

# The Pipeliners Association of Houston

August 29, 2016



# UAVs, Drones, UAS, sUAS, Toys?



# UAVs and the FAA



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## Unmanned Aircraft Systems



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## Unmanned Aircraft Systems



The **NEW** Small UAS Rule (Part 107), including all pilot and operating rules, will be effective on **August 29, 2016**. For more detailed information, please see:

- [Summary of the Small UAS Rule \(PDF\)](#)
- [Small UAS Advisory Circular – How to Use the Rule \(PDF\)](#)
- [Complete Text of the Small UAS Rule](#)
- [Part 107 Knowledge Test Prep](#)

Need more information? [Read about how to fly a UAS for your work or business.](#)



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### Top Tasks

[Fly a UAS for fun](#)

[Fly a UAS for work or business](#)

[Register your UAS](#)

[Become a UAS pilot \(coming soon\)](#)

[Apply for a waiver to Part 107 \(coming soon\)](#)



### Get Ready for the New Small Drone Rule!

Here's some important information about the Part 107 small drone rule that is effective August 29.



**Part 107**  
Knowledge Test Prep

# Rise of the Drone

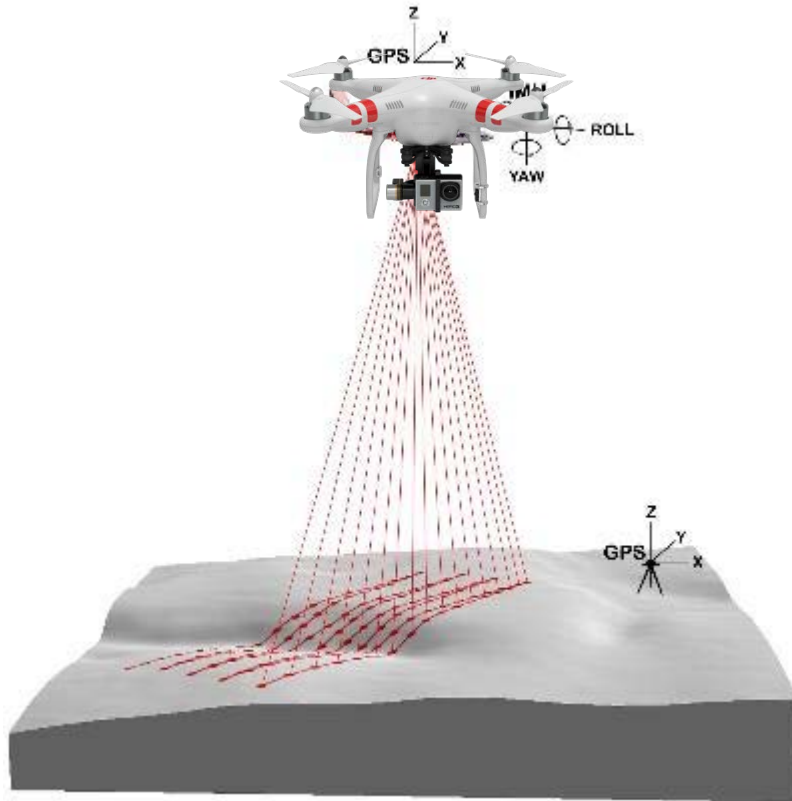
- Technology
  - The advancement and miniaturization of inertial measurement units (IMUs), gyroscopes, and accelerometers.
  - Battery size and capacity.
- Cost:
  - \$500 – \$70,000
  - For some purposes a \$4,000 investment will produce an adequate data collection tool.
- Ease of use.
- Capability.



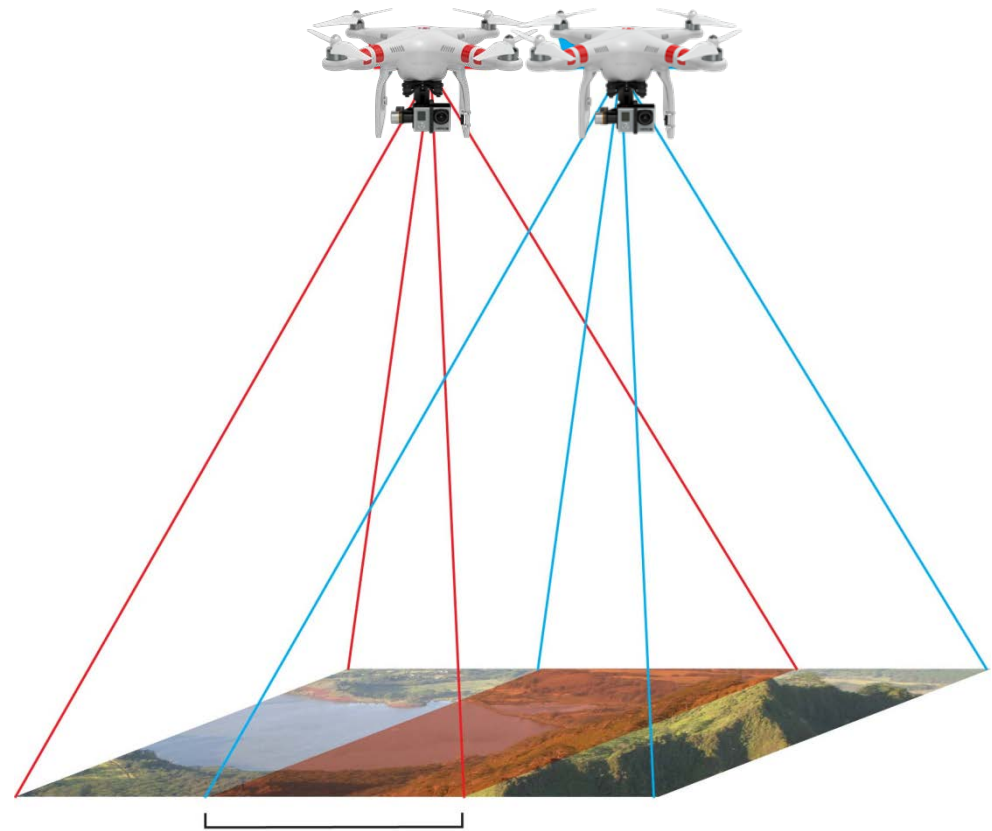


# UAVs as a Platform for Data Collection

## LiDAR



## Aerial Photography



Standard 60%  
Stereo overlap

# UAVs as a Platform for Data Collection

## LiDAR



## Laser Scanner

## Aerial Photography

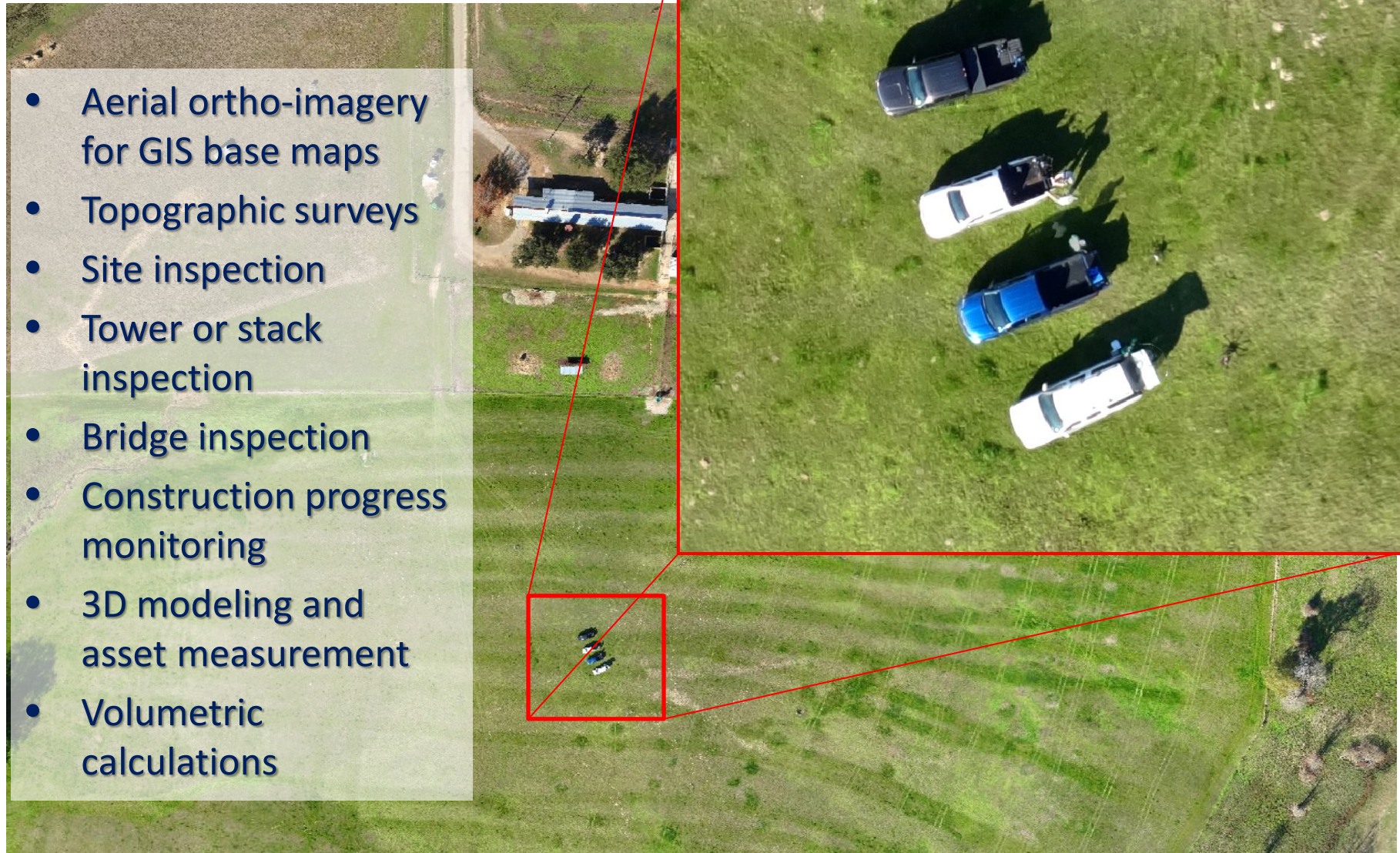


## Camera



# UAV Applications

- Aerial ortho-imagery for GIS base maps
- Topographic surveys
- Site inspection
- Tower or stack inspection
- Bridge inspection
- Construction progress monitoring
- 3D modeling and asset measurement
- Volumetric calculations





# HGA UAS Program





# Autonomous Flight

- Provide added safety by eliminating manned flights
- Allows for computed flight patterns to achieve the desired accuracy for each project
- Preprogrammed flights using Google Earth

**Mission Planner Software**

Distance: 6.4406 km  
Prev: 21.16 m AZ: 25  
Home: 127.05 m

COM7 115200 CONNECT

Zoom

**Action**

GEO 32.561364 -92.696199 90.20m

Grid View KML

GoogleSatelliteMap

Status: loaded tiles

Load WP File

Save WP File

Loaded Temple\_Topo.wi

Read WPs

Write WPs

Home Location

Lat 32.560839

Long -92.698281

Alt (abs) 62

**Waypoints**

WP Radius 10 Loiter Radius 60 Default Alt 100

Verify Height Add Below Alt Warn 0 Spline

	Command	Del				Lat	Long	Alt	Delete	Up	Down	Grad %	Angle	Dist	AZ
11	WAYPOINT	0	0	0	0	32.560553	-92.6975...	80	X			0.0	0.0	63...	89
12	WAYPOINT	0	0	0	0	32.560296	-92.69743	80	X			0.0	0.0	32.5	151

# Aerial Photography/Videography

Aerial photography can be used for:

- ROW Inspections/Class Studies
- Route Development
- Construction Monitoring
- Large Orthomosaic Imagery
- Updated Aerial Imagery
- Video Overviews
- Bridge Inspection



**Aerial photo of a pipeline bridge crossing the Red River.**



# Aerial Photography/Videography

## Construction Monitoring



November 19, 2015



# Aerial Photography/Videography

## Construction Monitoring



January 28, 2016

# Photogrammetry

Photogrammetry can be used to produce:

- Survey Grade Topographic Surveys
- Georeferenced 3D Point Clouds
- Point Clouds of “scanned” objects comparable to LiDAR scanners without the limitation of strictly only terrestrial scanning

Point cloud/Photograph information can be uploaded to AutoCAD/Field Pipe for processing into 3-D model.

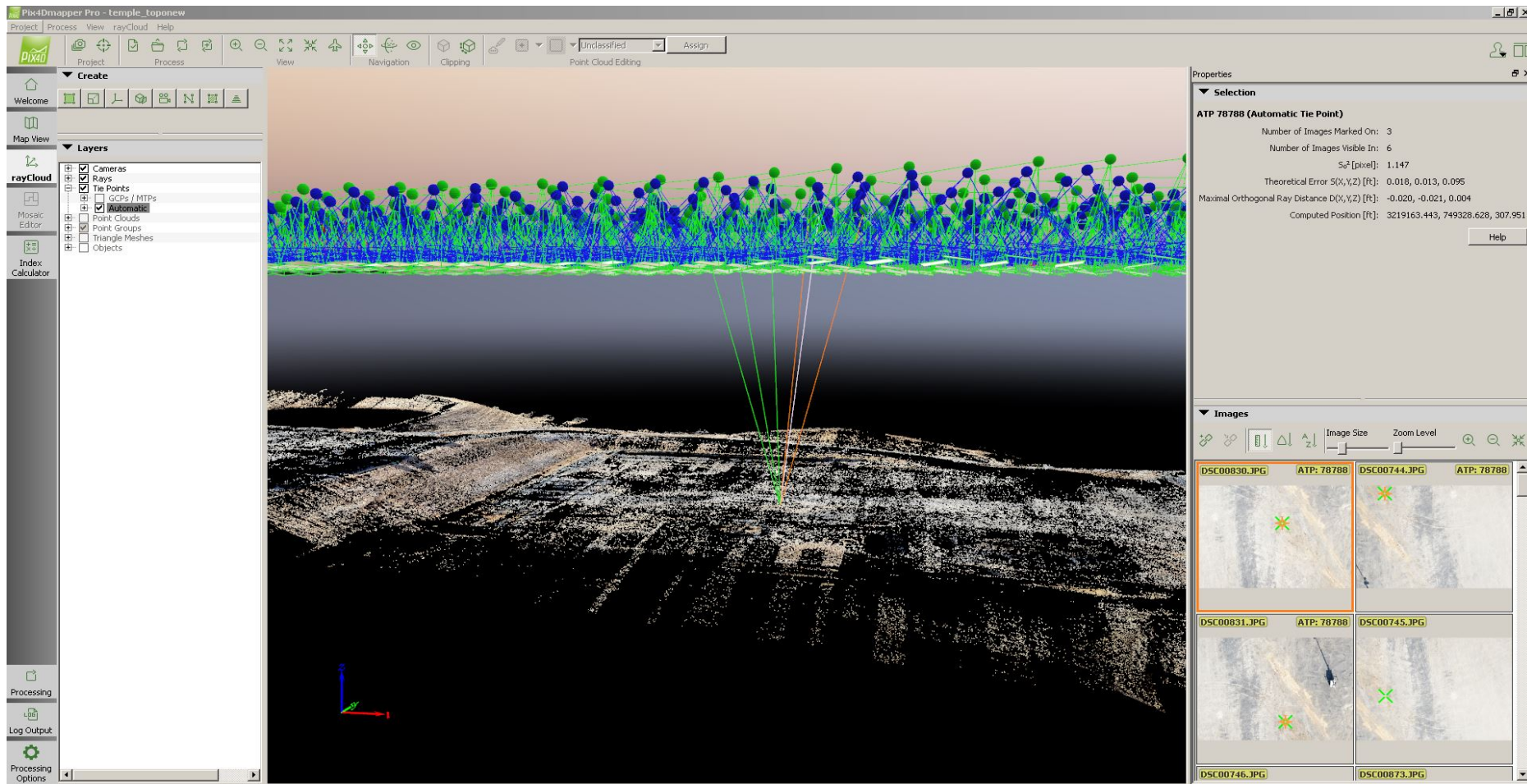
[www.hga-llc.com](http://www.hga-llc.com) [information@hga-llc.com](mailto:information@hga-llc.com) 1.866.255.6825





# Photogrammetry

## Pix4D Mapper Software





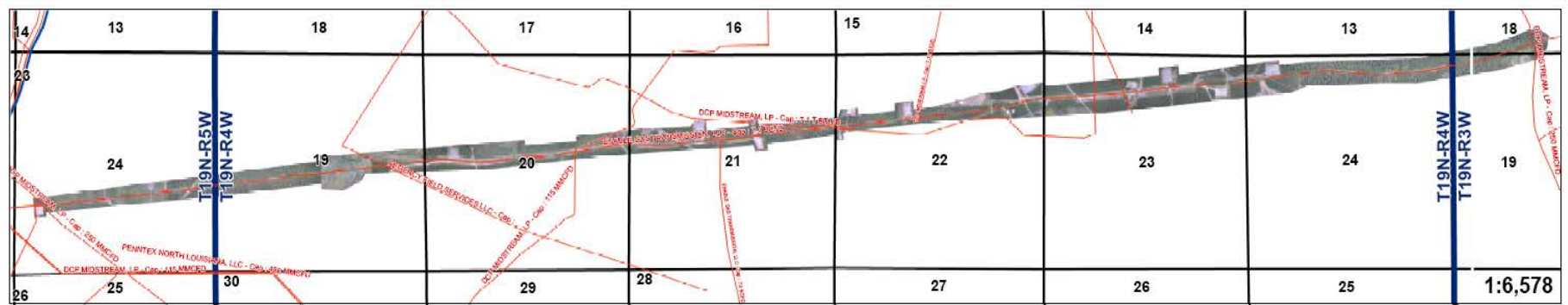
# Photogrammetry

## Photograph





# UAVs for Pipeline ROW



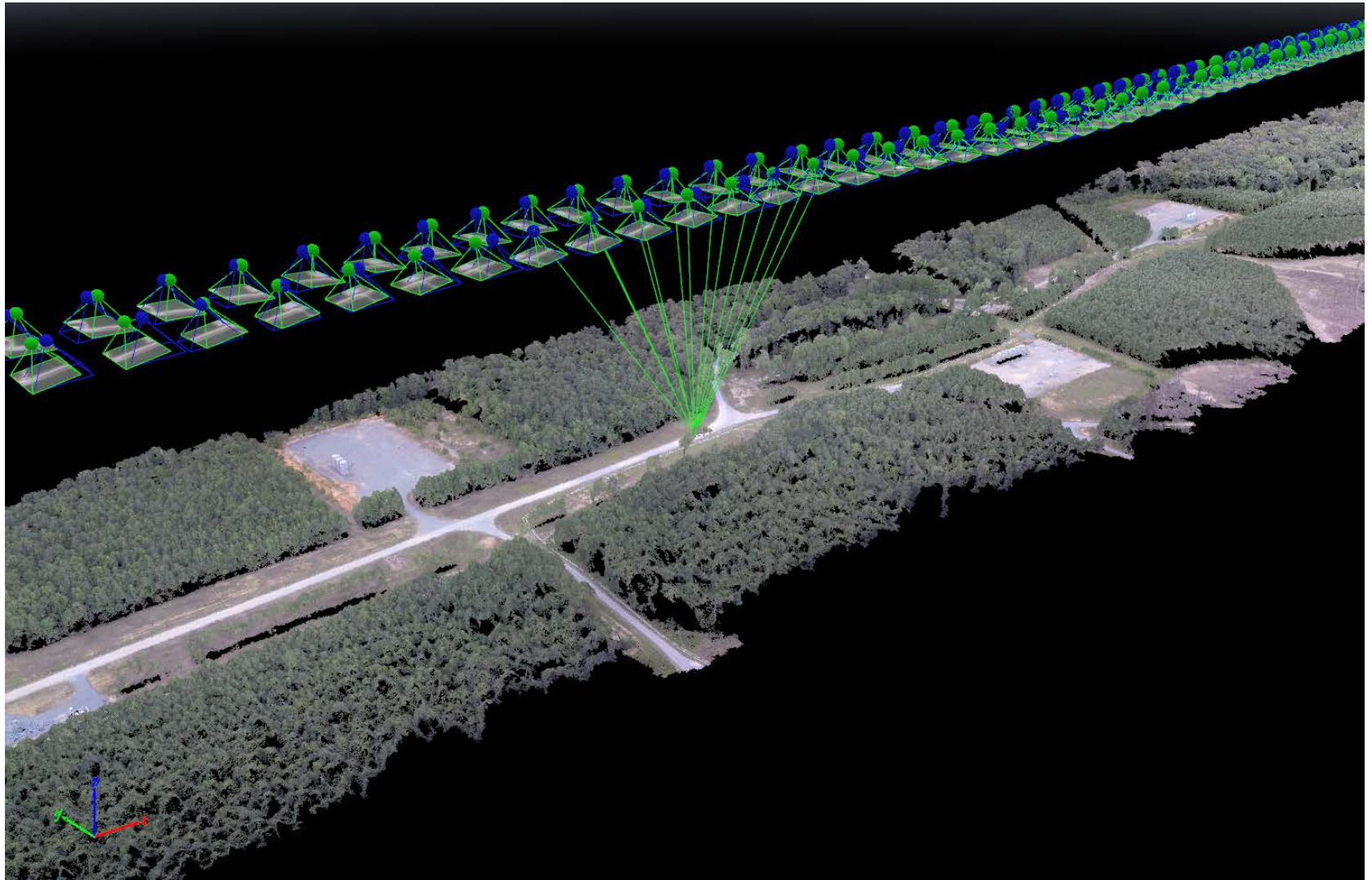
**NATURAL GAS PIPELINE**

LINCOLN PARISH  
LOUISIANA



**PT GEOSPATIAL**

# UAVs for Pipeline ROW





# Details for the HGA T-1070

- Custom designed and constructed for the specific use of aerial surveying by in house technician.
- Weight – 13.0 pounds
- Flight Time with 2 pound payload – 32 minutes per battery
- Battery – 22,000 mAh, 22.2 volt, 6 cell Lithium Polymer Battery
- Maximum Range – Telemetry radios vary between 2-5 miles. This unit has maintained connection at 1 mile.



# Details for the HGA Iris+

- Off the shelf model produced by 3DR
- Weight – 3.8 pounds
- Flight Time with 1 pound payload – 15 minutes per battery
- Battery – 5,100 mAh, 11.1 volt, 3 cell Lithium Polymer Battery
- Maximum Range – Telemetry radios vary between 2-5 miles. This unit has maintained connection at 1 mile.



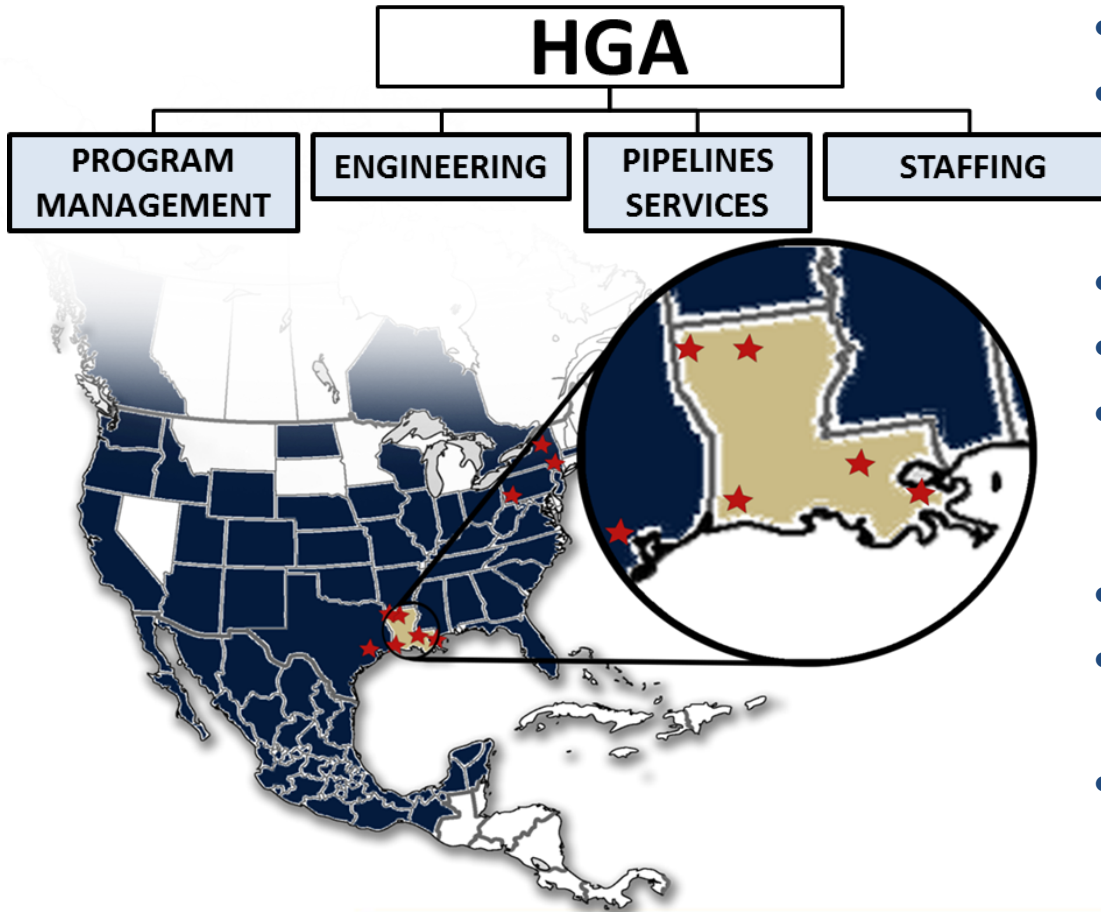
# Details for the PTV-Tail

- Flight time: 1.75hrs
- Mapping Coverage: up to 1500 ac
- Autonomous flight
- Automatic take off and landing
- Wingspan: 50 in
- Range: 15 miles
- RGB or IR payloads
- Forward video



# HGA Overview

HGA is dedicated to delivering on its commitments and building relationships for the long term.



- Est. 1997
- 13 Offices
- Newest: Birmingham, AL & Baton Rouge, LA
- 400+ Employees
- Full-service engineering
- Diverse, client base
  - Industrial & commercial
  - Public & private
- Over 2,000 projects
- 35 States, Canada, Mexico, Middle East
- ENR Top 500 Firm (No. 193)



# Questions ?