National Transportation Safety Board

Office of Highway Safety

Washington, DC 20594

HWY23MH004

SUAS SPECIALISTS REPORT

Specialist's Factual Report

October 17, 2023

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A. CRASH INFORMATION

Location: Williamsburg, VA
Date: December 16, 2022
Time: 1:36 A.M. EST

B. SUAS SPECIALISTS GROUP

Specialist, RPIC   Eric Gregson
                        National Transportation Safety Board
                        Washington, D.C.

Visual Observer   Bob Squire
                        National Transportation Safety Board
                        Washington, D.C.

C. SUMMARY

For a summary of the crash, refer to the *Crash Information and Summary Report,* which can be found in the NTSB docket for this investigation.

D. DETAILS OF IMAGERY

1.0 Equipment

Mapping and imagery flights were conducted on December 18th, 2022, using the NTSB DJI Phantom 4 Professional V2. The sUAS[1] is equipped with a dual GPS/GLONASS receiver which provides geo-referenced information on all still photos. The drone is equipped with an FC6310 camera using the Sony Exmor 1" CMOS sensor, with a focal length of 8.8 mm. Still photo resolution is 20 megapixels in JPG or RAW format.

2.0 Procedures

The crash scene was located on eastbound Interstate 64 located at coordinates 37.279032°N and -76.664195°W. The crash was in class G airspace, approximately 3.4 miles northeast of JGG Williamsburg-Jamestown Airport. There was no significant terrain, environmental, or obstruction hazards. The flight was conducted under 14 CFR 107. With the assistance of Virginia Department of Transportation, the right lane of eastbound I-64 was closed to assist with the scene documentation. **Figure 1** shows

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[1] sUAS – small Unmanned Aerial System

the crash scene, circled in red, and Williamsburg-Jamestown Airport, circled in orange.
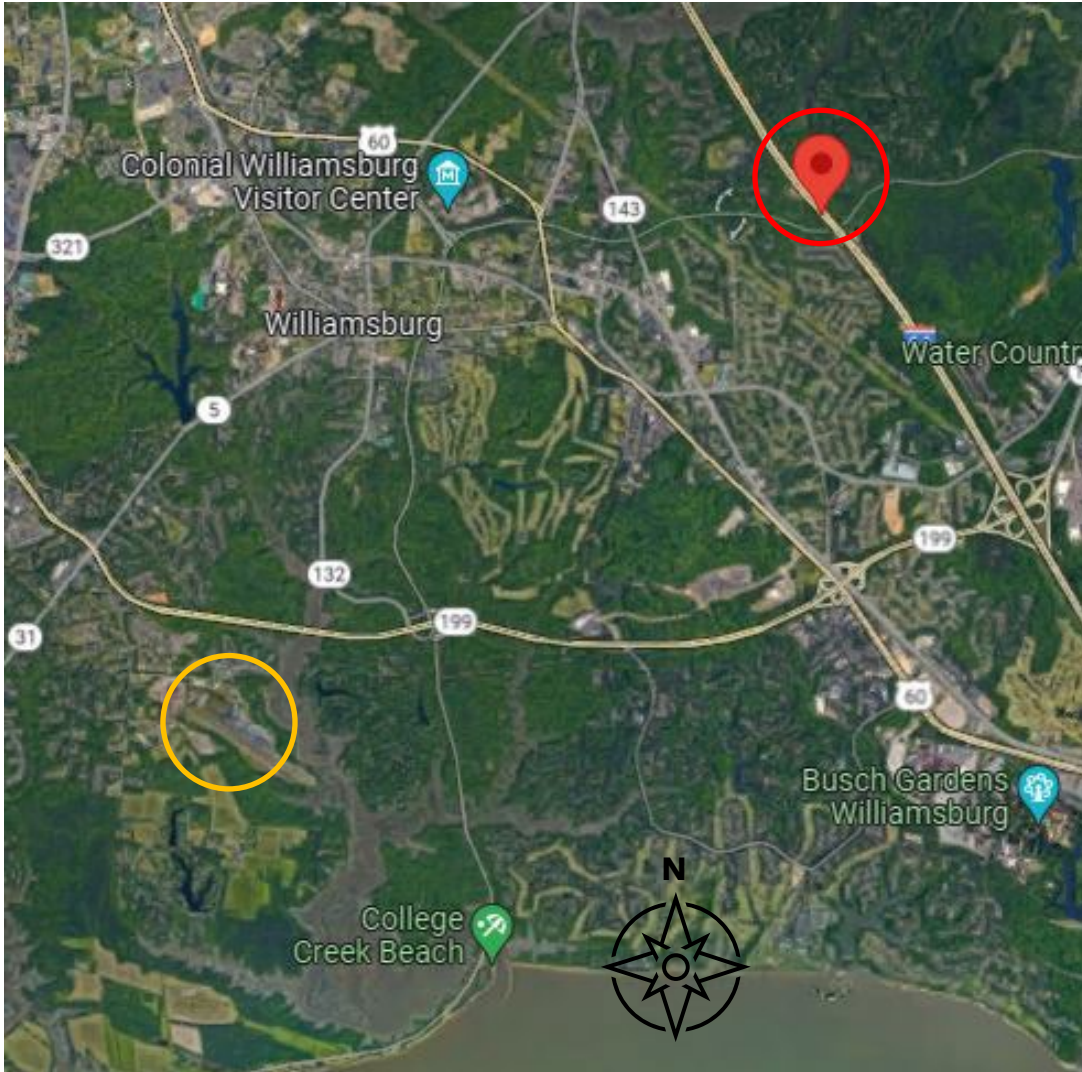
Figure 1. Image showing the nearest public airport to the crash location. (Source: Google Maps revised)

To obtain imagery for the orthomosaic map, the sUAS was flown over the collision area manually at various altitudes not exceeding 400 feet AGL. An additional manually flown orbit was conducted over the bus while at the tow facility.

A total of 3 flights and 389 photos were accomplished over the designated date/time. Total flight time was about 26 minutes.

3.0   Processing

The sUAS captured 333 high resolution, georeferenced photographs suitable for processing in the Pix4D photogrammetry software.[2]

The photographs taken using the sUAS were processed using Pix4D to create a point cloud of the crash scene. An oblique view of the point cloud can be seen in **Figure 2**. From the point cloud, a high resolution orthomosaic image was created of the crash scene and can be seen in **Figure 3**.

Figure 2. Screen capture of the generated three-dimensional point cloud from Pix4D

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[2] Pix4DMapper is a photogrammetry software package designed to use overlapping photographic images to generate 3D point clouds. Additional outputs from the generated point clouds include 3D models and 2D orthomosaic maps

Figure 3. Orthomosaic image.

The sUAS was used to capture 76 high resolution, georeferenced photographs of the bus involved in the crash suitable for processing in the Pix4D photogrammetry software. The resulting point cloud of the bus can be seen in **Figure 4**.

Figure 4. Screen shot of the three-dimensional point cloud.

Submitted by:

Eric Gregson
UAS Aerial Imagery Specialist/RPIC