




# It's Your Data. Optimize it!

Part 2 of 2

## The Power of Seamless Integrations & Open Data Standards

PVA 2019 Summer Conference

Owensboro, KY



Open Data Standards and leading technology can easily position any PVA office to implement a range of applications independent of proprietary data formats and in the process, save substantial amounts of time and money.

Multiple technology providers ***working together, with the PVA's best interests in mind, can deliver the best overall solution for any office.*** However, when technology providers take your data from CAMA, GIS, sketch, etc. and “lock it up” without an easy way to integrate with other solutions providers, your office will undoubtedly experience increased costs and stress associated with future project demands.

This session demonstrates the power of “open data standards” (across multiple vendors) while highlighting pitfalls of “proprietary data formats” that lock-up your once readable data.

Daniel T. Anderson  
President  
Data Cloud Solutions, LLC

# Agenda

- **Geo-referenced Sketch Validation** (change detection)
  - Find data issues that imagery comparisons cannot detect.
  - Do more in-house, for less.
- **DeskTop Review** (remote verification)
  - 100% configurable Workflow for any office, project, or challenge.
  - Pre-canvas areas prior to site visits and optimize resource allocation.
- **Data Visualization, Comp Props & Equity Reports + MRA**
  - Impact Analysis, Outlier Detection, Uniformity Reports (sold & unsold)
  - Class/Grade Calculator
  - qPublic, Web Services, Automated GIS views, etc.
- **Live Demonstrations**
  - Oohh... Aahh...!
- **Questions?**

# Integrated Tools

*... all working with your own CAMA/property data and other applications you've already invested in or plan to purchase!*

**It's your data. Don't let anyone hold it hostage.**

# Sketch Validation: Parcel View

**CAMA Cloud<sup>SM</sup> Sketch Validation**

Sketch Validation | History | Reports | Administration | Logout

Parcel ID: 7815437 | Neighborhood: | Flag Status: All | Reviewed By: | Search | Clear | Refresh

Sketches: RES ??? [7815437] | Sections: 1

Zoom: 78% | Rotate: -2°

**Sketch Validation & Review:**

Parcel ID: 7815437 | Neighborhood: 2017R

**OutBuildings**

Line	Code	OB Year	OB Area	Meas/Meas 1	Meas/Meas 2
1	GARAGE DETACHED - RES	1998	400	1	400

Save Review | Reset

**Notes:**  
sketch inaccurate

Field Inspection |  Data Entry |  Further Review  
 Completed |  QC Passed

**Other flags:** Click or slide the button to change state.

Obstructed View:  NO

Powered by CAMA Cloud  
Copyrights - Data Cloud Solutions, LLC - All rights reserved.

Rotate, scale, and anchor sketch over aerial images.

Check for issues in sketched \*AND\* unsketched CAMA data.

Sketch could have been incorrect for years, and comparing 1 aerial to the next would not find an issue.

# Sketch Validation: Neighborhood Overview

The screenshot displays the CAMA Cloud Sketch Validation web application. The interface includes a navigation menu with options for Sketch Validation, History, Reports, Administration, and Logout. Below the menu, there are search filters for Parcel ID, Neighborhood (set to 617R), Flag Status (set to All), and Reviewed By. The main area is a map showing a residential neighborhood with streets such as Eastgate Rd, Meadow Rue Dr, Glenbrier Rd, and Valley Ridge Ct. Numerous colored circular flags are scattered across the map, representing different validation statuses. The flags are primarily green, with some orange and purple flags. A white circle highlights a specific location on the map. The bottom of the interface shows the Google logo and copyright information for CAMA Cloud and Data Cloud Solutions, LLC.

Configurable flag colors for reasons like:

- Field Visit
- Data Entry
- Further Review
- Completed

...

# Sketch Validation: Reports

Field Visit reports  
for MobileAssessor  
Priority Lists.

More Reports:  
Productivity  
Flagged Parcels  
Completed  
Neighborhood  
User History  
.....



Sketch Validation History Reports Administration Logout

## Sketch Validation Reports

Select Report:

Parcels for Further Review

Report Parameters:

Parcel Flags

Field Inspection

Neighborhood

-- Select --

User

-- Select --

Parcel Number

Generate Report

1 of 31 Find | Next

### FOR FURTHER REVIEW - SKETCH VALIDATION

Neighborhood	Parcel Number	Street Address	Reviewer's Note
1013R	8369534	6149 HOLLIDAY DR	Rear addn missing, carport/porch?
313R	2315724	3124 BROCK DR	Add on to the house?
617R	2008852	1574 PARK RIDGE LN	Sketch Inaccurate
404R	0460181	1490 FOSTER AVE	large unidentified building.
313R	2315634	3239 BROCK DR	No Sketch
617R	1455594	1638 FALLBROOK RD	Sketch Inaccurate - WDDK turned into sun room
617R	1455604	4499 MEADOW CREEK CT	Sketch Inaccurate
313R	2315657	3211 BROCK DR	Sketch inaccurate
313R	2335907	3163 KEEMONT DR	Sketch Incorrect
617R	2058434	1666 GLENFIELD LN	Sketch Inaccurate
313R	2324474	3014 EDGEBROOK DR	Sketch inaccurate
313R	2324484	2966 EDGEBROOK DR	Sketch innaccurate
315R	2359874	2031 ROANWOOD DR	no sketch!



# DeskTop Review: Seamless Remote Verification



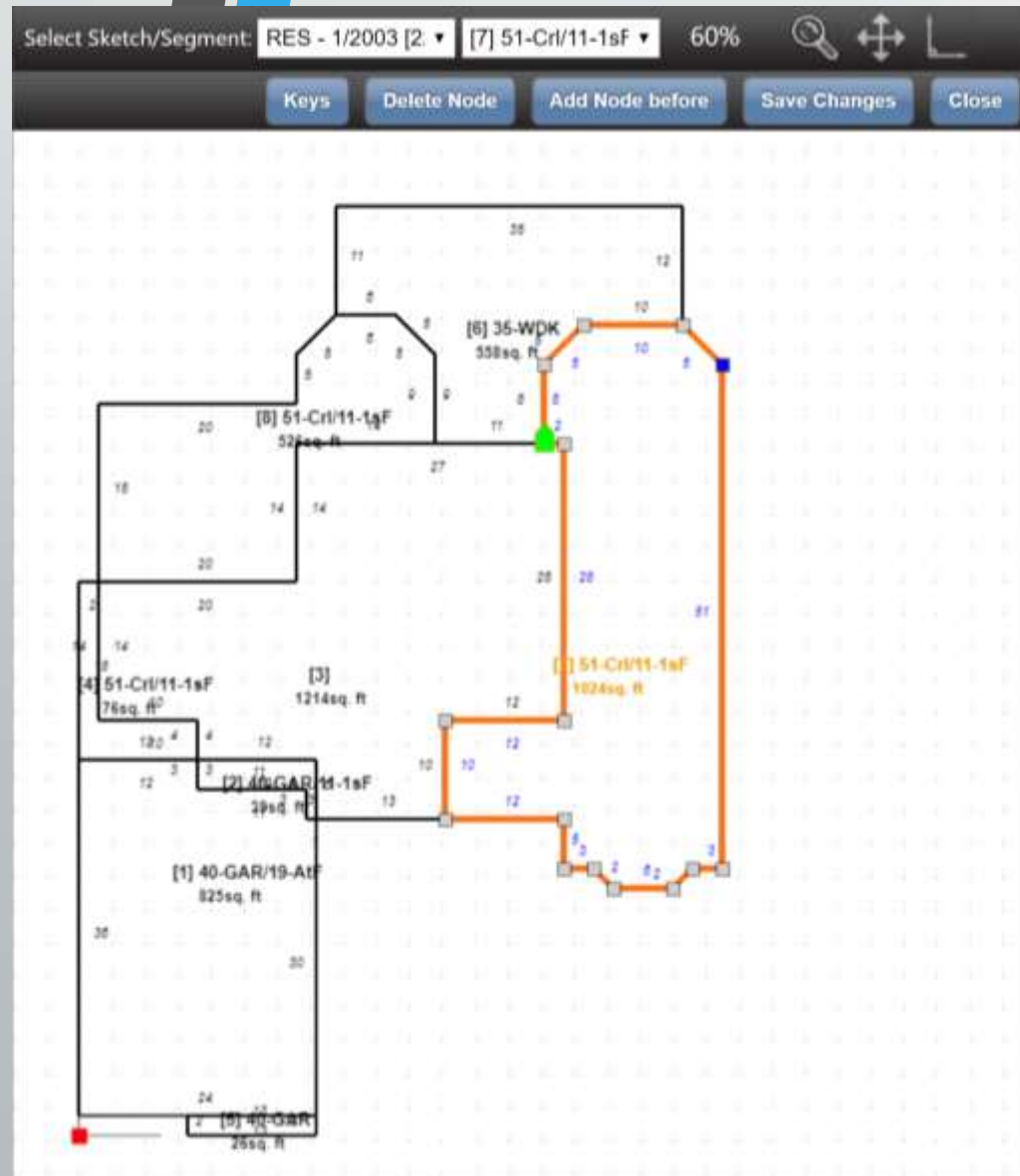
Seamlessly integrated with CAMA, Mobile, QC, and 3<sup>rd</sup> parties like:  
**Pictometry**  
**NearMap**  
**Sanborn**  
**CycloMedia**

With 100% configurable Workflow to meet your needs!

Review all desired data across multiple monitors and windows.



# DeskTop Review: Seamless Remote Verification



CCImageId:102988  
Parcel Photos - showing 1 of 1



Select All Add Photo Delete

Seamlessly integrated with CAMA, Mobile, QC, and 3<sup>rd</sup> parties like:

**Pictometry**  
**NearMap**  
**Sanborn**  
**CycloMedia**

Easily compare sketches to aerial and street-level images.

Find major issues BEFORE going to the field.

**Don't upset your cadence!**

# DeskTop Review: Eagleview (Pictometry)



Seamlessly integrated with CAMA, Mobile, QC, and 3<sup>rd</sup> parties like:

**Pictometry**

**NearMap**

**Sanborn**

**CycloMedia**

Your subject parcel is automatically loaded within your imagery services and the various CAMA Cloud modules; along with the sketch and other property data.

# DeskTop Review: CycloMedia + Flood Analysis

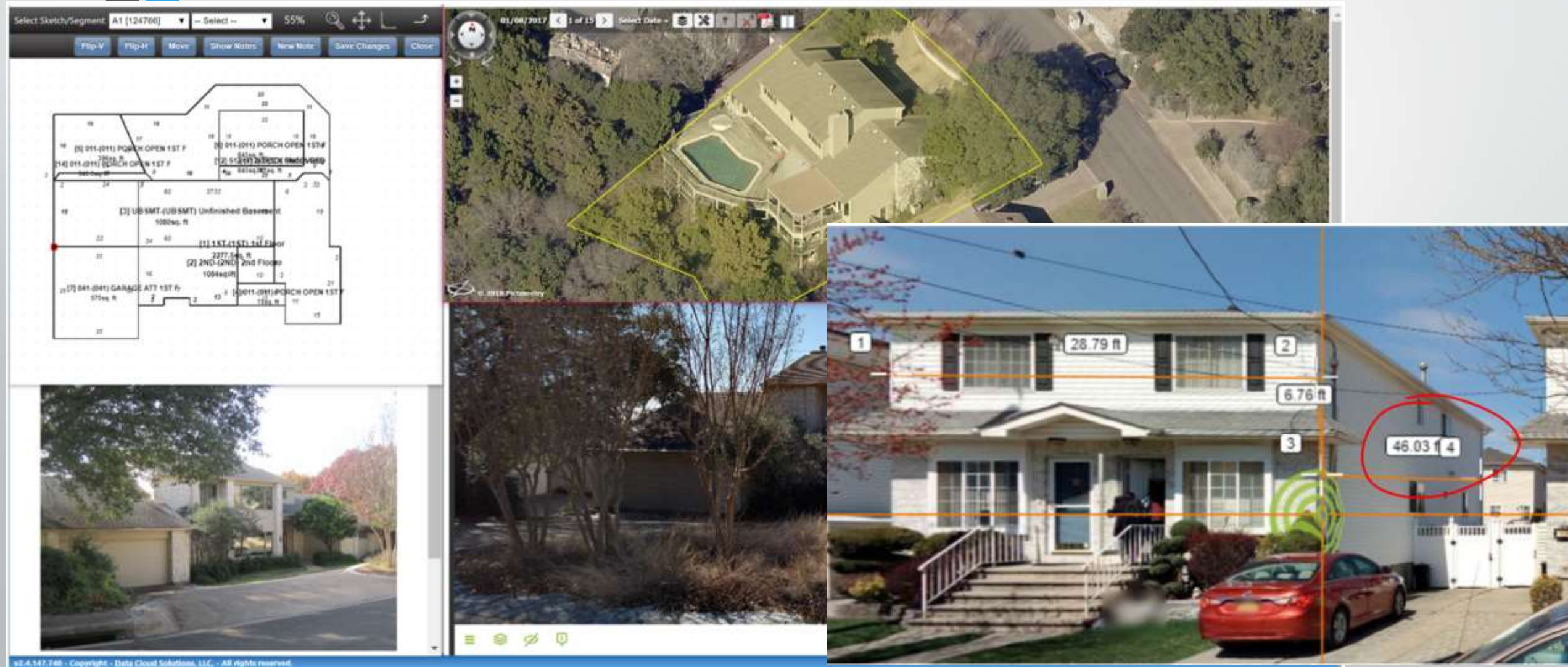
Visualize 1 foot of flooding vs ...

The image displays three different views of a flood analysis software interface:

- Left View (Street View):** Shows a house with a light blue overlay representing 1 foot of flooding. The elevation control shows a range from 32.23 ft to 65.04 ft, with the current setting at 49.63 ft (1.00 ft above the street level of 48.63 ft).
- Center View (Map View):** Shows a 2D map of a residential block with a large blue area representing the flooded region. The elevation control shows a range from 20.95 ft to 61.76 ft, with the current setting at 49.9 ft (1.54 ft above the street level of 48.36 ft).
- Right View (3D Street View):** Shows a house with a light blue overlay representing 4-5 feet of flooding. The elevation control shows a range from 20.95 ft to 61.76 ft, with the current setting at 49.9 ft (1.54 ft above the street level of 48.36 ft).

4-5 feet of flooding, or anything in between or more.

# DeskTop Review: Pictometry & CycloMedia + LiDAR



Measure heights & the sides of buildings (even if access would have been blocked!)

# DeskTop Review: Remote Change Detection Made Easy

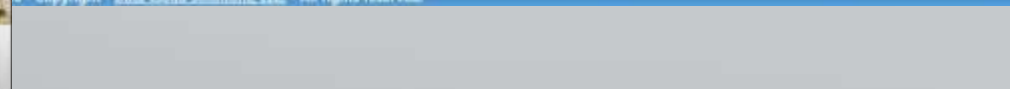
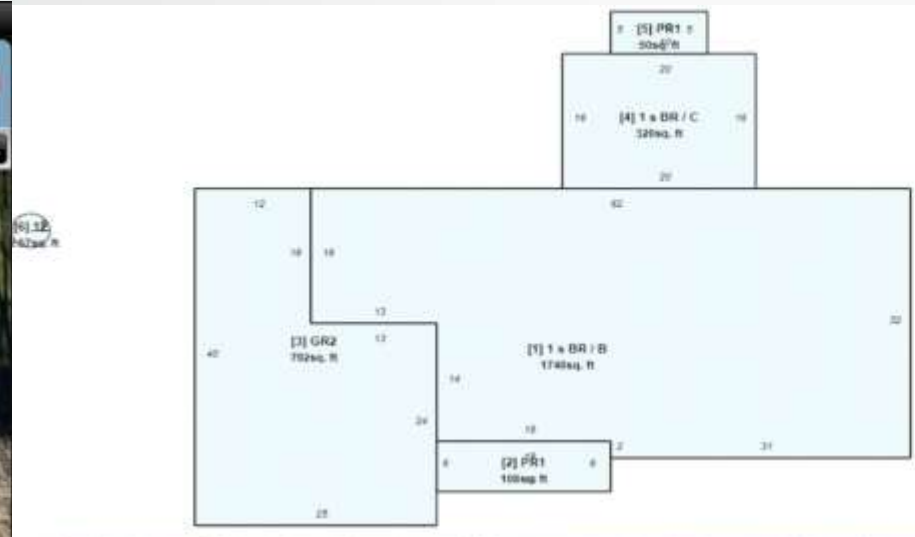
Outsource less. Do more in-house: quicker, more accurately, and more economically. Open data standards won't force you into paying additional professional services fees to your software vendor... if you don't want to!

The screenshot displays a software interface for remote change detection. It is divided into several sections:

- Top Right:** A 3D aerial view of a residential property with yellow lines indicating a measurement. A tooltip shows "Distance Result: 33.7 Feet".
- Top Left:** A 2D floor plan of the property with various rooms and areas highlighted in orange and blue. Labels include "[6] 35-WPK 558sq. ft.", "[8] 51-Cri/11-1sF 524sq. ft.", "[3] 51-Cri/11-1sF 1214sq. ft.", "[1] 51-Cri/11-1sF 78sq. ft.", "[2] 40-GAR 16-1sF 299sq. ft.", "[1] 40-GAR/19-AT 825sq. ft.", and "[5] 40-GAR 255sq. ft.". A toolbar at the top left includes "Select Sketch/Segment", "RES - 1/2003 [2]", "[7] 51-Cri/11-1sF", "60%", and navigation icons.
- Bottom Left:** A photo gallery titled "Parcel Photos - showing 1 of 1" with a thumbnail of the house. Below it are buttons for "Select All", "Add Photo", and "Delete".
- Bottom Center:** A timestamp "3/9/2017, 2:56:38 PM" and a unique identifier "2288831".
- Bottom Right:** A label "CCImageId:102988" and a street name "ORELAND AVE".

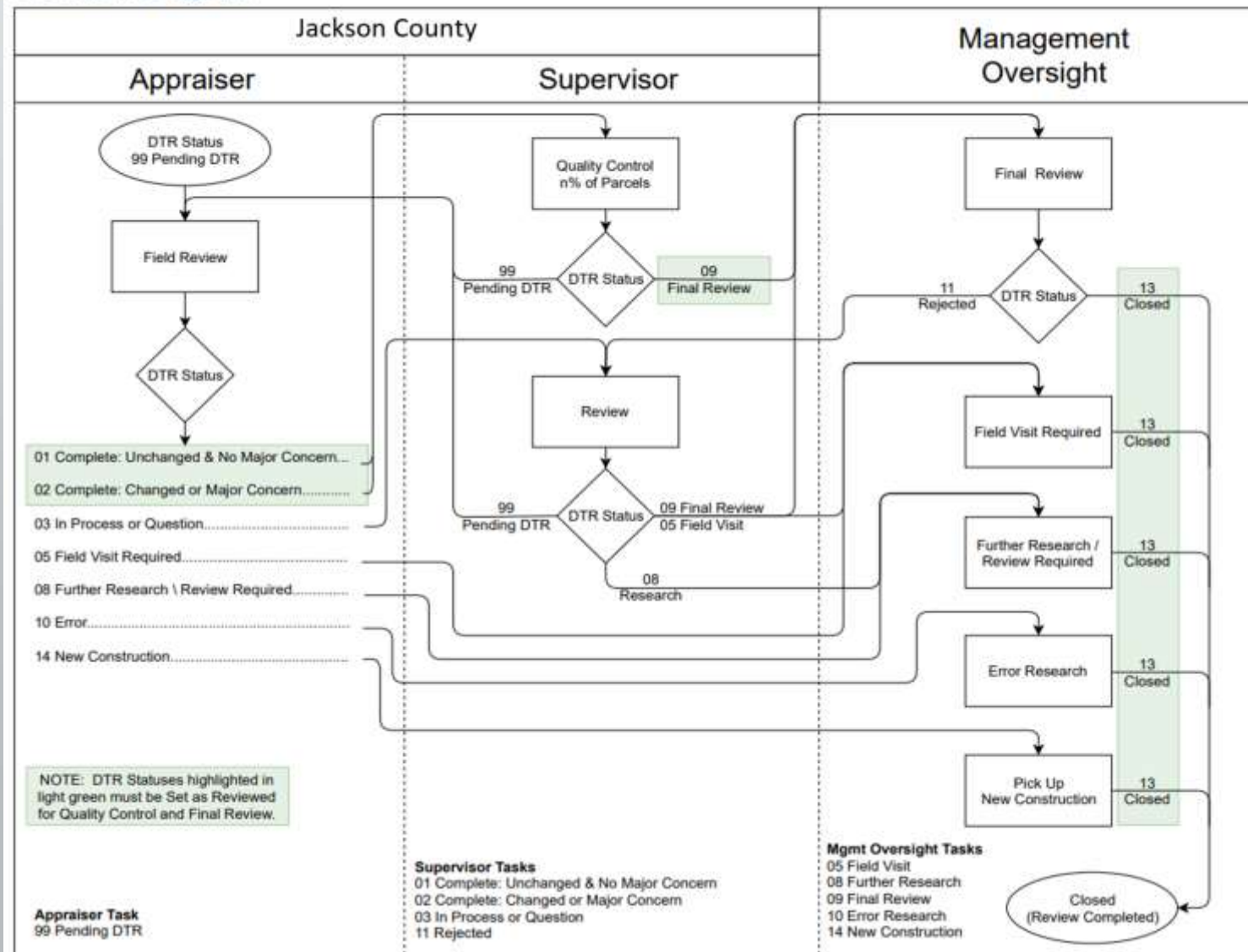
# Seamless Integrations: MobileAssessor + 3<sup>rd</sup> Party Tools

You've made the investment into other leading tools, open data standards should allow for you to link them together via vendors best in their class (or otherwise your choosing) in order to receive **Unmatched Experience**, **Stability**, and **Proven Workflow** configurations to resolve your unique challenges.



# DeskTop Review: Countless Workflow Options...

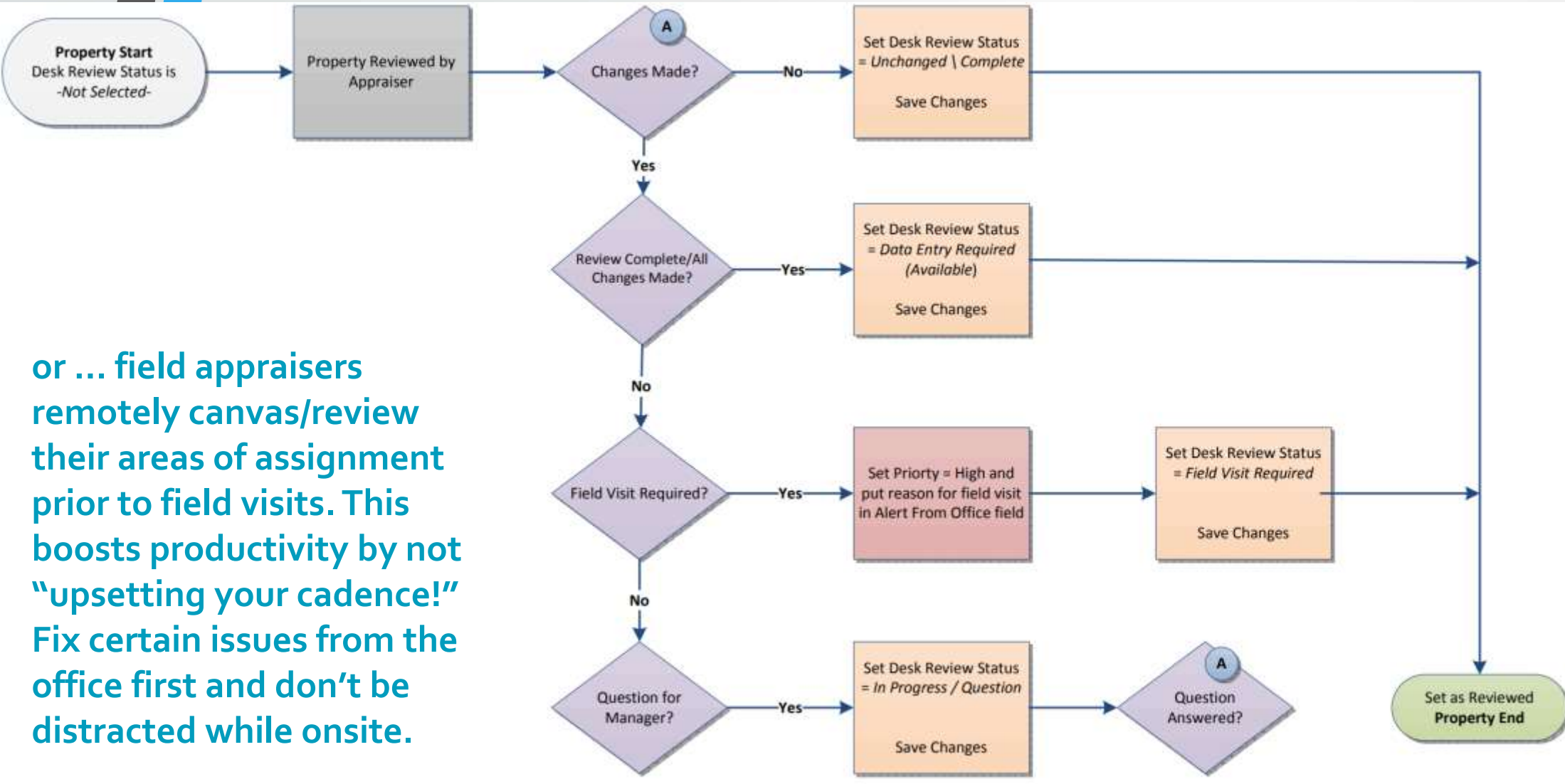
Workflow Diagram



**Complete Remote Verification work via DTR entirely in-house, or...**

*In this example Appraisers' work automatically goes back into CAMA, gets assigned to MobileAssessor, transfers to a Supervisor or other Oversight/Review Appraisers... as needed and as dictated by you. **Not as forced by locked-up data / closed-software services.***

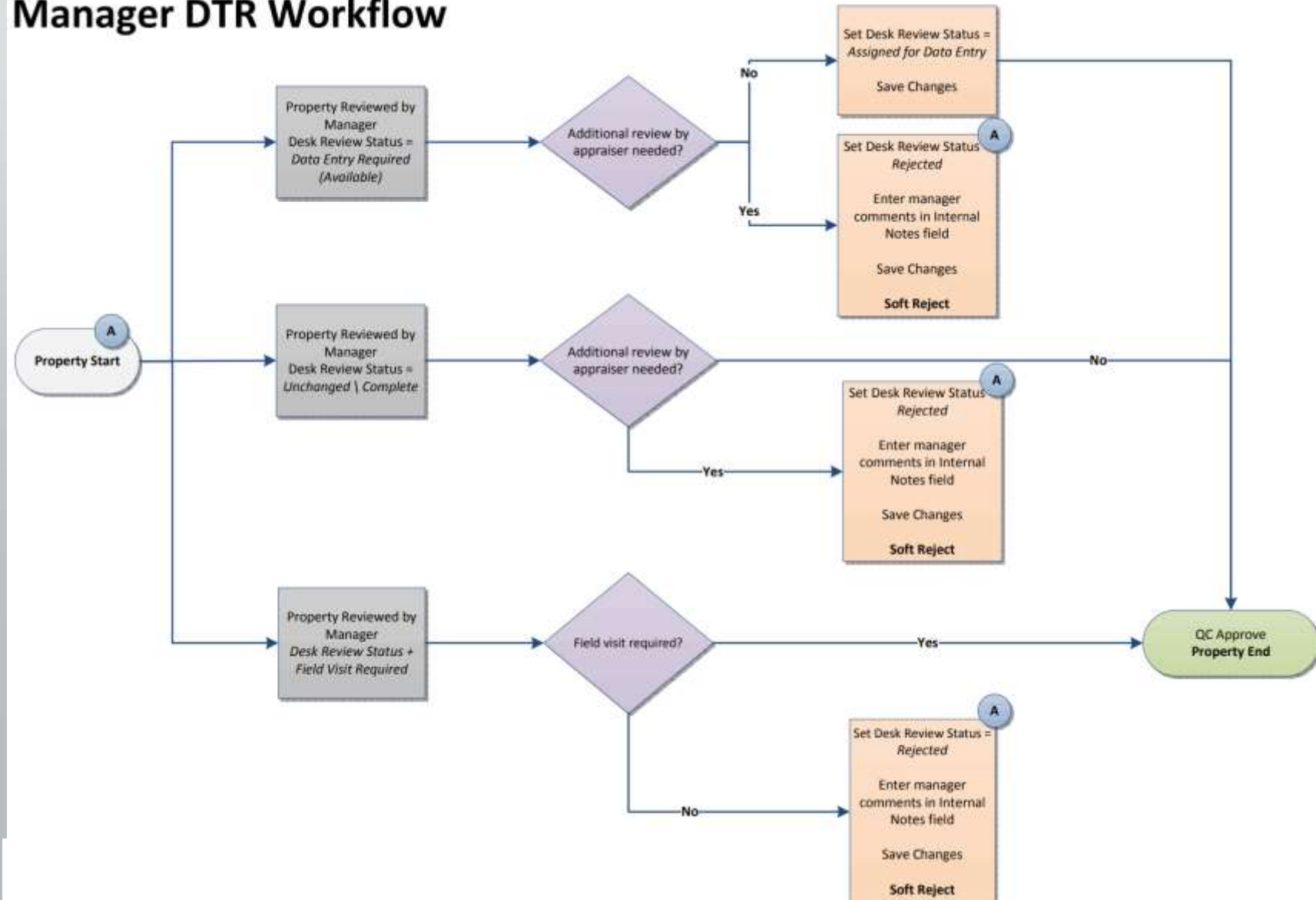
# DeskTop Review: Countless Workflow Options...






# DeskTop Review: Countless Workflow Options...

## Manager DTR Workflow



or ... have tiered Quality Control assignments. Supervisors can focus on “problem areas” or major items first, while less severe issues are assigned to different users or queues.

# MRA: Appraiser-Assisted, Not Machine Driven!




**LOGICAL**

**ILLOGICAL**

## Appraiser-Assisted MRA

Find & Correct Equitability Issues



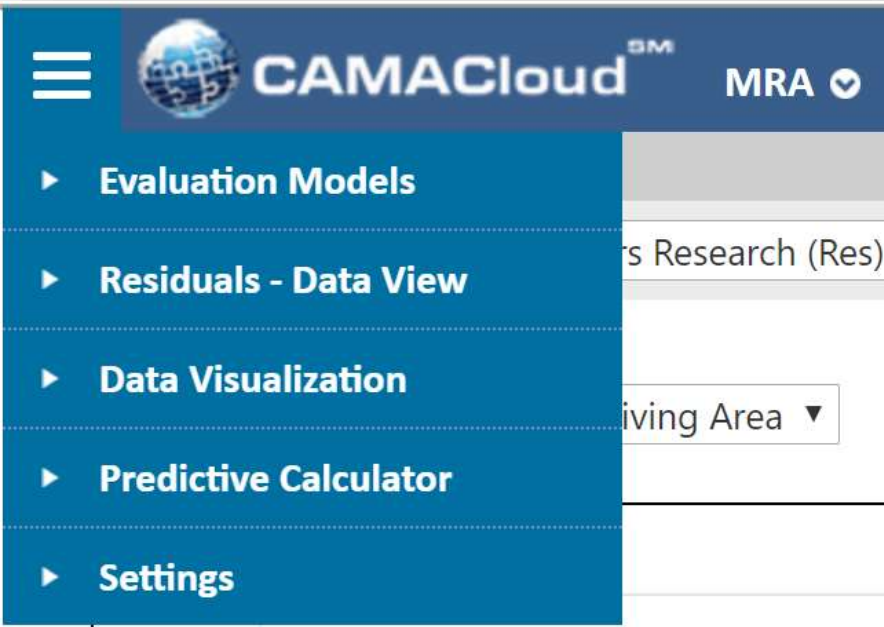
The MRA Module is designed to easily allow appraisal analysts to conduct empirically based trial-and-error tests on data that's known to be pertinent to local market areas – in a logical, explainable, and controlled fashion (i.e., not allowing an automated statistical package or step-wise program to introduce variables just for the sake of arriving at the highest  $r^2$ , regardless of explainability).

Understanding how a value was derived by a statistician's formula may not make sense, like what MRA Guy is feeling. While his overall temperature is 98.6°, his right foot will cook and his left foot will freeze. Regardless of the final value reached, the formula and method used to reach that number should be logical and explainable to anyone – especially the property owner. Reduce complaints up front.

**Put the appraiser in charge!** Let them determine which data variables to introduce (and sensible adjustments) so that the model and calculations can be explained to, and understood by property owners. **In the end, this approach is what typically holds true during an Appeal or Protest.**

With open data standards, and on-demand access by other industry experts and vendors, PVAs and their deputies can decide which data components they want to be analyzed, how they want them analyzed via logical constraints and filters, etc... so that any produced “valuation model” is explainable – without a machine chasing the highest  $r$ -squared while ignoring common sense; or without depending on any rigidity within your own tax-roll system.

**Test Models, See Analytics, Charts, Outliers, and more!**



☰ CAMACloud<sup>SM</sup> MRA

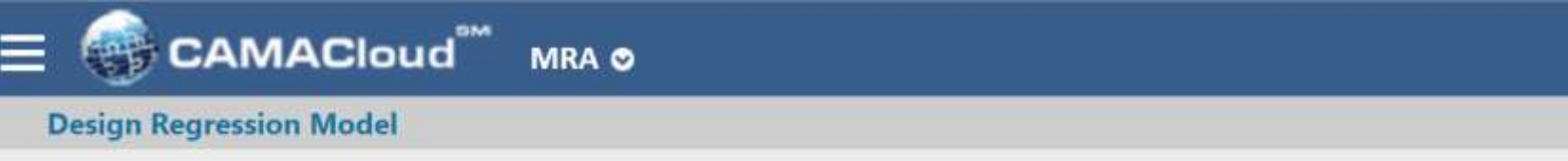
- ▶ Evaluation Models
- ▶ Residuals - Data View
- ▶ Data Visualization
- ▶ Predictive Calculator
- ▶ Settings

Residuals Research (Res)

Living Area ▾

# MRA: Test Models & Find Outliers

Easily deploy common sense knowledge and experience to select the market areas, property types, and other characteristics to filter on for further analysis. **You don't have to be a statistician!**



Regression Model Name:

Select Groups:

Output Field:

Comments (If any):

Input/Factor Fields:

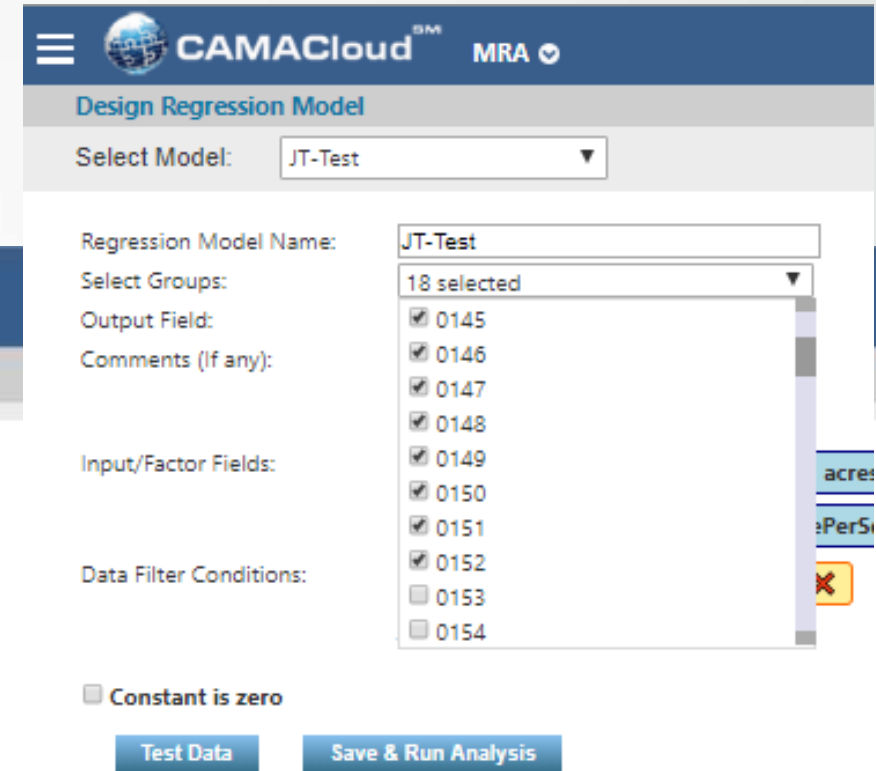
- 
- 
- 
- 
- 

[+] Add New

Data Filter Conditions:

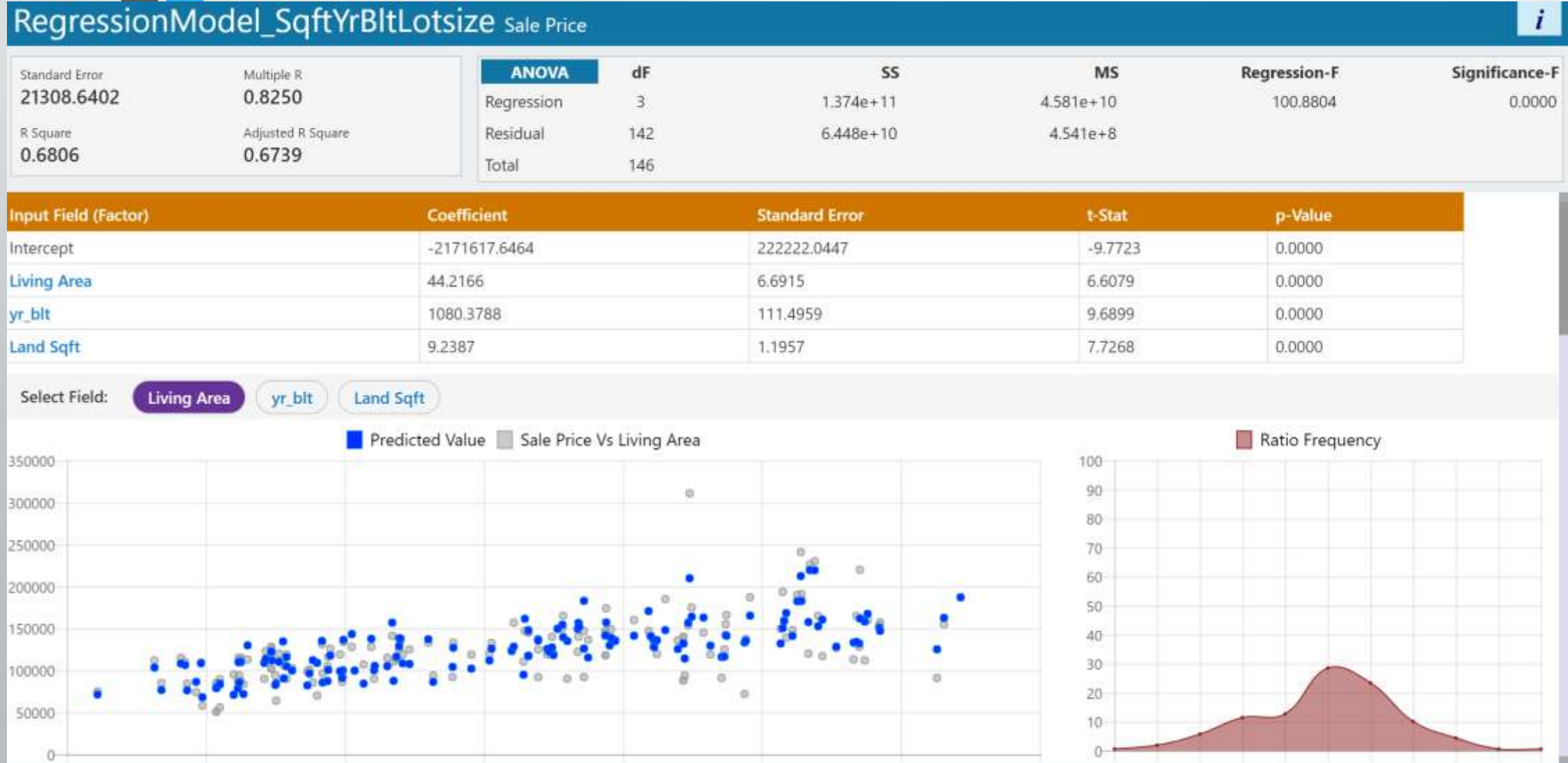
- 
- 
- 

[+] Add New



# MRA: Data Visualization

+ instant access to other systems for further research



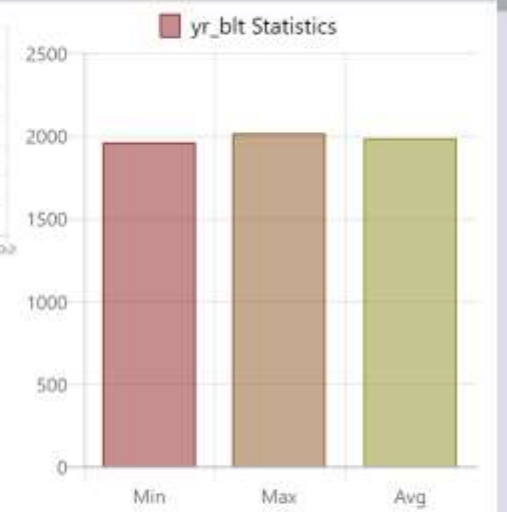
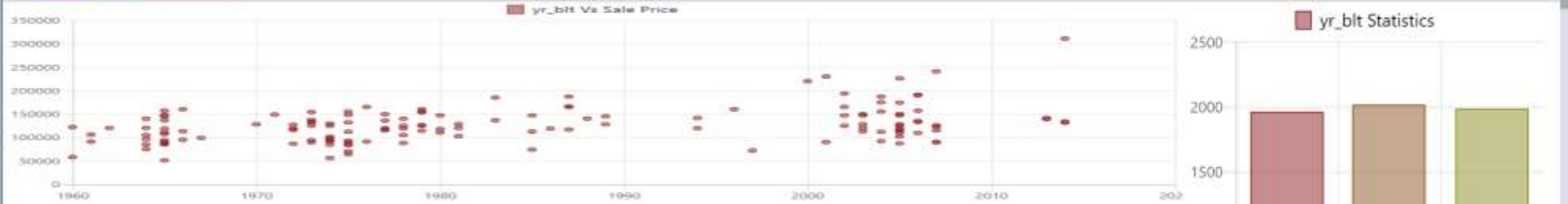
# MRA: Data Visualization & Outlier Review



Data Filters	Add Filter
property_profile.yr_blt	Input Filter
property_profile.living_area	Input Filter
property_profile.land_sqft	Input Filter
sales_history.sl_dt	✗
sales_history.adjusted_sl_price	Output Filter

Input Factor Fields:

Add **yr\_blt**  **Living Area**  **Land Sqft**   No Intercept



Input Field	Count	Maximum	Minimum	Range	Average	Standard Deviation
Living Area	146	2286	1044	1242	1637.4	317
yr_blt	146	2014	1960	54	1984.4	16
Land Sqft	146	14850	5850	9000	8849.3	1787

# MRA: Easy Data Exports to Excel

## Data View Extract

Obsv	Asmnt. Grp	Parcel	Actual Value	Estimated Value (Output)	Residual	Ratio7
1	4104	21632023	194,000	160,500	-33,500	0.827
2	4106	21220075	382,000	316,200	-65,800	0.828
3	99445	21110338	400,000	331,700	-68,300	0.829
4	4108	21409107	499,000	413,600	-85,400	0.829
5	99111	21118333	104,750	87,100	-17,650	0.832
6	4157	21415014	244,000	203,000	-41,000	0.832
7	99463	21630411	230,500	191,800	-38,700	0.832
8	4112	21311056	199,000	166,100	-32,900	0.835
9	4104	21632054	240,000	200,400	-39,600	0.835
10	99402	21418869C	110,000	92,000	-18,000	0.836
11	99116	21418378	60,000	50,300	-9,700	0.838
12	99311	21127821C	79,000	66,300	-12,700	0.839
13	99316	21418481	145,000	121,600	-23,400	0.839
14	99412	21507991C	158,500	133,000	-25,500	0.839
15	4132	21707032	342,000	342,000	0	1.000
16	4132	21712021	386,500	386,500	0	1.000
17	4132	21713010	461,000	461,000	0	1.000
18	99563	21714336	299,000	299,000	0	1.000
19	4157	21716023	162,500	162,500	0	1.000

Easily export all parcels that were part of your analysis and create Priority Lists, perform further research in your other favorite statistical packages, update data in a test environment, keep for archival purposes, and more...

# Comparable Properties: Equity & Uniformity Reports

This CAMAcloud<sup>SM</sup> module returns comparable properties\* for a subject parcel and notifies you whether the subject's current valuation is fair and equitable or not. A uniformity indication of value is also returned to let you know what the value should be in order for the subject property to be treated in a uniform manner. An optional Estimated Sale Price (fair market value) can also be reconciled if you desire. *\*Unsold comps too!*

## Comparability Report View

UNIFORM	Subject	Comparable #1	Comparable #2	Comparable #3	Comparable #4
<b>NON-UNIFORM</b>					
Site	Parcel ID Address Line 1 LMA Code	Parcel ID Address Line 1 LMA Code	Parcel ID Address Line 1 LMA Code	Parcel ID Address Line 1 LMA Code	Parcel ID Address Line 1 LMA Code
Sale	Sale Amount Sale Date A/S Ratio	Sale Amount Sale Date A/S Ratio	Sale Amount Sale Date A/S Ratio	Sale Amount Sale Date A/S Ratio	Sale Amount Sale Date A/S Ratio
Location	Neighborhood Street Front Traffic Side Walk Total Area Lot, sqft	Neighborhood Street Front Traffic Side Walk Total Area Lot, sqft	Neighborhood Street Front Traffic Side Walk Total Area Lot, sqft	Neighborhood Street Front Traffic Side Walk Total Area Lot, sqft	Neighborhood Street Front Traffic Side Walk Total Area Lot, sqft
Size & Room Count	Number of Stories Total Sqft Living Area Finished Basement Area Number Bedrooms Full Baths Half Baths	Number of Stories Total Sqft Living Area Finished Basement Area Number Bedrooms Full Baths Half Baths	Number of Stories Total Sqft Living Area Finished Basement Area Number Bedrooms Full Baths Half Baths	Number of Stories Total Sqft Living Area Finished Basement Area Number Bedrooms Full Baths Half Baths	Number of Stories Total Sqft Living Area Finished Basement Area Number Bedrooms Full Baths Half Baths
Quality & Condition	Year Built Exterior Wall Type Building Style Quality Condition Market Share	Year Built Exterior Wall Type Building Style Quality Condition Market Share	Year Built Exterior Wall Type Building Style Quality Condition Market Share	Year Built Exterior Wall Type Building Style Quality Condition Market Share	Year Built Exterior Wall Type Building Style Quality Condition Market Share
Amortize	Central AC Alarm Freeless Patio Freeless Wood Deck Sub Attached Garage Sp Built Garage Basement Garage (1)	Central AC Alarm Freeless Patio Freeless Wood Deck Sub Attached Garage Sp Built Garage Basement Garage (1)	Central AC Alarm Freeless Patio Freeless Wood Deck Sub Attached Garage Sp Built Garage Basement Garage (1)	Central AC Alarm Freeless Patio Freeless Wood Deck Sub Attached Garage Sp Built Garage Basement Garage (1)	Central AC Alarm Freeless Patio Freeless Wood Deck Sub Attached Garage Sp Built Garage Basement Garage (1)
Appraised Value	129,100	108,100	110,100	122,100	127,000
Comparability Index		85%	95%+	95%	94%
Uniformity Indication	\$130,900	\$95,100		\$144,700	\$158,300

**Address: 2400 SW MORNINGSIDE DR**

parcel\_id: 42120111500000000 link\_id: 6832135  
 Neighborhood: 7220 Group: SBS  
 Search Only for Absolute Comparables  Search within Group  
 List comparables with at least one sale  Estimate Subject's Sale Price

**Search Comparables**

Find Comparability, Uniformity, and Equity issues (or confirm a subject doesn't have an issue) across not only sold parcels, but unsold too! Utilize the Uniformity Indicated Value, or the Estimated Sale Price as further supporting evidence in any claimed opinion of value.

## Multiple Regression Analysis










Select Data for Analysis

Enter values in the form below and click the **Calculate** button to get the predicted value based on the regression model.

tot\_sqf\_l\_area: 2500  
 year\_built: 2010

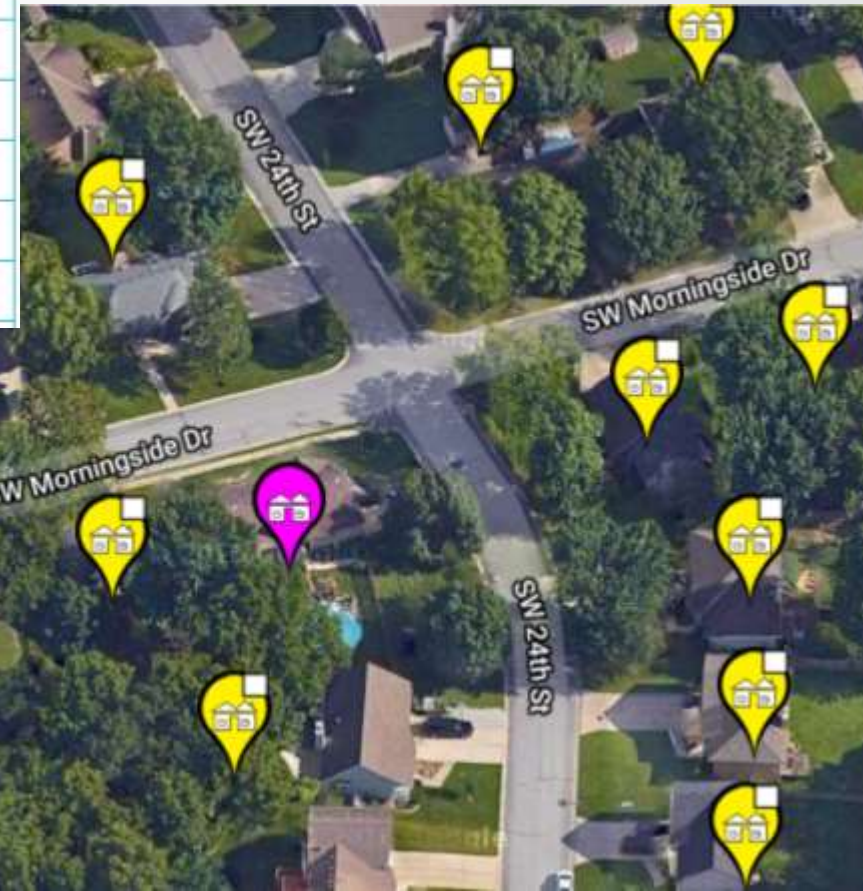
# Quickly Find Comparable Properties + QC Interaction

Evaluated 50 comparable properties in 3.7751287 seconds [Show In Map](#)

Group	Nbhd	parcel_id	link_id	Street Address	Comp%
	7220	42120074300000000	6831805	1204 SW 24TH ST	95%+
	7220	42120072300000000	6832160	2500 SW MORNINGSIDE DR	95%+
	7220	42120074400000000	6831808	1200 SW 24TH ST	95%+
	7220	42120074500000000	6831811	1120 SW 24TH ST CT	95%+
	7220	42120074900000000	6831822	1104 SW 24TH ST CT	95%+
	7220	42120113500000000	6832196	2607 SW MORNINGSIDE DR	95%+
	7220	42120112700000000	6832172	2608 SW MORNINGSIDE DR	95%+
	7220	42120113600000000	6832199	2603 SW MORNINGSIDE DR	95%+
	7220	42120110200000000	6832096	1304 SW 24TH ST	95%+

Find truly comparable properties (sold or unsold) within seconds, then generate comparison reports from a comparability index list view, or from a map view.

All parcels can also be opened within the Quality Control module for further review, or assignment to MobileAssessor as needed!





# Comparable Properties' Estimated Sale Report

UNIFORM		Subject	Comparable #1	Comparable #2	Comparable #3	Comparable #4	Comparable #5
		 42-120-11-15-00-0-00-000 07/15/2005	 42-120-07-43-00-0-00-000 07/14/2005	 42-120-11-23-00-0-00-000 07/15/2005	 42-120-07-44-00-0-00-000 07/14/2005	 42-120-07-45-00-0-00-000 07/14/2005	 42-120-07-49-00-0-00-000 07/14/2005
Situs	Parcel ID	42120111500000000	42120074300000000	42120112300000000	42120074400000000	42120074500000000	42120074900000000
	Address Line 1	2400 SW MORNINGSIDE DR	1204 SW 24TH ST	2500 SW MORNINGSIDE DR	1200 SW 24TH ST	1120 SW 24TH ST CT	1104 SW 24TH ST CT
	Use Code	1110 - SF RESIDENCE	1110 - SF RESIDENCE	1110 - SF RESIDENCE	1110 - SF RESIDENCE	1110 - SF RESIDENCE	1110 - SF RESIDENCE
<b>Appraised Value</b>		<b>129,100</b>	<b>125,500</b>	<b>126,800</b>	<b>125,800</b>	<b>130,200</b>	<b>126,700</b>
<b>Comparability Index</b>			<b>95%+</b>	<b>95%+</b>	<b>95%+</b>	<b>95%+</b>	<b>95%+</b>
<b>Uniformity Indication</b>		<b>\$130,800</b>					

Useful for Sold and Unsold parcels!

Median Sale for Comps	\$152,000	\$116,000	\$145,000	\$142,000	\$170,000
Total Adjustments	\$-7,500	\$3,900	\$5,600	\$2,700	\$-13,700
Sale Adjusted to Subject	\$144,500	\$119,900	\$150,600	\$144,700	\$156,300

Estimated Sale Price for Subject **\$144,700**

# Overview: Integrated Tools

(high-level demonstration)

The possibilities with open data standards!

# Questions?

## Thank you!