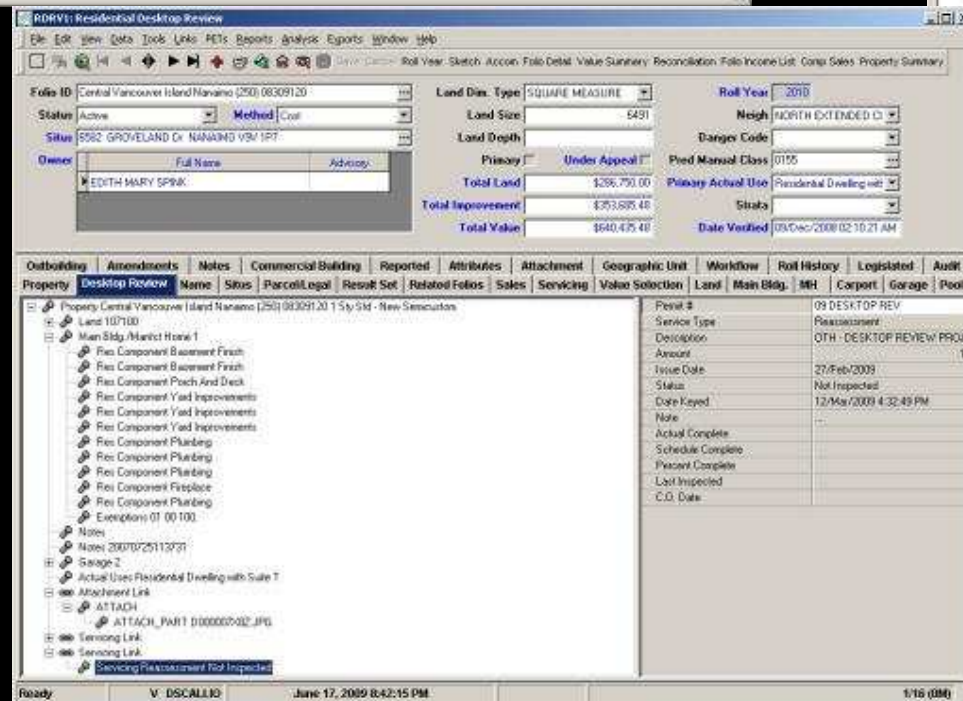
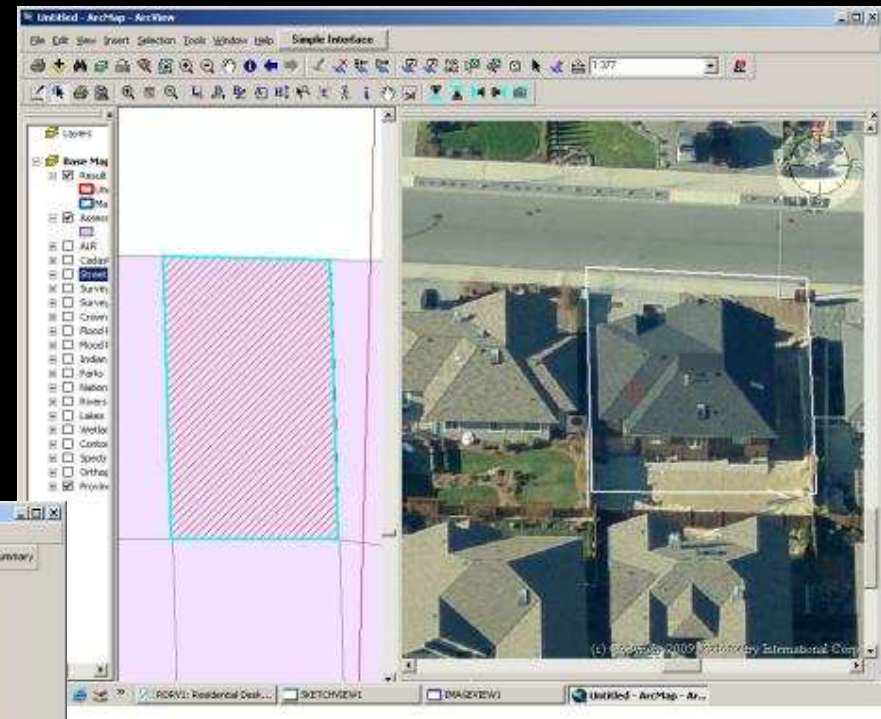
British Columbia



Street-front Image



Desktop Review – The Environment



Technology: The Desktop of the Future



BC Assessment

Desktop Review – GeoReferencing Sketches

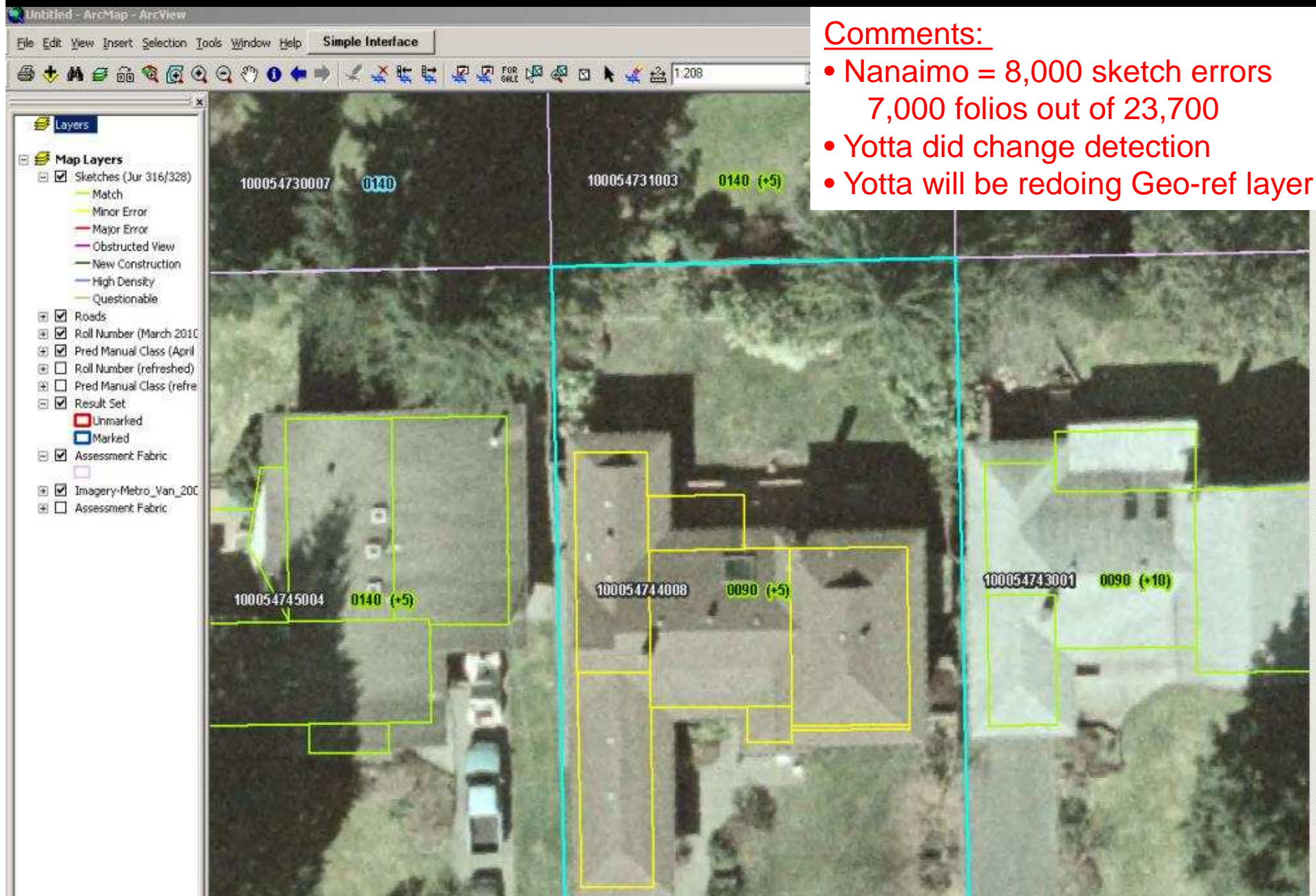


Desktop Review – GeoReferencing Minor/Major Deltas



BC Assessment

Ortho & Geo-referenced Sketch Image



Comments:

- Nanaimo = 8,000 sketch errors
7,000 folios out of 23,700
- Yotta did change detection
- Yotta will be redoing Geo-ref layer

Key Metrics - Nanaimo

Item:	Before DTR:	Using DTR:
Reassessment	14.2 folios / day	40 folios / day
Labour cost	\$616,000	\$216,000
Process (labour) cost	\$25.89 / folio	\$9.75 / folio
Total cost	\$616,000	\$399,000
Total process cost	\$25.89 / folio	\$16.78 / folio
Cycle time	27.4 minutes	9.75 minutes
Roll Quality ASR/COD	96.7% / 7.3%	96.8% / 6.0%
Sketch errors	0	8,452
# of data changes	0	40,678
New Construction	\$0	\$121,000,000

2010 Pilot - Indian Arm Example / Missing \$400K



BC Assessment

127

127

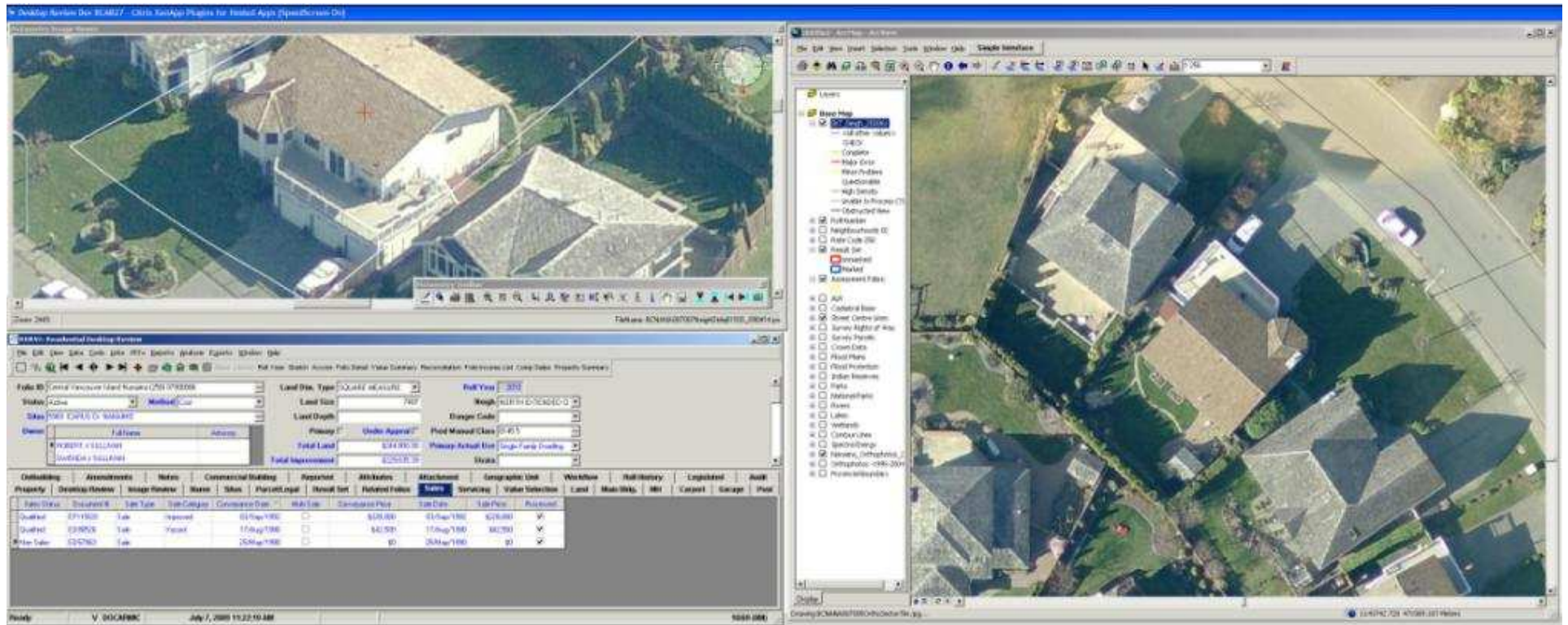
BC Conclusions

“ More information is available than ever before and we can do more than expected with the DTR (Desktop Review Process) approach to make more accurate and uniform reassessments.”

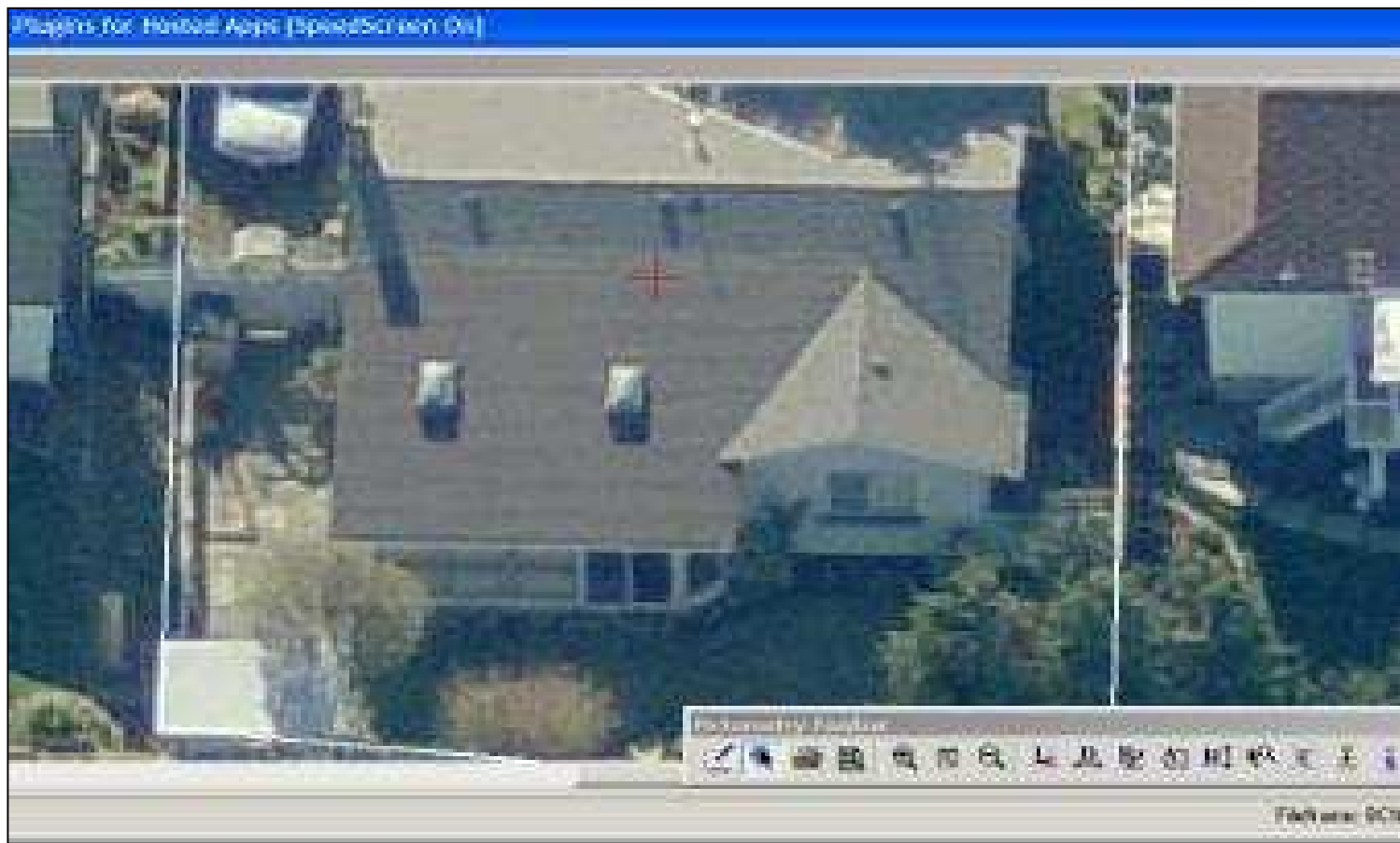
What Else???



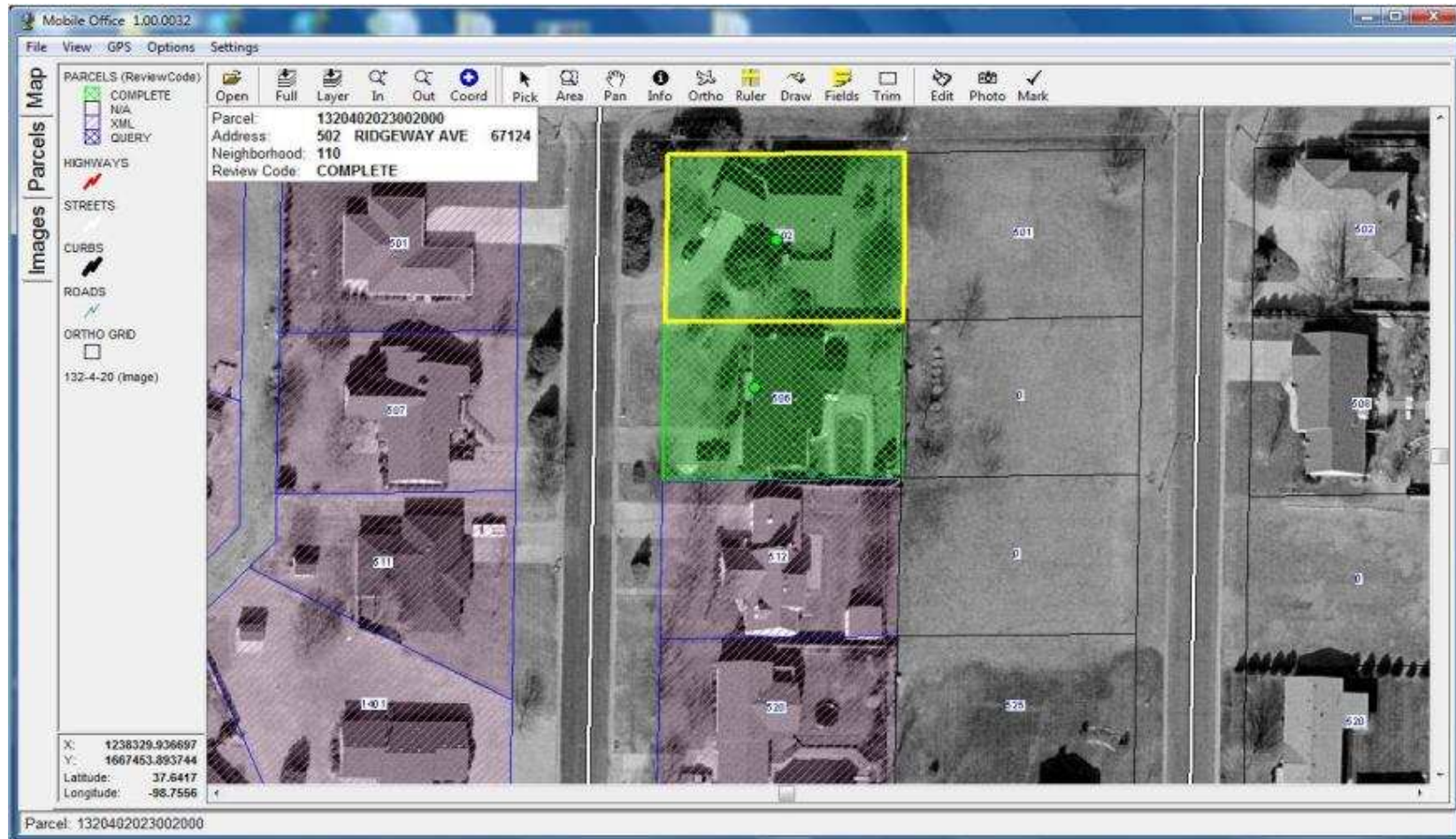
Oblique's / Orthos – 10 cm Resolution



The Desktop Pieces – Oblique Images



Mobile Office - Desktop Suite:




Mobile Office - Street front

Mobile Office 1.00.0032

File Images View GPS Options Settings

Image Folder	Image File	Sketch	Detail	Document	Frame	Media File
20080820	1320402023002000_11345401.J...	No	No	No	419	DSC00419.JPG

Images Parcels Map



1320402023002000 08/20/2008

Parcel: 1320402023002000

Field	Value
Address	502 RIDGEWAY AVE 67124
Bathrooms	2
Bedrooms	4
Card	01
CDU	GD
City Code	0
Class	
Full Parcel	076132040202300200001
GF Area	658
Grade	8
Neighborhood	110
Owner	GRAY HOWARD E & LOIS E
Parcel	1320402023002000
Review Code	COMPLETE
School District	382
Street Direction	
Street Name	RIDGEWAY AVE
Street Number	502
Street Type	
Tax District	6
Total Living Area	2287
Year Built	1977
Zip	