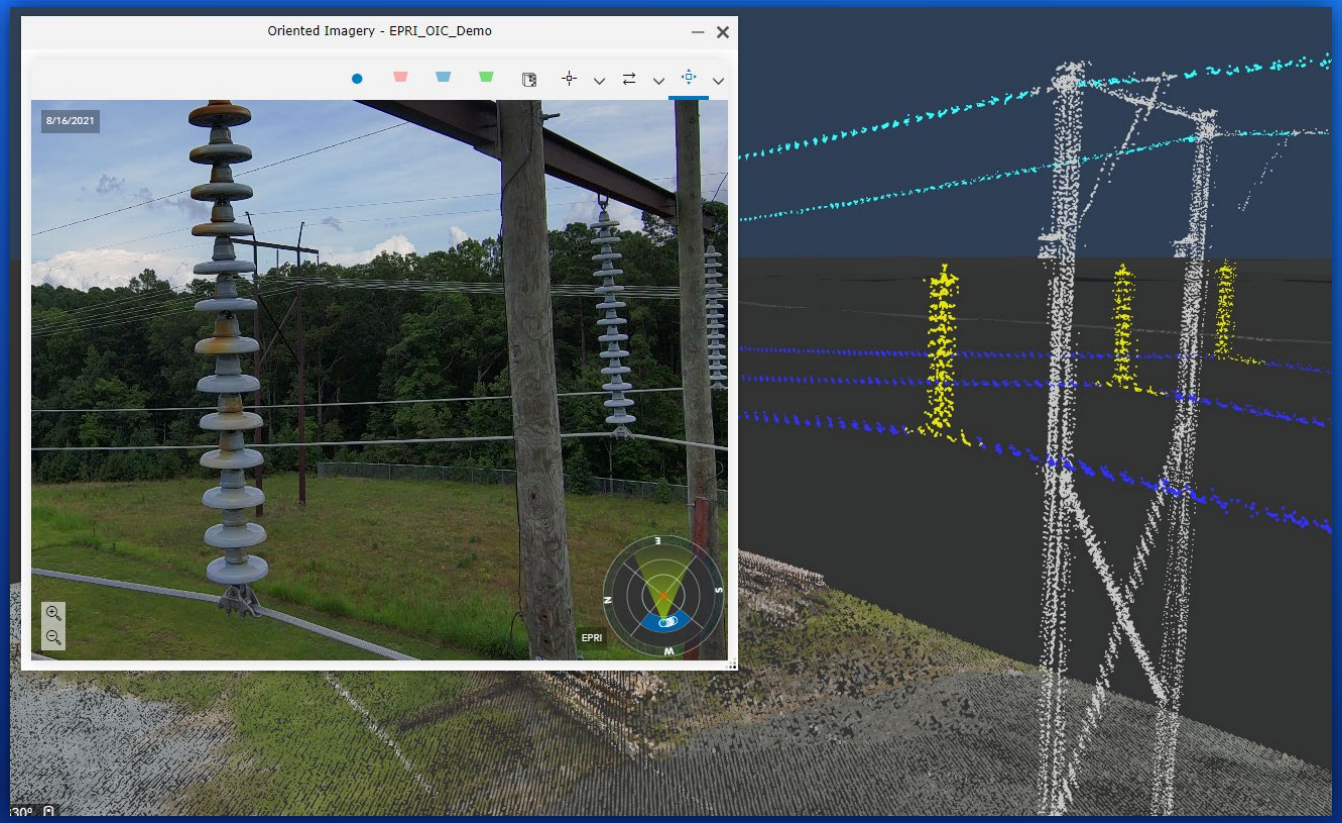


Using Oriented Imagery and ArcGIS

for Inspection and Image Management

Brian Connolly, Esri – Imagery & Remote Sensing

What is Oriented Imagery?

Access imagery at any angle for any location

Aerial
Digital / Scanned

Drone

360 Degree Imagery

Street-view Photography

Video
(H-264 Codec URL)

Oblique / Aerial

Street-view

Inspection

Panorama

Video

360 Image

Wide-angle / Fisheye

Oriented Imagery in ArcGIS

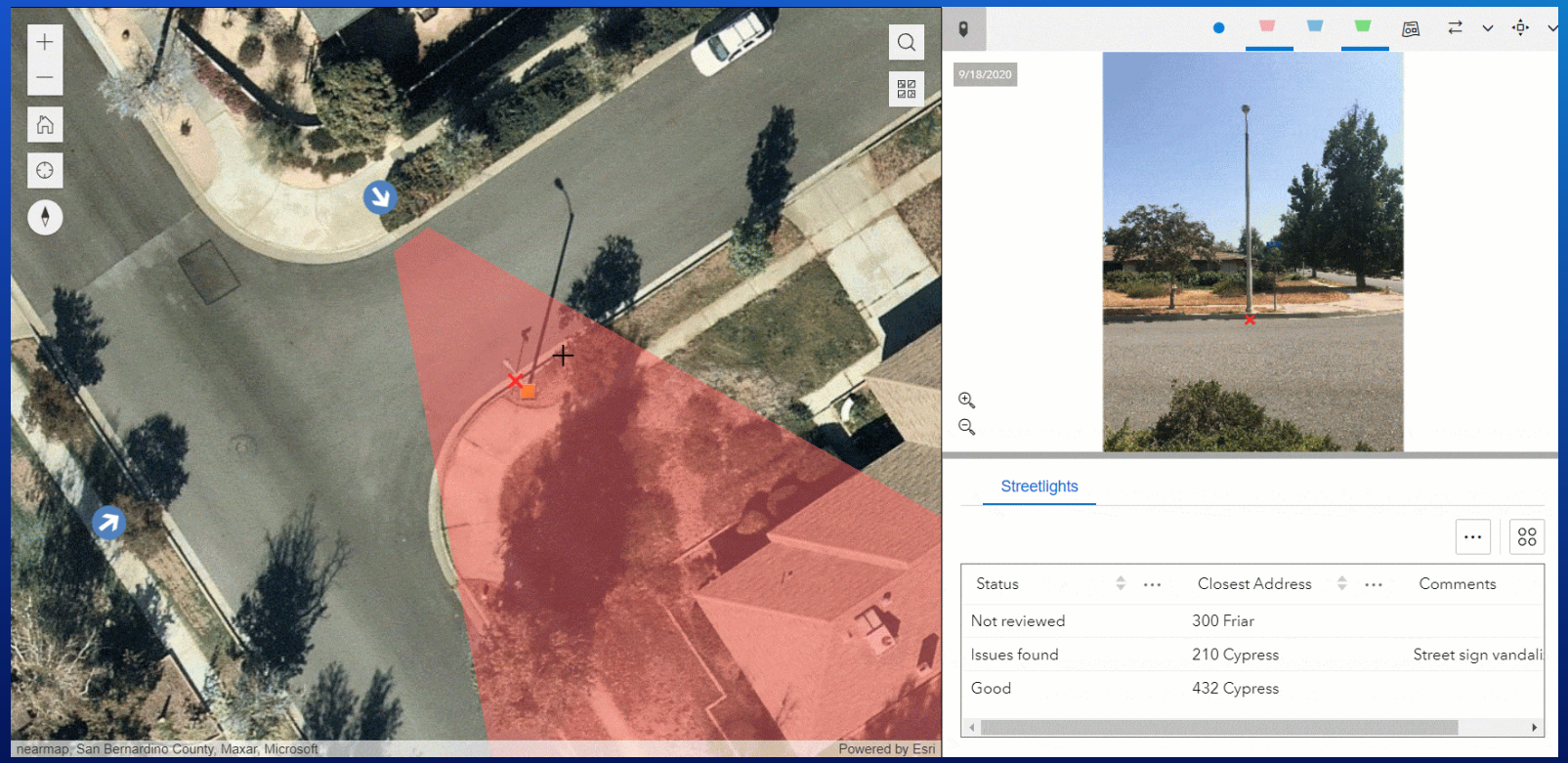
Access imagery at any angle for any location

Discover photos covering a particular location

View assets from multiple directions

Interact with image orientation

Digitize features in map and image space

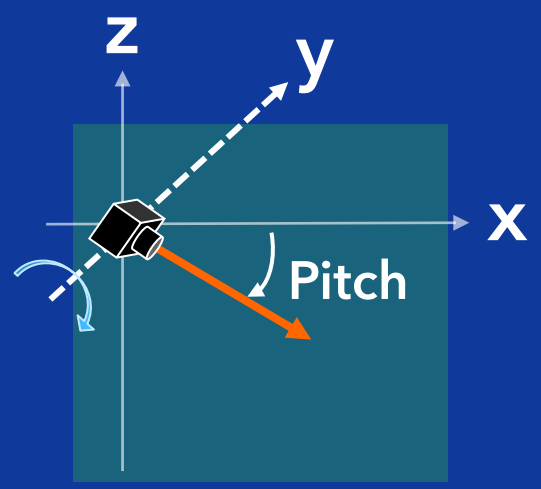


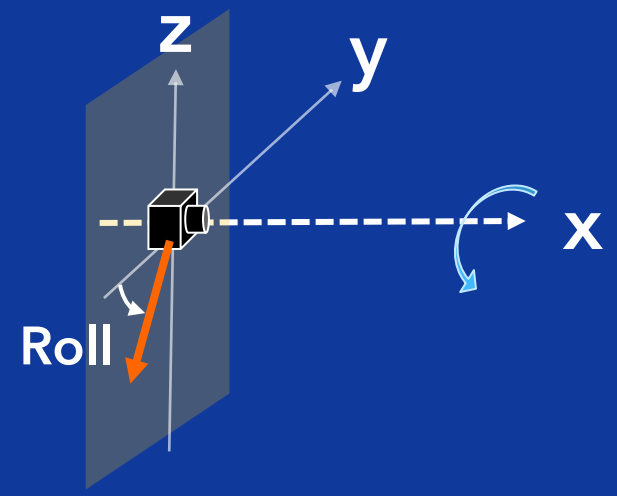
Visualize Image Orientation in ArcGIS

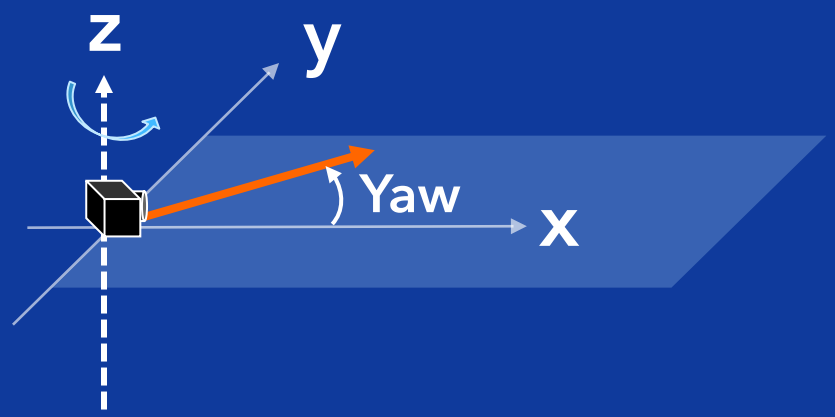
Adding image perspective to map applications

Required Image Information:

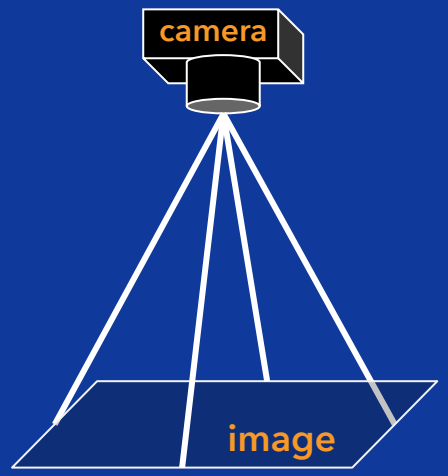
- Image Properties:
  - Geolocation (X, Y, Z)
  - Field of View
- Sensor Orientation:
  - Pitch
  - Roll
  - Yaw (Heading)







Location



Field of View

Oriented Imagery Catalogs

Data Model Structure

Oriented Imagery Catalog (OIC)

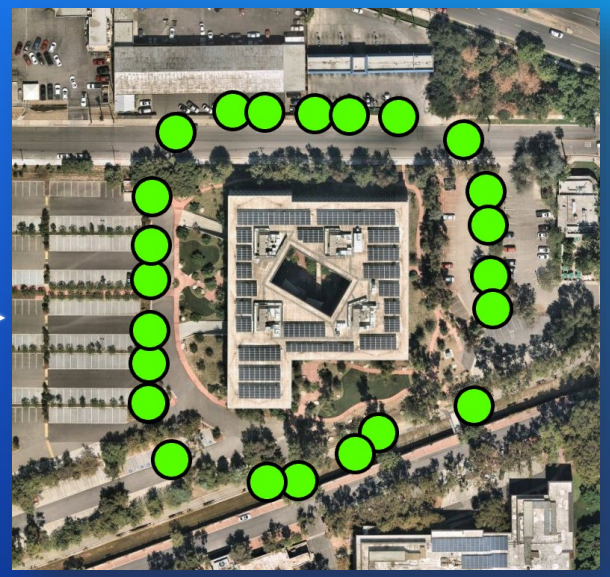
OIC file

- *Service URLs*
- *Common Attributes*

JSON

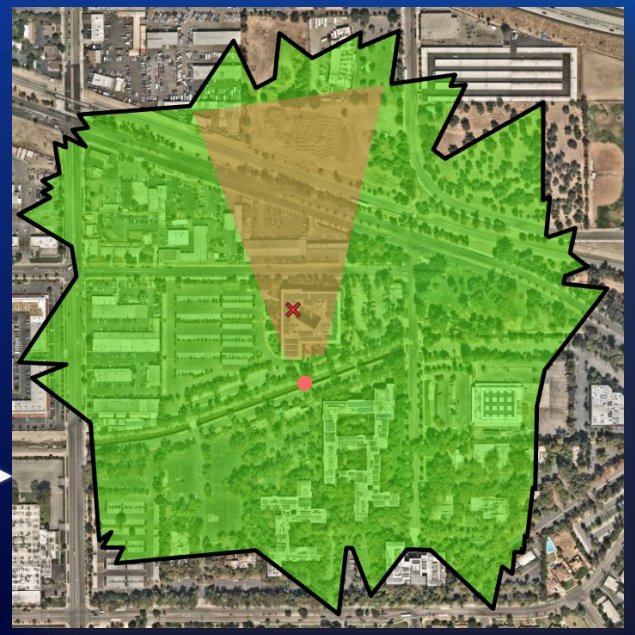
Exposure Table

- *Point Feature Service*
- *Image Attributes*



Overview Map

- *Vector Tile Package*
- *Image Coverage Map*



Oriented Imagery Catalogs

Data Model Structure

Oriented Imagery Catalog (OIC)

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- *Point Feature Service*
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Overview Map

- *Vector Tile Package*
- *Image Coverage Map*

Field	Description
Shape	Point geometry. XY or XYZ
Image	Link to Image – JPEG, MRF, TileHandler
Name	Visible Name
ExposureID	UniqueID
CamHeading	Heading of Camera – 0 North CW
CamPitch	Pitch of Camera – 0 Down, 90 Horizon
CamRoll	Roll of Camera - CW
ImgRot	Rotation of image in relation to camera
OIType	Oriented Imagery Type
HFOV	Horizonal Field of View
VFOV	Vertical Field of View
NearDist	Nearest useful distance
FarDist	Furthest useful distance
AvHtAG	Average Height Above Ground
CamOri	Camera Orientation - String
Accuracy	Accuracy of each parameter
CamOffset	Camera Offset - Optimization
ImgPyramid	Link to Image Pyramid if separate
DEM	Link to DEM – MRF, TileHandler
DepthImage	Link to Depth Image – MRF, TileHandler
Video	Link to Video
OffsetFromStrat	Offset(s) from start of Video
ExternalViewer	External Viewer to use
SortOrder	Order to sort records in gallery, Next, Previous
ExposureStationID	Group multiple image to same location
AcquisitionDate	Acquisition Date Time
...	Any user definable attributes

Oriented Imagery Management Tools

Creating Oriented Image Catalogs

Workflow:

1. Create an empty OIC
2. Add images to OIC
3. Create coverage features
4. Create coverage map
5. Publish OIC

https://esriurl.com/OrientedImageryWorkflow
https://github.com/Esri/oriented-imagery

ArcGIS QuickCapture

Create OICs directly in QuickCapture Mobile App

Collect oriented imagery to perform:

- Damage assessments
- Asset inventory and inspections
- Construction documentation
- Code violation reports
- Field observations

ArcGIS QuickCapture → Oriented Imagery Catalog (OIC)

Oriented Imagery Workflow

Working with Smart Photos in ArcGIS

Authoring Tools

- ArcGIS Pro
- ArcGIS QuickCapture

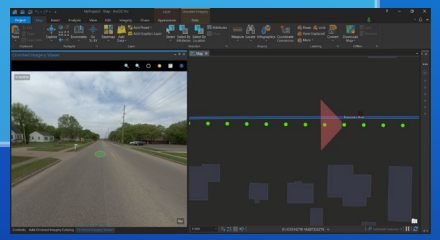
→ Oriented Imagery Catalog (OIC)

→ Oriented Imagery API

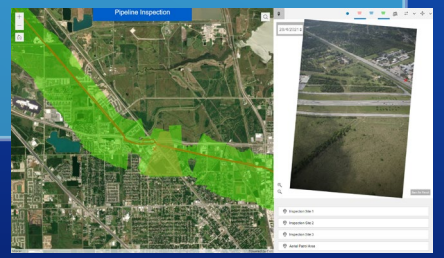
Client tools

(Oriented Imagery viewer)

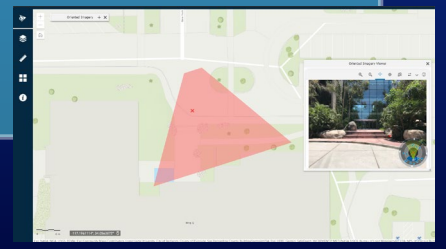
- ArcGIS Pro



- Experience Builder



- Sample Web Apps



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