

The background of the entire page is a photograph of two people, a man and a woman, sitting at a desk in a dimly lit office. They are looking at two computer monitors. The monitor on the right displays a colorful geospatial map with various shades of blue, green, yellow, and red. The man is on the left, wearing a blue shirt, and the woman is on the right, wearing a black and white striped shirt and glasses. The overall atmosphere is professional and focused.

GEOSPATIAL SERVICES

Improve accuracy, mobility and efficiency of your geospatial projects



Delivering value from acquisition to execution.

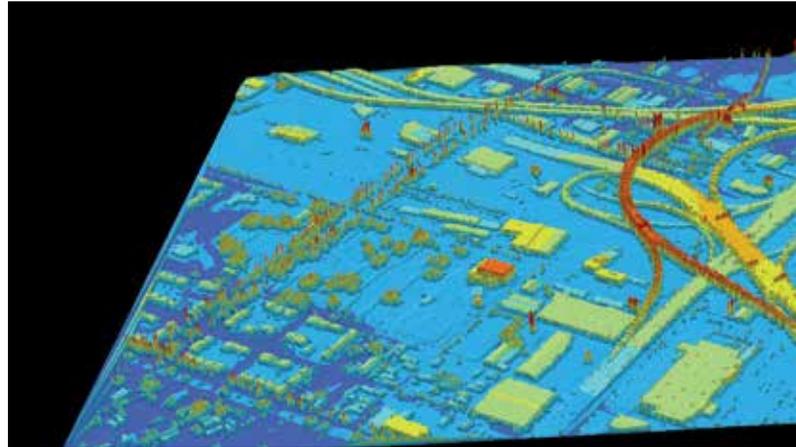
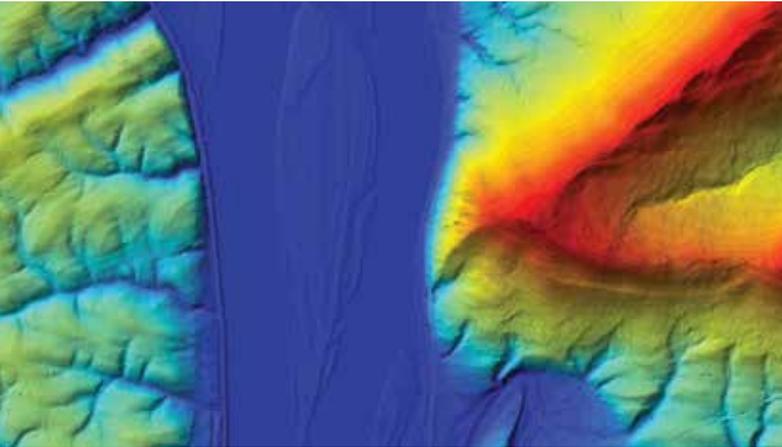
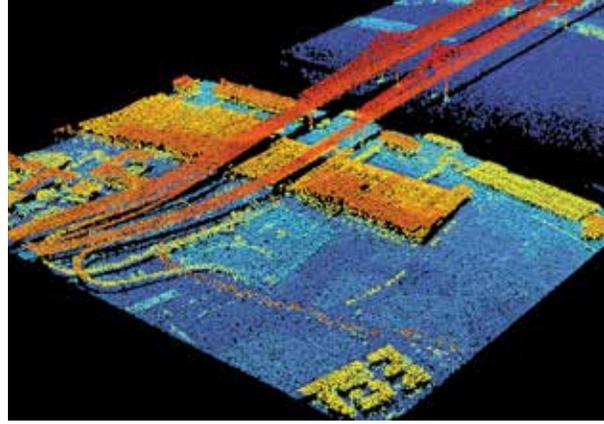
HGA geospatial experts combine leverage their expertise and industry-leading technology and software to collect, process, integrate, and distribute data for more-effective decision making.





Regardless of your project scale, complexity or operational dynamics, let us help you:

- Our expertise in LiDAR comes from our real-world experience, helping us deliver accurate data so that you can make informed decisions, reducing planning uncertainty.
- Improve your project development plans with high-resolution imagery from our aerial photography experts and industry-leading photo equipment.
- Our GIS team delivers comprehensive, integrated visualizations to provide deeper insights into data—from parcel mapping to pipeline right-of-way—helping clients make smarter decisions.
- Our unmanned aerial systems (UAS) deliver high resolution data that captures exceedingly precise points to use for design, calculations, and map products while improving safety, planning and design.



LiDAR Mapping Services

Our ASPRS-certified professionals and technicians have conducted hundreds of major LiDAR surveys. Over the years, our team has garnered extensive experience at all scales, from small area engineering projects to multi-county wide area acquisitions; the HGA geospatial team has the experience to accommodate projects of all sizes. With ASPRS-certified LiDAR Mapping Scientists on staff, our team ensures that all LiDAR products conform to applicable ASPRS and USGS specifications. During data acquisition, HGA's experienced specialists acquire aerial data from fixed-wing aircraft, helicopter, and unmanned aerial systems (UAS). HGA can even deploy multiple flight crews to collect a wealth of aerial data in a short window of time. In addition, HGA utilizes industry-leading sensors to deliver high-density and high-quality topographic and bathymetric LiDAR data. Finally, our dedicated processing teams use state-of-the-art processing software to generate data deliverables and verify complete data acquisition coverage.

Clients choose HGA for our dedication to deliver quality and on-time accuracy for their projects. They appreciate the sense of certainty they can derive from knowing that our geospatial analysts and professionals acquire, calibrate, edit, QC, and derive products from LiDAR data to the highest standards.

HGA LiDAR products and services include the following:

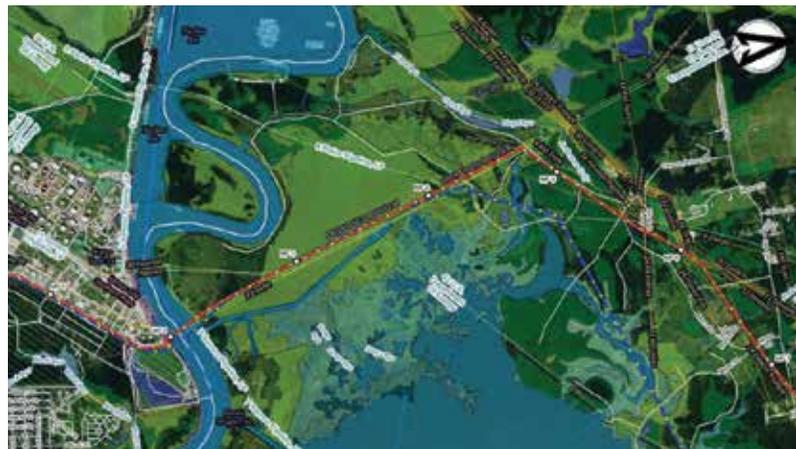
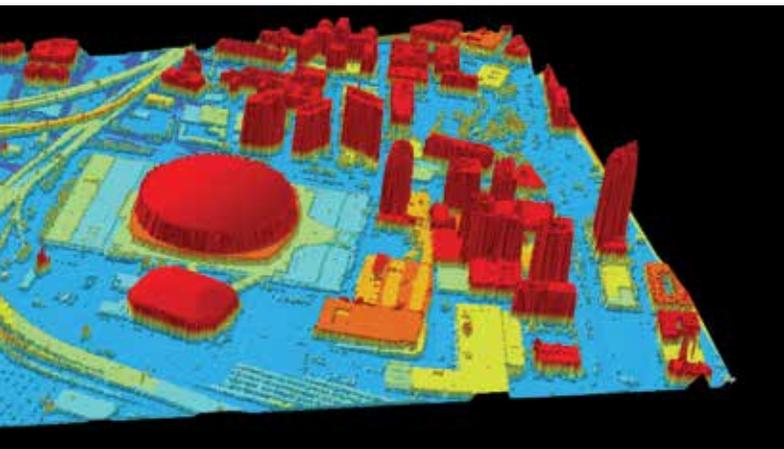
- Dedicated aircraft
- Data acquisition
- Flight crew management

- Flight planning
- Calibration
- Automated point filtering and classification
- Manual surface editing and cleanup
- Break lines and hydro-flattening
- DTM, DSM, CHM surface production
- Contour Generation
- USGS and ASPRS specification compliance
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GIS

HGA is a recognized leader in geographic information systems (GIS) solutions for our clients' program objectives. Widely used in many types of engineering projects, GIS has enhanced our surveying, mapping, and data acquisition capabilities. From pipeline planning to parcel mapping and more, HGA GIS services helps clients by providing affordable and accurate ways to analyze their mapping data.

Our certified GISP and ESRI ArcGIS Professional GIS specialists offer a unique combination of expertise, proprietary workflows, and software to transform information needed to make better-informed business decisions. The HGA GIS team also works with clients to identify the



right GIS solution to meet their exact needs and budgets. Unlike other companies, the HGA GIS team can leverage our existing hardware and software resources to accommodate large or smaller client focused tasks, all while maintaining cost efficiency. Our GIS team is proficient in all ESRI products and extensions, Trimble mapping and GIS software, ERDAS Imagine, and has experience with a variety of other industry-specific software platforms. The result: optimized images customized for your project and improved product quality.

Some of these capabilities are listed below.

- Land ownership mapping
- Geodatabase design and development
- High volume digitization and editing
- GIS/CAD data conversion
- Existing GIS workflow refinement
- Model building and programming custom tools
- Site selection and suitability analysis
- GPS mapping and data processing
- Web-based mapping and ArcGIS Online integration
- Pipeline right-of-way mapping
- Parcel mapping and municipal GIS support
- Address point mapping and geocoding
- Volumetric analysis
- Construction progress visualization

SUCCESS STORY

Producing design plats 40% faster

A large pipeline client required the expansion of three major gathering areas in Reeves County. The objective was to map 200 miles in five months to support the large-scale project.

HGA began the field alignment surveys and completed the initial field work within six weeks. The resulting surveys allowed HGA's pipeline designers to start the next major undertaking of producing all of the property plats. The first plats were issued in less than two weeks, and over the next six weeks, approximately 470 plats were issued. This is due in large part to the quality of HGA's field survey staff and HGA's advancements in utilization of GIS technology.

By utilizing our workflow processes for gathering field data and processing it using our current GIS based software, we have been able to reduce our time to complete plats and alignments by nearly 40%. Our advanced capabilities allow our field survey and GIS teams to produce property plats and construction alignment sheets more efficiently and at a higher quality.



Aerial Photography

When high-resolution aerial photographs are needed, HGA can help capture the complete view of large areas. Regardless of your project size, our photogrammetrists work with you to identify and acquire high-quality imagery to help you track construction progress, development planning, environmental, pipeline construction and disaster recovery planning. Through access to the latest technology, HGA is ready to mobilize our flight operations team and deploy aircraft with large-format metric cameras to provide the very best aerial photography possible. Additionally, HGA utilizes industry leading software to process all Aerial Triangulation and Orthophoto projects in-house for crisp digital aerial imagery. Our professionals are ASPRS Certified Photogrammetrists with extensive photogrammetric experience in all phases of mapping and other mensuration requirements, including planning and supervising photography, managing mapping projects, and interpretation. HGA can also coordinate with all parties to ensure project specifications are met, and accurate targets are fulfilled.

HGA's aerial imagery product and services:

- RGBN imagery acquisition
- Quick-turnaround imagery
- AT and Orthophoto production
- Mosaic creation
- Photogrammetric DSM and point clouds
- Image classification and segmentation

Unmanned Aerial Systems

HGA's unmanned aerial systems (UAS) solutions deliver hands-off piloting visualization from takeoff to landing, delivering highly precise points to use for design, calculations, and certifications from one short flight. Our Unmanned Aerial Vehicle (UAV) solutions are more flexible and cost-effective than piloted aircraft since they can be deployed repeatedly, rapidly and at reduced costs. Our high-resolution camera sensors capture hundreds of images in the locations necessary to generate high-density 3D point cloud models and with the use of GPS collected ground control, these point clouds will be within survey grade accuracy tolerance. Data is uploaded automatically and wirelessly to the cloud for fast processing and reporting.

The HGA UAS team has the skills and capabilities to deploy our unmanned vehicle, anytime, from any location for your project. We have an in-house specialist with a Remote Pilot in Command (RPIC) License obtained from the FAA, and multiple staff trained as pilots and visual observers. The onboard flight computer system uses a variety of sensors to deliver a hands-off, autonomous piloting experience from takeoff to landing, and can cover hundreds of acres in minutes. Real-time flight and data collection information is streamed to the ground station from all aircraft utilizing onboard telemetry radios. Using reliable, customized UAVs, we can vastly reduce the time spent collecting accurate data, resulting in more accurate project plans, models and operations.



HGA's UAS solutions will assist in the planning and design of any project, including construction sites, route development, infrastructure inspection and environmental studies. Your project will benefit from our advanced technologies and software for planning, design, and layout operations, all of which help you reduce collection/inspection time, for faster analysis and monitoring.

Our unmanned aerial systems make the inspection process quicker and safer. We do this by pre-programming waypoints for flights using Google Earth, which allows the drone to scan the site and capture high resolution images to give you a better understanding of your operation. The technology can help you with a wide range of issues, from right-of-way inspections to surveillance. In an infrastructure inspection program, we used infrared equipment and visual cameras on the UAV to find hot spots in addition to other infrastructure faults. With our ROW/route development accuracy, we can gather high-resolution map images necessary for a better understanding of operations, resulting in more accurate project development plans.

Our applications are:

- Aerial orthographic imagery
- Topographic surveys
- Site and infrastructure inspections
- Construction progress monitoring
- 3D modeling and asset measurement
- Volumetric calculations

- ROW inspections/class studies
- Route development
- Emergency management
- Environmental studies

About us

Over the past two decades, HGA has built an unrivaled culture by collaborating with our clients, leveraging our experience and delivering on our commitments to an extensive portfolio of customers. We seek long-term partnerships with our clients. Everything we do is grounded on our core values of building long-term customer relationships by listening to our clients. Our combination of resources enables us to deliver high-quality geospatial services and deliver objective information to increase the efficiency of each project. Our experts have conducted hundreds of major projects—from wide area QL1 LiDAR acquisitions and processing, to pipeline corridor mapping, adding valuable insight that has helped improve geospatial decisions across the entire planning cycle.

For more information on how HGA can help you with your next geospatial project, contact your HGA representative, email geospatial@hga-llc.com or visit www.hga-llc.com.

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