

Trusted Infrastructure, National Impact:

How North Dakota Built a First-in-the-Nation Model for Advanced Aviation Innovation



State of North Dakota - North Dakota Information Technology

Category: Cross-Boundary Collaboration

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Executive Summary

In North Dakota, distance shapes everything.

It influences how emergency responders reach those in need, how infrastructure is monitored across vast geographies, and how government delivers services to rural communities.

For years, advanced unmanned aircraft systems promised new ways to solve those challenges, but like most states, North Dakota faced a significant barrier: operational scale.

Without trusted, real-time awareness of surrounding airspace, drone operations remained constrained by line-of-sight limitations, narrower mission capability, and operational complexity.

North Dakota chose to solve the harder problem.

Through exceptional collaboration among federal, state, and private-sector partners, North Dakota became the first non-federal entity in the nation to securely access unfiltered Federal Aviation Administration (FAA) radar data, creating a trusted operational foundation for advanced beyond-visual-line-of-sight (BVLOS) unmanned aircraft operations.

This was not simply a technical milestone. It was a governance, infrastructure, and trust milestone.

At the center of this effort was North Dakota Information Technology (NDIT).

As the state's technology agency, NDIT designed and implemented the secure digital infrastructure required to support sensitive real-time federal aviation data integration. That included secure network architecture, protected computing environments, cybersecurity controls aligned with strict federal requirements, operational monitoring, and resilient infrastructure capable of supporting real-time decision-making.

The complexity extended far beyond technology.

This multi-year initiative required collaboration among the FAA, Northern Plains UAS Test Site, North Dakota Department of Commerce, strategic technical partners, state leadership, and multidisciplinary NDIT teams spanning cybersecurity, networking, enterprise architecture, systems administration, and project management.

Because no non-federal entity had done this before, there was no implementation playbook. North Dakota and its partners built one.

The result is a framework for advanced unmanned operations with practical public-sector implications, from emergency response and infrastructure resilience to rural service delivery and economic innovation.

More importantly, it offers a replicable model for how state governments can responsibly operationalize emerging technologies through trusted infrastructure and cross-boundary collaboration.

The Idea: Plotting the Flight Path

What Problem or Opportunity Does the Project Address?

The primary barrier to widespread UAS adoption has been the operational-scale barrier. Traditionally, drone operations are constrained by line-of-sight limitations, requiring an operator to maintain a physical view of the aircraft. Without trusted, real-time awareness of the surrounding airspace, missions are restricted to shorter ranges and high levels of human oversight. This project addressed the unprecedented opportunity to securely integrate raw FAA radar data into a state environment, solving a challenge no non-federal entity had previously overcome.

Why Does It Matter?

This project transforms UAS from a limited experimental tool into scalable public-sector infrastructure. For a rural state with dispersed communities, this capability is essential for modernizing service delivery.

Practical public sector implications:

- **Search-and-Rescue:** Drones can travel farther and faster to locate missing persons without requiring constant visual tracking, saving critical time in life-safety missions.
- **Infrastructure Resilience:** Enables remote inspection of North Dakota's 140-plus radio communications towers and critical utility lines, accelerating damage assessment after severe weather.
- **Rural Service Delivery:** Supports trials for drone-enabled medical supply delivery, overcoming the distance challenge for rural residents.

What Makes It Different?

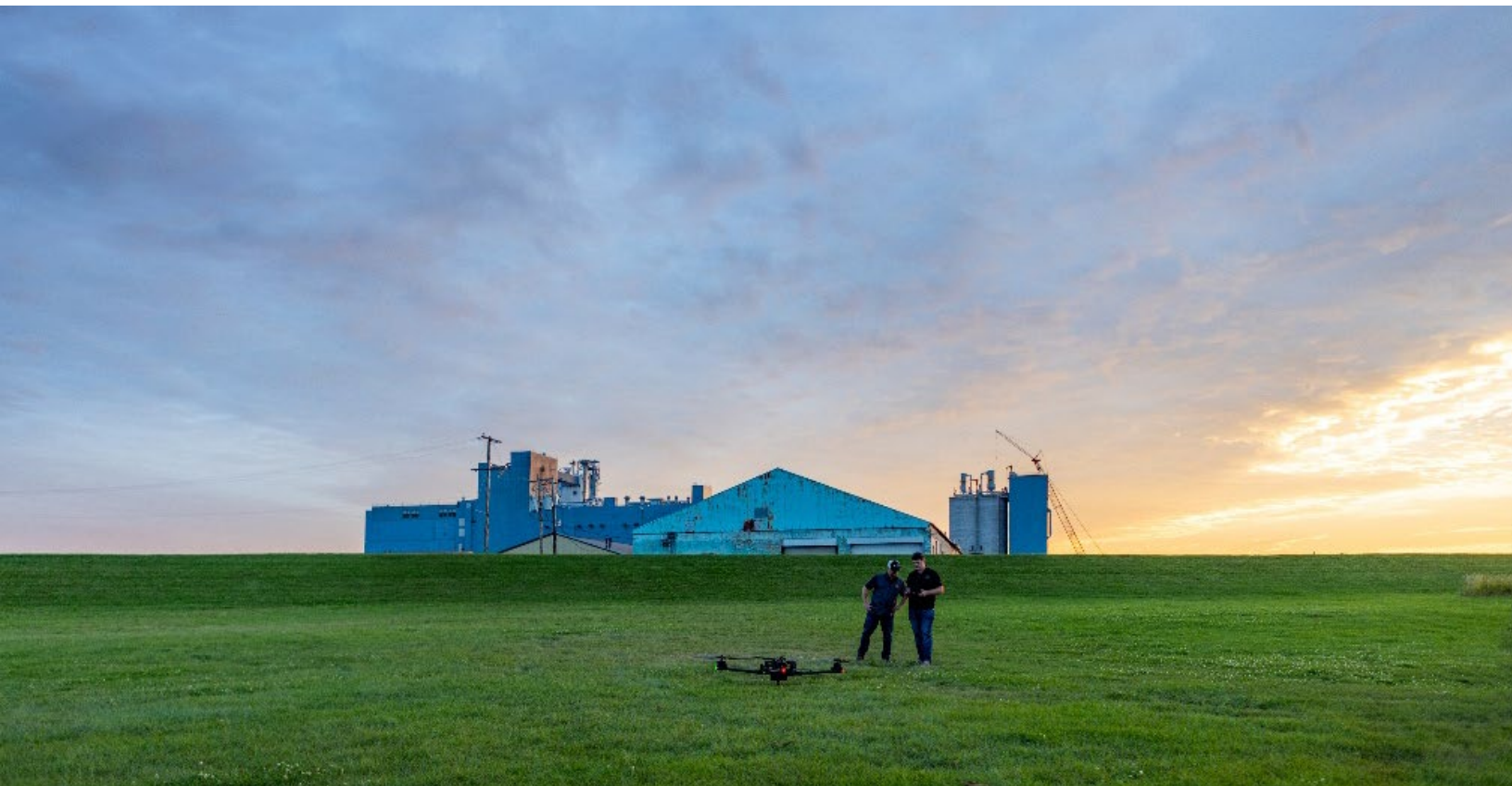
A first-of-its-kind public-sector achievement.

No other state has built a statewide system that integrates directly with this level of federal data to enable real-time airspace awareness at scale. North Dakota is the first non-federal entity in the nation to incorporate unfiltered FAA radar data into a state-governed environment. While other states conduct flight tests, North Dakota leverages a statewide governed surveillance backbone. This was a milestone of trust, requiring the state to meet and exceed the federal government's most stringent operational and cybersecurity expectations to handle sensitive aviation data.

What Makes It Universal?

The leadership challenge solved here is relevant for all state CIOs. It directly addresses NASCIO's formal priorities, specifically:

- **Modernizing Service Delivery:** Rethinking how government reaches citizens in rural areas.
- **Cybersecurity:** Integrating rigorous federal security standards into state innovation.
- **Enterprise Capability:** Treating emerging technology as a whole-of-state asset rather than an isolated agency experiment.



The Implementation: No Single Pilot

What Was the Roadmap? The First to File the Flight Plan

The project was the result of a 6–7-year strategic effort. Because no roadmap existed for non-federal FAA data integration, North Dakota had to build the playbook from scratch. The roadmap included passing federal legislation (the 2024 FAA reauthorization), securing state funding, passing rigorous multi-agency security reviews, and shifting the organizational mindset from deploying technology to building operational capability. A vision beyond line of sight reframed the challenge from deploying drone technology to building public-sector operational capability.

Who was involved? The Right Crew for the Mission

This initiative required sustained collaboration among organizations with differing missions, technical requirements, and governance responsibilities. This breadth of collaboration is unique—and central to the project’s success.

Stakeholder	Role in Project Success
Federal Aviation Administration	Federal partner; enabled secure access to unfiltered data; ensured compliance with national safety/security standards
North Dakota Information Technology	Enterprise technology lead; designed and engineered the secure digital infrastructure and network pathways

Northern Plains UAS Test Site	Aviation operations leadership; managed the Vantis ecosystem and flight validation
North Dakota Dept. of Commerce	Strategic lead; aligned the project with state economic innovation and autonomous systems strategies
Thales & MITRE	Strategic technical partners; validated system security with federal agencies and provided airspace expertise

How Did You Do It?

While the milestone centers on secure access to FAA radar data, the achievement wouldn't have been possible without the trusted digital infrastructure built behind the scenes. NDIT designed and implemented the secure enterprise foundation that made this capability possible, bringing together expertise across cybersecurity, networking, enterprise architecture, systems administration, and project management.

Secure Network Design: NDIT engineered protected pathways to connect FAA systems with the Vantis network. Using advanced network segmentation, the team ensured sensitive aviation data remained isolated and controlled within state infrastructure.

Hardened Computing Environments: The team built protected, high-availability infrastructure capable of reliably ingesting and processing continuous, live aviation data feeds for real-time situational awareness.

Cybersecurity Architecture: To earn federal trust, NDIT exceeded standard protocols. According to Thales CEO Alan Pellegrini, the architecture was designed to "exceed the most stringent operational and cybersecurity requirements in the world," incorporating layered defensive controls and continuous monitoring.

Real-time Operational Performance: Low-latency engineering was required to ensure drone operators receive continuous, uninterrupted radar feeds for split-second decision-making in shared airspace.

Testing and validation: Extensive validation ensured operational readiness, performance reliability, security compliance, and trusted activation.

The conversation changed from "Can government safely do this?" to "How should government responsibly use this capability?"

Before	After
Line-of-sight operational constraints	Trusted framework for BVLOS operations
Limited airspace awareness	Continuous real-time radar visibility
Narrower operational use cases	Broader public-sector application potential
Greater operational burden	More scalable deployment possibilities
Experimental capability	Operational infrastructure foundation
No state model for trusted federal integration	First-in-the-nation replicable framework



Impact: From Milestone to Momentum

What Did the Project Make Better?

Connected with NDIT StageNet secure fiber, this initiative fundamentally expanded North Dakota's ability to operationalize advanced unmanned aircraft systems for public-sector use.

Communication Without Borders, Public Safety Without Limits

In time-sensitive emergencies, distance matters.

When search-and-rescue teams are covering large areas, when disaster response requires rapid situational awareness, or when first responders need better visibility into dynamic conditions, operational limitations can affect outcomes.

The system provides the capabilities needed to address counter-drone concerns and protect high-profile national events, such as the 2026 World Cup and America's 250th anniversary celebrations.

Seeing Critical Infrastructure Differently

After severe weather or disruptive events, gaining operational visibility often requires personnel deployment, travel time, and manual inspection. Those delays matter.

Advanced unmanned operations create opportunities for faster situational awareness, safer inspections, and more informed operational decision-making.



- In 2 days, drones flew 80+ miles under FAA waiver to survey 1,700 power line poles, allowing inspectors to identify 150 needing repairs.
- Drone operators tracked manned traffic in the area both visually and via a surveillance service provided by the Vantis system to maintain clear and ongoing situational awareness.

Service at the Speed of Need

Distance creates friction in government service delivery. For rural communities, logistics challenges can slow access, increase operational complexity, and limit responsiveness.

Scalable unmanned operations create future opportunities to rethink those models. North Dakota's systems have already explored early drone-enabled medical delivery pilots, agricultural operations and precision agriculture, demonstrating that these applications are practical, not theoretical.

Economic Lift-Off

This initiative strengthens the state's advanced aviation ecosystem while creating opportunities for research, commercialization, business attraction, and innovation growth. Training and education reimagine the future workforce, university programs, and STEM in K-12 education.

The project has cemented North Dakota as the nation's premier UAS hub, supporting an industry that employs more than 1,000 people and has attracted over \$400 million in private investment.

How Do You Know?

The primary validation metric is the successful activation of the Vantis Federal Radar Data Enclave in February 2026. The secure radar data feed is officially live and delivers continuous data. The project has successfully completed specific proof-of-concept trials, including medical supply delivery and remote radio tower inspections.

What Now? Ready for the Next Mission

- Validating usage of data feeds counter-UAS and point-defense operations.
- Expanding use cases to new state agencies (e.g., Department of Transportation, Agriculture).
- Serving as a national blueprint for other states and countries looking to integrate UAS into the National Airspace System (NAS).

Stakeholder Testimony

"The Vantis Federal Radar Data Enclave cements North Dakota as the most advanced UAS ecosystem in the nation... No other state offers this level of capabilities, and it would take years for this type of system to be implemented anywhere else." – Senator John Hoeven

"What began as infrastructure to enable scalable BVLOS operations has become something more significant—a governed surveillance backbone that supports both aviation innovation and counter-UAS readiness." – Trevor Woods, Executive Director, Northern Plains UAS Test Site

"This ground-breaking work marks a significant evolution in the FAA's data-sharing approach and demonstrates our commitment to safe drone integration without disruption to existing airspace users." – Frank McIntosh, FAA Air Traffic Organization COO

"North Dakota is leading the nation in advanced aviation by becoming the first non-federal entity to access unfiltered FAA radar data. This milestone strengthens safety, expands what's possible with drone operations, and shows how NDIT's strategic IT infrastructure can power real-world innovation." – Craig Felchle, Chief Technology Officer, NDIT