



North Dakota Legislative Council

Prepared for the Workforce Committee
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EXISTING AUTONOMOUS SYSTEMS STUDY - BACKGROUND MEMORANDUM

Section 3 of House Bill No. 1519 (2023) ([appendix](#)) directs the Legislative Management to study the utilization of existing autonomous system capabilities and infrastructure to provide solutions to workforce and safety needs in North Dakota. The study must include an analysis of utilizing autonomous technology for infrastructure inspection, rural emergency service needs, agriculture advancement, energy industry application, and other opportunities for collaboration through the utilization of autonomous system technology.

BACKGROUND

House Bill No. 1519 appropriated \$475,000 of federal funds and \$12,500 from the strategic investment and improvements fund to the Department of Career and Technical Education for uncrewed aircraft systems (UAS), autonomous vehicles, or other autonomous technology grants to the workforce training center serving northwest North Dakota. The bill also appropriated \$275,000 of federal funds and \$12,500 from the strategic investment and improvements fund to the Department of Agriculture for UAS, autonomous vehicles, or other autonomous technology grants to individuals and entities in the agriculture industry. Testimony provided by representatives from the economic development, technology, aviation, energy, and agriculture sectors during the 2023 legislative session in support of the study praised the state for seeking to expand the use and development of autonomous systems. Testimony provided by representatives from TrainND, the Department of Agriculture, and the North Dakota University System also commended integration and greater utilization of autonomous systems in new sectors of state government.

STATE LAW AND PROGRAMS Advancement Innovation Loans

North Dakota Century Code Chapter 6-09.18 provides for a loan program administered by the Department of Commerce in consultation with the Bank of North Dakota. Section 6-09.18-04 provides for a legacy investment technology loan program to develop emerging technologies in North Dakota. When reviewing a loan application under the program, the Legacy Investment for Technology Committee assesses whether the proposal will deliver applied research, experimentation, or operational testing in one or more diversification sectors to create information or data to enhance industries in North Dakota. Section 6-09.18-01 provides "diversification sectors" include autonomous and uncrewed vehicles and related technologies. Section 6-09.18-06 requires loan recipients to use loan proceeds only to conduct applied research, experimentation, or operational testing in North Dakota. The loan proceeds may not be used for capital or building investments, academic or instructive programming, workforce training, administrative costs, or to supplant funding for regular operations of institutions of higher education.

Autonomous Vehicles

Chapter 8-12 provides for the establishment of autonomous vehicles and on-demand autonomous vehicle networks. Section 8-12-01 defines an "autonomous vehicle" as "a vehicle equipped with an automated driving system." The section defines an "on-demand autonomous vehicle network" as "a transportation service network that uses a software application or other digital means to dispatch or otherwise enable the prearrangement of transportation with autonomous vehicles for purposes of transporting persons or goods, including for-hire transportation, transportation for compensation, and public transportation." These networks and vehicles may provide transportation of persons or goods for public, for-hire, or rideshare transportation services.

Section 8-12-02 requires an on-demand autonomous vehicle network connecting passengers to autonomous vehicles without human drivers to comply with Section 39-01-01.2(3). Under Section 39-01-01.2, a registered and insured autonomous vehicle may operate on any public highway if the vehicle complies with all applicable state and federal laws. An autonomous vehicle does not require a human driver to operate on the public highway if the autonomous vehicle can safely bring the vehicle to a complete stop in case of a system failure. An individual using an autonomous vehicle does not need a driver's license to use the vehicle if the vehicle is completing all of the real-

time operational and tactical functions required to operate a vehicle in on-road traffic and is capable of safely bringing the vehicle to a complete stop in case of a system failure.

Surveillance by Unmanned Aerial Vehicles

Chapter 29-29.4 outlines when unmanned aerial vehicles (UAVs) may be used for surveillance. Under Section 29-29.4-01, the term "unmanned aerial vehicle" means any aerial vehicle, excluding satellites, operating without the possibility of direct human intervention within or on the aerial vehicle. Section 29-29.4-02 prohibits the use of information obtained from a UAV as admissible evidence in a prosecution or proceeding in North Dakota unless the information was obtained under a search warrant or a legally recognized warrantless search exception. Information collected from a UAV may not be relied upon to obtain a search warrant unless the information was collected under a valid search warrant or a legally recognized warrantless search exception or was obtained by monitoring public lands or international borders.

Chapter 29-29.4 does not prohibit the use of UAVs for surveillance under certain circumstances. These circumstances are provided in Section 29-29.4-04 and include the use of a UAV for surveillance of national borders for illegal activity; by law enforcement if exigent circumstances exist for purposes of preventing imminent danger to life or bodily harm; by state or local authorities to investigate environmental or weather-related catastrophes; or for research, education, training, testing, or development efforts undertaken by or in conjunction with a school or institution of higher education in North Dakota. Section 29-29.4-05 expressly prohibits the use of UAVs for purposes of domestic use in private surveillance or surveillance of the lawful exercise of constitutional rights.

UAS Test Site

Pursuant to Section 54-60-28, the Department of Commerce operates and administers the UAS Test Site, which was authorized and designed as a test site in 2014 by the Federal Aviation Administration (FAA). The Department of Commerce may cooperate and contract with the University of North Dakota, the North Dakota Aeronautics Commission, the Adjutant General, and other public or private entities in the operation and administration of the test site. Section 54-60-29 establishes the UAS program fund. This fund was established to defray the expenses of the operations of the UAS Program and test site and the Beyond Visual Line of Sight (BVLOS) UAS Program, which is established under Section 54-60-29.1. The Department of Commerce administers this program for the design, purchase, implementation, and operating costs of the BVLOS UAS. The Northern Plains UAS Test Site is one of seven FAA-approved UAS test sites.¹ Research is conducted at the test sites to determine ways to integrate UAS into the national airspace safely. In May 2014, the Northern Plains UAS Test Site, headquartered in Grand Forks, was the first FAA test site to conduct a research flight.²

Unmanned aircraft systems are used in several industries, including precision agriculture, disaster and emergency response, energy monitoring, and scientific research.³ In agriculture, applications include pesticide spraying, crop monitoring, livestock tracking, yield estimations, crop harvesting, disease detection and mitigation, and moisture monitoring. In response to disasters and emergencies, UAS help monitor forest fires, floods, and tornadoes and assist in search-and-rescue operations. In the energy industry, UAS are used in the exploration of oil, gas, and mineral deposits. These systems also are used to monitor transmission lines, components of wind turbines, pipelines, and pollution levels. As it relates to scientific research, this technology is used for biological research; wildlife conservation efforts; archeological surveys; polar, volcanic, and oceanic research; and the monitoring of animal poaching.

Unmanned aircraft systems also are used for military purposes in North Dakota. The 40 RQ-4 Global Hawk, housed at the Grand Forks Air Force Base, provides global intelligence and surveillance. MQ-9 Predator aircraft are used by the North Dakota Air National Guard to aid in global military missions and by the United States Customs and Border Protection in Grand Forks to monitor 861 miles of international border between the United States and Canada.

FEDERAL LAW AND PROGRAMS

Under the FAA Modernization Reform Act of 2012,⁴ a 5-year program was created to establish six UAS test sites. The Administrator of the FAA was tasked with creating these sites, which were designed to integrate UAS into the National Airspace System. In 2014, the FAA established six UAS test sites throughout the United States.

¹ Northern Plains UAS Test Site, Department of Commerce, October 2023. (<https://www.commerce.nd.gov/economic-development-finance/autonomous-systems/northern-plains-uas-test-site>).

² Id.

³ UAS Uses and Benefits, Department of Commerce, October 2023. (<https://www.commerce.nd.gov/economic-development-finance/autonomous-systems/uas-uses-and-benefits>).

⁴ Pub.L. 112-95; 126 Stat. 11; 49 U.S.C. § 40101 et seq.

In 2016, Congress passed the FAA Extension, Safety and Security Act of 2016⁵, which added a seventh test site. The seven test sites are administered by Griffiss International Airport (New York), New Mexico State University (New Mexico), North Dakota Department of Commerce (North Dakota), State of Nevada (Nevada), Texas A&M University Corpus Christi (Texas), University of Alaska Fairbanks (Alaska), and Virginia Polytechnic Institute & State University (Virginia). The United States Congress is working to pass Senate Bill 1939, the FAA Reauthorization Act of 2023, which would reauthorize the FAA through fiscal year 2028, including activities and programs related to airport planning and development, facilities and equipment, and operations. The bill also would require the FAA to establish a regulatory pathway for the certification or approval of commercial unmanned aircraft to operate beyond the visual line of sight.⁶

The administrative rules for the FAA are provided in 14 CFR Chapter I. Small UAS in the United States are governed by 14 CFR Part 107. Small unmanned aircraft are defined under 14 CFR 107.3 as "an unmanned aircraft weighing less than 55 pounds on takeoff, including everything on board or otherwise attached to the aircraft." Operational limitations, pilot certification and responsibilities, and aircraft requirements are provided under 14 CFR Part 107; however, these regulations only apply to commercial and government uses. Operators are required to obtain a remote pilot certification from the FAA before flying for commercial purposes pursuant to 14 CFR 107.52. Under 14 CFR 107.51, the aircraft may not exceed an altitude of 400 feet, and speeds must be kept below 100 miles per hour. Flights are generally limited to daylight hours in good visibility. However, to fly at night, 14 CFR 107.29 requires additional remote pilot training and the presence of anti-collision lights visible from at least three miles away. A remote pilot in command of the aircraft or a visual observer must be able to see the aircraft throughout the entire flight pursuant to 14 CFR 107.31. A visual observer is defined as "a person who is designated by the remote pilot in command to assist the remote pilot in command and the person manipulating the flight controls of the [aircraft] to see and avoid other air traffic or objects aloft or on the ground." All UAS operations conducted by state agencies must comply with 14 CFR Part 107 regulations or under an FAA Certificate of Authorization as a public aircraft.⁷

In 2018, The Exception for Limited Recreational Operations of Unmanned Aircraft⁸ was signed into law for individuals operating UAS for recreational purposes. This exception allows recreational flyers to fly drones for personal enjoyment. To be a recreational flyer, the flyer must adhere to the following limitations:

- The aircraft is flown strictly for recreational purposes;
- The operator must follow the safety guidelines of an FAA-recognized community-based organization;
- The operator must keep the aircraft within the visual line of sight or use a visual observer who is physically next to and in direct communication with the operator;
- The operator must give way to and not interfere with other aircraft;
- The flight must be conducted at or below FAA-authorized altitudes in controlled airspace only with prior FAA authorization by using the Low Altitude Authorization and Notification Capability or the FAA Drone Zone programs;
- The flight must be conducted at or below 400 feet in uncontrolled airspace;
- The operator must take the FAA's recreational UAS safety test and carry proof of test passage when flying;
- The aircraft must show a current FAA registration mark and number and carry proof of registration when flying; and
- The operator may not operate the aircraft in a manner that endangers the safety of the national airspace system.

The Department of Transportation is one of eight federal UAS BEYOND program participants. The UAS BEYOND program focuses on the steps necessary to facilitate scalable, repeatable, and economically feasible BVLOS operations.⁹ The program will involve leveraging North Dakota's statewide UAS network, known as Vantis. This first-of-its-kind network promotes safe and efficient BVLOS flights, giving North Dakota a broader ability to establish sophisticated programs.¹⁰ According to the FAA, in October 2020, the UAS BEYOND program was

⁵ Pub.L. 114-190; 130 Stat. 615; 49 U.S.C. § 40101 et seq.

⁶ Summary: S. 1939 - 118th Congress (2023-2024), S. 1939 - FAA Reauthorization Act of 2023, October 2023. (<https://www.congress.gov/bills/118th-congress/senate-bill/1939?s=6&r=9&q=%7B%22search%22%3A%221939%22%7D%22%7D>).

⁷ Pub.L. 115-254, Div. B, Title III, § 355(b); 132 Stat. 3305; § 49 U.S.C. 40125.

⁸ Pub.L. 115-254; 132 Stat. 3186; 49 U.S.C. § 44809.

⁹ Integration Pilot Program - BEYOND, North Dakota Department of Transportation. (<https://www.dot.nd.gov/uas/#beyond>).

10 *Id.*

launched as a 4-year program pursuant to a Presidential memorandum. The program is striving to operate under established rules rather than waivers; gather data to develop performance-based standards; receive and implement community feedback; fully understand the potential societal, economic, and community benefits associated with UAS use; and establish a more uniform approval processes for drone integration.¹¹ As part of the UAS BEYOND program, the Department of Transportation used UAS during extensive flooding in 2019 and 2020 to analyze flood damage, advise first responders, and notify the public about road and bridge closures. The department obtained the first state agency waiver from the FAA to enable public safety operations.¹²

APPROACHES BY ADJACENT STATES

Montana

In Montana, Section 7-1-111 of the Montana Code prohibits a local government unit with self-government powers from enacting an ordinance governing the private use of a UAV in relation to a wildfire. Section 7-32-401 prohibits a law enforcement agency from acquiring armored or weaponized drones from a military equipment surplus operated by the federal government. Section 46-5-109 limits the use of UAVs in criminal searches and seizures. Under this section, information collected from a UAV is not admissible evidence in a proceeding unless the information was collected pursuant to a search warrant, lawful warrantless search exception, or during the investigation of a motor vehicle crash scene on a public roadway. The information collected from a UAV also may not be used to obtain an affidavit of probable cause to obtain a search warrant. A UAV is defined as an aircraft, excluding satellites, operated without direct human intervention from, on, or within the aircraft. Section 76-13-214 provides a civil penalty for any person using a UAV that obstructs, impedes, prevents, or interferes with a lawful aerial wildfire suppression response by a state or local government effort.

Governor Steve Bullock established the Montana Unmanned Aerial Systems Council through Executive Order No. 4-2020.¹³ The council was required to provide recommendations and strategies for the State of Montana to determine the best way to centralize control of UAS and create a central resource for regulations, requirements, and best practices. The council was required to implement a procurement process for UAS, including a cost-benefit analysis. The council was required to create a statewide policy for UAS use that reduces taxpayer cost, addresses state employee safety concerns, and protects the privacy of Montana citizens. In 2022, the council released its plan for gubernatorial implementation. The council has since disbanded.

Minnesota

The Aeronautics and Aviation Division of the Minnesota Department of Transportation regulates UAVs in Minnesota. Section 626.19 of the Minnesota Statutes prohibits a law enforcement agency from using a UAV without a search warrant unless an exception applies. Section 626.19(3) lists the permissible exceptions under which a law enforcement agency may use a UAV. These exceptions provide a law enforcement agency may use a UAV:

- During or in the aftermath of an emergency situation that involves the risk of death or bodily harm to a person;
- Over a public event where there is a heightened risk to the safety of participants or bystanders;
- To counter the risk of a terrorist attack by a specific individual or organization if the agency determines that credible intelligence indicates a risk;
- To prevent the loss of life and property in natural or manmade disasters and to facilitate operational planning, rescue, and recovery operations in the aftermath of these disasters;
- To conduct a threat assessment in anticipation of a specific event;
- To collect information from a public area if there is reasonable suspicion of criminal activity;
- To collect information for crash reconstruction purposes after a serious or deadly collision occurring on a public road;
- Over a public area for officer training or public relations purposes; and
- For purposes unrelated to law enforcement at the request of a government entity provided that the government entity makes the request in writing to the law enforcement agency and specifies the reason for the request and proposed period of use.

¹¹ BEYOND, Federal Aviation Administration, October 2023. (https://www.faa.gov/uas/programs_partnerships/beyond).

¹² Integration Pilot Program Lead Participants, Federal Aviation Administration, October 2023. (https://www.faa.gov/uas/programs_partnerships/completed/integration_pilot_program/lead_participants).

¹³ Executive Order Creating the Montana Unmanned Aerial Systems Council, Office of the Governor, State of Montana, May 2020. (https://formergovernors.mt.gov/bullock/docs/2020EOs/EO-04-2020_Creating%20Montana%20Unmanned%20Aerial%20System%20Council.pdf).

Section 360.012 permits flight over Minnesota lands and waters unless the flight is at a low altitude that interferes with the then-existing use of the land or water. Using an aircraft is not permitted if the flight above the land or water is imminently dangerous or damaging to persons or property lawfully on the land or water beneath. This section also makes it unlawful to land an aircraft on the lands or waters of another without the other's consent, except in the case of a forced landing. The operator of an aircraft in a forced landing is liable for damages caused by the forced landing. Under Section 360.013(37), an "aircraft" means any device used or designed for navigation of or flight in the air, excluding parachutes. Section 360.013(57)(a) designates a small unmanned aircraft as an aircraft under Section 360.013(37).

Chapter 360 of the Minnesota Statutes requires most aircraft operated over Minnesota airspace to be registered with the Minnesota Department of Transportation. These registration requirements apply to UAS for commercial use, not recreational use. To register an aircraft in Minnesota, the applicant must register the aircraft with the FAA, obtain insurance on the aircraft as specified in Section 360.59(10), complete the application on the Minnesota Department of Transportation's website, and pay the registration fee. In some instances, a commercial operations license is also required. Section 360.075 makes it unlawful for a person to advertise or hold themselves out as providing a service that involves aircraft, including drones, without a commercial operations license. There are additional sector-specific requirements an applicant must satisfy. However, at minimum, each applicant must obtain approval from the airport listed on the applicant's application to operate on the field, obtain insurance complying with Minnesota rules and regulations, provide a maintenance agreement with a licensed commercial operator, verify the aircraft is registered in Minnesota, and submit a commercial operations license application along with the license fee. The associated administrative rules are provided in Chapter 8800 of the Minnesota Administrative Rules.

RECENT LEGISLATION

During the 2023 legislative session, the North Dakota Legislative Assembly introduced House Bill No. 1018, relating to uncrewed vehicles. House Bill No. 1018 renamed the innovation loan fund to support technology advancement as the legacy investment for technology fund. The bill changed the name of the innovation technology loan program to the legacy investment technology loan program. The bill also changed the term "unmanned vehicles" to "uncrewed vehicles," as the term is used in Chapters 6-09 and 54-60. The bill removed the requirement for the Department of Commerce to cooperate with the University of North Dakota, Aeronautics Commission, Adjutant General, and other private parties appointed by the Governor in administering a UAS test site. Lastly, the bill authorized the Commissioner of Commerce to determine a fee structure for the quarterly payments to the State Treasurer required from an entity receiving funding for BVLOS UAS.

SUGGESTED STUDY APPROACH

In conducting this study, the committee may wish to receive testimony from representatives associated with:

- The Department of Commerce;
- The Department of Agriculture;
- The Department of Career and Technical Education;
- The Department of Health of Human Services;
- The University System;
- The Aeronautics Commission;
- The FAA;
- The aviation industry;
- The agriculture industry;
- The energy industry;
- Rural emergency services providers;
- North Dakota utility companies;
- Economic development departments in the private sector and cities, counties, and the state; and
- Emerging companies working with robotics and artificial intelligence.

ATTACH:1

SECTION 3. LEGISLATIVE MANAGEMENT STUDY - UNCREWED AUTONOMOUS SYSTEMS.

During the 2023-24 interim, the legislative management shall consider studying the utilization of existing autonomous system capabilities and infrastructure to provide solutions to workforce and safety needs in the state. The study must include an analysis of utilizing autonomous technology for infrastructure inspection, rural emergency service needs, agriculture advancement, energy industry application, and other opportunities for collaboration through the utilization of autonomous system technology. The legislative management shall report its findings and recommendations, together with any legislation required to implement the recommendations, to the sixty-ninth legislative assembly.