

MHA Drone Project: Planning and Protocol Development Background

Unique Need for Use of Drones at MHA Nation

In the 1950's, construction of the Garrison Dam by the Federal government resulted in the flooding of tribal lands. The MHA Nation is located on both sides of the Missouri River (Lake Sakakawea) in McLean, Mountrail, McKenzie, Dunn, Mercer, and Ward Counties, in the western part of North Dakota. The Nation encompasses 988,000 acres, with nearly half of the land being owned by Indigenous citizens.

The flooding created dramatic changes to the geography, landscape, and resource base of that region, and presented difficulties for travel to and from medical facilities. A one-mile-long bridge connects six segments of this Tribal Nation which results in the need for extensive travel to ensure access to a host of resources, including healthcare. Access to health care is especially difficult in tribal communities, but even more difficult with the complication of only one bridge connecting the rural areas of the Nation.¹

Funding and Partnerships

This creates both a need and an opportunity to examine the effective use of autonomous systems for the delivery of resources to support societal and personal well-being on the Tribal lands of the Three Affiliated Tribes (TAT) of the Fort Berthold Reservation – the Mandan Hidatsa and Arikara (MHA) Nation. To support this effort MHA Nation secured Stage One SMART grant funding provided by the United States Department of Transportation (DOT) in the amount of \$1,966,345.00. The project is entitled the *MHA Drone Project: Planning and Protocol Development* and is funded from August 2023 to February 2025. TAT is the only Tribal Nation to secure an award and the only recipient in a broad geographic area of the mid-west of the United States. The project will demonstrate the potential regarding the use of UAS/drones to ensure better access to medical care and equipment and potentially other use cases. The priority use case is the application of drones to deliver medical supplies between Twin Buttes, ND, and New Town, ND across the Missouri River in northwestern North Dakota.

Partnerships:

A myriad of entities supporting this effort include the Nueta Hidatsa Sahnish (NHS) College, TAT GIS Water Resources, the University of North Dakota (UND), the Northern Plains UAS Test Site, and industry partners including Thales, and Airspace Link. The primary goal is to develop a safe, efficient, and scalable network within MHA Nation to deliver products and services using drones on tribal lands. MHA Nation has contracted with NHS College, UND and industry partners to (1) finalize a community assessment of needs to support decisions regarding future use cases, (2) determine the economic viability of using drones to improve the quality of life on these tribal lands, (3) expand workforce capacity and development in collaboration with the NHS College and Boys and Girls Club of the Three Affiliated Tribes, (4) expand government to government relationships, (5) plan for integration of Beyond Visual Line of Sight (BVLOS)

¹ <https://blogs.und.edu/und-today/2022/08/drone-tests-showcase-medicine-deliveries-in-indigenous-communities/>

operations and implementation of drone use on tribal lands through application of the Vantis Network,² and (6) evaluate the effectiveness of planning and protocol development activities with plans to submit for additional fundings to ensure implementation of planning efforts.

Background on MHA Drone Project: Planning and Protocol Development

In 2022 the University of North Dakota began a partnership with MHA Nation in collaboration with Elbowoods Memorial Clinic to explore the possibility of the delivery of medication through the use of drones to remote areas on these Tribal lands at the suggestion of MHA Nation Tribal Chair, Mark Fox, and Jared Eagle, Director for Health Administration at Elbowoods Memorial Health Care Center. In particular, they expressed an interest in delivering medications between New Town, ND, and Twin Buttes, ND. Traveling by roads between the two communities necessitates a 98-mile drive on two-lane highways with large oil trucks at MHA Nation given that it is in the heart of the Bakken³, frequently in adverse weather conditions. Whereas a drone flight is less than 50 miles if you cross the Reservoir.

The collaborators in the first planning stage, were MHA Nation, Elbowoods Memorial Health Center NHS College, UND, Merck⁴, a multi-national pharmaceutical company, and Volansi, the drone service provider. Volansi completed two test cases including one at the Diabetes Education Center connected to Elbowoods in New Town on July 12, and another at the Wellness Center in Twin Buttes on July 13, 2022. The tests demonstrated the execution of loading and unloading medical supplies and the departure and landing portions of flights that support medical deliveries. UND Professor Mark Askelson, a meteorologist, provided long and short-range weather forecasts to ensure the capacity to fly in allowable weather conditions. The preliminary flights have laid the groundwork for further collaborative efforts to deliver medications and blood samples in a more direct and time-saving manner: across portions of the Reservoir. The Department of Transportation SMART grant provided funds to MHA Nation to continue this work in collaboration with UND.

Before the test flights, a community event was hosted on July 11 in collaboration with NHS College with a prayer and introduction of need from Hidatsa language and custom tradition educator, Charlie Morin. UND, Volansi, and Merck showcased materials and visited with local youth and community members. UND staff supervised and helped young people practice flying a small drone. Following that, members held a picnic and many from Elbowoods were able to learn about the drone used in the test flights. The effort was a precursor to the DOT project Drone Camps for Youth at MHA in collaboration with the TAT Boys and Girls Club.

Drone Use: TAT Collaboration with GIS/Water Resources

Three Affiliated Tribes of the Fort Berthold Reservation have developed and expanded the use of drones on their Tribal lands beginning with training and education in 2016. The GIS/Water

² <https://www.vantisuas.com/>

³ <https://www.projectremote.com/blog/bakken-oil-boom/>

⁴ <https://www.merck.com/>

Resources Department⁵ with the support of the MHA Tribal Nation⁶, operates the drone use program. Their seven-year history includes a collaboration with Nueta Hidatsa Sahnish (NHS) College⁷ and ArcGIS⁸ who supported training and workforce development programs. In 2017 they expanded their capacity to use drones by integrating drone use into an academic course on Sustainability at NHS College. The GIS/Water Resources Office hosts a director, Tanya Sand-Driver, and four other GIS Specialists who understand the weather, topography, and geography of tribal lands. Of note is their capacity to fly in inclement weather while adhering to current FAA regulations. Most recently they have purchased an underwater drone that is being used in the winter months when the water is clear. They began building their drone fleet in 2019 with growing use to include the use cases that are listed below.⁹

- Construction Management Inspection includes providing information through use of a thermal camera/infrared on construction progress to identify any leaks, groundbreaking issues, and progress on construction.
- Land Inspection on Tribal Lands,
- Farm and Pasture Inspection for TAT Realty,
- Rangeland Inspection for TAT,
- Marketing Video and Imagery for TAT Web Design,
- Noxious and Invasive Weed Mapping,
- Examine soil and vegetative health.

Role of GIS/Water Resources

The mission of the GIS/Water Resources Department is to “*establish a foundation of accurate geographic information to support decision-making and daily operations of the Three Affiliated Tribes. The GIS Department strives to provide accurate spatial data and products to the Three Affiliated Tribes and community*”. The GIS data are critical to the safety of operations in the use of drones. The Departments on Tribal lands that access GIS data, and future and current partners on the MHA Drone Project include Tribal Administration, Future Tribal Homeowners, Tribal and Non-Tribal Farmers & Ranchers, Seismic Companies, Division of Energy and Mineral Development, Tribal Realty-Range-Farm Pasture, Game and Fish, Environmental, Energy Department, Law Enforcement, Roads Department, Construction Management, Bureau of Indian Affairs, Fort Berthold Agency, Tribal Energy, Tribal Transportation, Fire Management, Emergency Operation Center, Fort Berthold Rural Water, Parks and Recreation Energy, Tribal Transportation, Fire Management, Emergency Operation Center, Fort Berthold Rural Water, Parks and Recreation, and Parks and Recreation.

⁵ <https://www.mhanation.com/geographic-information-systems>

⁶ <https://www.mhanation.com/>

⁷ <https://nhsc.edu/>

⁸ [ARC/GIS](#)

⁹ Tanya Sand-Driver content submitted February 6, 2025