



Utilizing Geospatial Data and Tools for Pipeline Applications

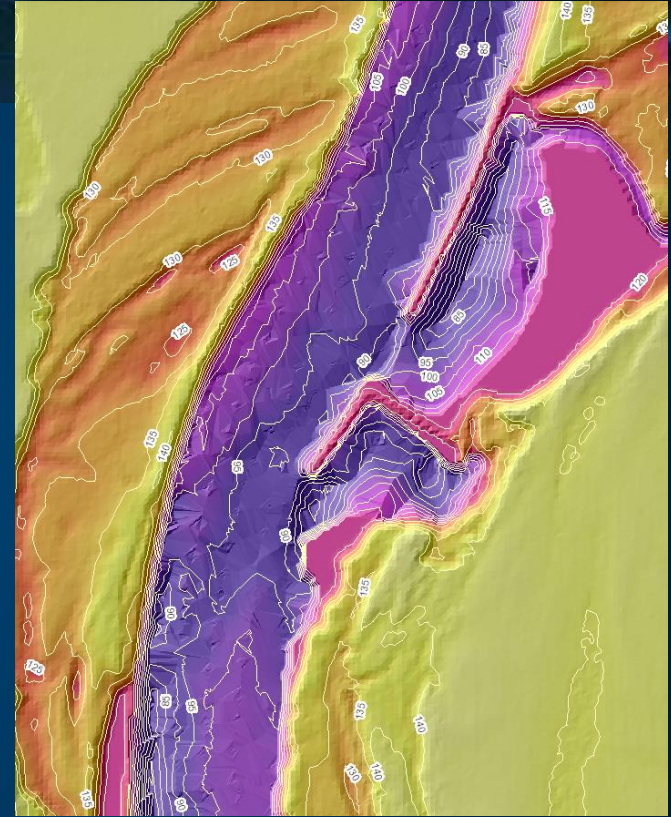
Pipeliners Association of Houston meeting

Wesley Palmer, CP, CMS-Lidar, GISP
Geospatial Manager
Hunt Guillot and Associates (HGA)



Discussion Topics

- Utilizing Geospatial data to aid in pipeline routing
- Using remote sensing (LiDAR / Imagery) to supplement survey and pipeline operations
- Leveraging Artificial Intelligence (AI) to support integrity management.
- Online GIS platforms to enable Geospatial data access to project managers and stakeholders

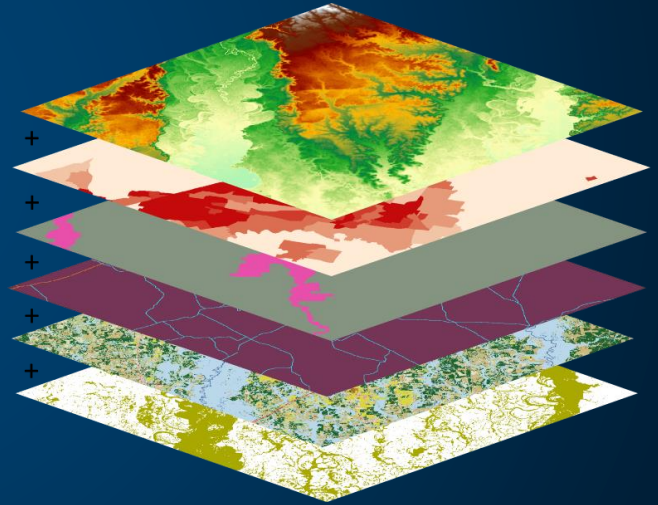


(LiDAR/Sonar Fusion)

Pipeline Routing - Data

- Data, Data, and More Data!
- Sources of GIS data
 - USGS
 - National Wetlands Inventory
 - State and Local Databases
 - USDA
 - Commercially available datasets

Geospatial Data



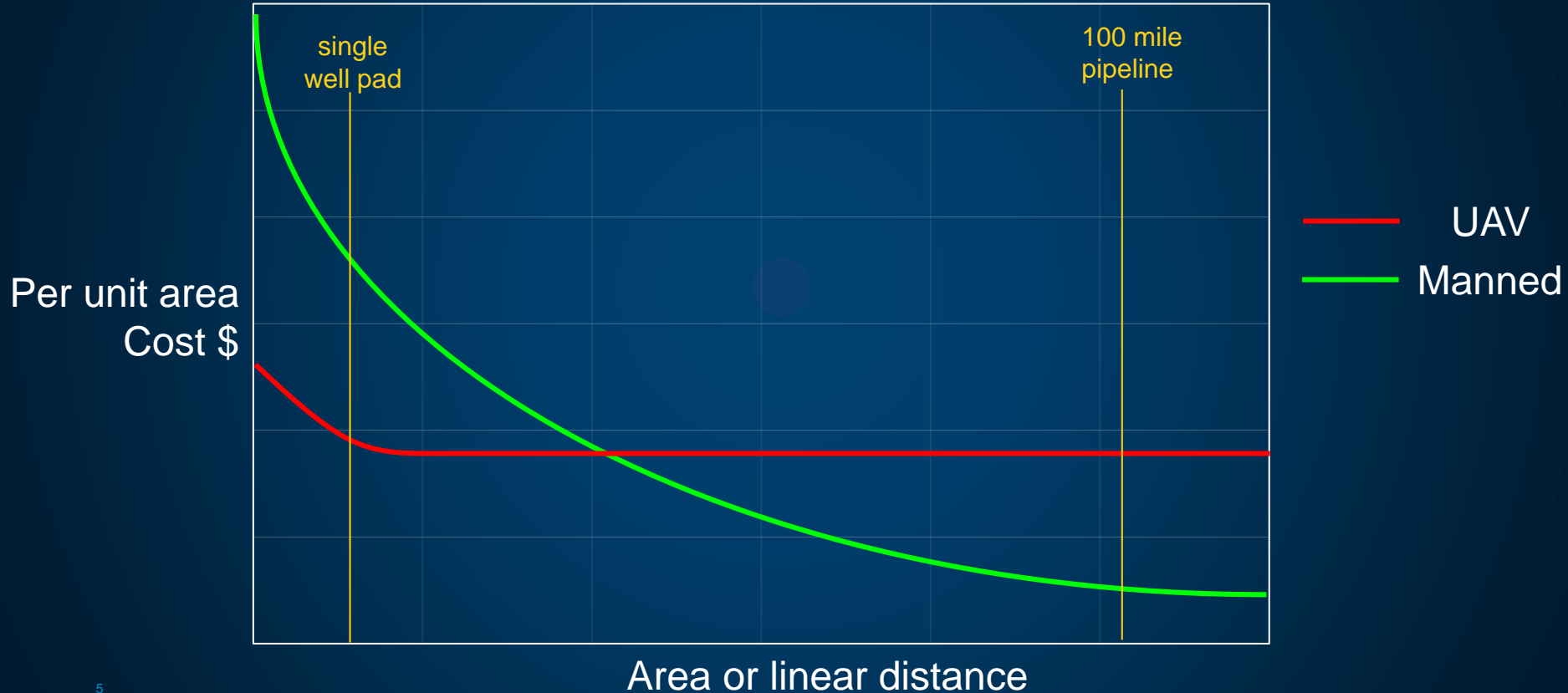
Pipeline Routing - Imagery



- Acquiring up to date imagery
 - Satellite?
 - Manned?
 - Unmanned?
 - Resolution?



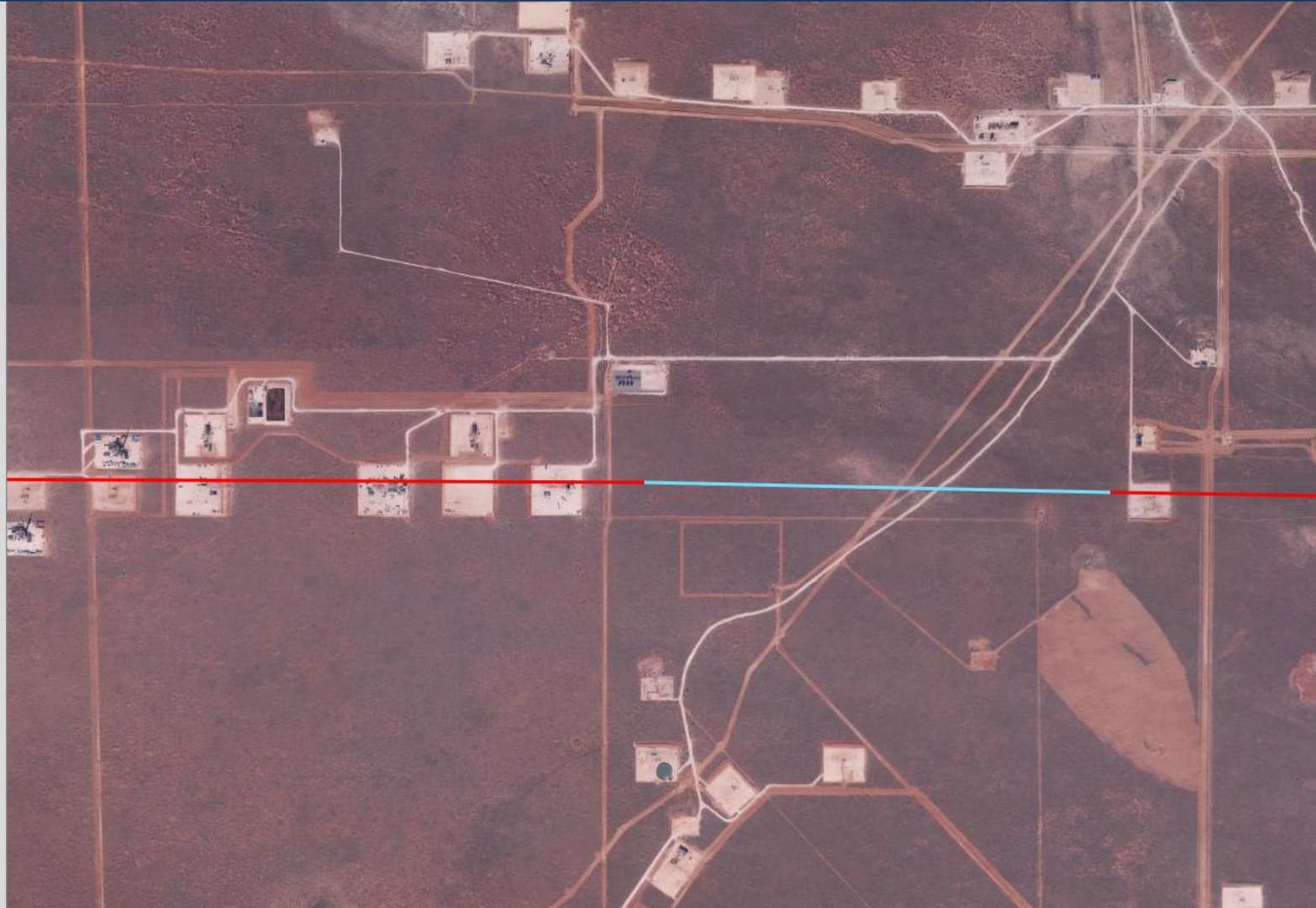
(side note!) UAVs vs Manned Aircraft Cost comparison



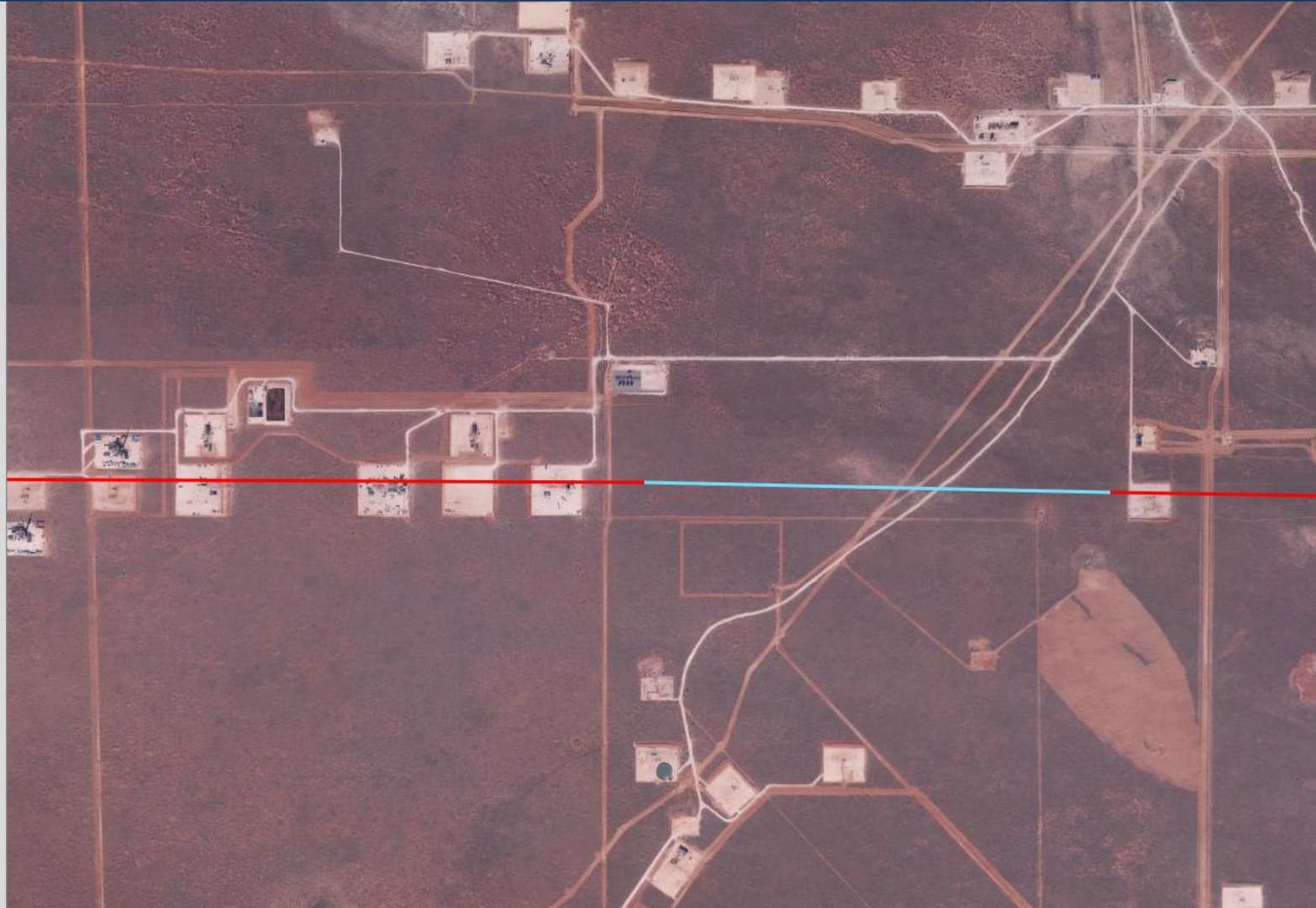
An aerial photograph of a large dam and reservoir, surrounded by dense green forest. The dam is a long, low structure with a spillway on the right. The reservoir is a large body of water behind the dam. The surrounding area is covered in thick trees.

Existing vs Current Imagery Comparisons



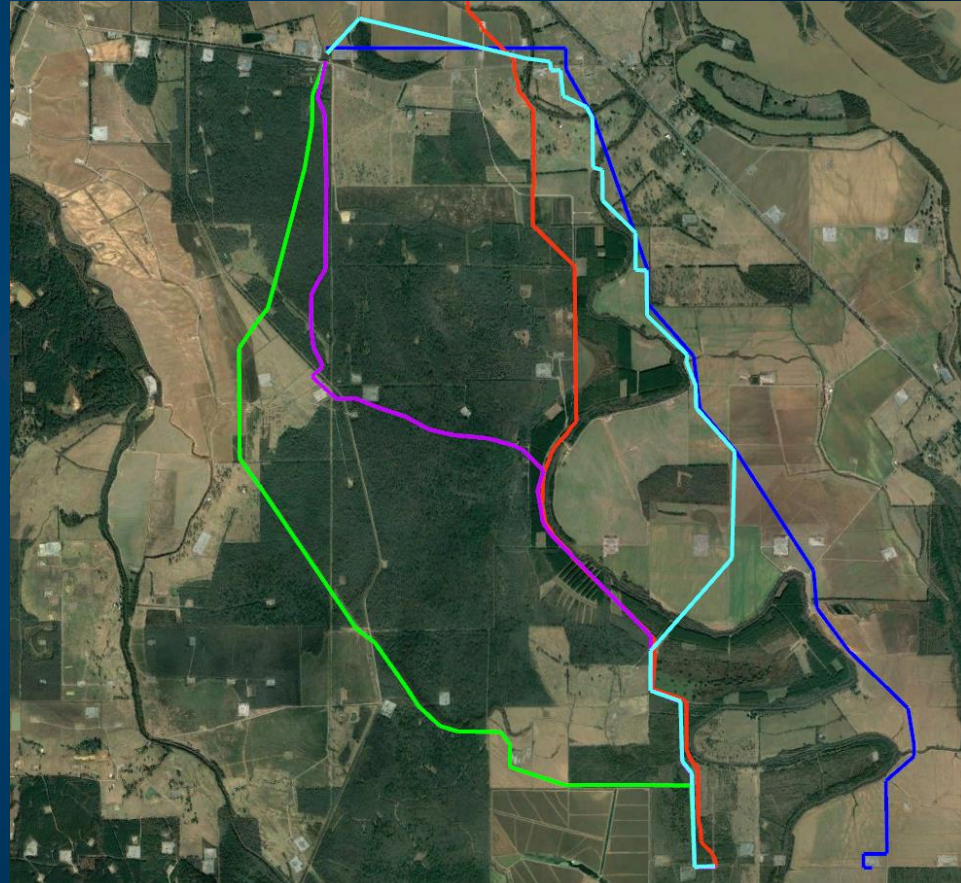






Routing Development

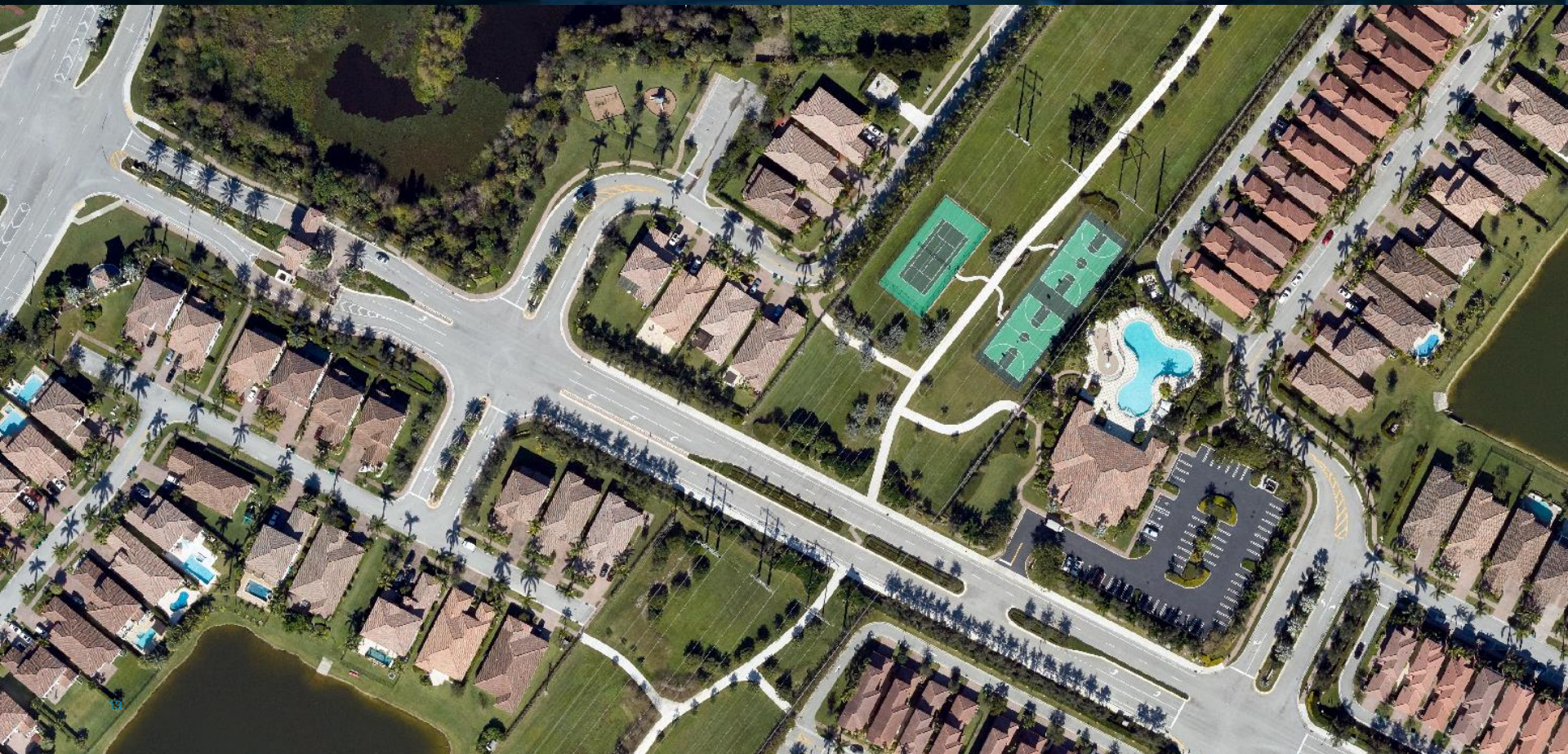
- Utilizing GIS data and updated imagery
- Leveraging those datasets with a GIS routing platform and pipeline experience
- Produce constructible routes



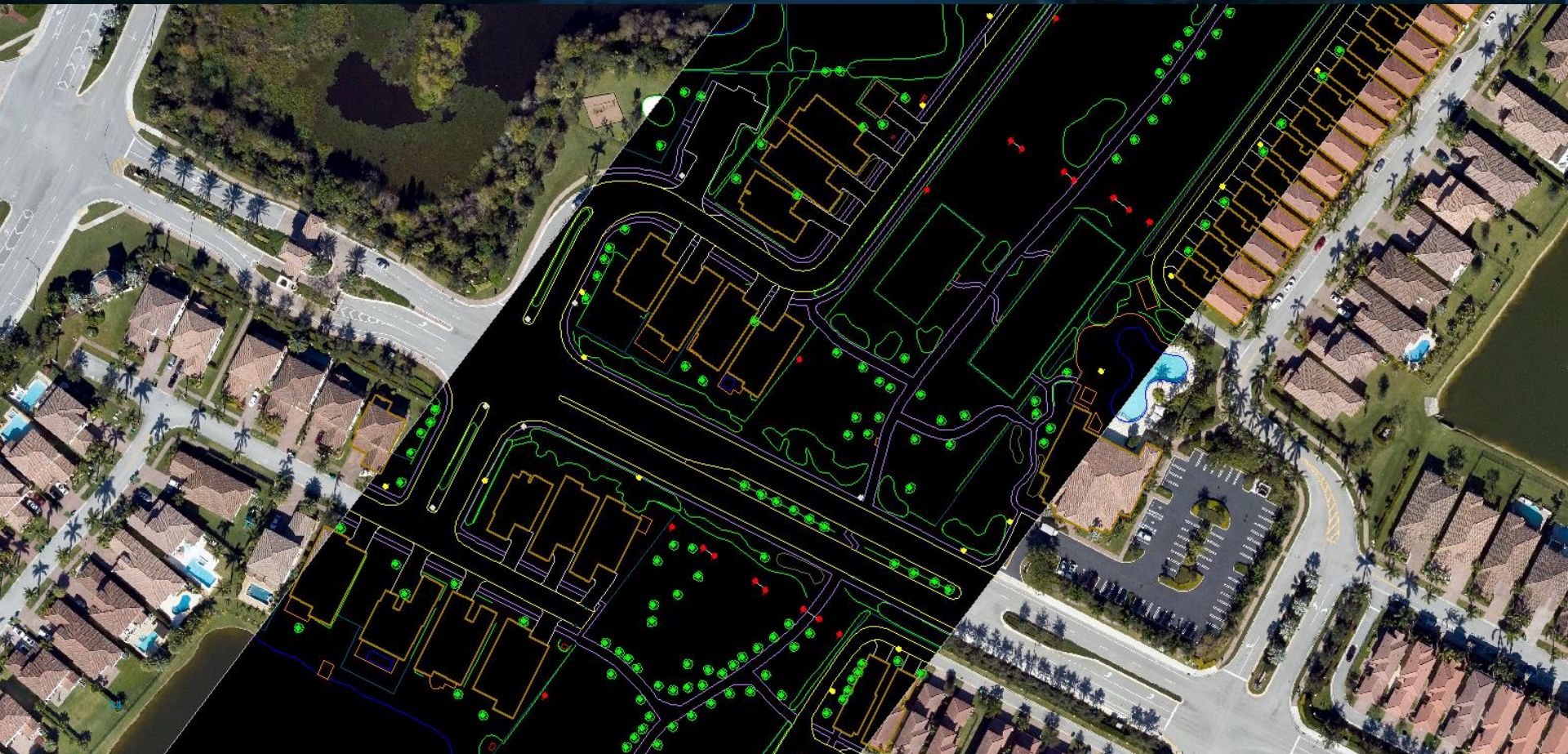


Using remote sensing (LiDAR / Imagery) to supplement survey and pipeline operations

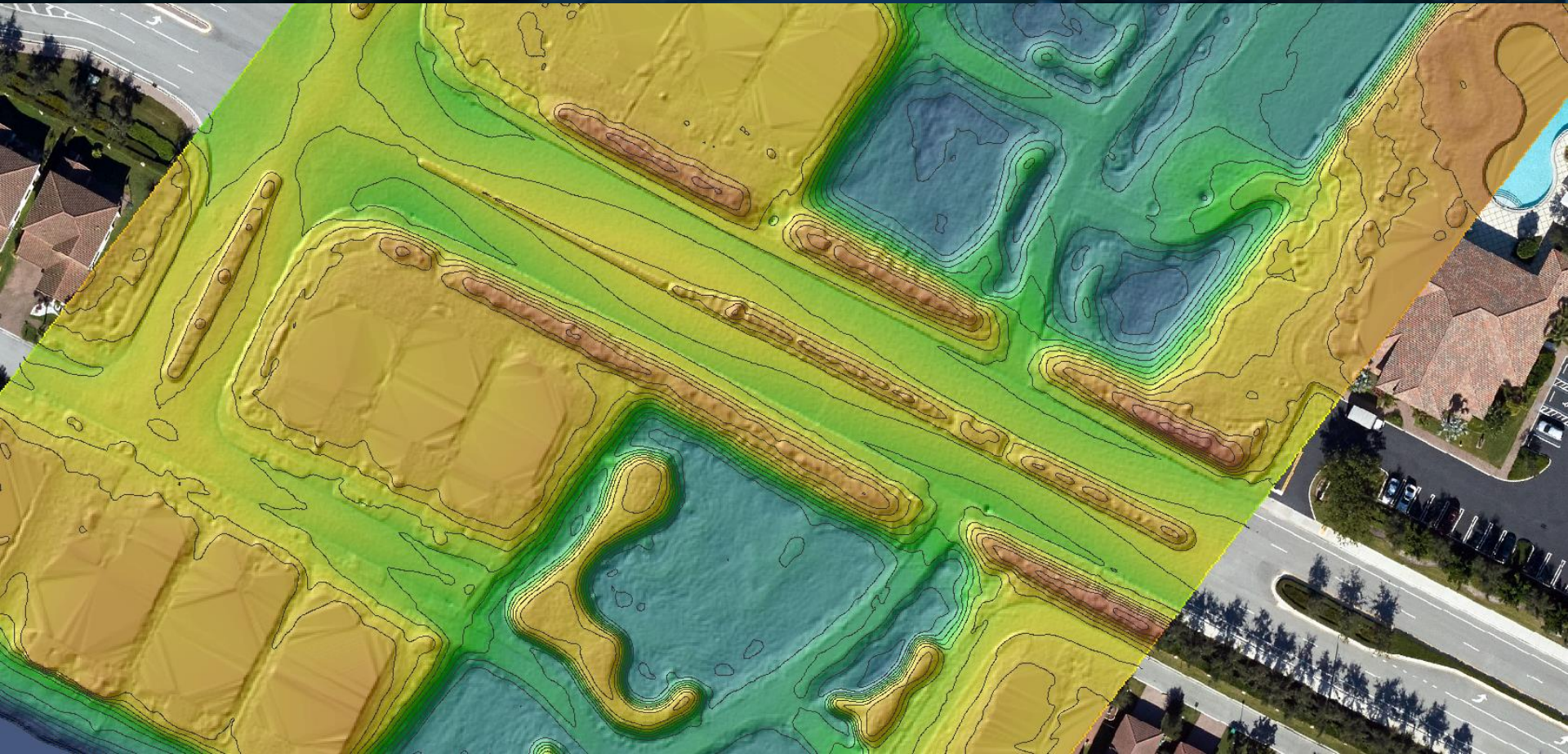
High Resolution Orthoimagery



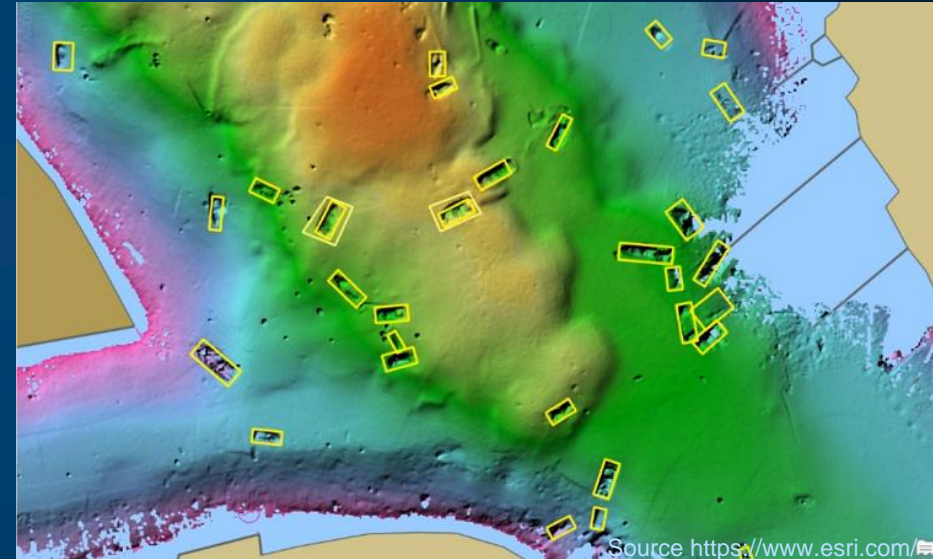
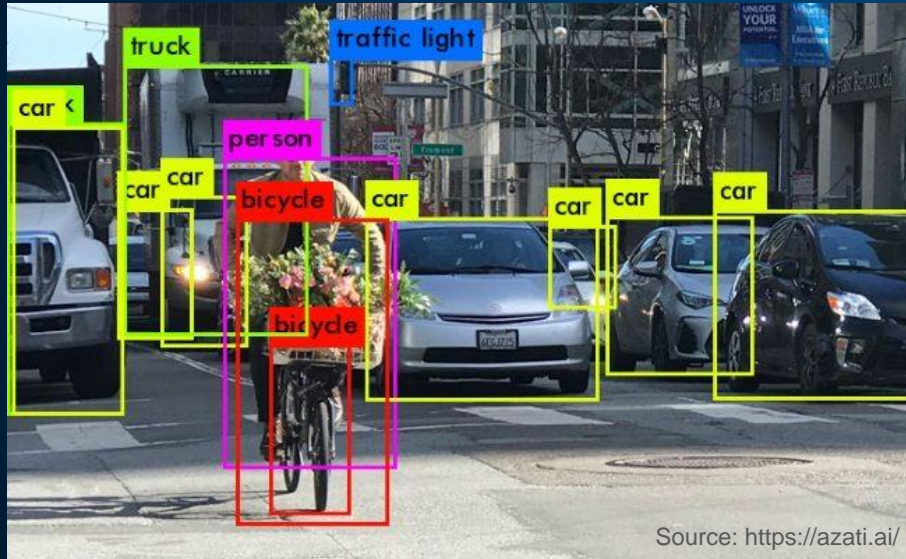
Detailed Planimetric Data



Detailed LiDAR Elevations and Contours

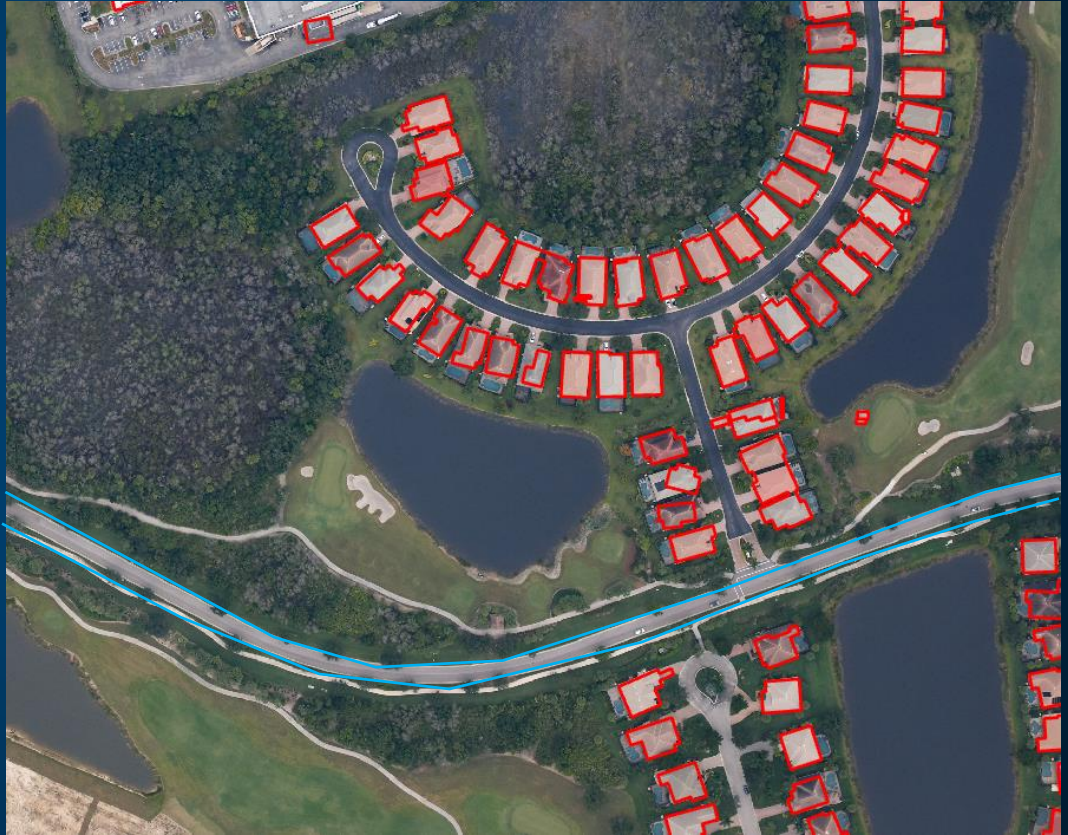


Leveraging Artificial Intelligence (AI) to support Integrity Management Programs.



Class Location, HCA, MCA

Utilizing AI, structures can be automatically extracted and then classified to support Class Location, HCA, and MCA Studies



Algorithms to Support Compliance

✓ ROUTECHECK_EXAMPLE ...

✓ Class_Location ...

1

2

3

✓ HCA_MCA_ ...

✓ HCA, CLASS 3 LOCATION

✓ MCA, 5+ HOUSES IN PIC

✓ MCA, INTERSTATE CROSSING (4+ LANES)

✓ MCA, STATE HIGHWAY (4+ LANES)

✗ Structure PIC ...

✓ PIC_Buffer ...

8"

24"

✓ StructureFootPrint ...

Apartment

Barn

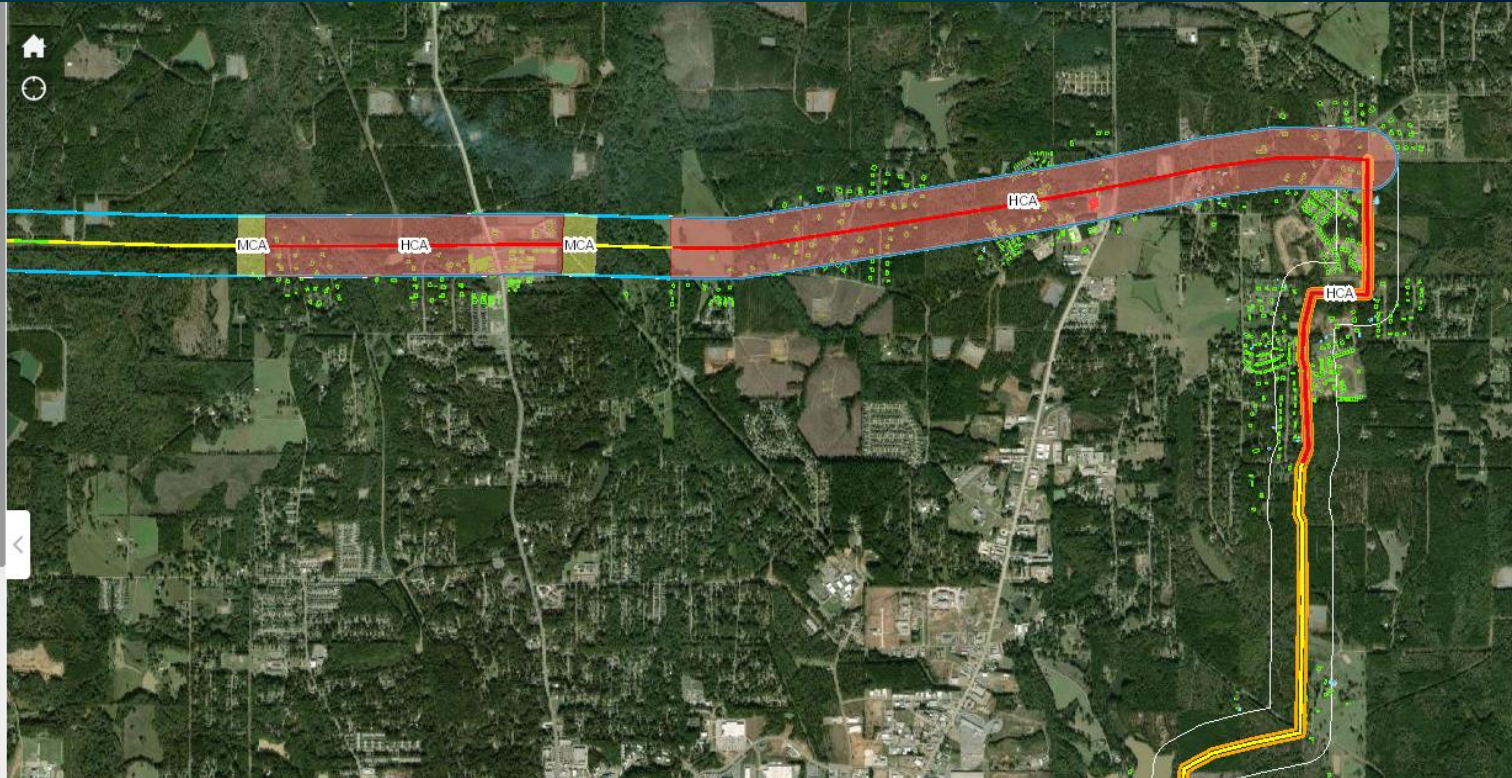
Cemetery

Church

Communication Tower

Community Center

Compressor Station Building



Web based platforms





Thank you!

Any questions?

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