

# Summary of the Proof-of-Concept Flights at MHA Nation on September 17 and 18, 2024

## On behalf of the MHA Drone Project: Planning and Protocol Development

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**Purpose:** The project goal was to develop an MHA Nation driven use case with a proof-of-concept flight to explore the use of an uncrewed aircraft system (UAS), or drones, for a direct flight between New Town, ND, and Twin Buttes, ND. The long-range goal is to eliminate extensive ground transportation time and risk between the two locales.

**Summary:** Two beyond visual line of sight (BVLOS) flights were conducted between the Veterans Administration Building in New Town and the Pavilion/powwow grounds in Twin Buttes, ND on September 17 and September 18. **The flight time on September 17 was 30 minutes and the flight time on Sept 18, 2024 was 39 minutes.** Both days had extensive winds which would have resulted in additional time. Without wind, the flight time would be 23 minutes. **The use case was proven successful and scalable for future operations.**



Figure 1. Display of Swoop Aero Kite at Community Event at Earth Lodge Village



Resolution No. 24-155-FWF

### RESOLUTION OF THE GOVERNING BODY OF THE THREE AFFILIATED TRIBES OF THE FORT BERTHOLD INDIAN RESERVATION

A Resolution Entitled: "MHA Drone: Planning and Protocol Development Use Case."

WHEREAS, This Nation having accepted the Indian Reorganization Act of June 18, 1934, and the authority under said Act and having adopted a Constitution and By-Laws pursuant to said Act; and

WHEREAS, The Constitution of the Three Affiliated Tribes, also Known as the Mandan Hidatsa Arikara Nation ("Tribes" or "MHA Nation"), generally authorizes and empowers the Tribal Business Council to engage in activities on behalf of and in the interest of the welfare and benefit of the Tribes and of the enrolled members thereof; and

WHEREAS, Article III of the Constitution of the Three Affiliated Tribes provides that the Tribal Business Council is the governing body of the Tribes; and

WHEREAS, Article VI, Section 5(i) of the Constitution of the Three Affiliated Tribes provides the Tribal Business Council authority to adopt resolutions regulating the procedure of the Tribal Council and other Tribal Agencies and Tribal Officials of the Reservation; and

WHEREAS, The Three Affiliated Tribes of the Fort Berthold Reservation has been awarded a Strengthening Mobility and Revolutionizing Transportation ("SMART") grant FY22N1P1G3, for the Project entitled "MHA Drone Project: Planning and Protocol Development," from the United States Department of Transportation ("US DOT"), to explore Unmanned Aerial System ("UAS") technology in furtherance of delivering lifesaving medical supplies and other beneficial health materials to members of this Nation between New Town and Twin Buttes on the Fort Berthold Reservation; and

WHEREAS, The MHA Project Team supporting this use case includes Nucta, Hidatsa, Sahnish (NHS) College, the University of North Dakota, the Northern Plains UAS Test Site, Airspace Link, and Thales; and

WHEREAS, A MHA advisory board to guide activities and engage Tribal stakeholders and Tribal elders in planning and protocol development has been assembled for the Project; and

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Figure 2. Tribal Resolution No. 24-155-FWF

**Approvals:** The corridor used for the flight was approved by the MHA Nation Tribal Council on May 7, 2024 (Tribal Resolution 24-155). The flight was conducted with the approval of the Department of Transportation/Federal Aviation Administration (FAA) for Matador UAS Logistics, LLC (dba Valkyrie UAS Solutions) under waiver number 107W-2024-02500. The pilot was Catherine Self with Valkyrie UAS Solutions flying a Swoop Aero Kite. All safety measures were deployed.



*Figure 3. Pre-Flight Training of MHA Citizen*

The University of North Dakota (UND), as the prime subcontractor to MHA Nation, provided a host of support for the flights. The UND Research Institute for Autonomous Systems (RIAS), provided two visual observers at take-off and landing and served as HUB operators for Valkyrie. The two staff were trained in aircraft operations. Additionally, they supported geo-synchronization procedures. The Director of RIAS and Project Co-PI, Dr. Mark Askelson, is a meteorologist and provides frequent weather updates critical to safety. The PI on the Project from UND Research and Economic Development, Thomasine Heitkamp, served in the role of operational manager for the flights. She provided information about the flight to the Chair and Tribal Council, MHA Drone Advisory Board, local stakeholders, and residents. She hosted a community event at the Earth Lodge Village on September 16, coordinated logistics, and local arrangements, worked collaboratively with Elbowoods Memorial Health Center, and assisted MHA Nation in local media.

**Safety Measures and Public Participation:** To provide additional flight safety, two partners on the project (Thales and the Northern Plains UAS Test Site aka Test Site) provided 8 visual observers on the corridor. However, it is important to note that these BVLOS flights did not require a visual observer to execute this use-case to see the aircraft. Additionally, DeTect Inc. donated access to two mobile radars that were driven from Panama City, Florida, and installed at the Twin Buttes Pavilion and the Veterans Building in New Town. In coordination with DeTect, UND Aerospace provided access to their mobile radar truck to a remote rural area of Mandaree, ND to assist in monitoring the aircraft. The three radar trucks provided 360-degree coverage of the entire flight corridor.



*Figure 4. Pre-Dawn Readiness Checks of Radar*



The Test Site provided Mobile Command Centers at both the New Town Veterans Administration Building and Twin Buttes Powwow grounds to track aircraft during flight, providing real-time movement of the drone to the public who attended the launch and landing. Airspace Link integrated their Air Hub surveillance software with DeTect-Inc to enhance the live display of the aircraft as it moved through the approved corridor. This allowed for additional situational awareness updates for communication and coordination to the visual observers placed along the flight path.



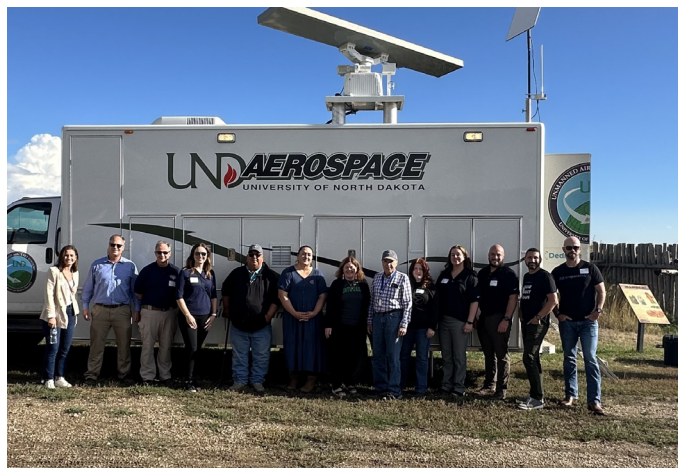
*Figure 5. The community watching the flight from Mobile Radar truck - following Flight Path*



*Figure 6. Celebration of Landing in Twin Buttes*

Prairie Rose Seminole, staff of Nueta Hidatsa Sahnish (NHS) College on the MHA Drone Project, provided a live stream of the flights on Facebook on the MHA DOT Drone Project page. Local enthusiasm was noted in public comments during the livestream. In coordination with Lovell Overlie, Public Relations Coordinator/Executive Liaison for the Three Affiliated Tribes, the MHA Drone Team on the ground contributed several interviews to the media during and after flight operations. Prairie Rose Seminole provided streaming of the flights to local media at their request. The links to the media will be shared in a larger report to MHA Nation regarding the proof-of-concept flights. That report will be completed by mid-November 2024 to be provided to MHA Nation.

**Summary:** The project is funded by the United States Department of Transportation (SMARTFY22N1P1G38). All expectations and deliverables outlined in the project work plan were achieved in this proof-of-concept flight allowing MHA Nation to report strong outcomes to DOT. MHA Nation is eligible to apply for additional funding from DOT for a Stage 2 effort for \$15 million over 36 months. UND staff and faculty on the project anticipate that information gathered during this proof-of-concept flight, which will be reflected in the grants extensive final report to DOT, will assist in your preparation of a proposal to DOT for additional funding that assures sustainability and scalability for the future. UND, and additional partners, are here to assist in any manner desired by MHA Nation.



*Figure 7. MHA Drone Team*

**Thanks to MHA Nation:** We wish to thank all the MHA Nation Citizens who helped ensure the success of the proof-of-concept flight event. They all provided many key elements and contributions including (1) MHA Nation Chair Mark Fox, for his support, (2) Robert Hunter Sr. and C. Preston Danks at the Veterans Administration Building in New Town who contributed critical access to their grounds and internet and provided free lunches to the Veterans who traveled as part of the project, (3) Jared Eagle, Shelby Stein, Justice Rabbit Head, Dr. Kathy Eagle, and Dr. Anita Martin with Elbowoods Memorial Health Center who supported these efforts and committed to current and future efforts, (4) Gary Snow with MHA Tourism who provided access and support at the Earth Lodge Villages, (5) Charlie Moran, MHA Drone Advisory Board Member, who offered prayer and critical historical information at the community event, (6) Better B Café for catering the dinner on September 16, 2024, (7) Sheila Many Ribs, fiscal Project management for MNA Nation, (8) Melissa Starr, Staff with Councilman Corey Spotted-Bear's office, (9) Alyssa Starr, Twin Buttes School Board President (10) Marle Baker, offered to store the radar trucks, (11) Dr. Kerry Hartman, PI for NHS College, provided space at the College for the MHA Drone Team and hosted a workforce development meeting, (12) the MHA Nation GIS/Water Resource Staff, and (13) Chad Wright, Marketing Specialists NHS College.

We are humbled and honored to be acknowledged by Jared Eagle following the flight in New Town, ND on September 18, 2024.



*Figure 8 and 9. MHA Nation Honors MHA Drone Team*

*The authors thank all who contributed to this report including Catherine Self and Tyson Harmon (Valkyrie), Prairie Rose Seminole (NHS College), Ryan Walsh (DeTect, Inc.), Greta Silewski (Thales), Kelley Lindish (Airspace Link), and Sheila Hanson (UND-Nistler).*