High Resolution Ortho and Oblique Imagery – Local Government Imagery Applications

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Pictometry

TOP DOWN or ORTHO SHOT

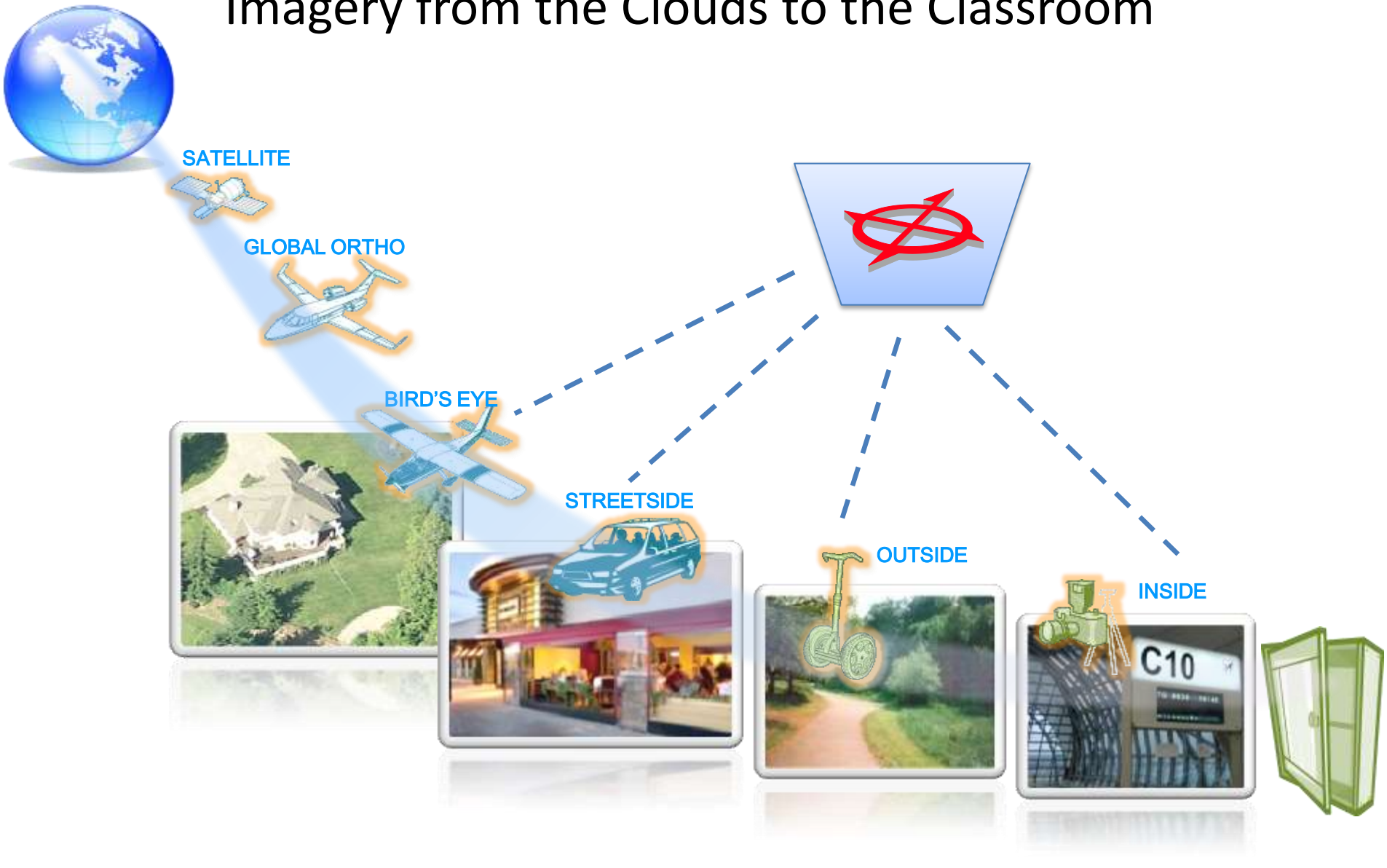
AN OBLIQUE PERSPECTIVE

Agenda

- Pictometry Overview
- Products and Services
- Image Resolution Types
- Applications
- Integrations
- Questions
- Appendix
  - Lots of info!!!!!

IMAGERY

Imagery from the Clouds to the Classroom



Intelligent Imagery

- Images—captured at an angle—reveal the world from a more natural perspective
  - objects are easier to recognize and interpret.
  - With resolutions set as high as 3 inch Ground Sample Distance (GSD), you can see all in amazing detail and view every feature, structure and parcel from North, South, East, West or straight down
  - When you layer GIS information on top of such meticulous imagery, you turn data into knowledge.

- Easier to understand than traditional aerial and satellite images
- Every pixel is geo-referenced
  - Obliques- With X,Y & Z!!
- Meets a rigorous quality control check
- Provides greater detail with higher resolution and 360-degree views
- Horizontal Accuracy depends upon image resolution type and Digital Elevation Data used to process imagery.

Imagery Products

- Aerial- 2 Flavors
  - Standard Oblique's & Ortho
  - USGS Certified Orthophotography -AccuPlus
- LiDAR
- 3DModels
- Streetview
- Inside

The world's only USGS - certified oblique camera system, but also invented the patented technology to accurately measure images

Key Applications

- Public Safety (Police, Fire, EMS)
- 911 Call Taking and Dispatch
- Property Appraisal and Assessment
- Public Works, Utilities, Transportation
- GIS, Addressing, Census
- Planning, Zoning, Permits, Code Enforcement
- Coastal Zone Management
- Homeland Security
- Economic Development

AccuPlus Certified Ortho's

- The highest quality in the market
  - captured with a USGS-certified camera system that are aerial triangulated and then expertly stitched into a seamless mosaic using a digital terrain model.
- unmatched precision, useful for such exacting purposes
  - tax map generation, street centerlines and planimetric data.
- Captured at lower altitude for unmatched clarity
- Provides mosaic, oblique and LiDAR images with two to four times more accuracy than standard product
- Aero-triangulated with surveyed ground control for certification
- Small Format Camera

Horizontal Accuracy:

4" AccuPlus: $RMSE_r$ = 1.41 ft, NSSDA (95%) = 2.5 ft., meets or exceeds NMAS 1" = 100'

6"AccuPlus: $RMSE_r$ = 1.85 ft, NSSDA (95%) = 3.2 ft., meets or exceeds NMAS 1" = 100'

12" AccuPlus: $RMSE_r$ = 3.20 ft, NSSDA (95%) = 5.5 ft., meets or exceeds NMAS 1"= 200'

12" AccuPlus Lite: $RMSE_r$ = 4.40 ft, NSSDA (95%) = 6.5ft., meets or exceeds NMAS 1"= 200'

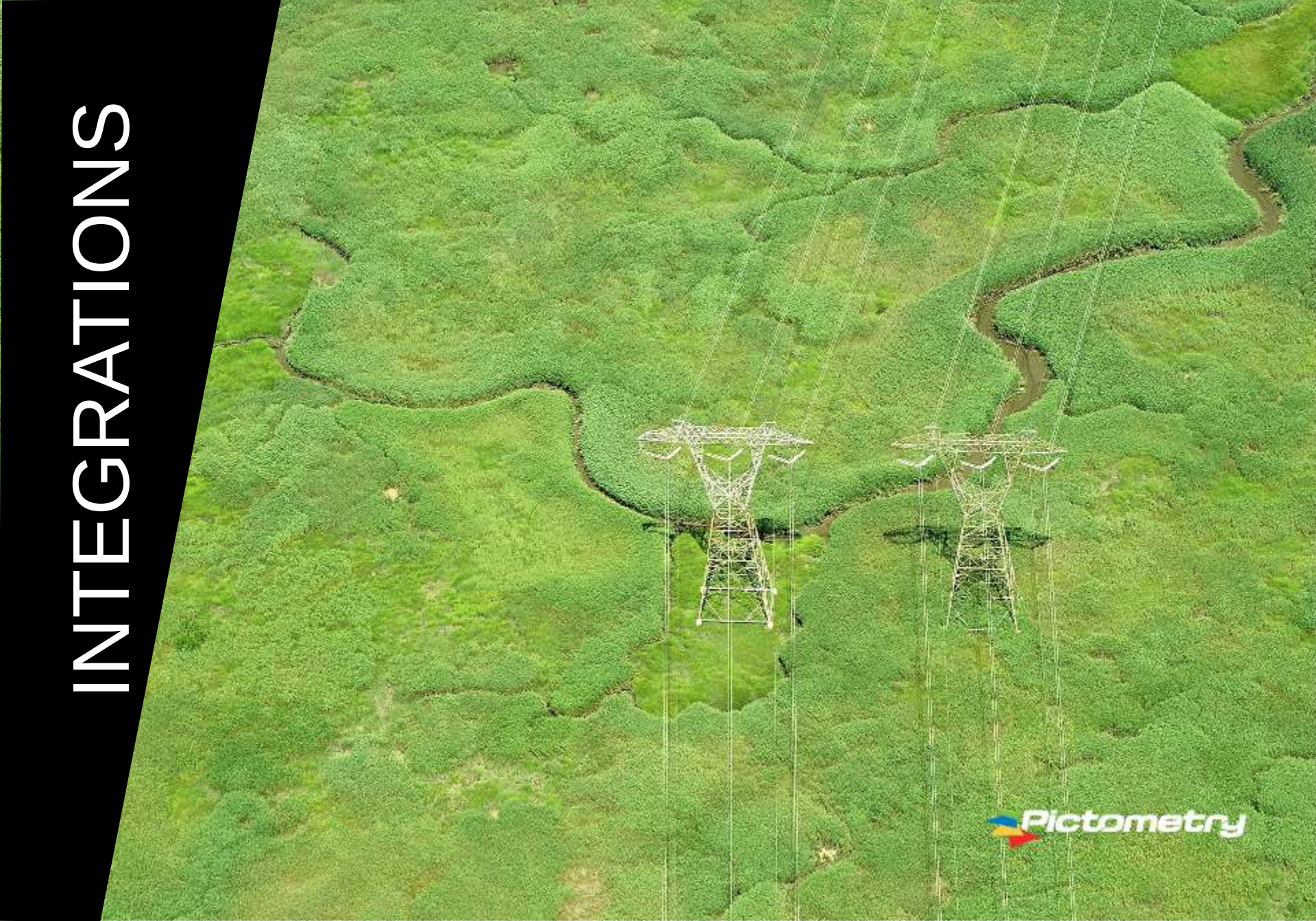
ANALYTICS

Analytics Products

- Pictometry Online
- Electronic Field Study (EFS)
- Self Hosting

– Enterprise Wide
  - Lifetime EFS & Imagery License
  - ESRI Integrations

INTEGRATIONS



Integration Products

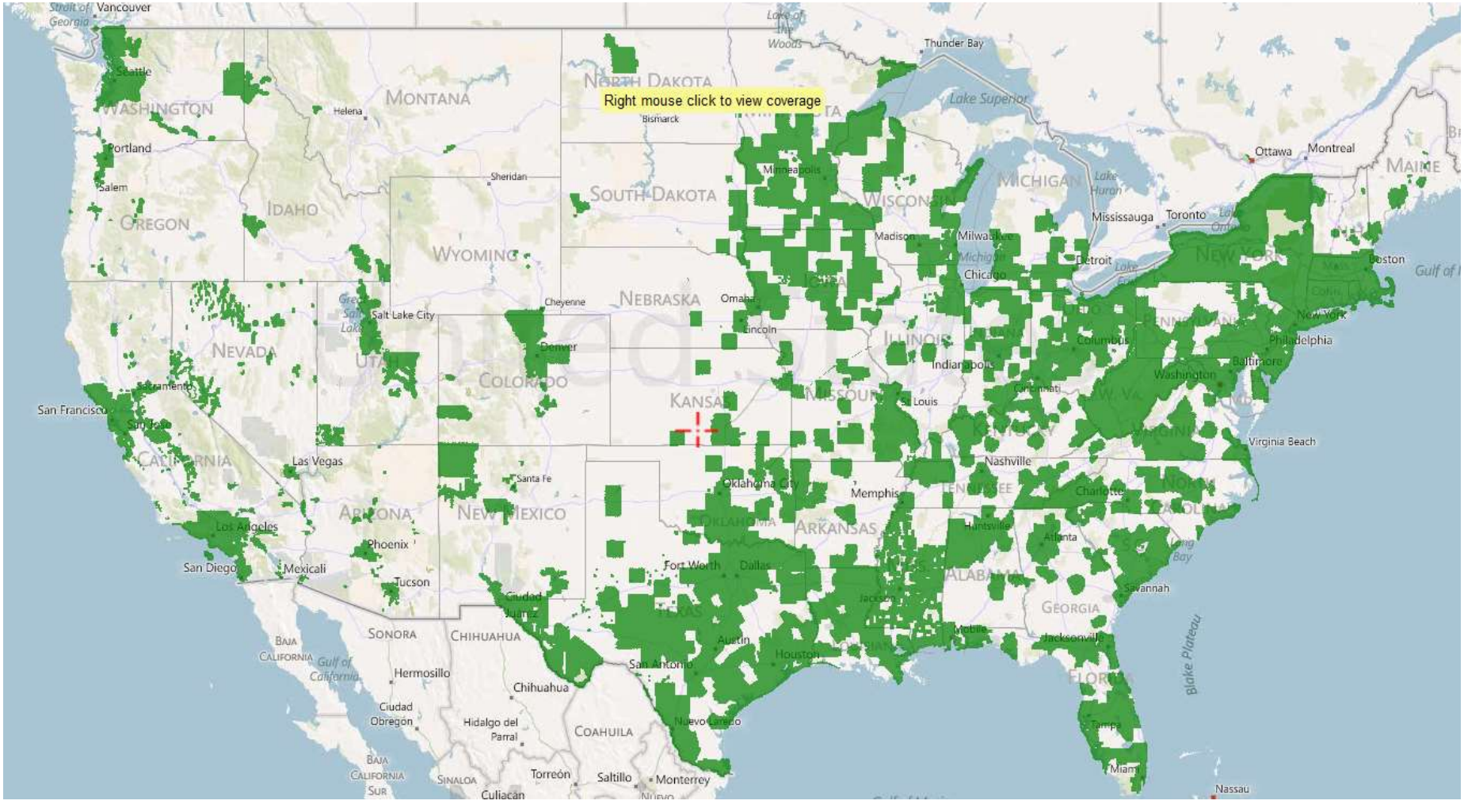
- ESRI ArcDesktop
  - 9.X
  - 10.X
- ArcServer Solutions
  - Flex & Silverlight
- Autodesk Solutions
  - including AutoCAD Map 3D & Infrastructure Map Server
- Integraph Solutions
  - including CAD, Mobile and GIS integrations
- All major E911 Computer Aided Dispatch software systems
- Emergency Vehicle Tracking systems
- Powerful API’s and SDK’s for custom developed integrations

REPORTS

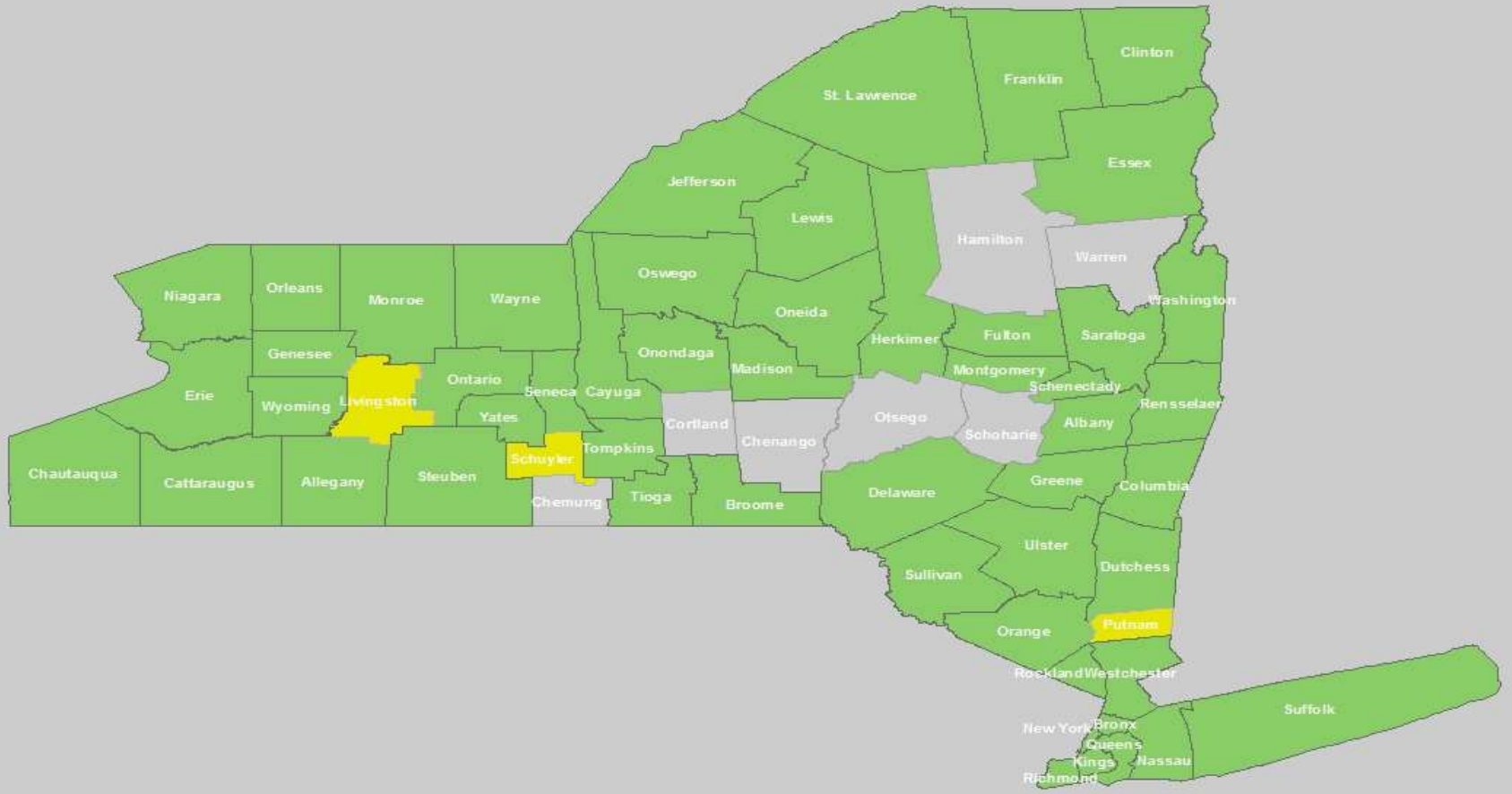
Reports –Products

- Roof Reports
- Hazard Reports
- SketchCheck
  - Convert to .shp
  - Geo-reference
  - Validate & Return results
  - Change Detection
- ChangeFindr™
  - Automatic Change Detection
  - Building Outline Creation

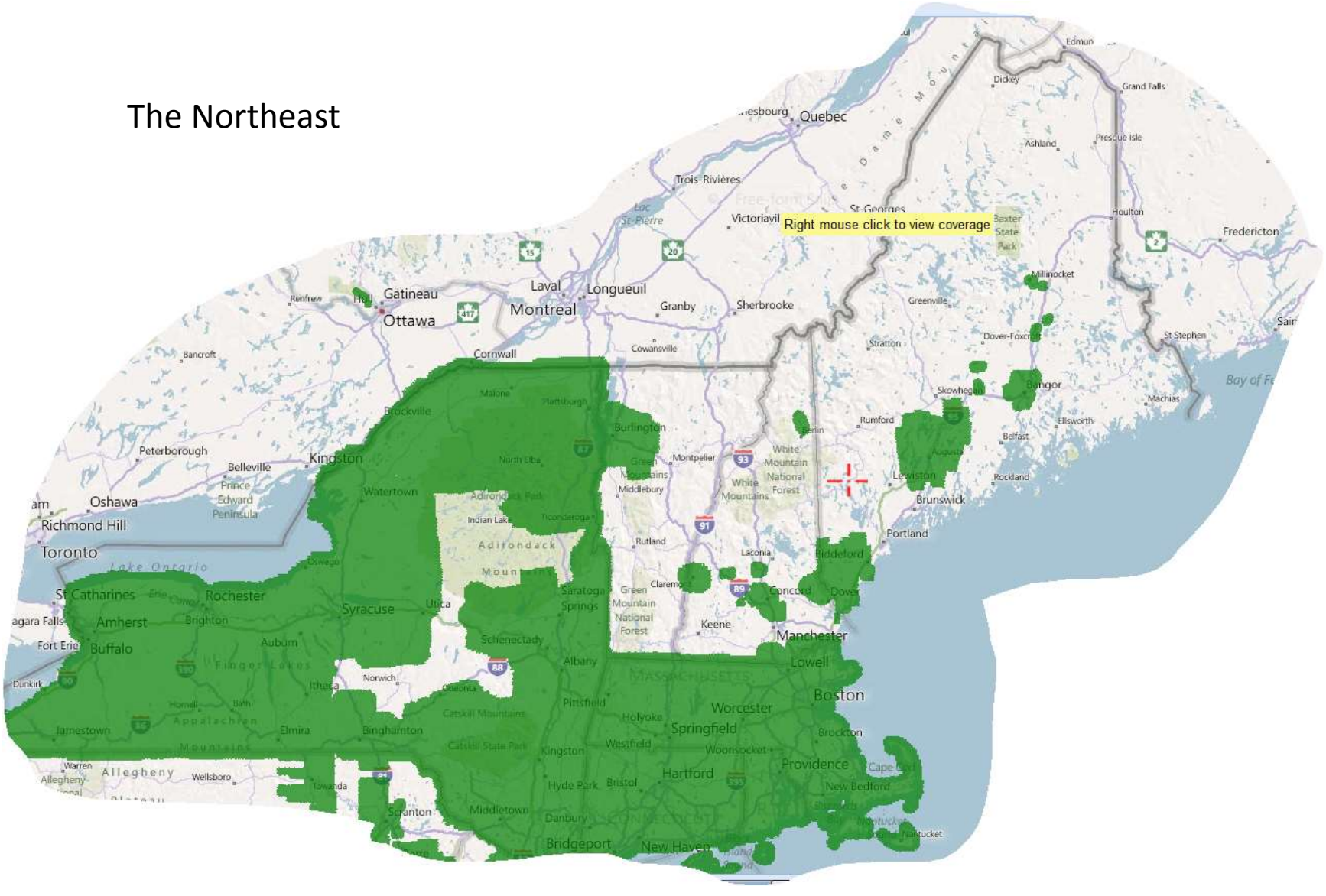
Over 1,000 County Clients!!!!



A little bit about NYS….



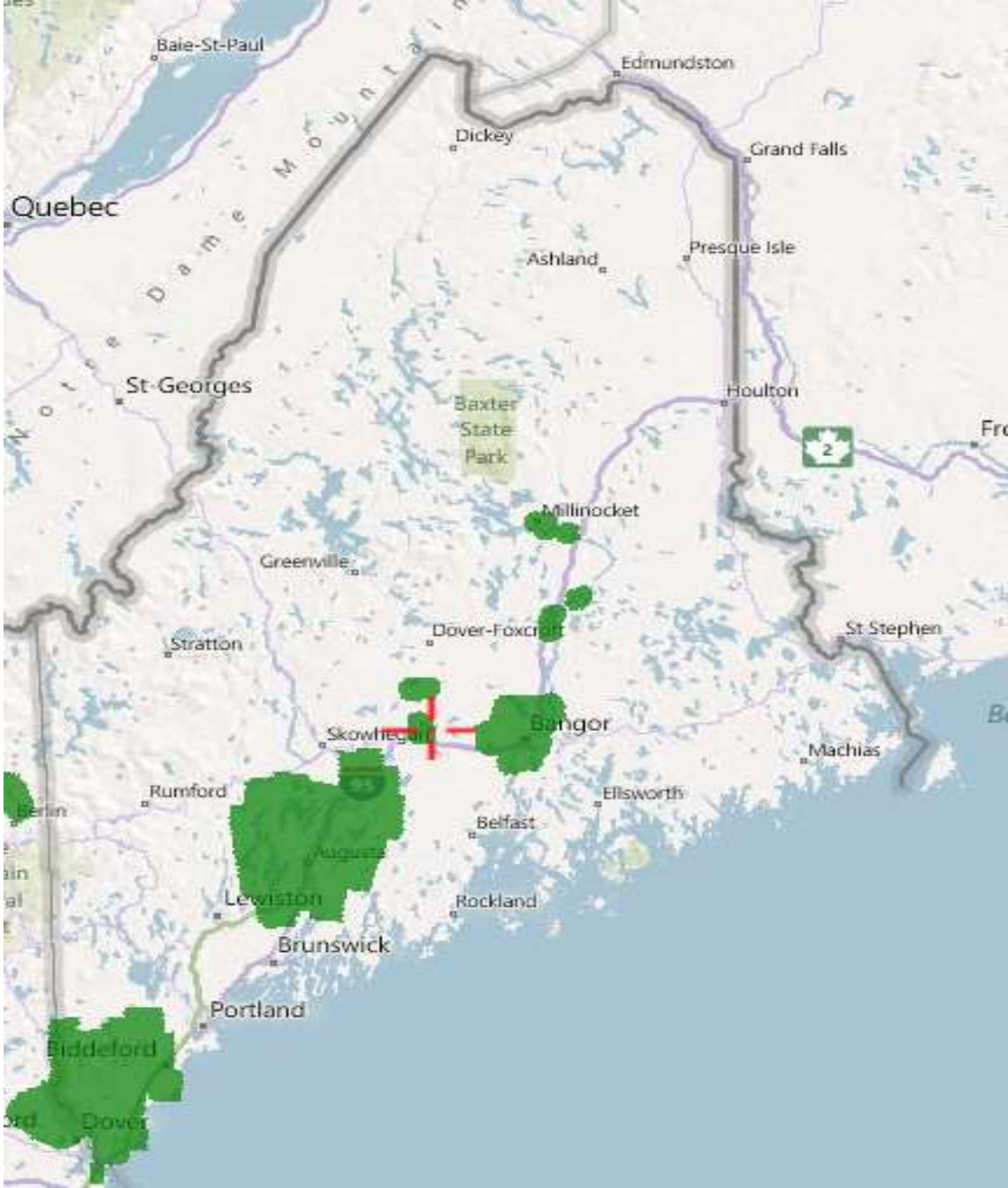
The Northeast



The Great State of…

Maine!!!

Coverage to Date



Oblique Technology-Time and Date Stamped Images

A visual intelligence tool

Oblique aerial imagery shows the sides of structures & real world features from all directions

Images are digital, color and of a high pixel resolution

in Addition To This…

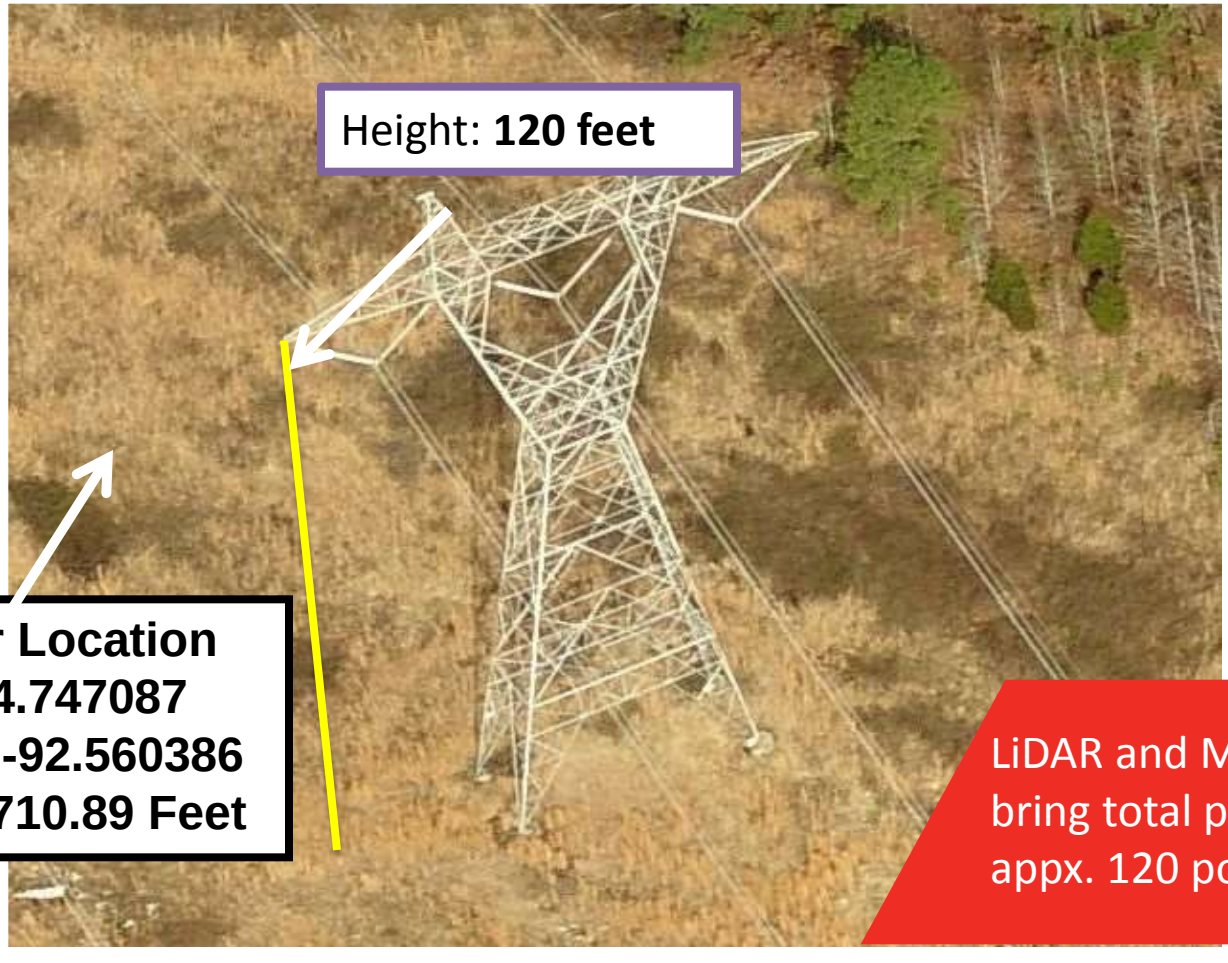

North

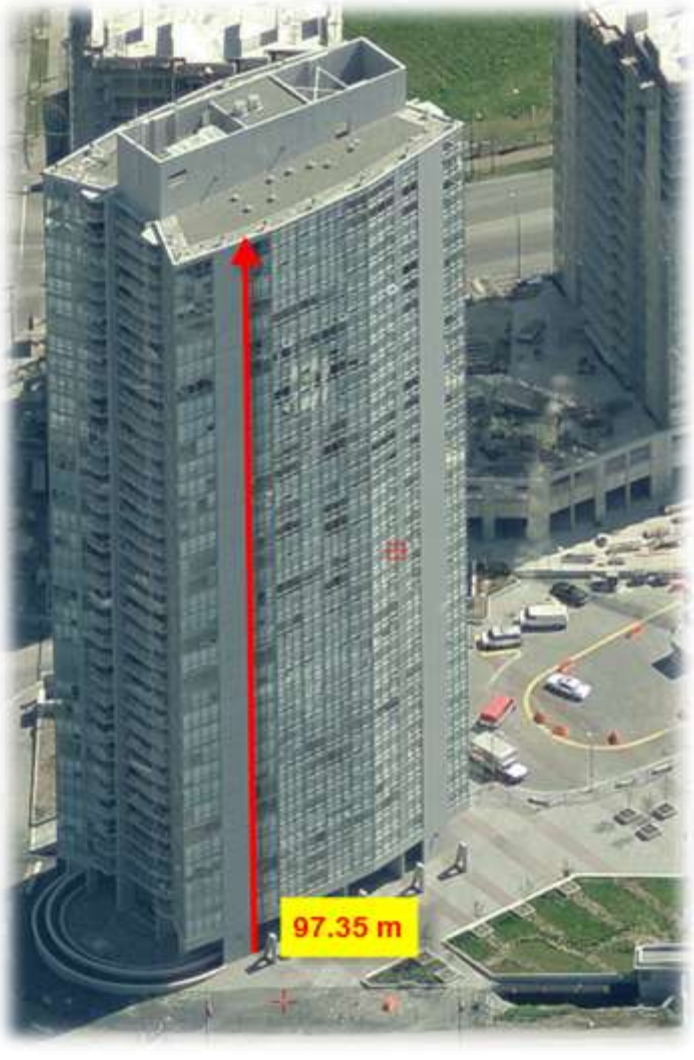

South


East


West

Pictometry Oblique

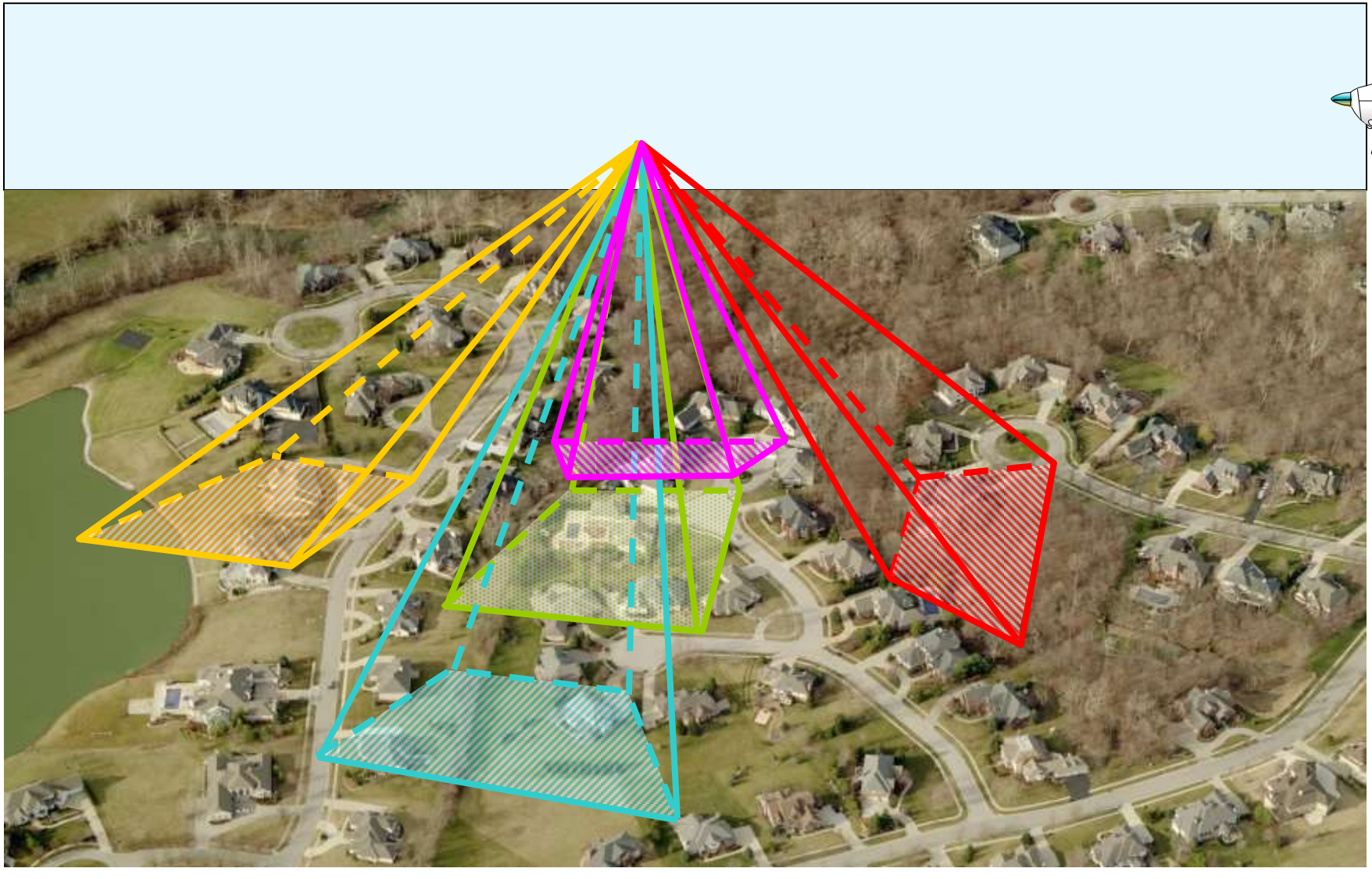


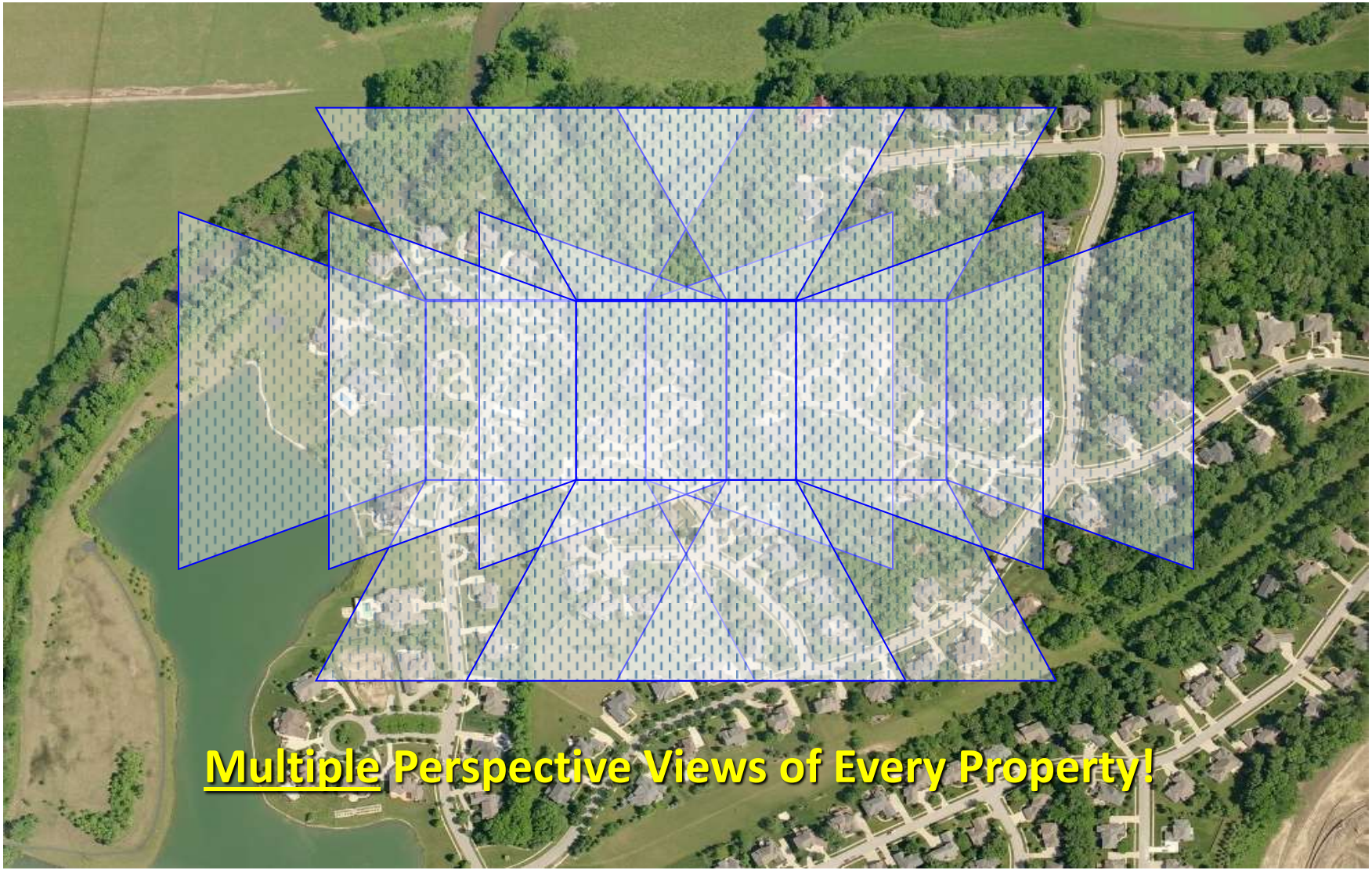


Each image pixel has an X,Y, and Z values. You can measure right on the image for:

- Height
- Distance
- Area
- Bearing
- Angle
- Pitch
- Latitude/Longitude
- Elevation/Slope

Magnification, Height, Area, Distance, Vertical Area , etc




Multiple Perspective Views of Every Property!

Plan Everything

See Everywhere

Measure Anything

Know Before You Go


12 Inch Oblique


8 Inch Oblique


6 Inch Oblique


4 Inch Oblique

FEATURES	BENEFITS
• Oblique aerial images of your entire jurisdiction	• Enables instant and realistic viewing of any project area, building, property, landmark, and road in your district from your PC
• Change Analysis	• Compares changes in land use over time such as appearance of new developments, property additions, and highway improvements
• Overlay data directly on images	• Documents and annotates all relevant data in one place for comprehensive decision-making and image exporting
• Interactive software	• Reduces expenses and field work in obtaining vital dimensions, measurements, and elevations of buildings, properties, roads, and assets of any site
• Multiple, high-resolution images per address	• Provides a wide choice of images for a more accurate representation of subject property and its buildings that may not be seen in traditional drive-by photos
• Intuitive user interface	• Shortens learning curve — anyone can quickly learn to run the system
• Renewable image libraries	• Maintains accurate up-to-date images on all properties, roads, and developments

Applications for Planning Using Intelligent Imagery

- Compare land use and expansion over time with Change Analysis
- Valuation of Tree Stands
- Inspect proximity of new developments to housing, schools, and roadways
- Measure angles, area, distance, height, and width of any structure or property
- View parcels from multiple directions to identify modifications to properties not recognizable from traditional drive-by photos or orthogonal images
- Import data from third-party information systems such as GIS information
- Create incentive packages with visual documentation to entice new businesses and industries into region
- Review properties for additions, new construction, and permits prior to a field visit
- Bring up-to-date and affect temporal changes to assessment and planning maps
- Examine environmentally sensitive areas

Public Safety Applications

- **Law Enforcement**
  - Tactical Operations
  - Situational Awareness
  - Deployment planning and response-time analysis
  - Threat assessment
  - Night becomes Day

- **911 Call Taking and Dispatch**
  - Land marking
  - Taking the confusion out of critical situations
  - Routing Info for Responders
  - Night Becomes Day
  - Integrations with most CAD systems

- **Emergency Services & Management**
  - Critical infrastructure protection & Awareness
  - mitigation and response
  - Situational awareness
  - planning and management
  - Night becomes day

Applications

- **Economic Development**
  - Promotion
  - Special district assessments
  - Business retention and attraction
- **Education**
  - Facilities planning and management
  - Classroom instruction
  - School boundary assignment
- **Community Development**
  - 3D visualization
  - Capital improvement planning
  - Land-use analysis
  - Sustainability initiatives
  - Zoning efforts
- **Environment**
  - Air quality improvements
  - Endangered species and environmental protection
  - Regulation
  - Site remediation
  - Disaster response

And More Applications

- **Utilities**
  - Asset management
  - Call-before-you-dig programs
  - Demand forecasting
  - Dispatching
  - Outage notification and response
- **Assessment**
  - Field Work brought to the Office
  - Impact and impervious surface fee assessment
  - Property tax assessment
  - Revenue projection

- **Public Works**
  - Vehicle routing for inspections,
  - trash pickup, and snow plowing Parks management
  - Permitting
- **Health and Human Services**
  - Disease outbreak tracking and response
  - Services locators
  - Social services administration

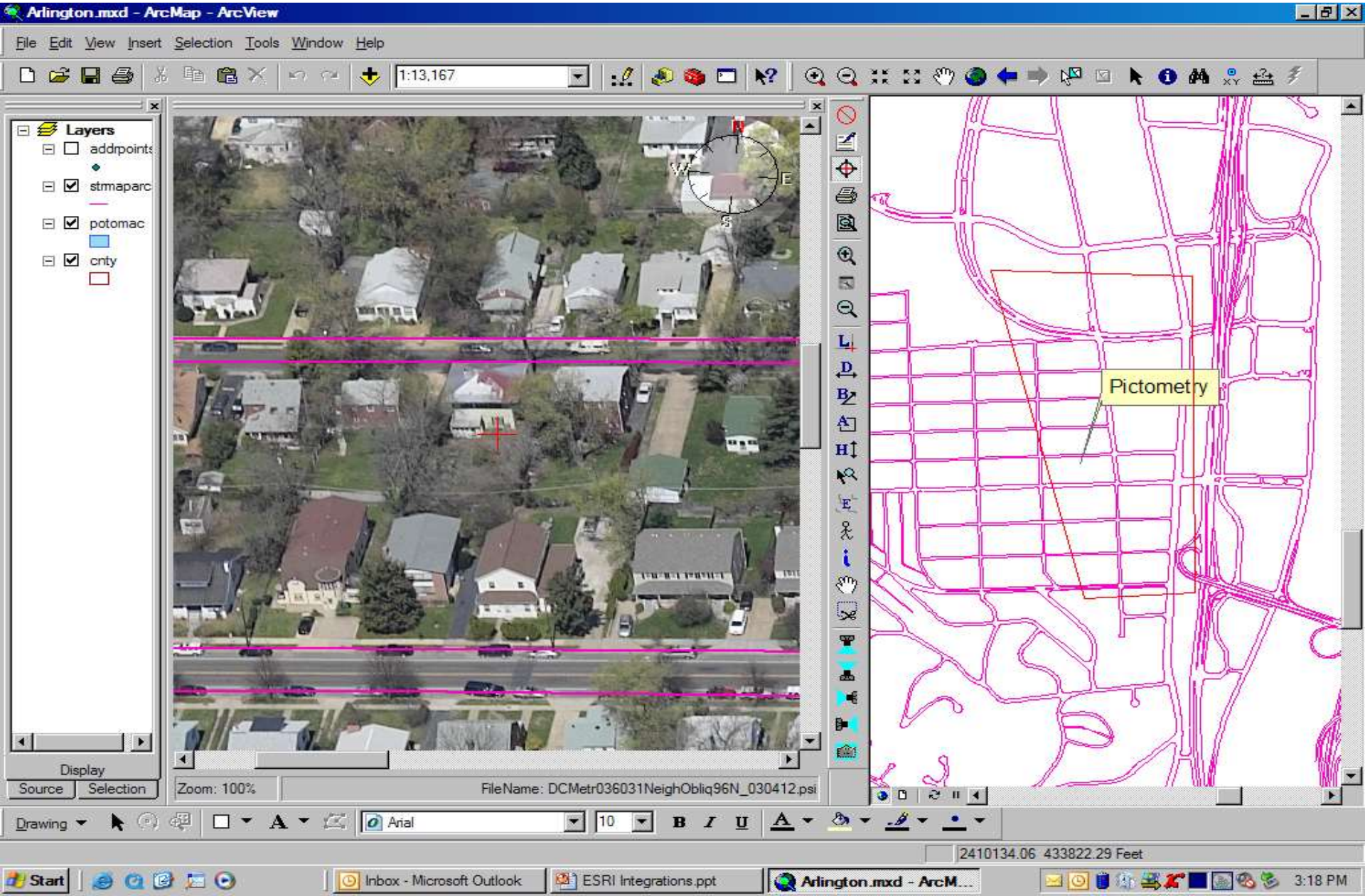
Integrations

ESRI ArcMap 9.xx &10.xx

AutoCad Map 3D Map

ArcServer Web Integrations Flex/Silverlight

ArcMap 9.xxx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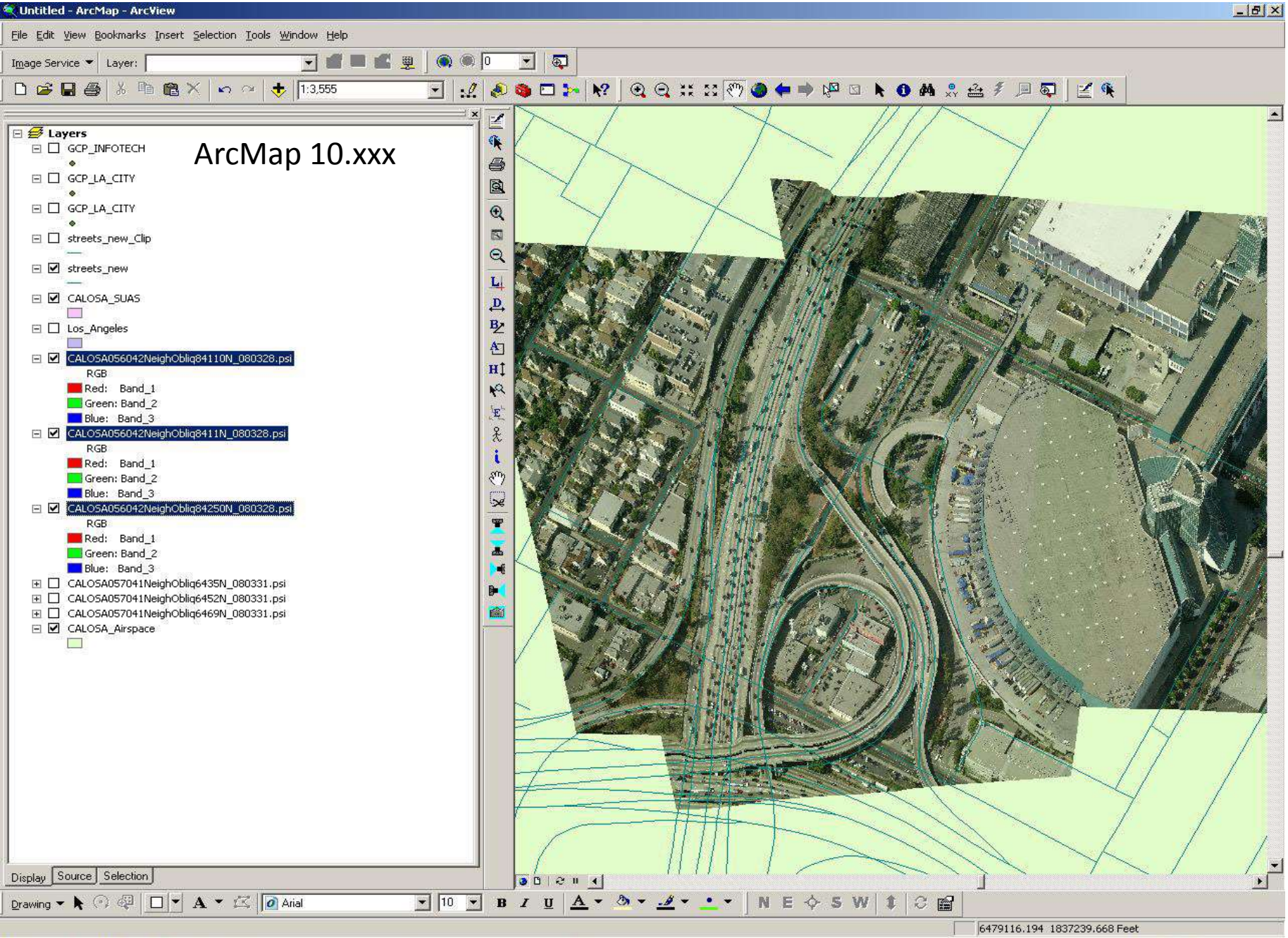
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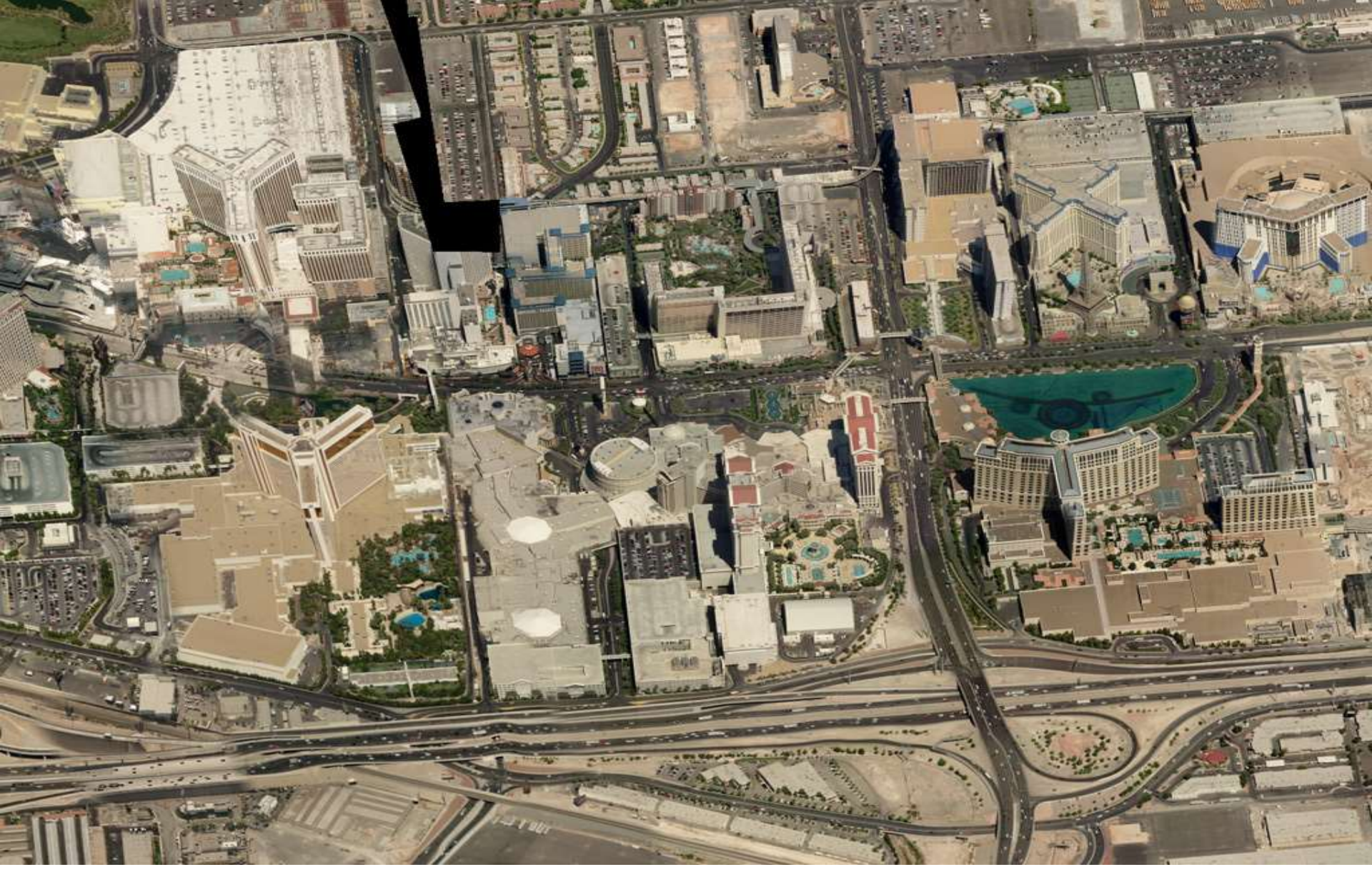

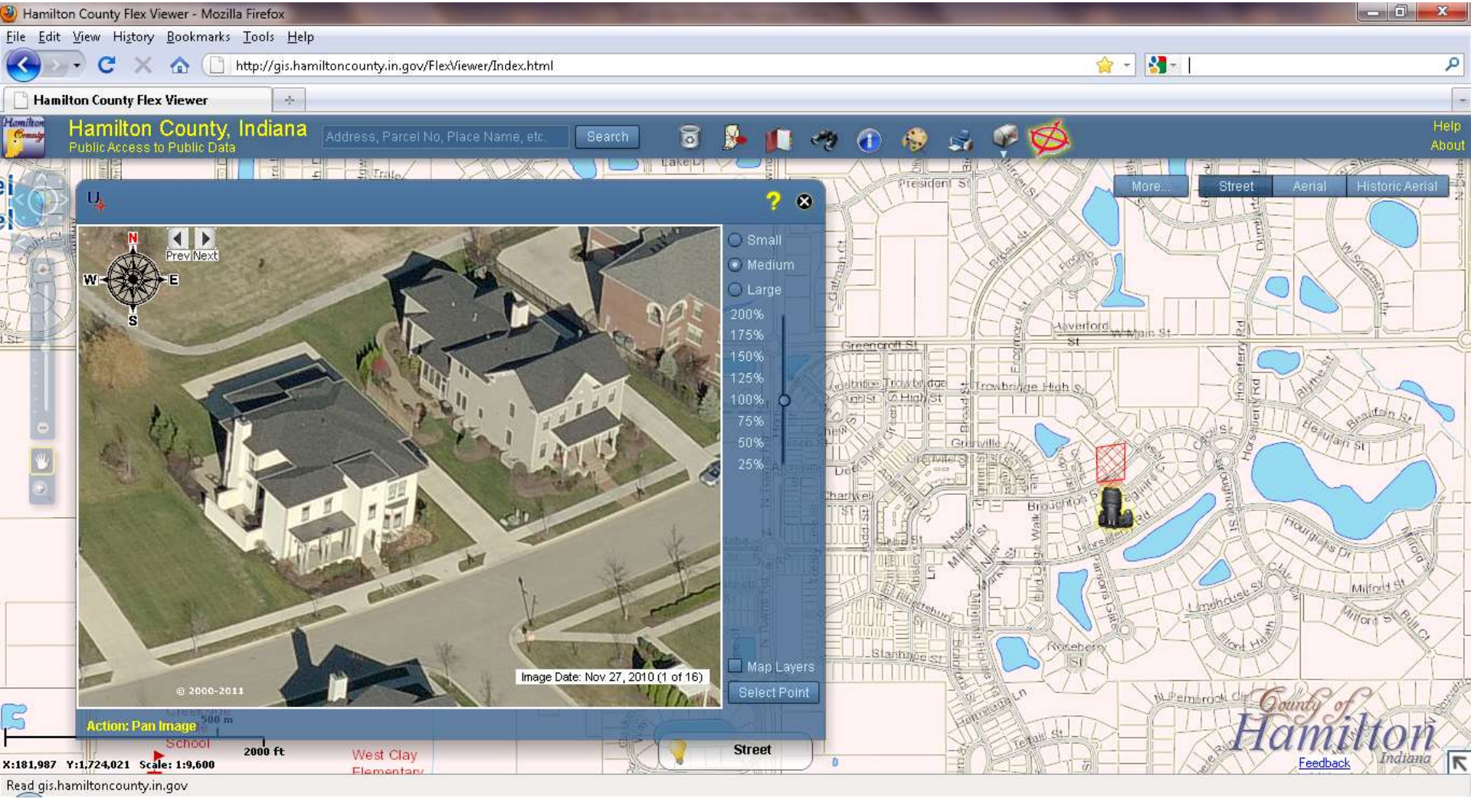
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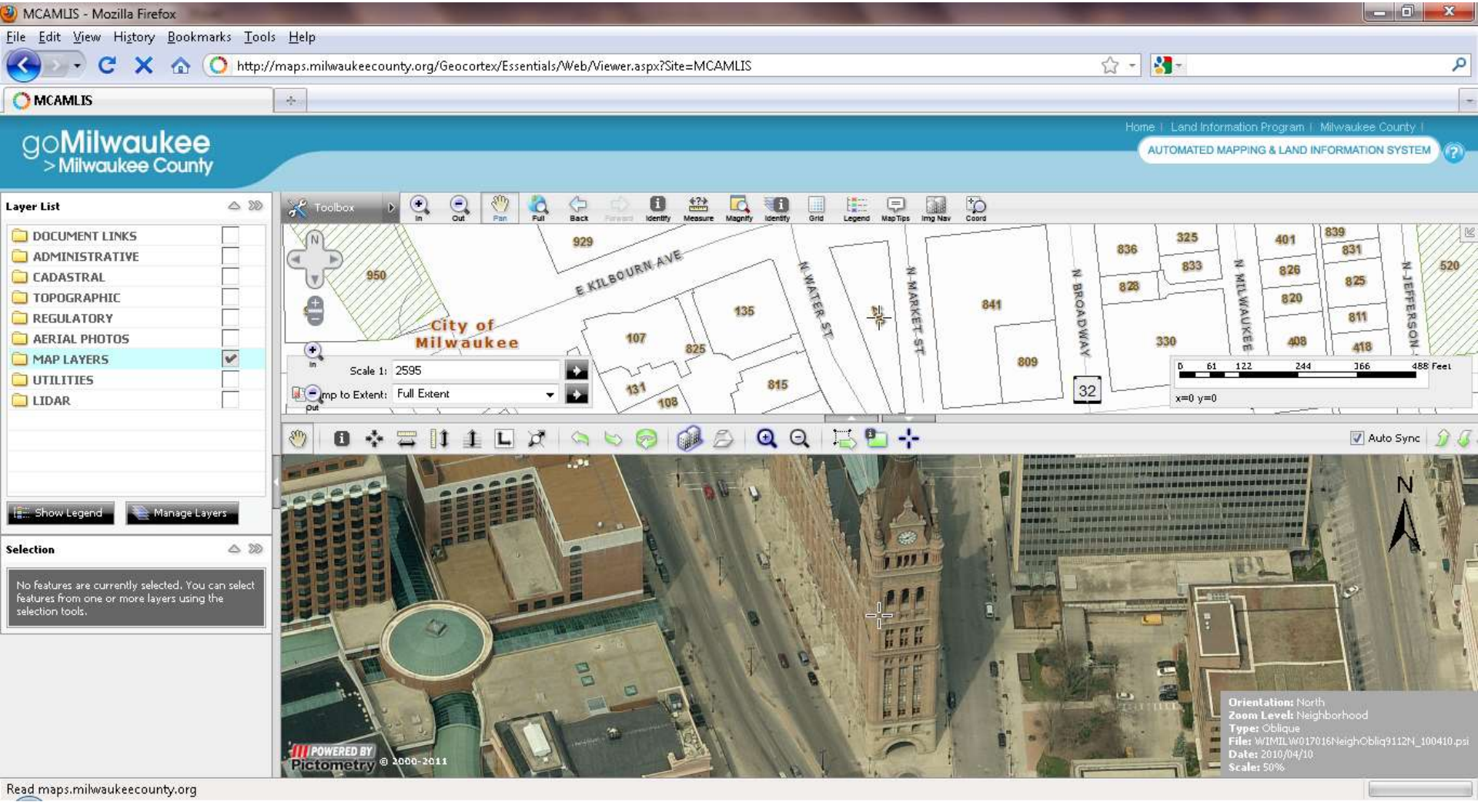
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N WATER ST
N MARKET ST
N BROADWAY
N MILWAUKEE
N JEFFERSON
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POWERED BY Pictometry © 2000-2011
Orientation: North
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Type: Oblique
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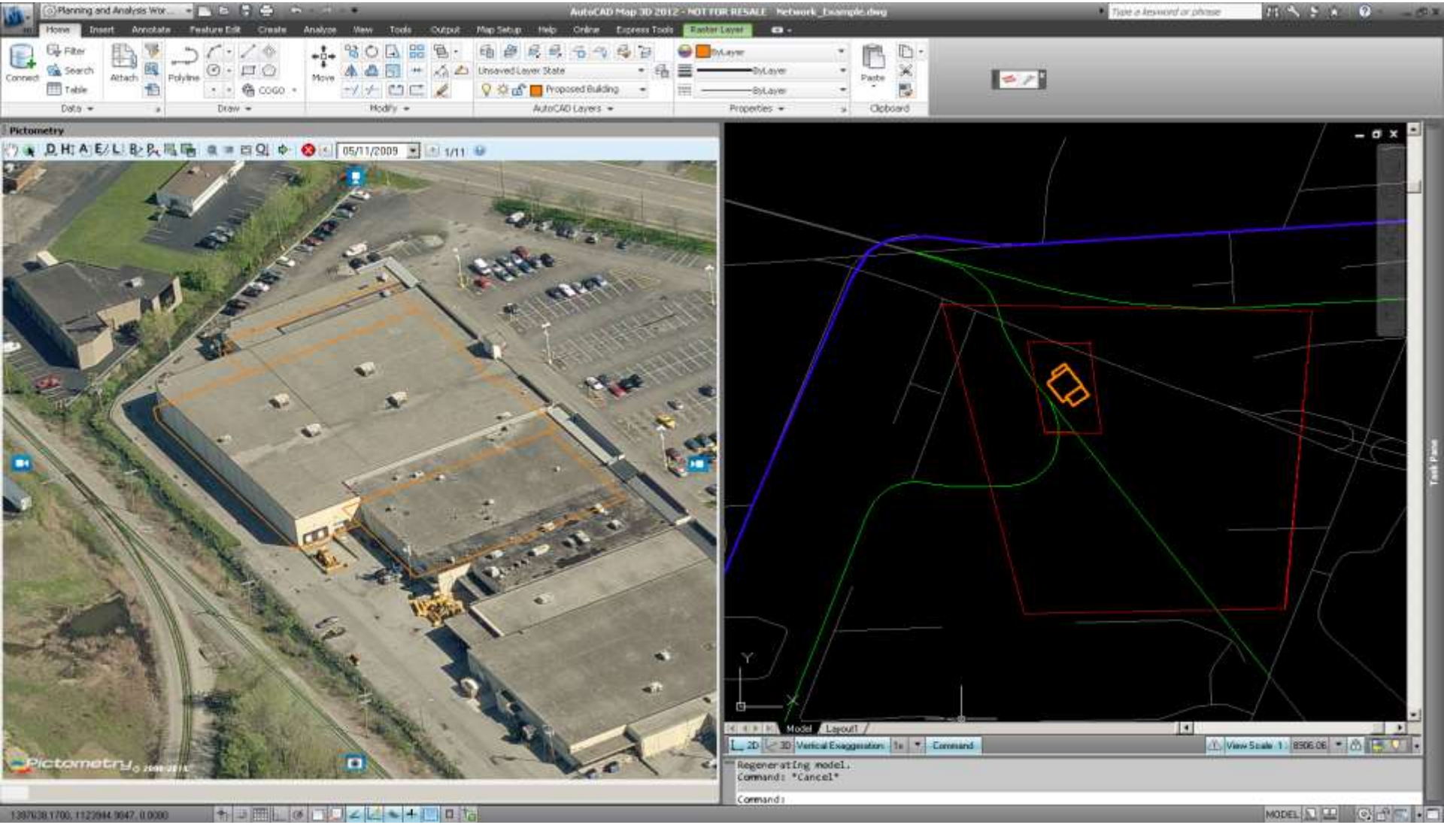
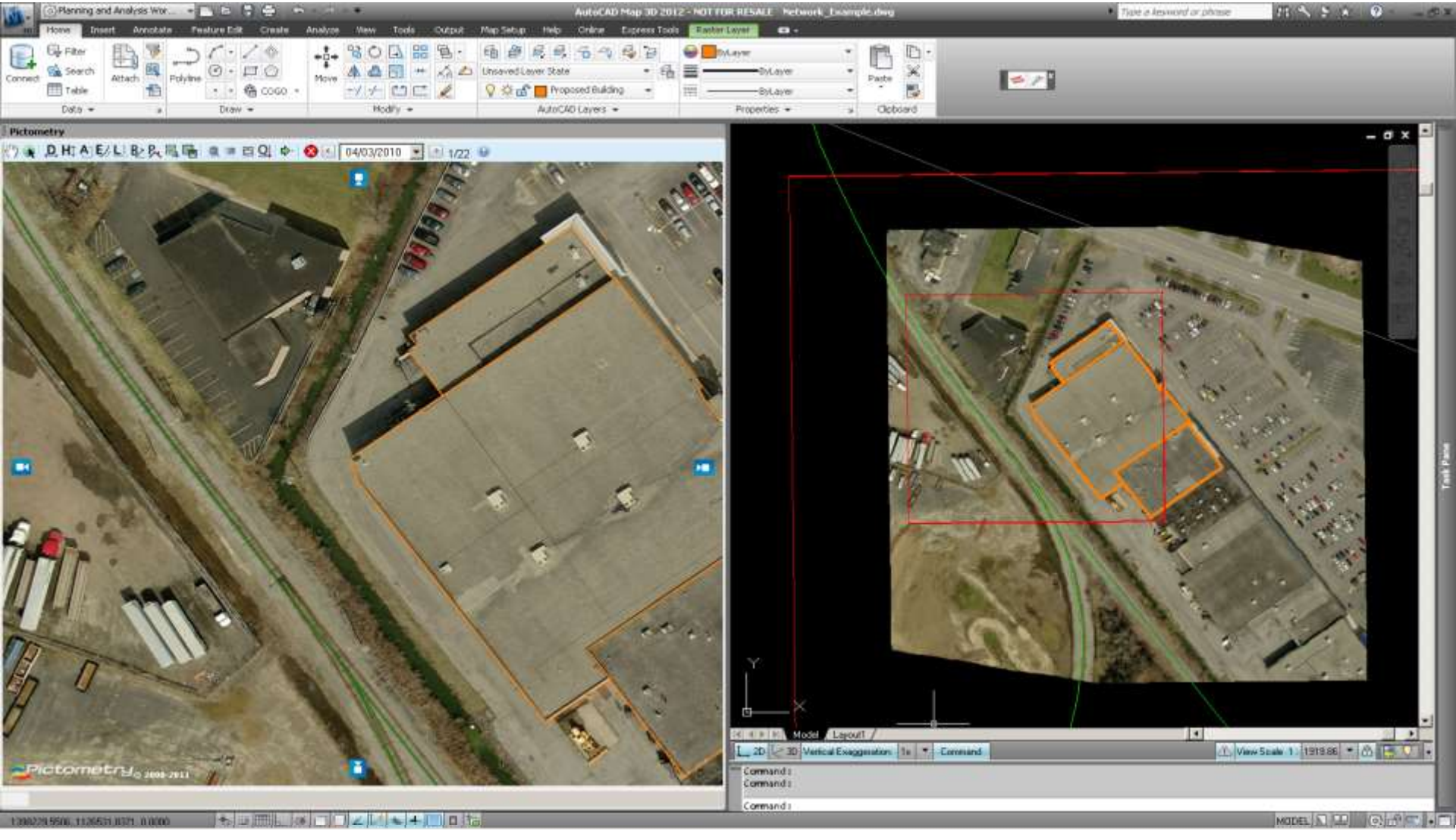
Scale: 50%
Read maps.milwaukeecounty.org

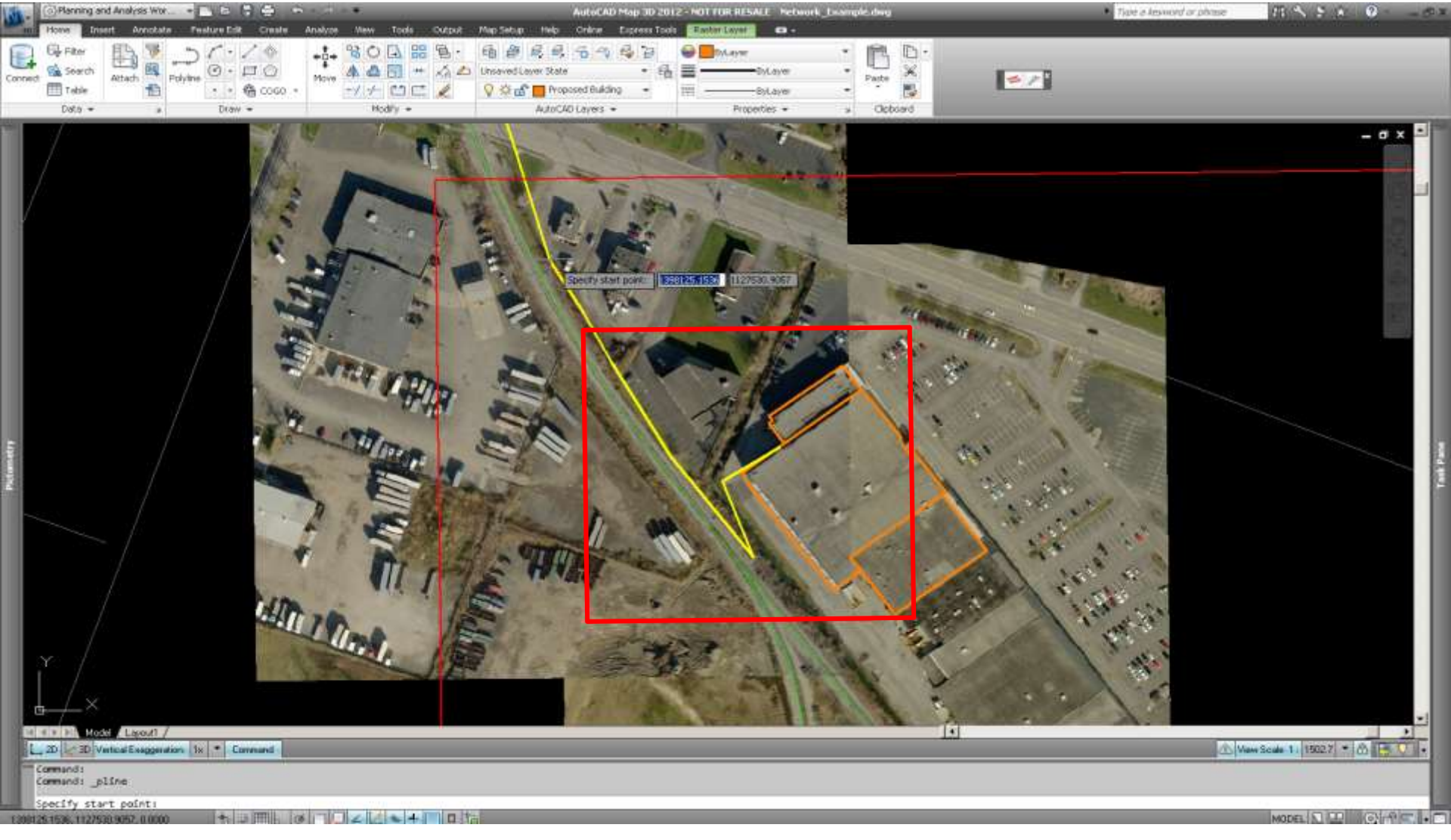
Validate & Inspect locations with incredible detail …



Bring high resolution Ortho imagery – directly into your workspace..



Work with confidence..accurate



Summary

- Imagery for your day to day operations
- Interdisciplinary Functions for all your local agencies
- Process Improvement ,Efficiency and Effectiveness (Return on Investment)
- Integrations

Questions???

Thank You!

APPENDIX

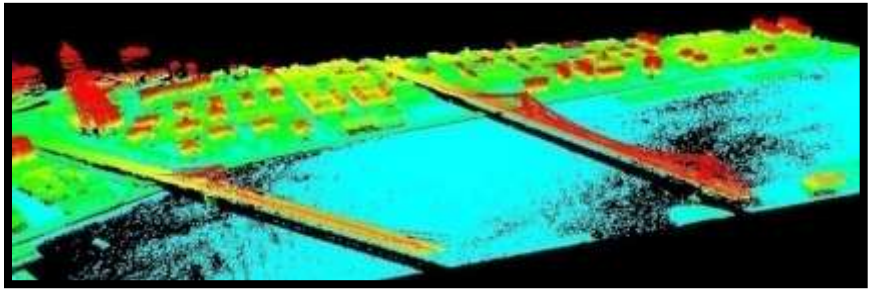
AccuPlus

Certified Ortho’s

AccuPlus

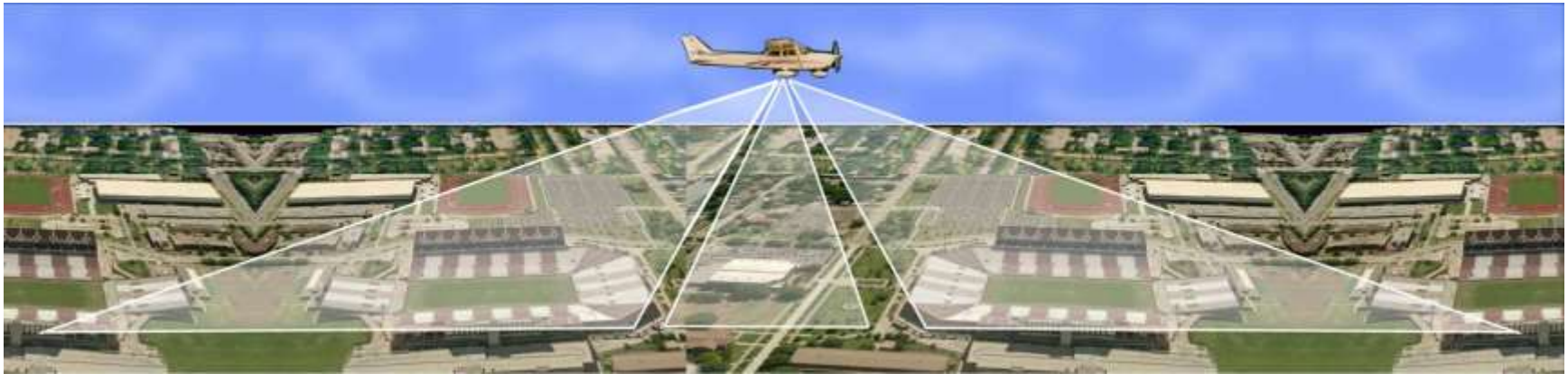
AccuPlus

Premium Ortho-Mosaic + More Accurate Obliques + LiDAR



AccuPlus

AccuPlus Capture Process



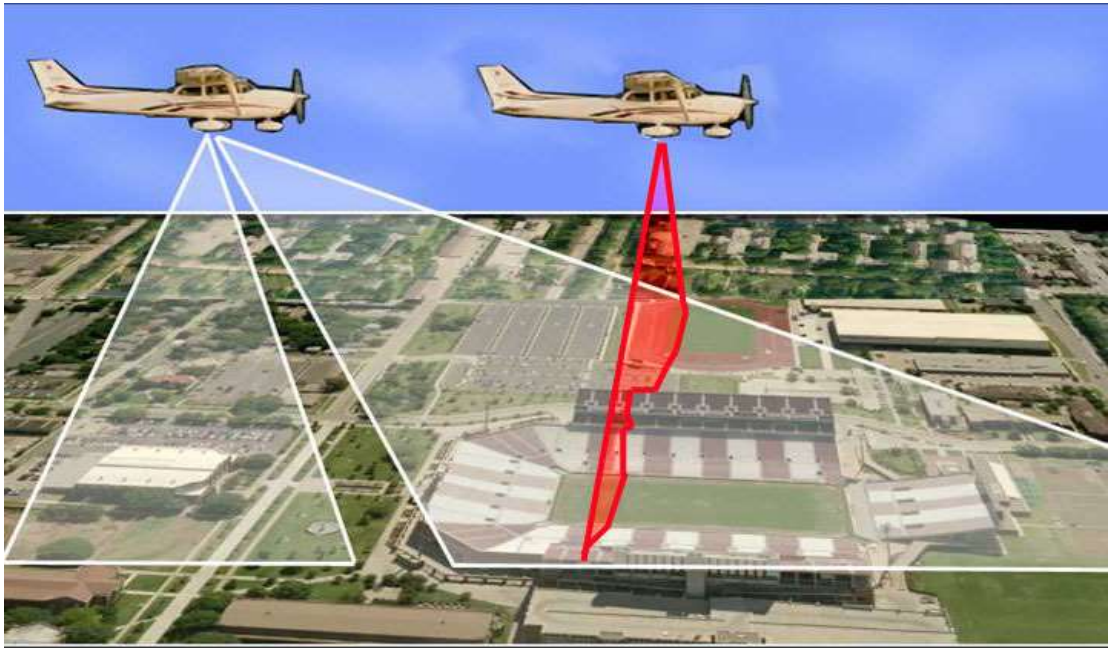
- Pictometry's Penta System captures nadir imagery at the same time as the oblique imagery.
- Pictometry then captures LiDAR on a separate flight.
- Stringent surveyed Ground Control, and aero-triangulation
- Pictometry uses these data sets to produce the three deliverables of AccuPlus.

AccuPlus Capture Process

Small Format Camera

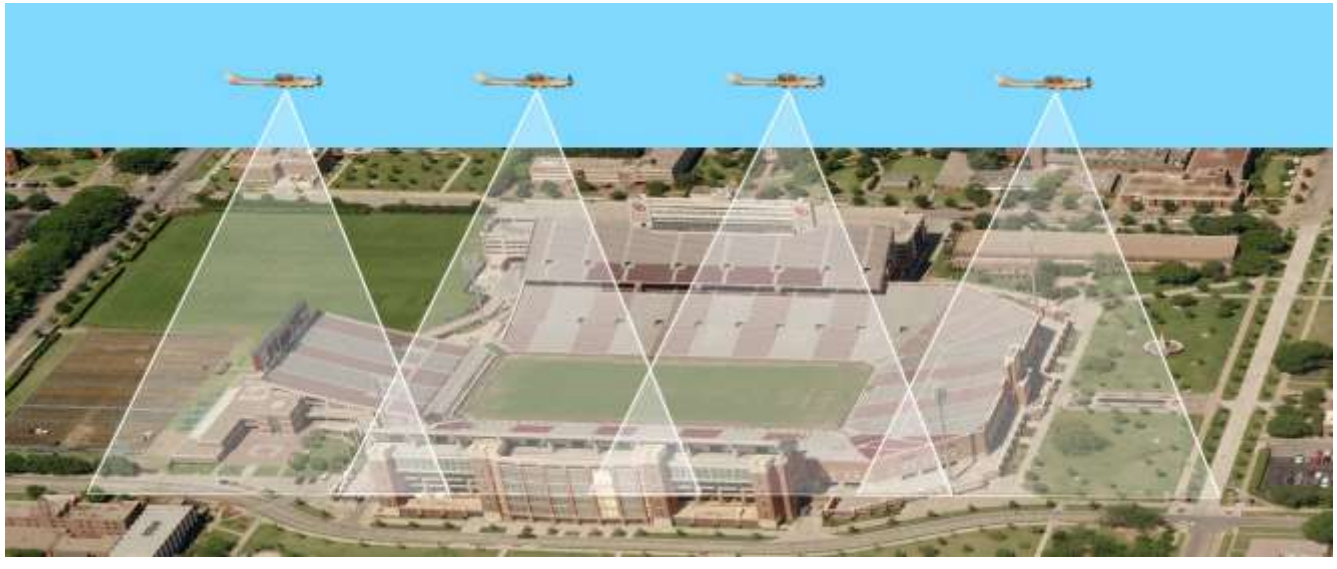
- We capture over 100 images per square mile, resulting in more actual nadir points than traditional mapping cameras.
- We have a smaller field of view resulting in less building lean.
- We fly closer to the ground resulting in less atmospheric anomalies and degradation
- Produces natural color imagery – No false greens

AccuPlus Co-Processing



- Pictometry has developed a proprietary method of utilizing the combined nadir imagery, LiDAR raw data and ground control to greatly increase the efficiency of the mosaic process.

AccuPlus Value Proposition



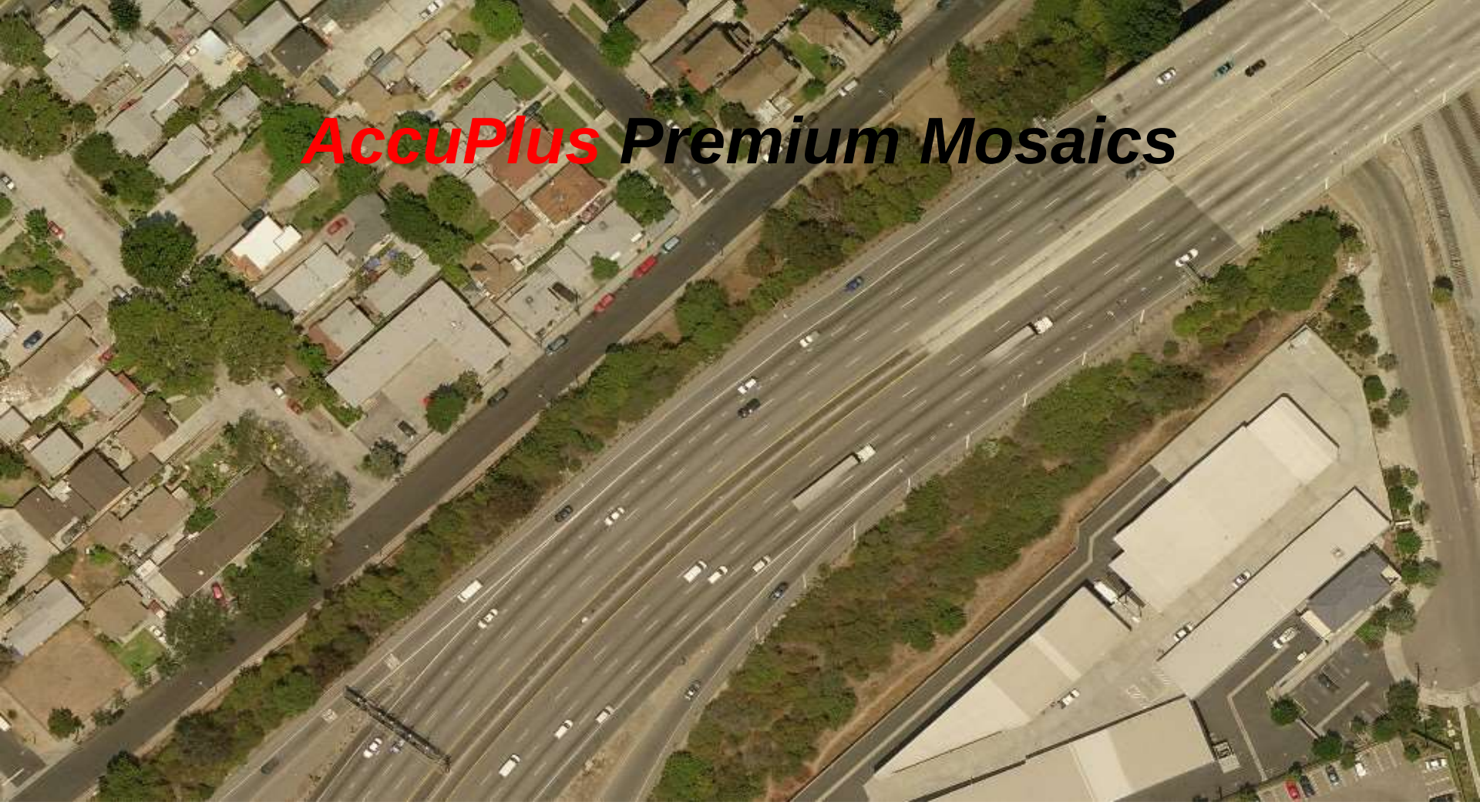
- Pictometry captures over 100 nadir images per square mile from only 3,000 feet over ground, typically.
- A mosaic created from these images is much higher quality, if seams are created properly.
- Pictometry's AccuPlus patent-pending process allows for the proper stitching of these 100's of images per square mile in a cost-effective manner.

AccuPlus Value Proposition

- Pictometry captures the nadir image at the same time we capture the oblique images, lowering capture costs.
- Pictometry then uses the raw LiDAR data in a patent-pending method, in combination with ground control, aero-triangulation, and block corrections, to efficiently produce the ortho-mosaic.

Large area 4” GSD mosaic - Note the tonal balance.

AccuPlus



Cut-line detail - Note the “sliced” truck.

One-to-one detail - Note the clarity and lack of cutlines

AccuPlus

AccuPlus Specifications

Horizontal Accuracy:

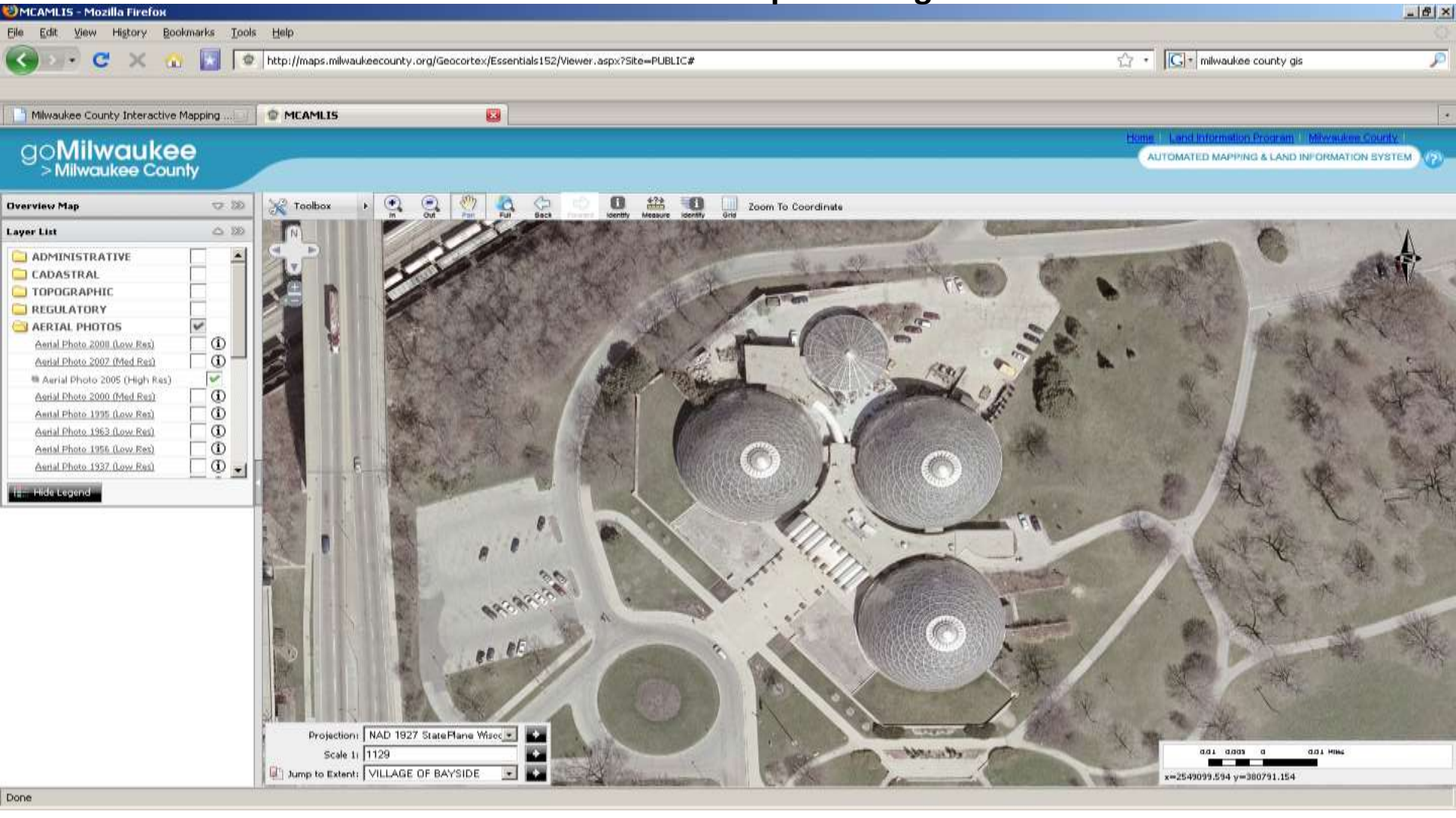
4" orthos:	1.50 ft., NSSDA 95%, meets or exceeds the following: 1:600 (1" = 50') National Map Accuracy Standards (+/- 1.67ft.) 1:1200 (1" = 100') ASPRS Class I Standards (RMSE = 1.0 ft)
6" orthos:	1.73 ft., NSSDA 95%, meets or exceeds the following: 1:1200 (1" = 100') National Map Accuracy Standards (+/- 3.33ft.) 1:1200 (1" = 100') ASPRS Class I Standards (RMSE = 1.0 ft)
12" orthos:	3.46 ft., NSSDA 95%, meets or exceeds the following: 1:1200 (1" = 100') National Map Accuracy Standards (+/- 3.33ft.) 1:2400 (1" = 200') ASPRS Class I Standards (RMSE = 2.0 ft.)

AccuPlus Deliverables

- Project Wide Seamless Ortho Mosaic – SID or ECW
- Tiled Ortho Imagery in TIFF, GeoTIFF, or JPG
- Orthos tiled to customer provided tiling scheme
- FGDC Compliant Metadata
- High Accuracy Oblique Imagery
- LiDAR – 1.0M Point Spacing Bare Earth Model

Non-Pictometry Ortho:

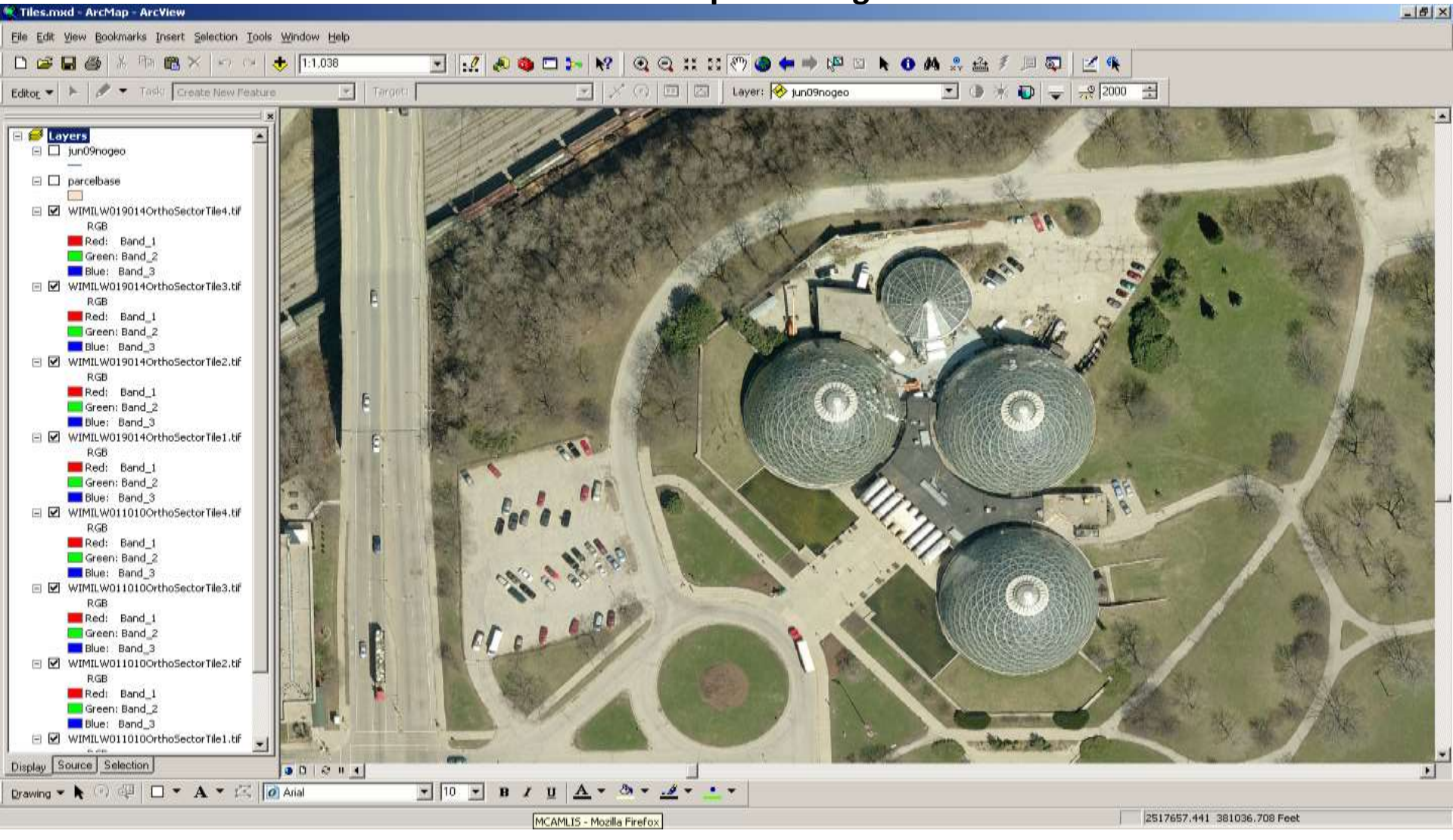
Poor Color and Atmospheric Degradation



AccuPlus

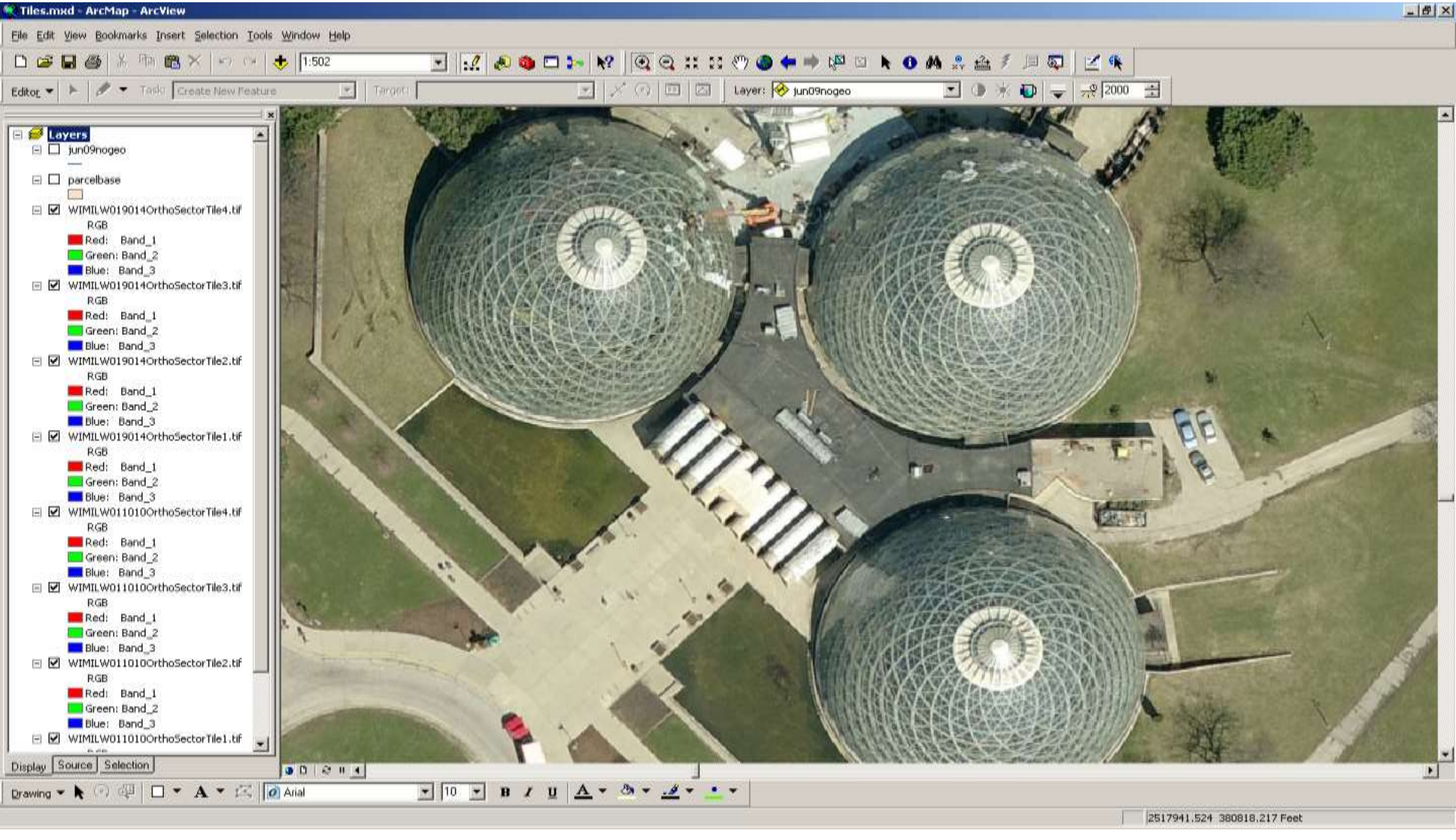
Pictometry Ortho: Natural Color and

Minimal Atmospheric Degradation



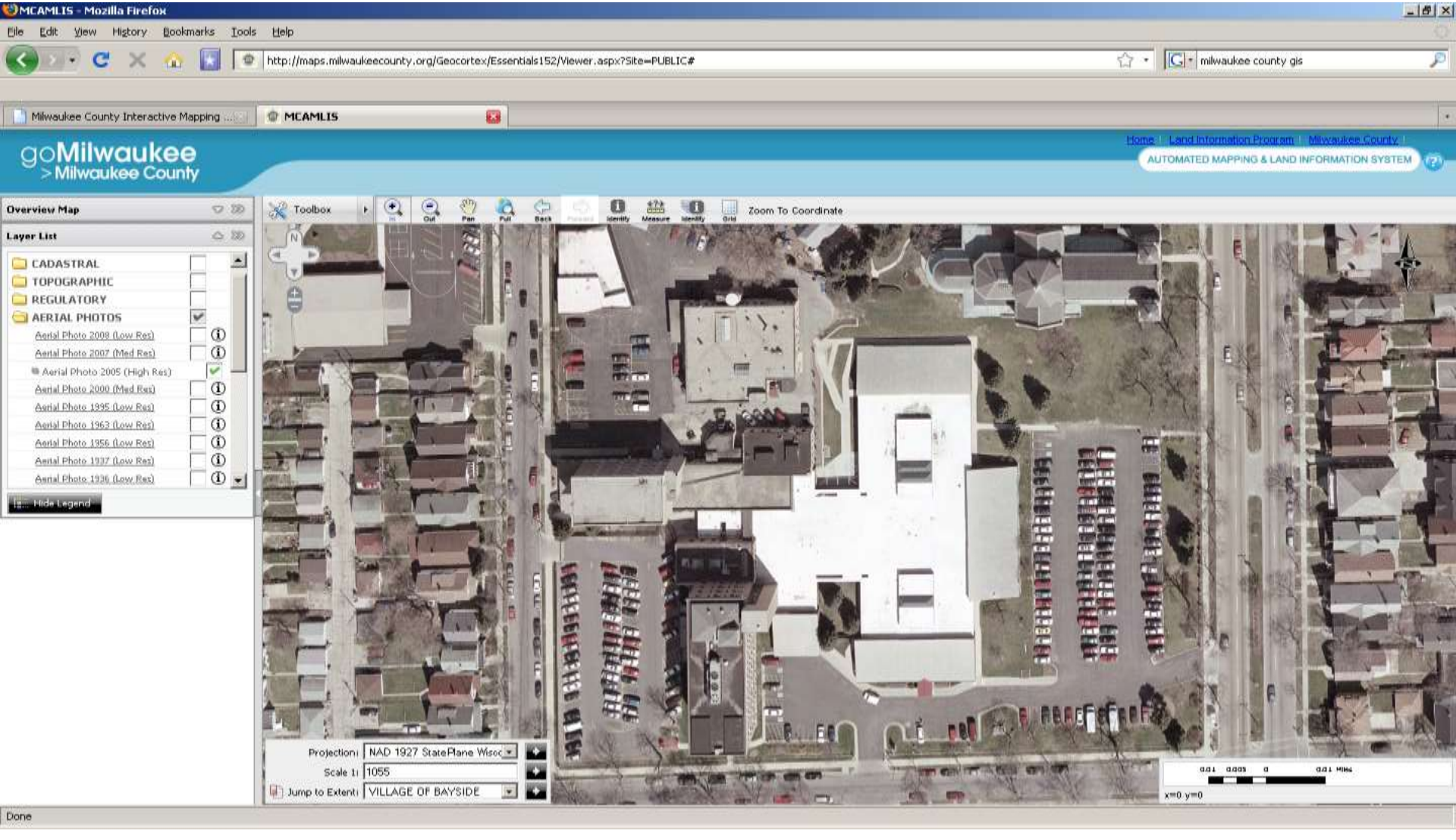
AccuPlus

Natural Colors and Minimal Atmospheric Degradation



AccuPlus

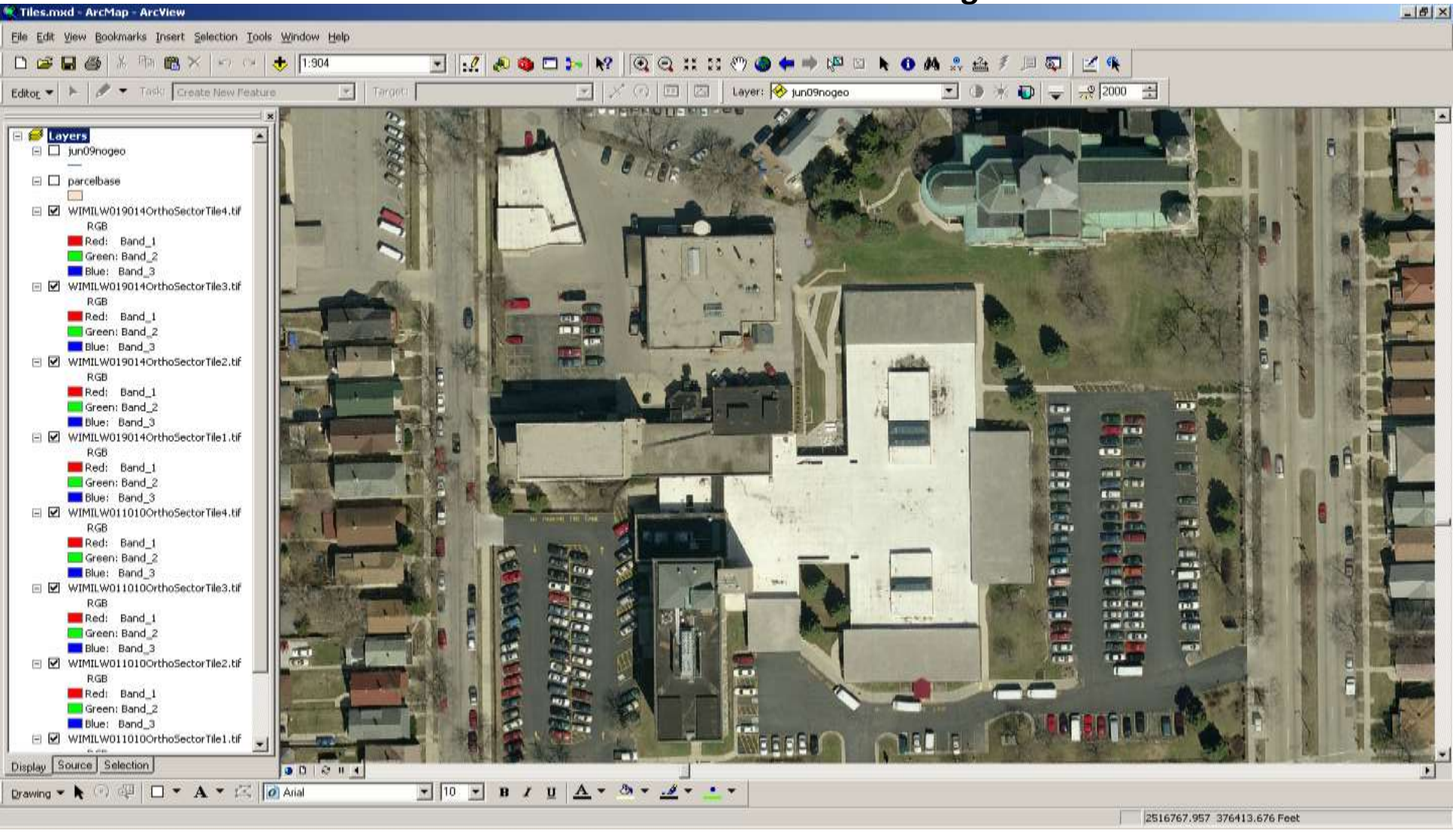
Non-Pictometry Ortho: Building Lean



AccuPlus

Pictometry Ortho

More Nadir Points = Reduced Building Lean



AccuPlus

SCHEDULE C3

AccuPlus Technical Specifications

AccuPlus/AccuPlus Lite Premium Ortho-Mosaic and 4-Way Obliques

Customer must provide coverage area definition in electronic format (i.e., shape files, KML, DXF, etc.). Inquire about other formats.

TECHNICAL SPECIFICATIONS: AccuPlus Premium Ortho-Mosaic

Product Overview:
Seamless ortho-mosaic produced from individual frames and tiled to customer's preferred tiling scheme. Available at 4-inch, 6-inch, and 12-inch GSD.

Acquisition:
Flight plans will be prepared to capture image frames with nominal 60% forward overlap and nominal 30% sidelap in order to provide sufficient overlap for automatic aerial triangulation and mitigation of building lean in orthophotography produced. Source imagery will be acquired during times of optimal environmental conditions. Imagery will generally be captured when solar altitude is 30 degrees or greater and/or by using the most optimal four-hour window, except where capture season offers significantly longer window. Imagery will be acquired with ground free of snow cover and deciduous vegetation less than 30% of full bloom. Frames with clouds will be rejected and reflown. Any planned deviation from these conditions imposed by capture window constraints will be discussed with client prior to commencement of acquisition.

Camera:
Pictometry utilizes its USGS certified, custom designed mapping camera incorporating a Kodak sensor and custom designed photogrammetric lenses. The sensor is fully calibrated according to Pictometry's USGS approved calibration process. Pictometry's sensor provides a dynamic range of 12 bits per band, RGB (resampled to 8 bits during processing).

Ortho-Rectification:
Prior to the production of orthophotography, Pictometry will perform automatic aerial triangulation, utilizing the directly observed Exterior Orientations (EOs) and ground control points (GCPs), measured by a licensed surveyor, for the purpose of orienting the individual frames for creation of the final ortho imagery. In addition to the GCPs, sophisticated matching techniques will be employed to automatically create tie points for use in performing a bundle adjustment. Pictometry will utilize best available Digital Terrain Models, combined with the calibrated camera interior orientations, ground control points, and triangulated EOs to rectify the images. When the rectification requires a resampling of the source imagery, a cubic convolution method will be utilized.

Horizontal Accuracy:
4" AccuPlus: $RMSE_r$ = 1.41 ft, NSSDA (95%) = 2.5 ft., meets or exceeds NMAS 1" = 100'
6"AccuPlus: $RMSE_r$ = 1.85 ft, NSSDA (95%) = 3.2 ft., meets or exceeds NMAS 1" = 100'
12" AccuPlus: $RMSE_r$ = 3.20 ft, NSSDA (95%) = 5.5 ft., meets or exceeds NMAS 1"= 200'
12" AccuPlus Lite: $RMSE_r$ = 4.40 ft, NSSDA (95%) = 6.5ft., meets or exceeds NMAS 1"= 200'

Mosaic:
Global color balancing will be applied to all orthophotos to create homogeneous orthophotos within the project area. Local adjustments of brightness values, color and contrast will be performed if needed. There will be no obvious seam edge between two adjacent orthophotos. Mosaic will be created using automated seamline steering, with manual edits to eliminate feature misalignment caused by seamlines which pass thru features above the elevation surface. Feature alignment across seamlines will be 3 pixels or better. When possible, seamlines will be steered away from elevated features to improve orthophoto quality. Once the mosaic has been produced, the imagery will be tiled and named according to the customer provided (or Pictometry generated) schema for delivery.

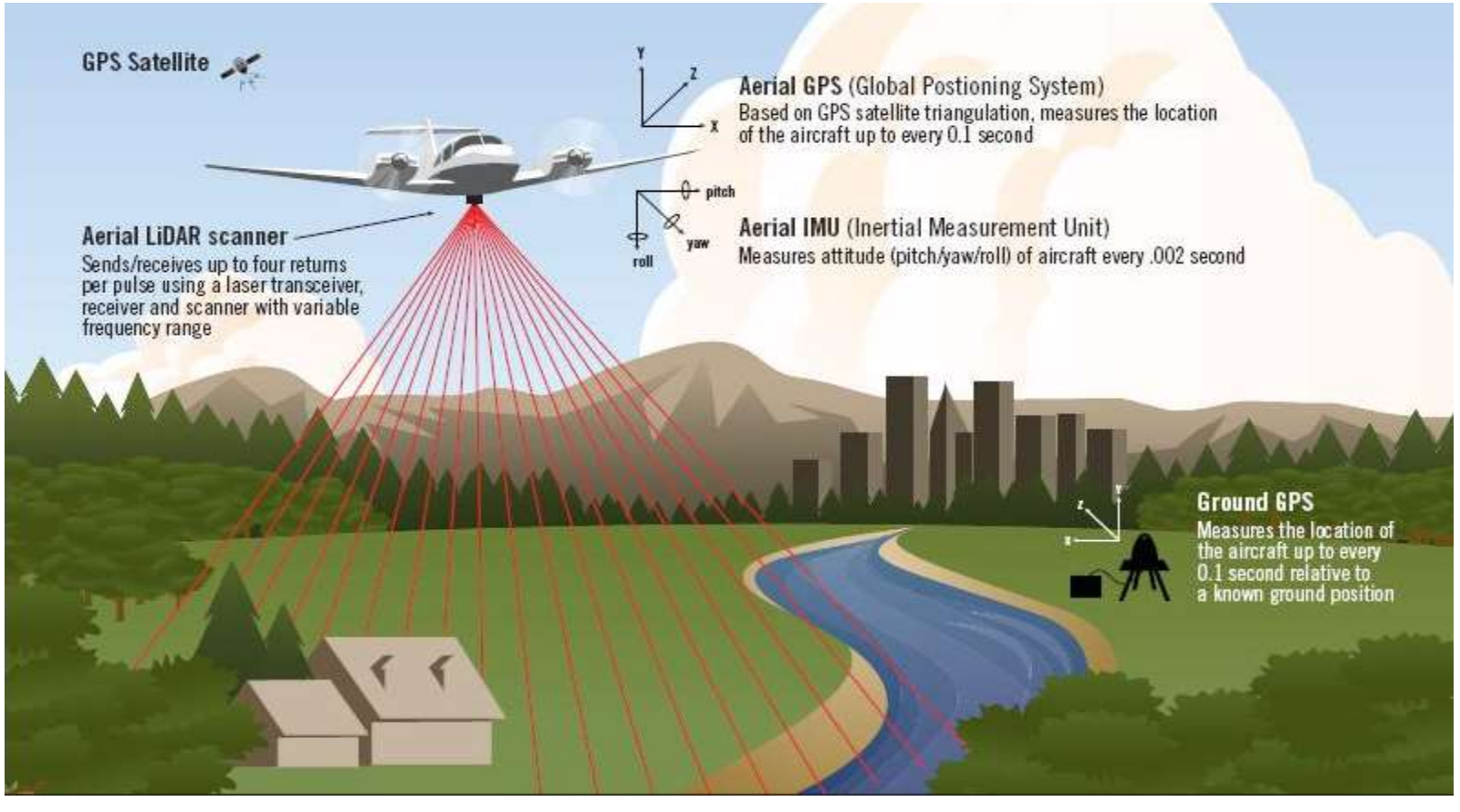
Deliverables:
All deliverables in customer preferred coordinate system.

- Project-wide seamless mosaic in ECW (or MrSID if requested) format
- Tiled imagery according to customer provided tiling scheme – available as TIFF, GeoTIFF or JPG
- FGDC compliant metadata

LiDAR

Pictometry LiDAR

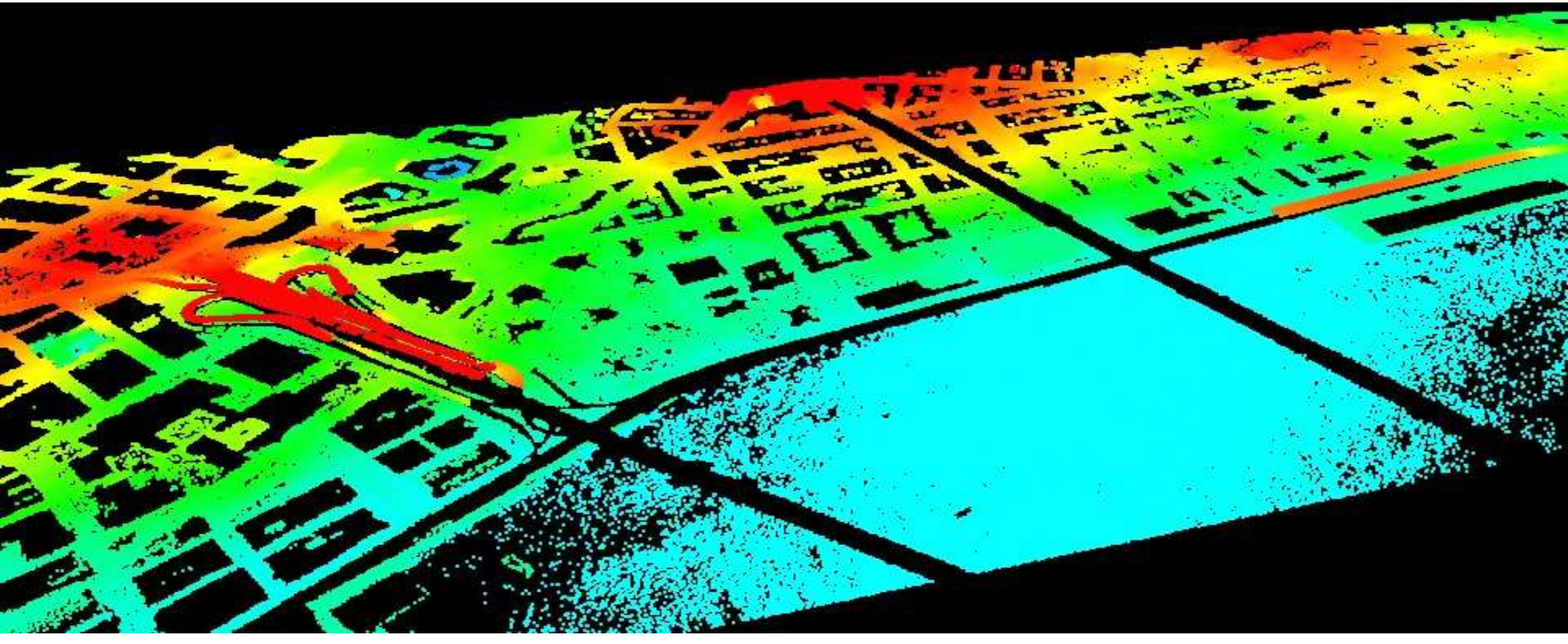
The image to the left is LiDAR taken by Pictometry for a December 2010 project.


GPS Satellite
Y
Z
X
Aerial GPS (Global Postioning System)
Based on GPS satellite triangulation, measures the location of the aircraft up to every 0.1 second
pitch
yaw
roll
Aerial IMU (Inertial Measurement Unit)
Measures attitude (pitch/yaw/roll) of aircraft every .002 second
Aerial LiDAR scanner
Sends/receives up to four returns per pulse using a laser transceiver, receiver and scanner with variable frequency range
Ground GPS
Measures the location of the aircraft up to every 0.1 second relative to a known ground position

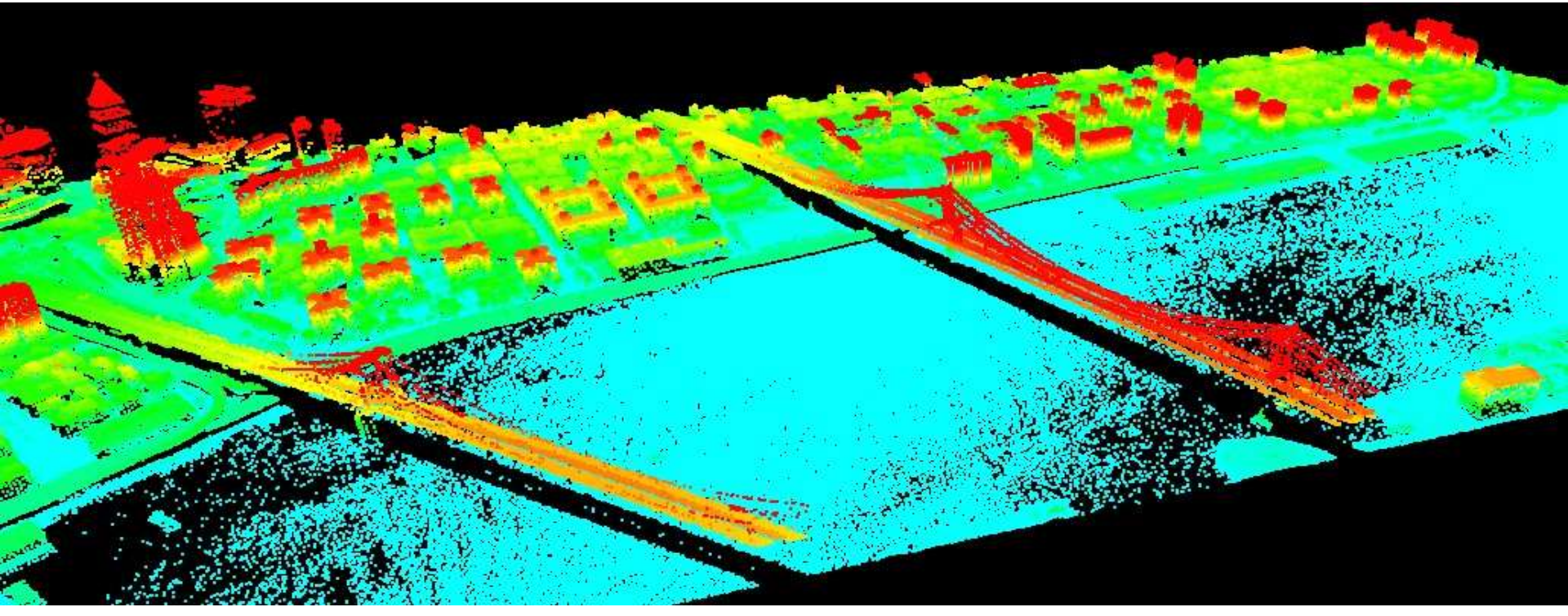
Uses of LiDAR

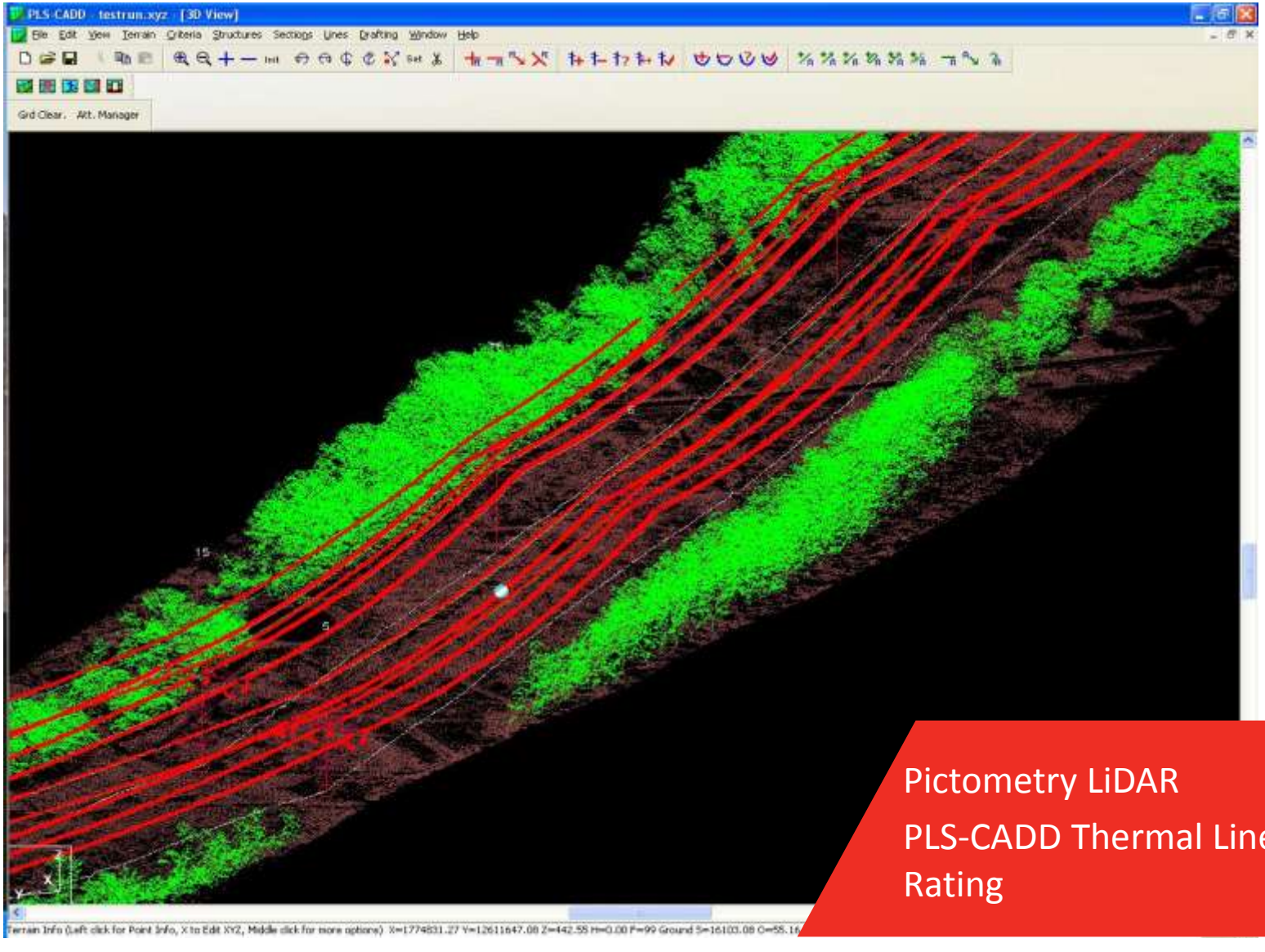
- Generation of Bare-earth Digital Elevation Models
  - Used in elevation contour generation
  - Vegetation Management
  - Thermal Line Rating
- Watershed/Hydrographic analysis
- Tree canopy and vegetation analysis
- 3-D Modeling

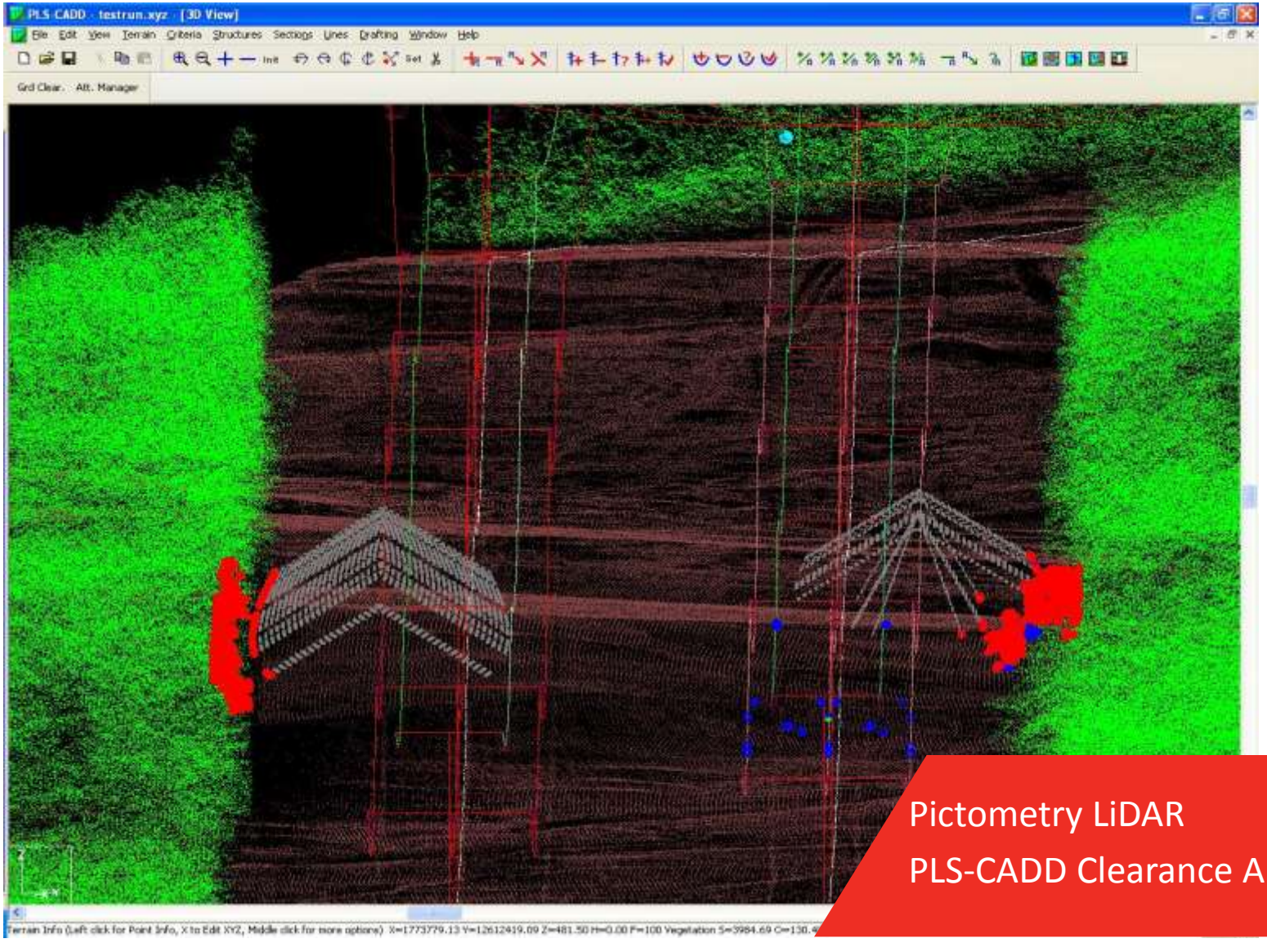
Bare Earth Model- LiDAR



LiDAR




PLS-CADD - testrun.xyz - [3D View]
File Edit View Terrain Criteria Structures Sections Lines Drafting Window Help
Grd Clear... Art. Manager
Pictometry LiDAR
PLS-CADD Thermal Line Rating


PLS-CADD - testrun.xyz - [3D View]
File Edit View Terrain Criteria Structures Sections Lines Drafting Window Help
Grd Clear Att. Manager
Pictometry LiDAR
PLS-CADD Clearance Analysis

ChangeFindr

ChangeFindr

- Compares ortho imagery of the same area over two different time points.

- Automatically identifies changes in land and property features for GIS professionals, real property tax agencies, planning departments, and public safety users.

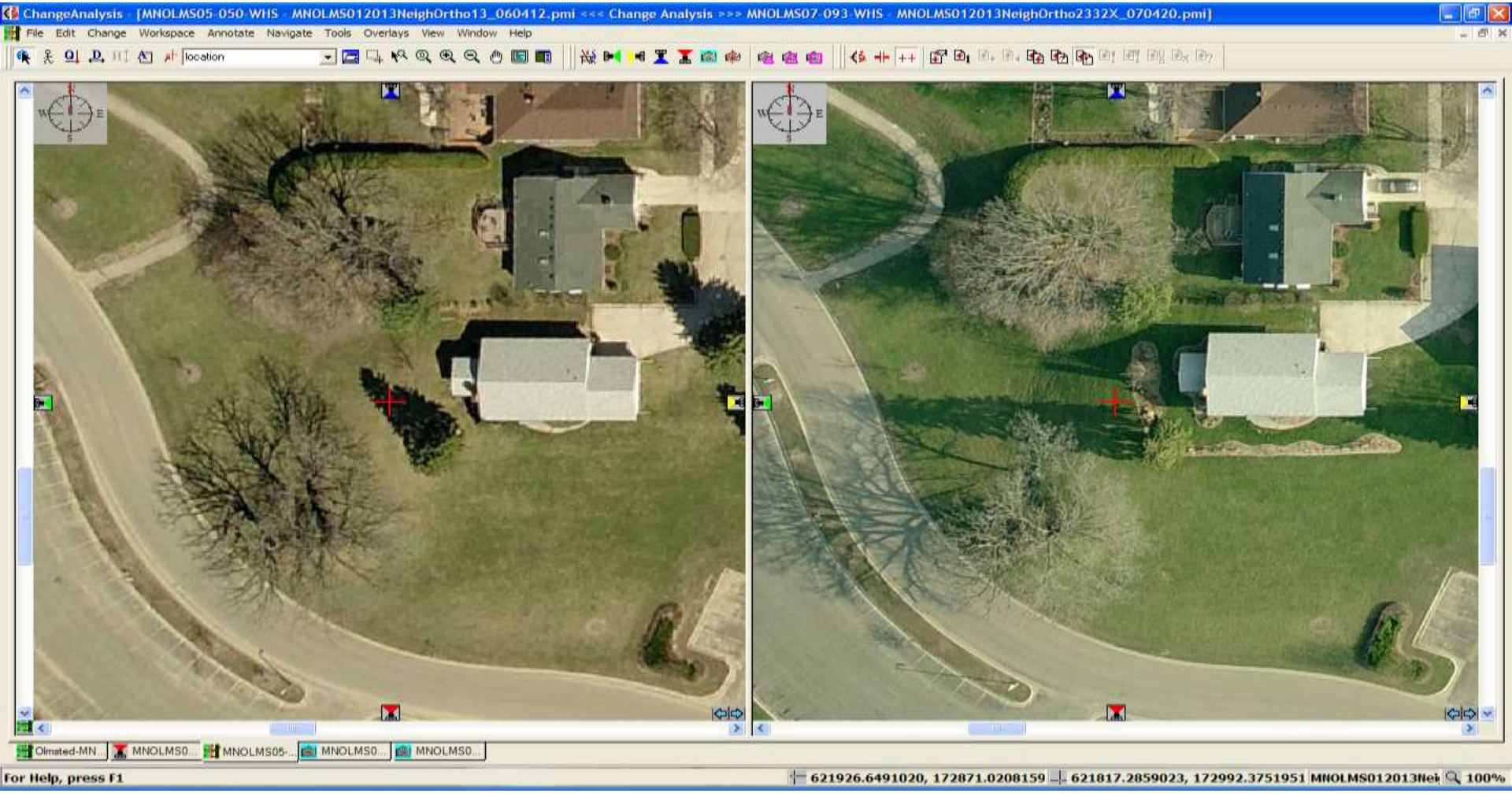
- Allows officials to view the changes from their office

ChangeFindr

•Detects additions to existing structures, demolitions, new construction, or changes in other real property features.

•Creates a GIS polygon “building outlines” and analyze them for changes in size and shape.

•Pictometry Change Analysis simultaneously displays the old and the corresponding new image with the changes determined by HouseDiff, highlighted in each image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File Edit Change Workspace Annotate Navigate Tools Overlays View Window Help
location
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MNOLMS0...
MNOLMS05-...
MNOLMS0...
MNOLMS0...
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621926.6491020, 172871.0208159
621817.2859023, 172992.3751951
MNOLMS012013Nei
100%

ChangeFindr
Deliverables-Samples

ChangeFindr Deliverables-Samples

2005

New

2007

ChangeFindr Deliverables-Samples

2005

Changed

2007

ChangeFindr Deliverables-Samples

2005

2007

Possibly *Changed*

ChangeFindr Deliverables-Samples

2005

2007

Demolished

ChangeFindr Deliverables-Samples

2005

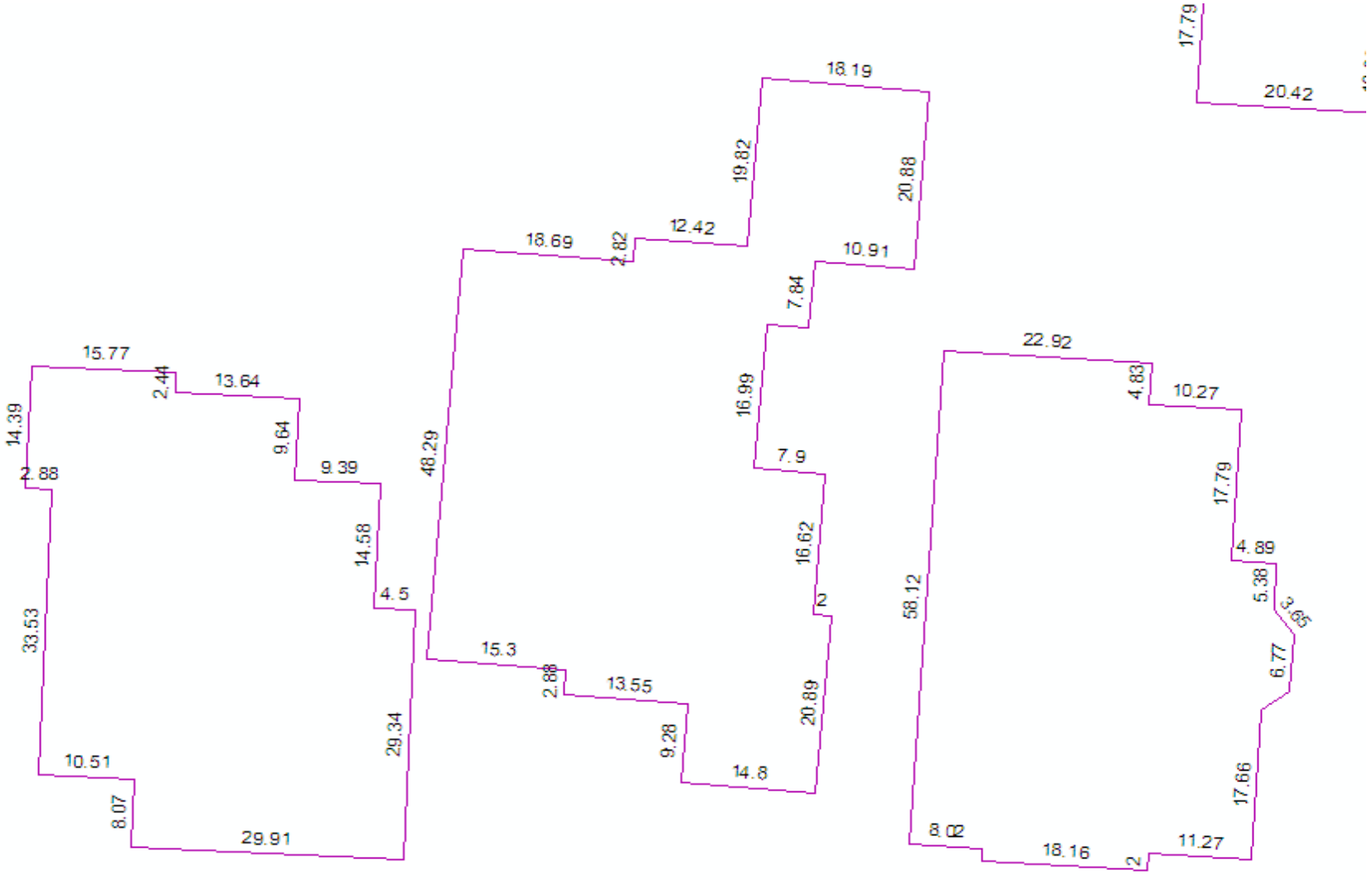
2007

Unknown

Sample Regional Report

Table Status Distribution of Geauga County

Name	Existing		Changed		New		Demolished		Unknown		PossiblyChanged		Total
Thompson Twp.	1,680	(68.4 %)	194	(7.9 %)	410	(16.7 %)	44	(1.8 %)	85	(3.5 %)	43	(1.8 %)	2,456
Montville Twp.	1,614	(63.9 %)	243	(9.6 %)	499	(19.8 %)	74	(2.9 %)	78	(3.1 %)	16	(0.6 %)	2,524
Hambden Twp.	2,341	(62.8 %)	280	(7.5 %)	842	(22.6 %)	180	(4.8 %)	62	(1.7 %)	18	(0.5 %)	3,723
Chardon Twp.	2,713	(74.5 %)	242	(6.6 %)	470	(12.9 %)	34	(0.9 %)	166	(4.6 %)	14	(0.4 %)	3,639
City of Chardon	2,339	(81.7 %)	139	(4.9 %)	248	(8.7 %)	17	(0.6 %)	84	(2.9 %)	33	(1.2 %)	2,860
Huntsburg Twp.	2,076	(62.9 %)	316	(9.6 %)	663	(20.1 %)	121	(3.7 %)	87	(2.6 %)	33	(1.0 %)	3,296
Claridon Twp.	2,056	(68.3 %)	250	(8.3 %)	518	(17.2 %)	86	(2.9 %)	80	(2.7 %)	15	(0.5 %)	3,005
Munson Twp.	3,264	(73.1 %)	293	(6.6 %)	688	(15.4 %)	36	(0.8 %)	142	(3.2 %)	34	(0.8 %)	4,457
Chester Twp.	6,042	(76.3 %)	553	(7.0 %)	855	(10.8 %)	108	(1.4 %)	277	(3.5 %)	67	(0.9 %)	7,902
Aquilla Village	187	(77.3 %)	24	(9.9 %)	23	(9.5 %)	3	(1.2 %)	4	(1.7 %)	0	(0.0 %)	241
Middlefield Twp.	2,812	(65.4 %)	342	(8.0 %)	863	(20.1 %)	164	(3.8 %)	88	(2.1 %)	23	(0.5 %)	4,292
Burton Twp.	1,941	(68.3 %)	243	(8.5 %)	510	(17.9 %)	28	(1.0 %)	97	(3.4 %)	24	(0.8 %)	2,843
Newbury Twp.	3,651	(74.0 %)	384	(7.8 %)	608	(12.3 %)	43	(0.9 %)	200	(4.1 %)	42	(0.9 %)	4,928
Russell Twp.	2,973	(77.7 %)	240	(6.3 %)	361	(9.4 %)	33	(0.9 %)	193	(5.0 %)	27	(0.7 %)	3,827
Hunting Valley Village	101	(81.5 %)	6	(4.8 %)	8	(6.5 %)	3	(2.4 %)	5	(4.0 %)	0	(0.0 %)	123
Middlefield Village	1,055	(68.9 %)	78	(5.1 %)	331	(21.6 %)	24	(1.6 %)	34	(2.2 %)	7	(0.5 %)	1,529
Burton Village	796	(81.7 %)	58	(6.0 %)	72	(7.4 %)	2	(0.2 %)	35	(3.6 %)	8	(0.8 %)	971
South Russell Village	1,520	(82.1 %)	140	(7.6 %)	114	(6.2 %)	8	(0.4 %)	53	(2.9 %)	15	(0.8 %)	1,850
Parkman Twp.	2,390	(63.1 %)	347	(9.2 %)	813	(21.5 %)	76	(2.0 %)	132	(3.5 %)	29	(0.8 %)	3,787
Troy Twp.	1,966	(67.8 %)	281	(9.7 %)	497	(17.2 %)	65	(2.2 %)	59	(2.0 %)	24	(0.8 %)	2,892
Auburn Twp.	2,747	(61.0 %)	357	(7.9 %)	1,145	(25.4 %)	49	(1.1 %)	171	(3.8 %)	28	(0.6 %)	4,497
Bainbridge Twp.	5,112	(74.8 %)	503	(7.4 %)	824	(12.1 %)	94	(1.4 %)	229	(3.4 %)	60	(0.9 %)	6,822
Total	51,376	-	5,513	-	11,362	-	1,292	-	2,361	-	560	-	72,464



Displayed on ArcGIS

Polygon_ID	Side_ID	Parcel_ID	Status	Start_X	Start_Y	End_X	End_Y	Length	Angle_Clk	Angle_Cnt
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4341	2	3400600004225010	Existing	1596946	701985.06	1596947	702002.63	17.59	93.3	86.7
4341	3	3400600004225010	Existing	1596947	702002.63	1596950.63	702002.44	3.63	177	3
4341	4	3400600004225010	Existing	1596950.63	702002.44	1596949.75	702005.94	3.61	76	104
4341	5	3400600004225010	Existing	1596949.75	702005.94	1596974.25	702004.56	24.54	176	3.2
4341	6	3400600004225010	Existing	1596974.25	702004.56	1596973.88	701999.88	4.7	85.4	94.6
4341	7	3400600004225010	Existing	1596973.88	701999.88	1596977.88	701999.69	4	177	2.7
4341	8	3400600004225010	Existing	1596977.88	701999.69	1596977.25	701988.88	10.83	86.7	93.3
4341	9	3400600004225010	Existing	1596977.25	701988.88	1596985.63	701988.44	8.39	177	3
4341	10	3400600004225010	Existing	1596985.63	701988.44	1596984.38	701965.25	23.22	86.9	93.1
4341	11	3400600004225010	Existing	1596984.38	701965.25	1596980.25	701965.5	4.13	3.5	176
4341	12	3400600004225010	Existing	1596980.25	701965.5	1596979.25	701947.31	18.21	86.9	93.1
4341	13	3400600004225010	Existing	1596979.25	701947.31	1596948.25	701949.06	31.05	3.2	176
4341	0	3400600004225009	Existing	1596938.13	702009	1596935.38	701958.25	50.82	86.9	93.1
4341	1	3400600004225009	Existing	1596935.38	701958.25	1596931.88	701958.44	3.51	3.1	176
4341	2	3400600004225009	Existing	1596931.88	701958.44	1596931.75	701954.19	4.25	88.3	91.7
4341	3	3400600004225009	Existing	1596931.75	701954.19	1596910.13	701955.38	21.66	3.1	176
4341	4	3400600004225009	Existing	1596910.13	701955.38	1596910.5	701962.38	7.01	93.1	86.9
4341	5	3400600004225009	Existing	1596910.5	701962.38	1596908.75	701962.5	1.75	4.1	175
4341	6	3400600004225009	Existing	1596908.75	701962.5	1596911	702003.13	40.69	93.2	86.8
4341	7	3400600004225009	Existing	1596911	702003.13	1596924.38	702002.38	13.4	176	3.2
4341	8	3400600004225009	Existing	1596924.38	702002.38	1596924.75	702009.75	7.38	92.9	87.1
4341	9	3400600004225009	Existing	1596924.75	702009.75	1596938.13	702009	13.4	176	3.2
4344	0	3400600004225009	Existing	1596932.13	702027	1596947.25	702025.75	15.18	175	4.7
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4344	3	3400600004225009	Existing	1596931.38	702018.63	1596932.13	702027	8.41	95.1	84.9
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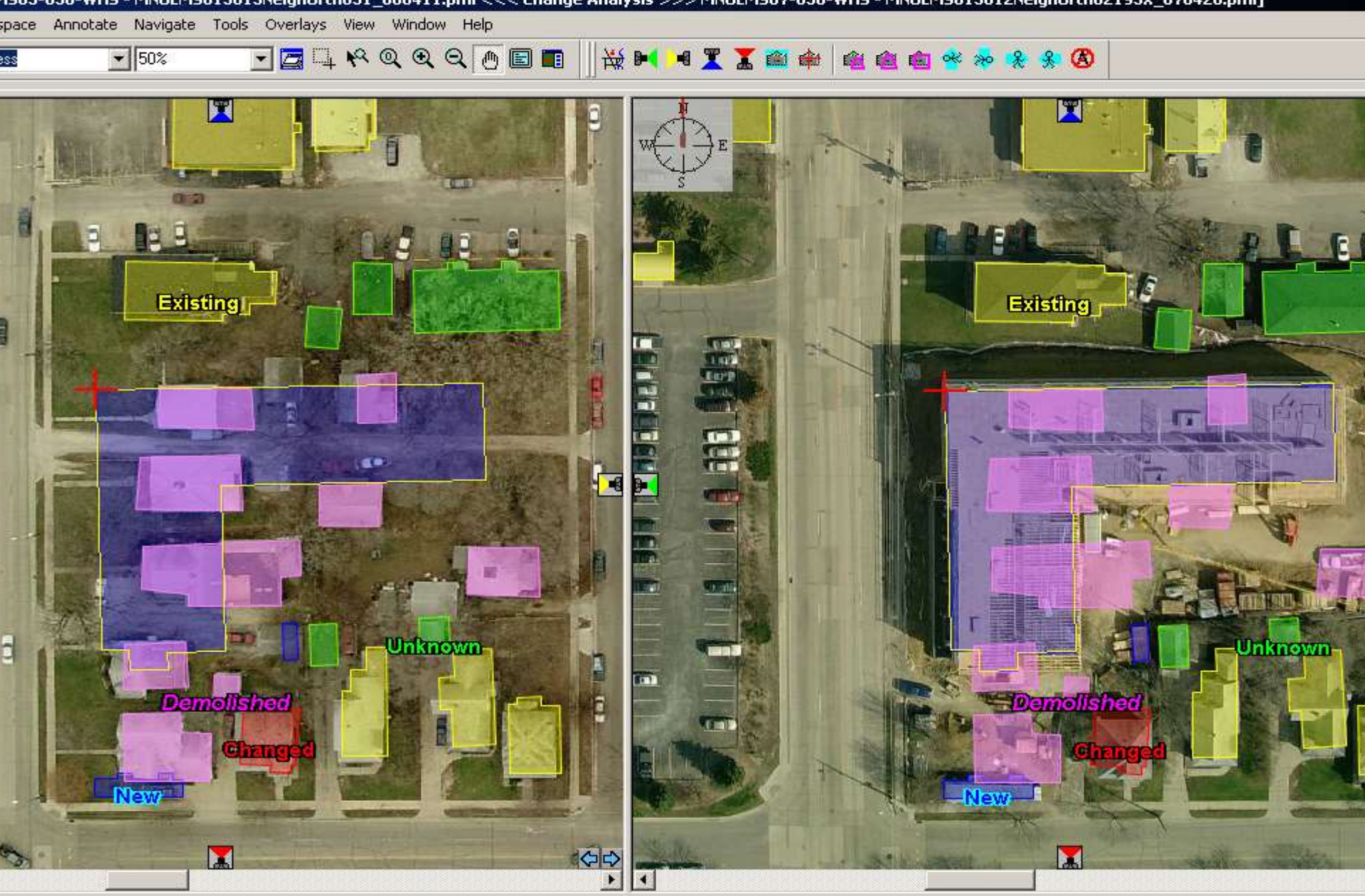
4346	1	3400600004221010	Existing	1596980.75	702359	1596945.88	702360.81	34.92	3	177
4346	2	3400600004221010	Existing	1596945.88	702360.81	1596946.88	702380.38	19.59	92.9	87.1
4346	3	3400600004221010	Existing	1596946.88	702380.38	1596953.88	702380.06	7.01	177	2.6
4346	4	3400600004221010	Existing	1596953.88	702380.06	1596955.63	702413	32.98	93	87
4346	5	3400600004221010	Existing	1596955.63	702413	1596983.5	702411.56	27.91	177	3

The contents of DBF file

Percentage Rate of Change (area)

FID	Shape*	Status	PARCEL_ID	X	Y	Area	Orig_Area	ChangeRate
59	Polygon	Changed	11-061500	2284763.36	671433.36	3746.51	3394.91	10.36
30	Polygon	Changed	11-104000	2284941.65	672336.5	3441.61	3183.12	8.12
74	Polygon	Changed	11-046700	2283846.22	672127.31	3426.16	3161.25	8.38
54	Polygon	Changed	11-164100	2284644.73	671011.1	3510.91	2638.62	33.06
79	Polygon	Changed	11-291300	2283633.93	671254.01	2889	2555.6	13.05
71	Polygon	Changed	11-217300	2284554.63	671617.96	3117.16	2534.39	22.99
81	Polygon	Changed	11-126800	2284602.69	672272.8	2653.72	2317.63	14.5
33	Polygon	Changed	11-287100	2284937.41	672009.27	3291.98	2075.71	58.6
22	Polygon	Changed	11-221400	2284521.22	671498.73	2132.54	1848.31	15.38
75	Polygon	Changed	11-235500	2283746.52	671839.21	2136.11	1792.19	19.19
86	Polygon	Changed	11-227600	2284636.5	672647.61	2061.34	1501.8	37.26
9	Polygon	Changed	11-048700	2283362.27	671252.53	2473.24	1286.98	92.17
10	Polygon	Changed	11-048700	2283342.63	671185.61	417.65	684.09	-38.95
41	Polygon	Changed	11-235500	2283801.73	671874.02	970.43	496.88	95.3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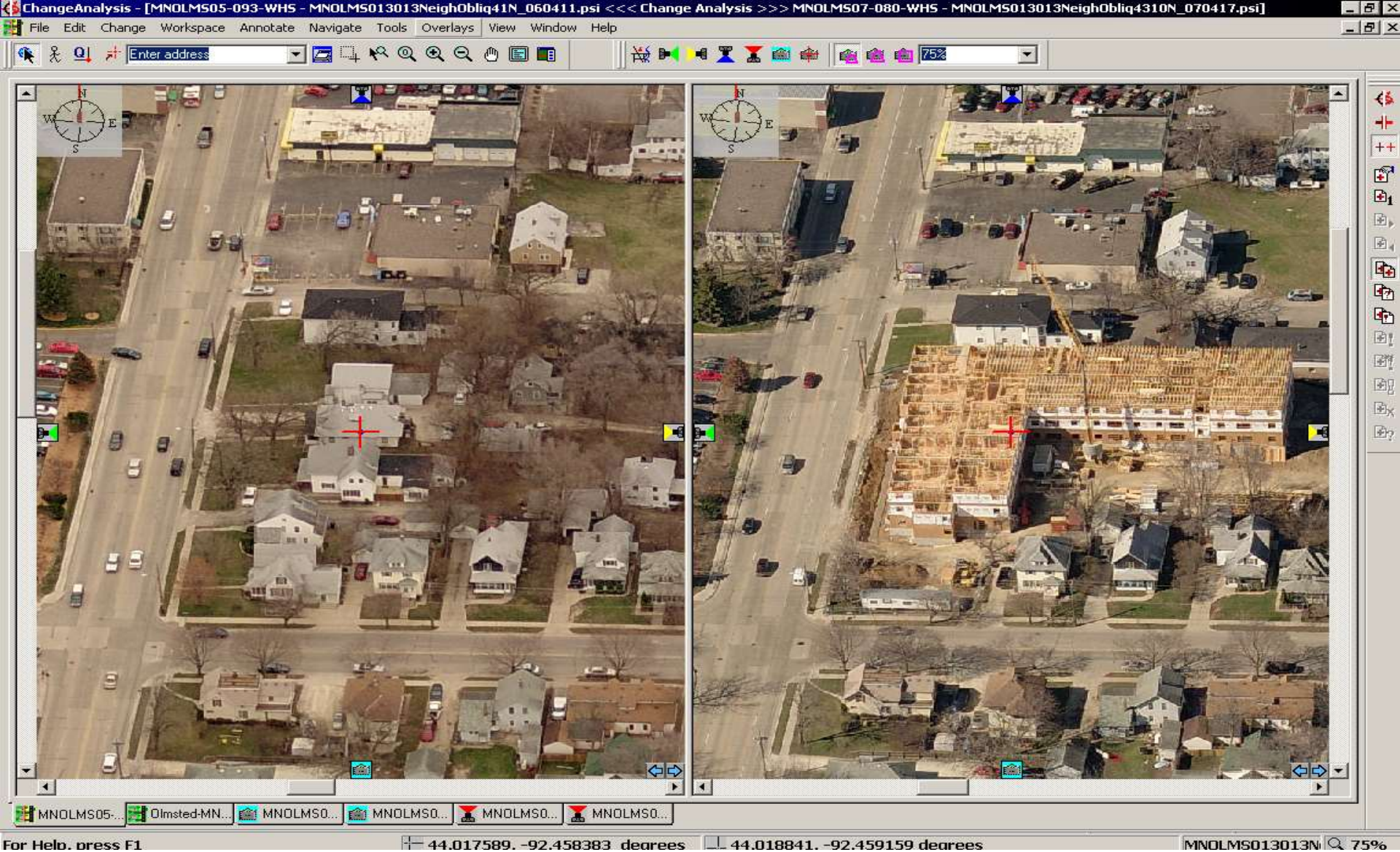
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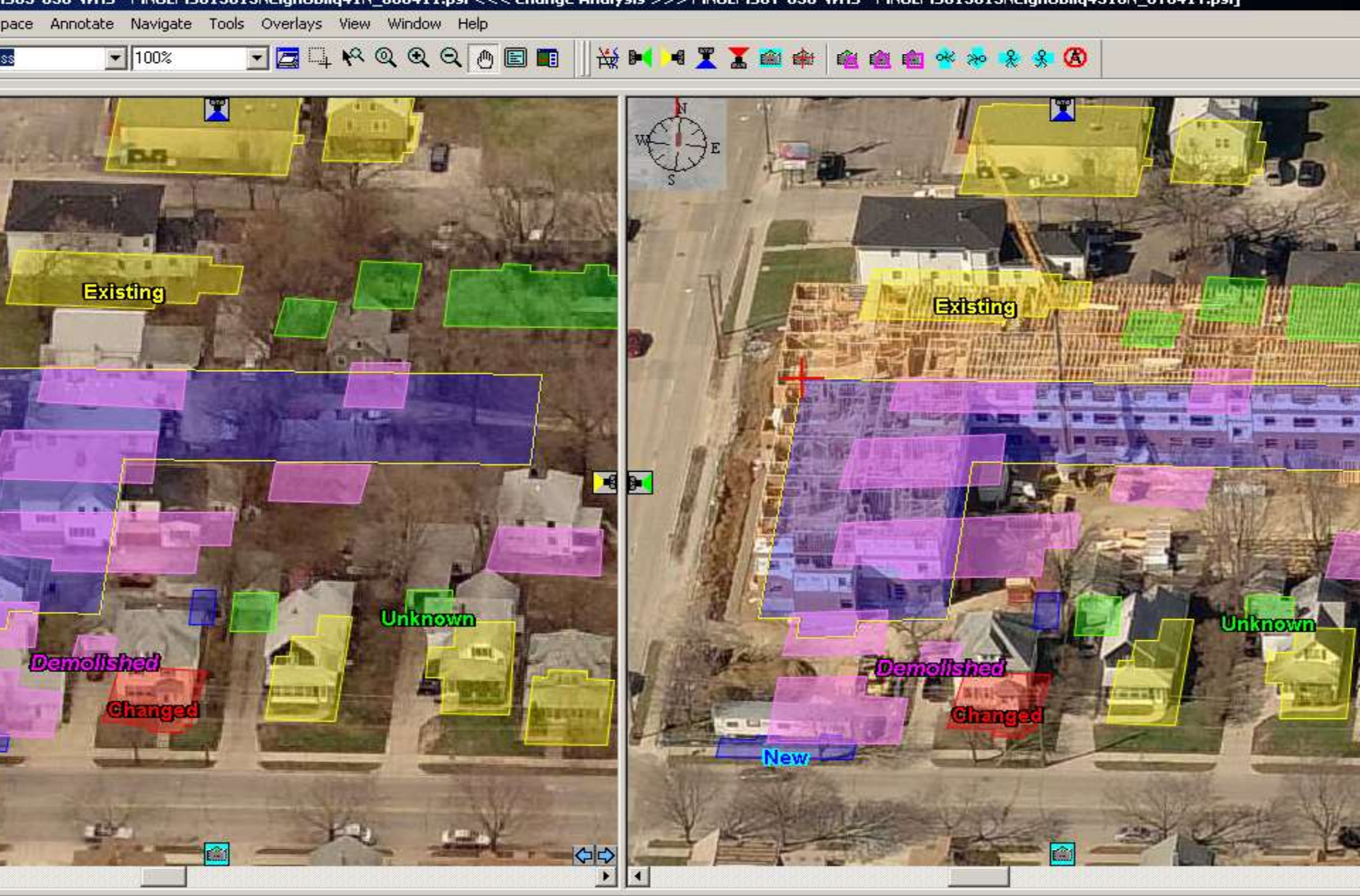
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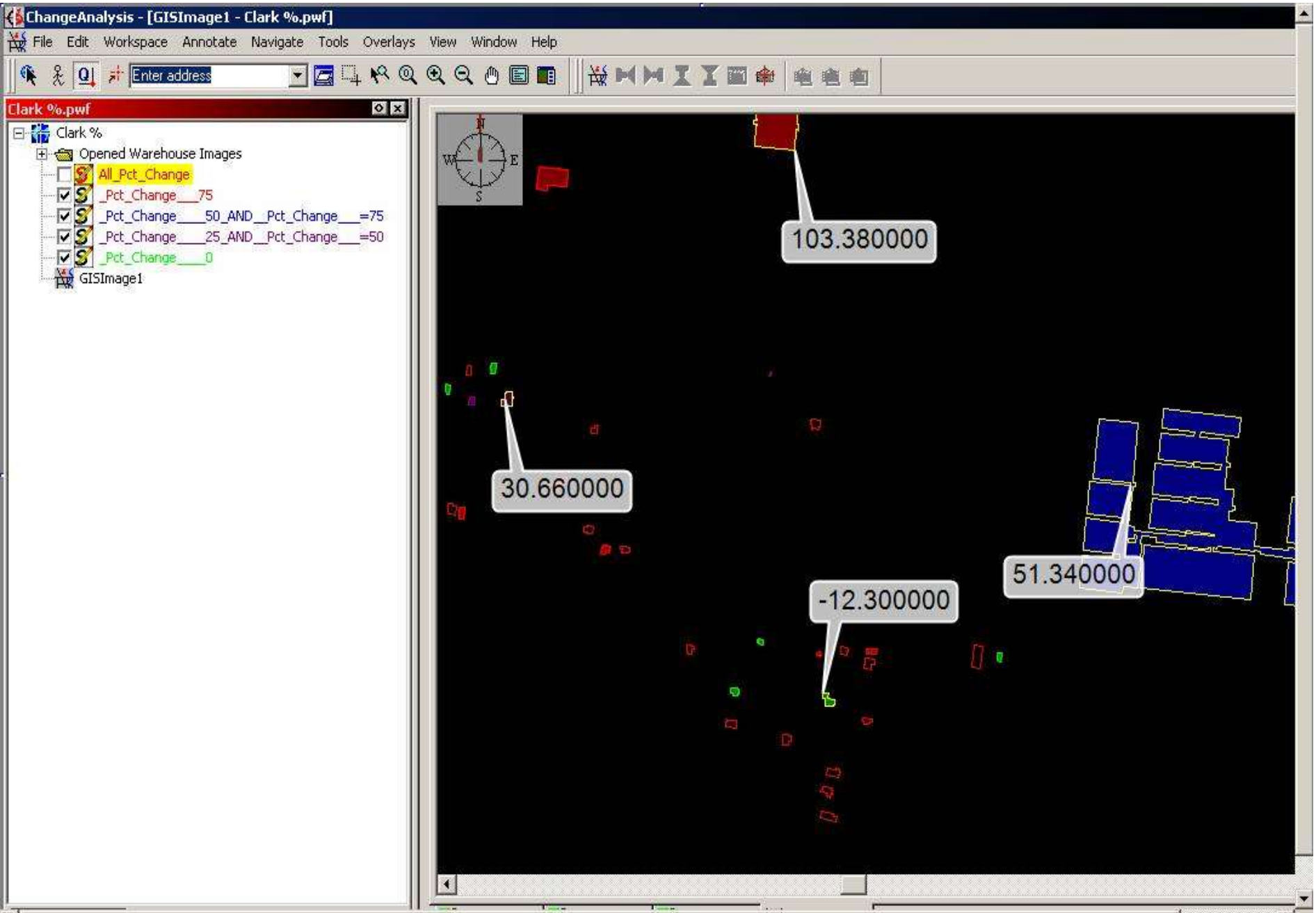
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Opened Warehouse Images
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_Pct_Change____50_AND__Pct_Change___=75
_Pct_Change____25_AND__Pct_Change___=50
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103.380000
30.660000
51.340000
-12.300000


ChangeAnalysis - Clark %.pwf - [Clark OH 2002 NN Imagery - r_1642.pmi <<< Change Analysis >>> Clark OH 2007 Resized NN Imagery - A5532680.pmi]
File Edit Workspace Annotate Navigate Tools Overlays View Window Help
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_Pct_Change____5
_Pct_Change____2
_Pct_Change____0
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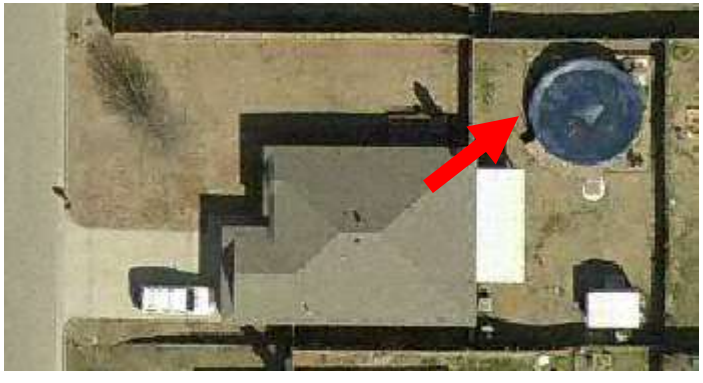
GIS Annotation Layer
GIS data properties
GIS data source
GIS Object Query Display
PDX
Auto label
Query Display Field :
Pct_Change

Pool Findr

- Deliverable is a GIS point in ESRI format which includes the center of the pool based on latest imagery provided. Imagery of 1 foot GSD or better with the pool being 150 sq feet or larger are targeted for this option.

Area : 180 sq ft



Area : 490 sq ft

The Area of an ordinary temporary pool could be more than 150sq ft.
If this temporary pool is greater than 150 sq feet then this temporary pools will be included in the result.

Pool Findr

- Targeted Pools
  - Pools built on the ground.
  - Area is more than 150 sq ft.
  - Not targeted Pools
    - Pools that seems to be obviously temporary pool.

*Please note that pools which cannot be determined whether they are temporary pools or not will be included in result. (The pool below is a sample of that)

Samples of Targeted Pools

Southampton ChangeFindr Case Study for Missed assessment

New Assessments Added		
Type	Quantity	Contributory Value
Pool	169	$10,140,000
Patio	344	$1,720,000
Shed	79	$395,000
Boathouse	33	$330,000
Tennis Ct.	46	$2,990,000
Larger SF	105	$10,500,000
New House	26	$78,000,000
Garage	105	$2,100,000
Addition	23	$2,300,000
Basketball Court	16	$320,000
2nd Structure	33	$16,500,000
Completion 100%	8	$2,400,000
Renovated	6	$1,800,000
Dock	51	$510,000
Bulkhead	10	$200,000
Add 2nd Story	6	$1,200,000
Catwalk	10	$100,000
Gazebo	4	$40,000
New Construction (incomplete)	6	$600,000
Man-made Pond	7	$140,000
Completion 60%	5	$300,000
Putting Green	5	$375,000
Jacuzzi	1	$5,000
Barn	2	$60,000
Horse Arena	1	$50,000
TOTAL	1,101	$133,075,000
Tax Rate - Tax Revenue	0.013	$1,765,905

Pictometry Cost:
$112,000

Tax Revenue:
$1,765,905

Revenue ÷ Cost =
15.76 ROI

John Valente Senior Real Estate Analyst
3/29/2010

ChangeFindr

Structures **Not** targeted by the process

- Vehicles, Boats, Ships
- Paved areas, including patios without a railing or wall
- Bare ground surrounded by a fence or wall
- Steel Tower/Frames, Antenna, Cell phone towers
- Billboards
- Tombstones
- Changes in vertical direction (e.g. a one story building that is renovated to a two story building

ChangeFindr Accuracy-BOC

Building Outline Creation

- Positional Accuracy: offset from the imagery ≤ 5 pixels
- Geometric Accuracy: length of untraced edges ≤ 5 pixels
- Error Rate: ratio of positional/geometrically inaccurate buildings and missed buildings ≤ 0.5%

ChangeFindr
Accuracy-CD

Change Detection

The process is greater than 98% accurate – the standard error rate is 2% for false positives, and 0.2% for false negatives.

- False Positive Rate: ratio of buildings with fault state for all Changed/New/Demolished buildings ≤ 2.0%
- False Negative Rate: ratio of buildings with fault state for Existing buildings ≤ 0.2%