UNMANNED AIRCRAFT SYSTEMS (UAS)

OVERVIEW:

The GIS Department's Drone Program is a testament to our commitment to precision and innovation. By leveraging unmanned aircraft systems, we enhance mapping data with a level of accuracy that is both safe and transparent. This dedication to embracing cutting-edge technologies improves service delivery and safeguards our community's privacy and security, instilling confidence in our operations.

Unmanned aircraft systems (UAS) are rapidly evolving technologies increasingly used by law enforcement, first responders, and GIS professionals for mapping purposes. A drone, also known as an unmanned aerial vehicle (UAV), is a vital component of UAS. UAS encompasses the entire system, including the aircraft and the ground control unit, while UAV refers explicitly to the drone itself.

WHAT IS DRONE MAPPING?

Drone mapping uses aerial imagery to create 2D and 3D maps, models, and other outputs, such as ortho-mosaics.

3D drone mapping is efficient and much more cost-effective than traditional alternatives. It can be especially useful for creating maps of hard-to-reach or hazardous locations, minimizing the need to walk the area and increasing safety.

Drone mapping supports informed decision-making by providing accurate, up-to-date visualizations through photogrammetry. It also enables the efficient management of resources across all the sectors where it is used.

<u>Photogrammetry</u> is the science of collecting physical information from two-dimensional photos, often aerial images captured by drones. By combining overlapping, geotagged images of the same features from different angles, photogrammetry software generates photorealistic 3D representations of topographic surfaces.

<u>Drone photogrammetry</u> captures aerial site photos to create a 3D map with GPS coordinates and accurate measurements.

HOW IS UAS MAPPING USED?

Drone mapping creates a <u>digital twin</u> (a computerized reflection of the site or area). This makes it easy to replace time-consuming base and rover surveys with a simple, efficient drone survey flight.

Software like ArcGIS Drone to Map or Pix4D converts drone images and flight data into an interactive 3D map that can be used for various purposes.

DRONE MAPPING APPLICATIONS ACROSS THE BOARD

Drones are used for a variety of missions, such as mapping/surveying, public safety, and emergency response, including, but not limited to:

- Conducting damage assessment,
- Gathering and maintaining situational awareness during emergencies, site operations, exercises, and planned events,
- Conducting fire or hazardous materials response activities,
- Performing search and rescue operations,
- Conducting infrastructure assessments,
- o Inspection of radio towers and associated communication infrastructure,
- Inspection of buildings, roads and bridges.

TOOLS & SOFTWARE

- \circ To aid in the achievement of these responsibilities, the GIS department utilizes:
- ESRI products
- ArcGIS Drone to Map
- o Pix4D
- DJI Mavic 3 Enterprise Drones
- DJI D-RTK 2 High Precision GNSS Mobile Station
- Trimble DA2 Receiver and TerraFlex Advanced

POLICIES & REGULATIONS

Our policies and administrative regulations are intended to improve the efficiency of departmental operations, ensure the security of employees, the community, and personal property, and respect and protect the public's privacy. The UAS administrative regulation provides a framework and direction to all county departments. Each County department is responsible for developing and integrating its own UAS program to meet its department mission objectives and the County's needs while ensuring that they follow the policy outlined in this UAS Policy.

UAS Policy

Part 107 FAA Summary Sheet

PUBLIC AGENCY UAS COA:

2024-WSA-13877-COA

UAS RESOURCES

Emerging technologies, like drones, can be leveraged to enhance and strengthen the country's capabilities. To ensure that these new technologies meet the needs of the county. Our office must continue to evaluate our current resources and plan to integrate new technologies and capabilities into our training and exercises.

For more information on drone technology, visit:

https://www.faa.gov/uas

https://faadronezone-access.faa.gov/#/