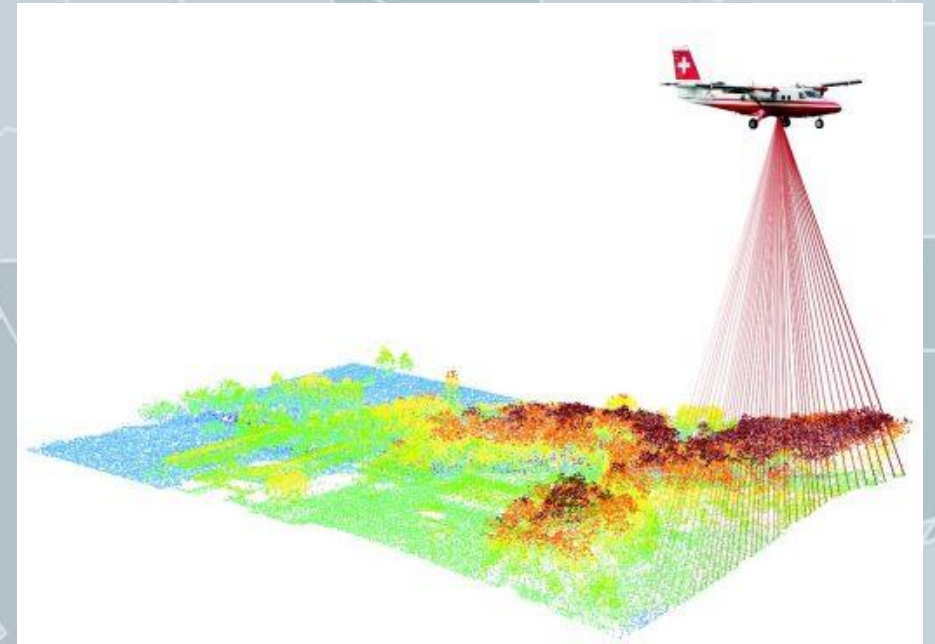
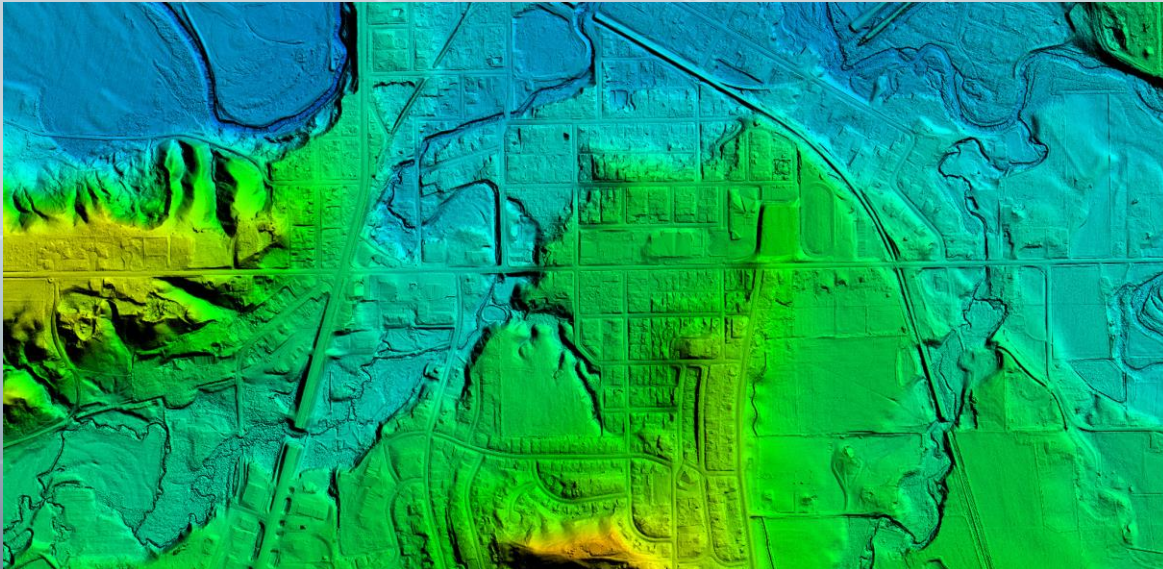


2024 H-GAC LiDAR and Aerial Imagery Cost-Share Program Updates

Thushara Ranatunga, PhD, GISP
GIS Program Lead
Houston-Galveston Area Council

Lidar Explained

- **L**ight **D**etection **a**nd **R**anging
- High-frequency laser scanning
- Airborne, mobile, or stationary
- High-resolution topographic data (3-D point cloud > Elevation Models)



- FEMA Risk Mapping, Assessment and Planning (RiskMAP)
- USGS 3D Elevation Program (3-DEP)

2024 Lidar Scope

- Resolution / Point Density (USGS Quality Levels):

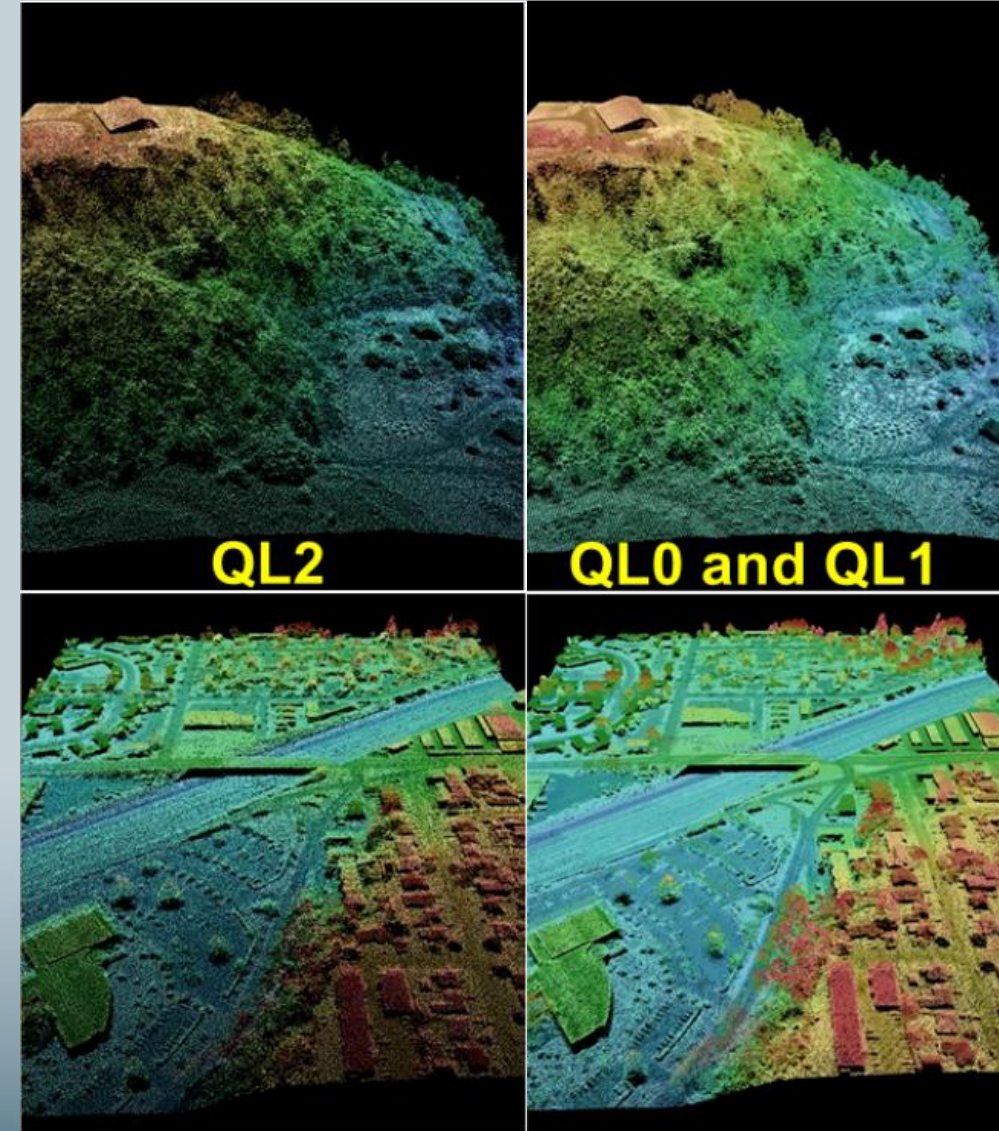
Quality Level	Point Density	DEM Resolution	Vertical Accuracy
QL 2	$\geq 2 \text{ pts/m}^2$	1 m / 2ft	10 cm RMSE _z
QL 2+	$\geq 4 \text{ pts/m}^2$	0.5 m / 1 ft	10 cm RMSE _z
QL 1	$\geq 8 \text{ pts/m}^2$	0.5 m / 1 ft	10 cm RMSE _z
QL 0	$\geq 8 \text{ pts/m}^2$	0.5 m / 1 ft	5 cm RMSE _z

- Products:

- Classified point cloud: ground, vegetation (high, medium, low), structures, water, other/noise
- Hydro delineation breaklines
- 2ft and 5ft Contours
- Digital elevation models (DEMs)
 - Hydro-flattened – water bodies $>2 \text{ ac}$, $>100 \text{ ft}$
 - Hydro-enforced? – for drainage modeling
- Building footprint extraction?

- Est'd. Cost:

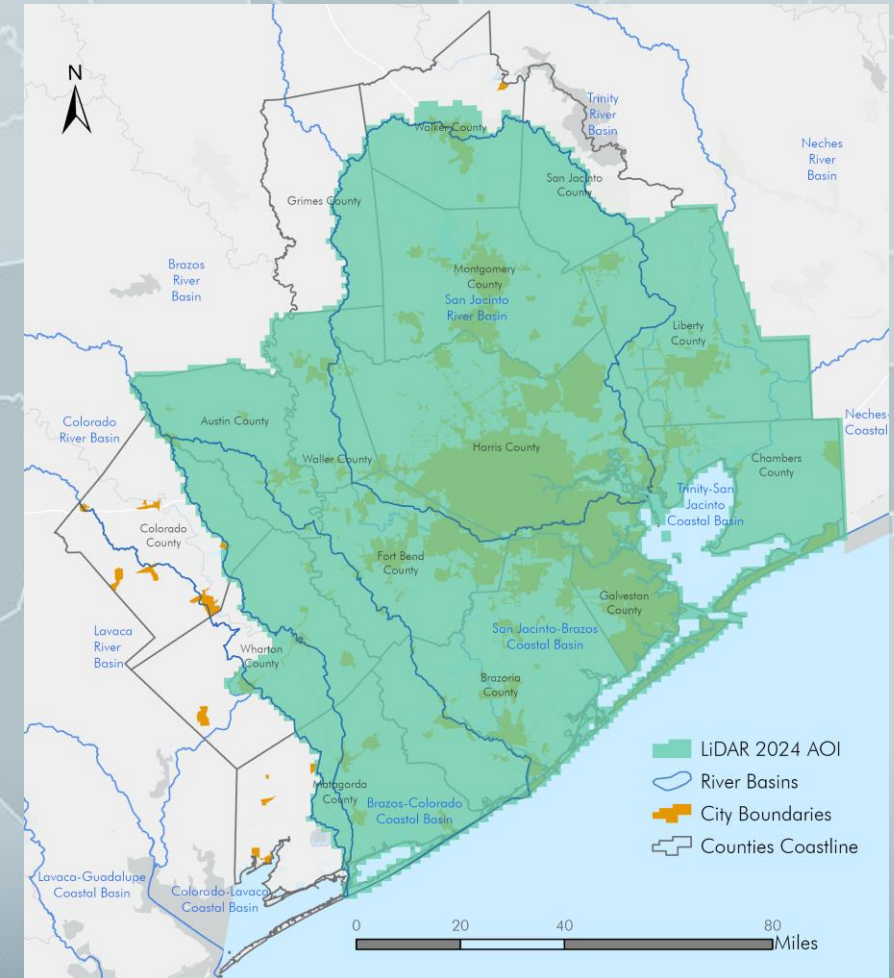
- 8 pts/m^2 : \$240/ mi²



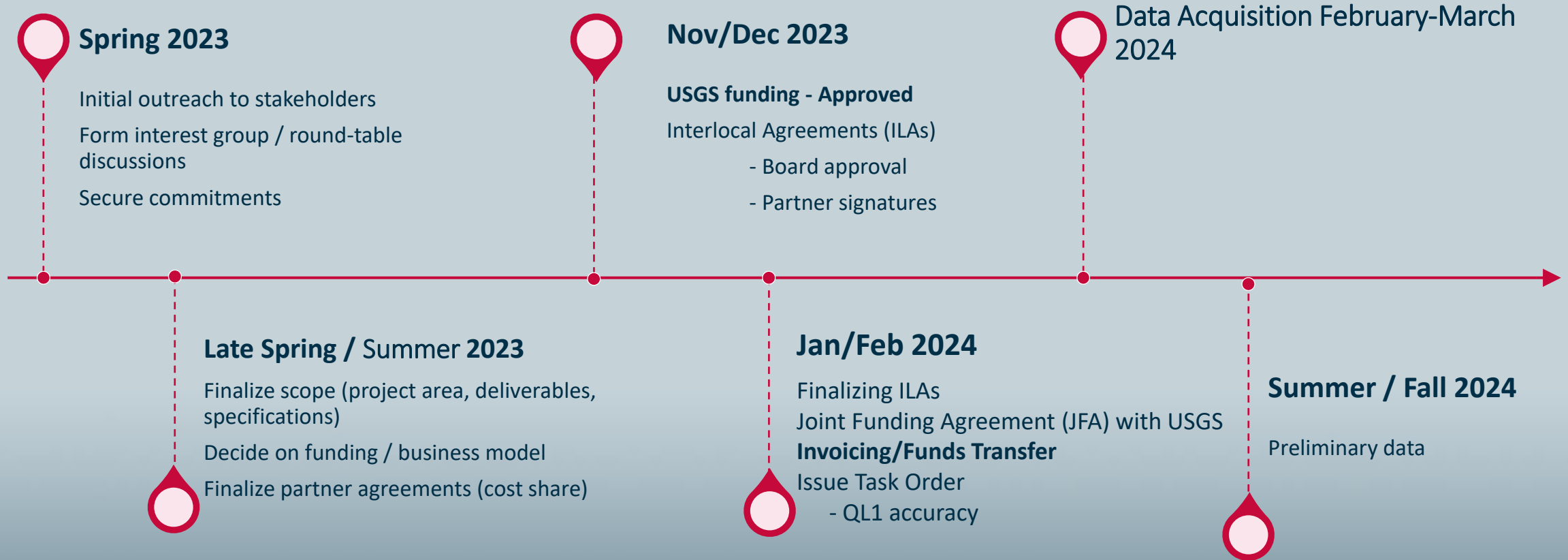
2024 Lidar Program

- Point density of 8 pls/m2 for > 11,500 mi2
- Funds committed by fifteen (15) cost-share member organizations for a total of \$1,764,480.
- Federal contributions through USGS' Data Collaboration Announcement (DCA) for a total of \$1,064,255.
- Total program value \$2,828,735.

Organization	Commitment
Harris County Flood Control District	\$400,000
Harris County Engineering	\$166,000
Liberty County	\$253,000
Fort Bend County	\$183,000
Galveston County	\$120,000
Brazoria County	\$384,000
Waller County	\$94,000
Austin County	\$40,000
City of Houston	\$71,000
City of Pearland	\$9,000
City of Huntsville	\$17,000
Friendswood	\$2,000
Port of Houston	\$16,000
Rice University	\$3,000
City of Wharton	\$6,480



Tentative Timeline

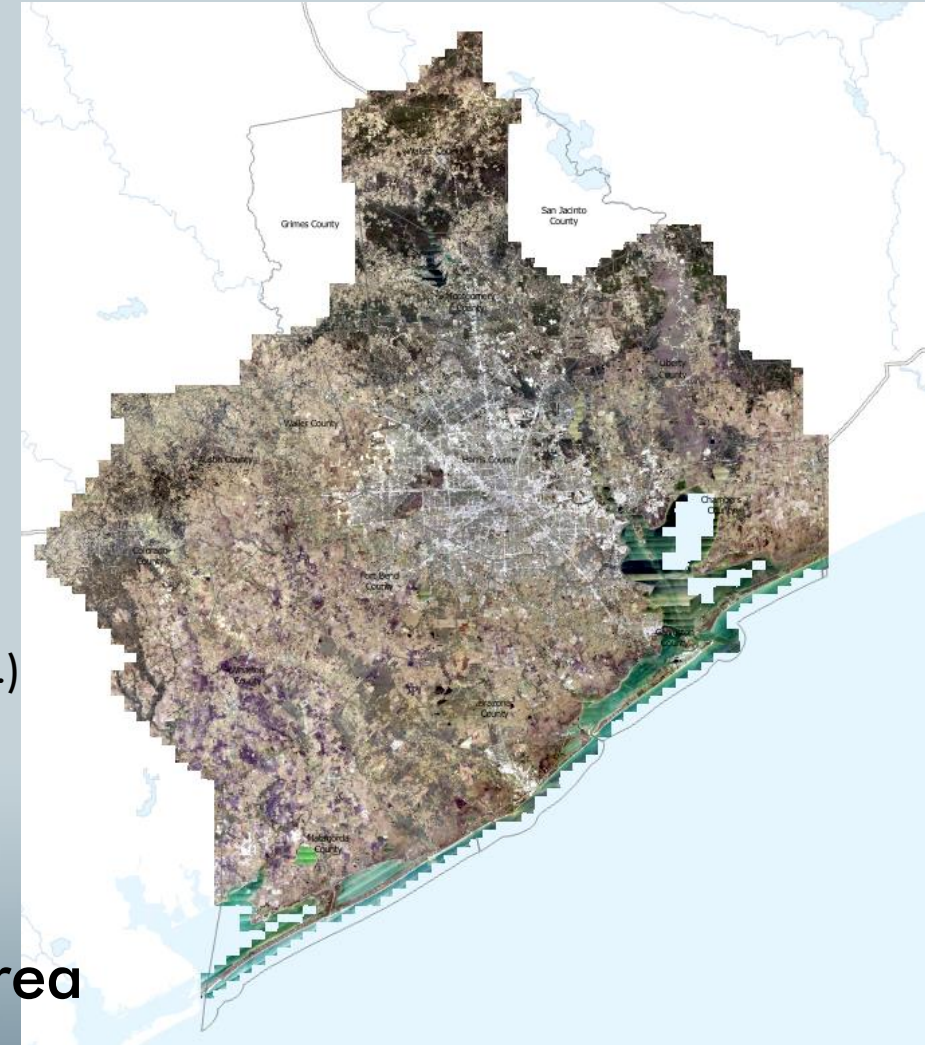


2024 Lidar Next Steps..

- **Task Order – Issued by USGS**
 - Technical requirements (point density, vertical accuracy, point classification, intensity images, derived product specifications - DEMs, etc)
- **Invoicing and Transferring funds**
 - Cost-share partners with fully executed ILAs will receive invoicing
- **Data acquisition**
 - Early-Mid March
- **Preliminary Data Delivery**
 - Point cloud processed with automated routines to denoise and classify ground.
 - Derived bare earth DEM
 - Swath separation imagery
 - Maximum surface height raster
 - Product-level metadata.

Regional Aerial Imagery Cost-Share Program – Upcoming 2024

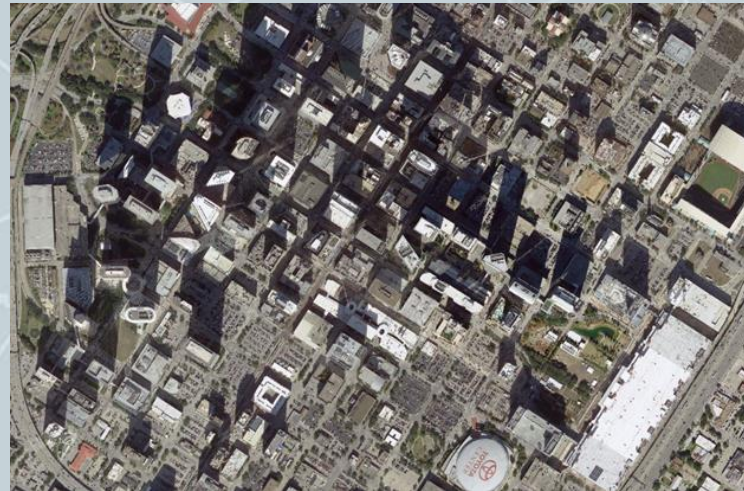
- Region wide Biannual Imagery collection
- Intended uses of the imagery include:
 - Cartographic representation
 - Land use / land cover classification
 - Change detection analyses
 - Planimetrics (feature extraction) for
 - Structures (buildings, porches, fences, etc.)
 - Transportation features (roadways, sidewalks, paths, parking lots, signage, railroads, etc.)
 - Water bodies and associated features (bridges, culverts, dams, etc.)
 - Utilities (power poles, light poles, etc.)
 - Vegetated areas (forested, grasslands, crops, etc.)
 - Other (pools, pads, etc.)
- Last Imagery Collection 2022
 - 6 in – RGB and Color Infrared for 13 County area



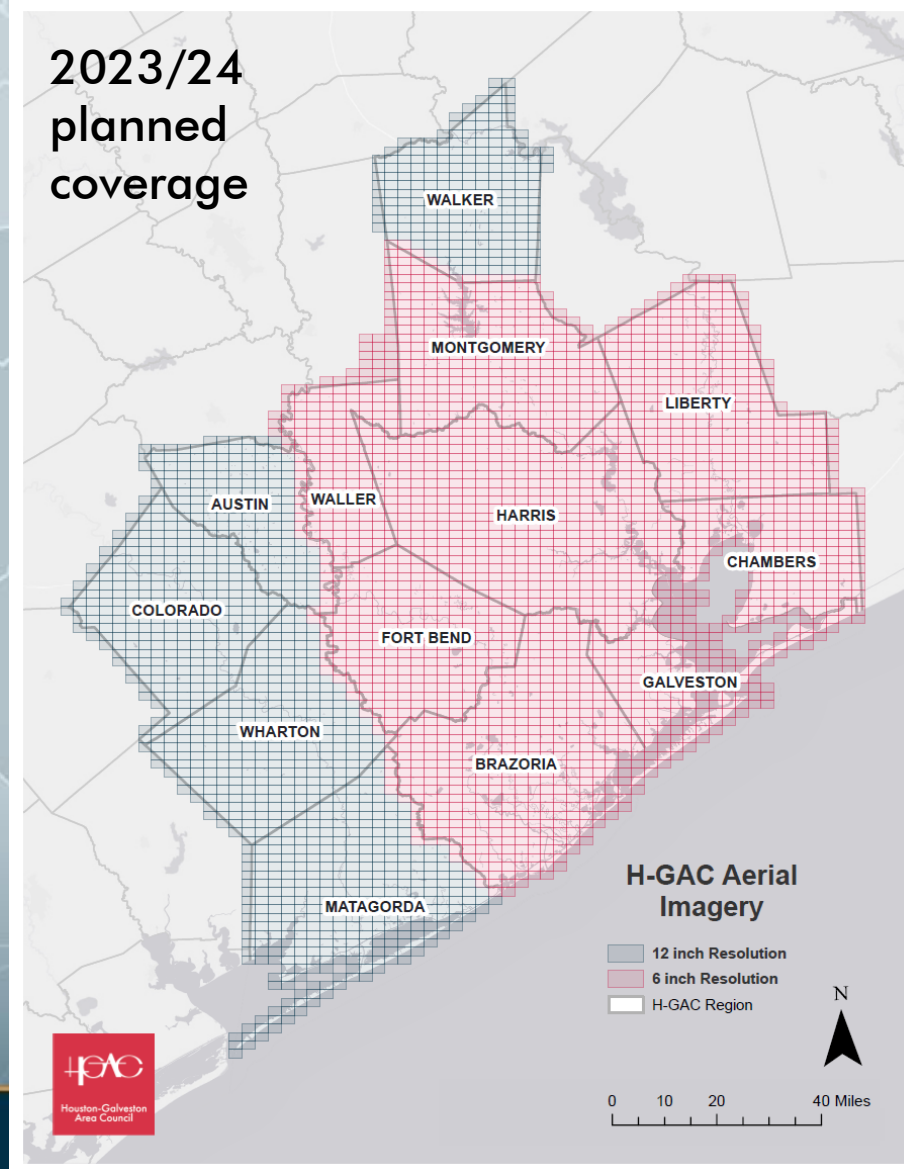
Regional Aerial Imagery Cost-Share Program – Upcoming 2024

Option 1:

- Cost-Share Procurement
- On-prem RGB & CIR
- 6 & 12"
- Total cost: ~\$630k

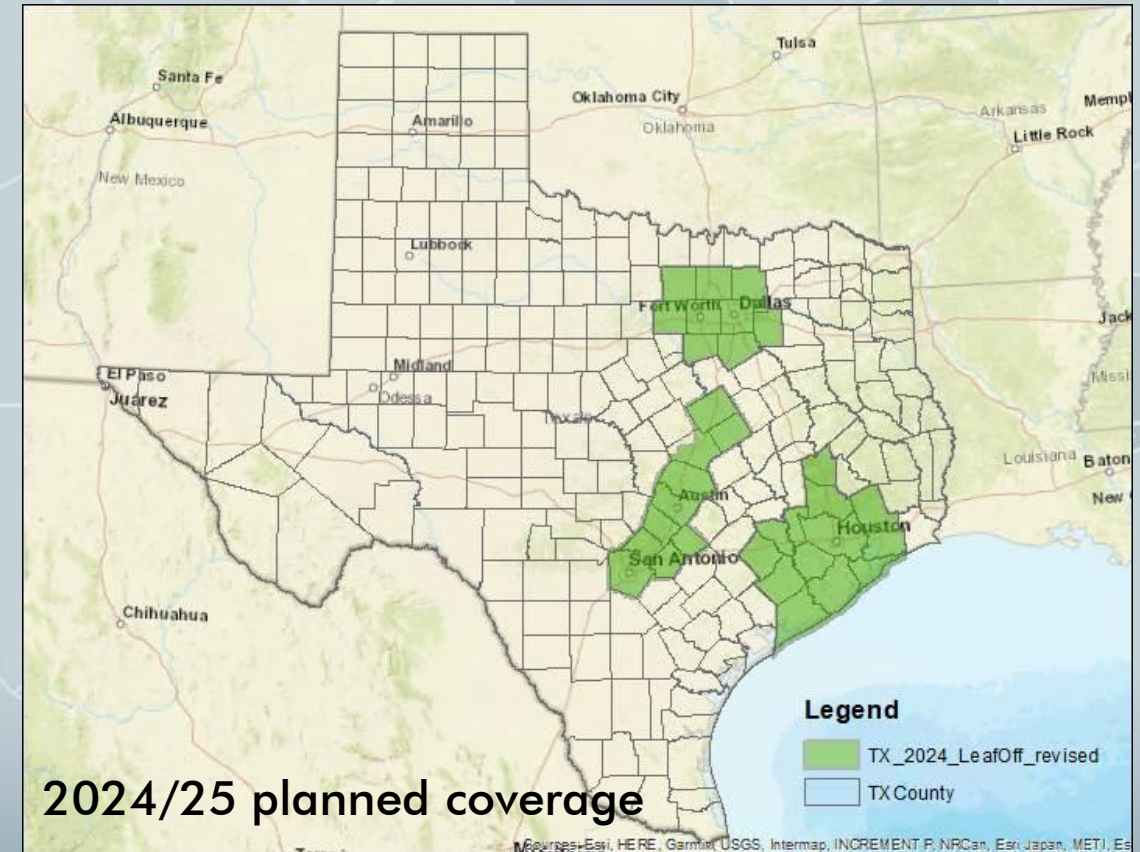


2024 6 Inch CIR & RGB Tiles	2024 6 Inch CIR & RGB Cost
1-15	\$5,000
16-30	\$9,000
31-60	\$15,000
61-250	\$18,000
251-600	\$22,000
601-2,234	\$37,000
2,235-3,473	\$49,000

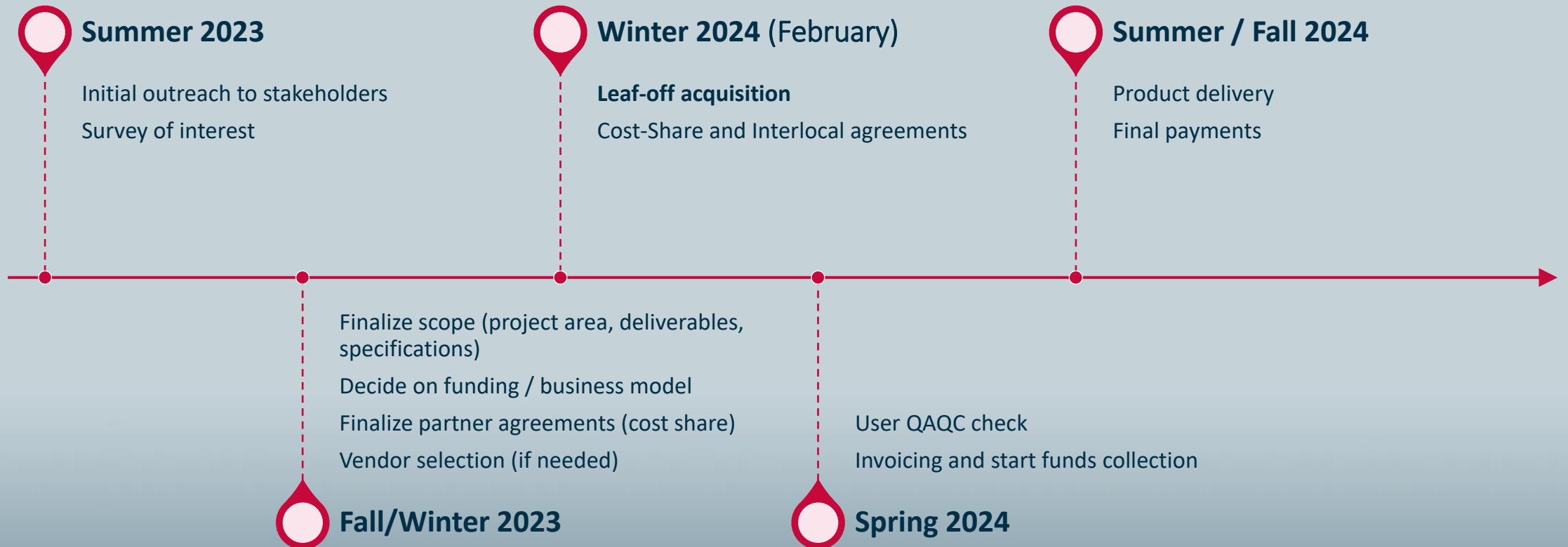


Regional Aerial Imagery Cost-Share Program – Upcoming 2024

- Option 2:
 - TxGIO Streaming Service
 - Subscription-based
 - Gov't. only
 - \$ 2,000 / County / year
 - \$ 200 - \$1,000 / City / year

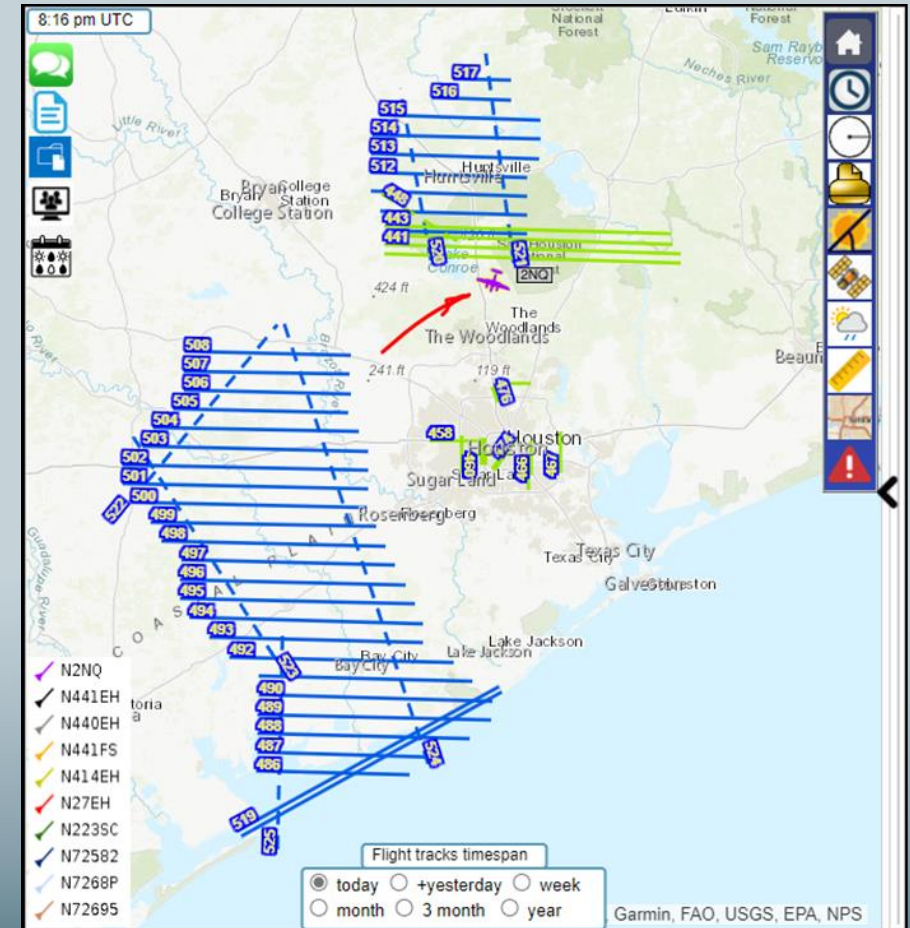
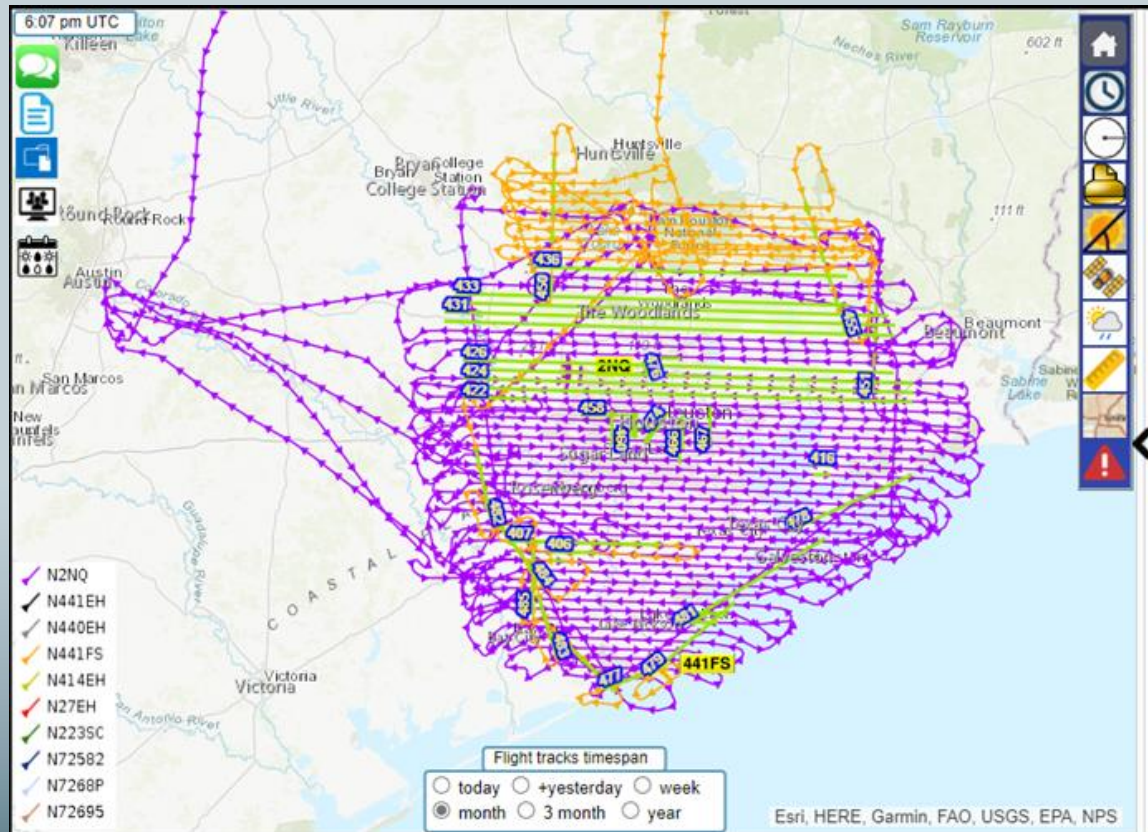


Tentative Timeline



2024 aerial Imagery Next Steps..

- Data Acquisition – Surdex Corporation
 - 3,647 sq. miles (90%) of 6-in completed
 - 100% 12-in remaining



2024 aerial Imagery Next Steps..

- Data acquisition – complete by mid Feb (permitted by weather and sun angles)
- Acquisition inspection and production approval underway
 - If issues arise, re-flights will be scheduled
- Aerial triangulation and Orthorectification (imagery adjusted to fit ground control survey)
- Pilot data delivery for User QA/QC
 - Four to six weeks for review
- Additional processing and final delivery
- Cost-share and Interlocal agreements
 - Requested H-GAC board approval for signing agreements
- Invoicing and Transferring funds
 - Start issuing invoices and funds collection

Contact

■ Jochen Floesser

- Director Data Analytics & Research
- 346-272-9743 (m)
- jochen.floesser@h-gac.com

■ Thushara Ranatunga

- GIS Program Lead
- 832-681-2551
- thushara.ranatunga@h-gac.com