

**TESTIMONY OF
ROBERT J BECKLUND
EXECUTIVE DIRECTOR, NORTHERN PLAINS UAS TEST SITE
BEFORE THE
INTERIM ECONOMIC IMPACT COMMITTEE
MAY 24, 2016**

Madam Chairman and Members of the Committee:

I am Robert Becklund, Executive Director of the Northern Plains Unmanned Aircraft Systems Test Site (NP UAS TS) and here to report on the status of the Unmanned Aircraft Systems Program, established by the Federal Aviation Administration (FAA) under the North Dakota Department of Commerce, to administer an unmanned aircraft systems test site in cooperation with the University of North Dakota, North Dakota State University, the Aeronautics Commission, the Adjutant General and private parties appointed by the Governor. I understand you are interested in learning more about a couple specific areas as well including the recent Technical Interchange Meeting we hosted; and any thoughts and concerns we may have regarding the FAA's recently published *State and Local Regulation of Unmanned Aircraft Systems (UAS) Fact Sheet* as it relates to either the NP UAS TS or the Grand Sky UAS Business Park.

FAA Technical Interchange Meeting

The NP UAS TS recently hosted a Technical Interchange Meeting (TIM) in Grand Forks attended by approximately 30 personnel including senior representatives from each of the other Test Sites as well as representatives from the FAA Headquarters. This was the fourth TIM that has been held since the Test Sites were established and they are intended to provide the FAA a periodic update of the research conducted, lessons learned and results of any data collected. At this TIM, in addition to our good hospitality, we provided tours of UND Aerospace, the USAF and Customs and Border Protection (CBP) UAS operations at Grand Forks Air Force Base, and the Grand Sky UAS Business Park complex being built there. Everyone left North Dakota impressed with our program, operations and capabilities.

FAA's Fact Sheet on State & Local Regulation of UAS

The FAA recently released a fact sheet related to State and Local regulation of UAS. Basically, it reminds everyone that the FAA governs all navigable airspace in the United States and provides some examples of state or local laws that can be governed at the state and local level and also those that must be coordinated with the FAA prior to any legislative action. Essentially, states or local municipalities may not enact any laws or regulations that supersede FAA rules regarding navigable airspace. The current challenge is that UAS are expanding the definition of navigable airspace and the FAA is attempting to deal with this new frontier of navigable airspace that UAS have opened up. Locally, we do not believe that North Dakota's current laws regarding state and local government police power would affect the Test Site or the Grand Sky UAS Business Park.

We recommend that North Dakota follow the guidance in the FAA's UAS Fact Sheet and allow the FAA and the courts to develop any new rules regarding operations of UAS. This will allow us to continue to offer industry a cooperative environment for the operations of UAS in North Dakota while avoiding any issues of jurisdiction with the FAA.

Northern Plains UAS Test Site Update

It has been an extremely busy period for us since the last time I appeared before you and thought you'd appreciate an update.

We have now had detailed discussion with over 200 companies resulting in over 65 executed Non-Disclosure Agreements (NDA) with those seriously interested in learning more about opportunities to use the NP UAS TS for their research and certification needs. This has resulted in numerous contracts for services including two that we have completed already, eleven current contracts and another three that are in the final stages of execution. Three of these contracts leveraged our internal matching funds, five were completely funded by private industry for operations all across the country, five were funded through broader research projects under the Research ND Program and three were entirely publically funded (federal or state). Additionally, we just returned from this year's Association of Unmanned Vehicle Systems International (AUVSI) conference where we had continual engagement with companies interested in working with the NP UAS TS – most certainly our efforts will result in subsequent contracts.

Operationally, we just finished successful execution of a \$200K project with NASA by flying four separate aircraft simultaneously as part of a national stress test of their recently developed UAS Traffic Management (UTM) system. In an effort to broaden the economic impact to our local area as well as provide diversity to the NASA test, we subcontracted private sector partners to provide and fly some of the aircraft. Specifically, the teams from Botlink, Sensurian Aerospace, Altavian and Simulyze corporations did a great job and contributed to the ultimate success of our performance. I understand we were the only test site to use private-sector partners and our goal was to build a team that could exceed NASA expectations - and we certainly did so thanks to everyone's efforts.

Additionally, just last Friday, we achieved yet another "first" by supporting the first flight of the Elbit System's Hermes 450 Medium Altitude Long Endurance (MALE) UAS from Hillsboro Municipal Airport. As far as we know, this is the first flight of a MALE UAS flown from a civil airport, under civil flight rules and outside of FAA-designated Special Use Airspace (SUA). These flights will continue throughout the summer and support an NDSU agricultural research project in collaboration with Elbit Systems of America, the NP UAS TS and UND. I encourage you to come and take a look at these operations if you have some time.

As an example of our ever-increasing operations tempo, in 2014 we supported 2 projects with 2 different aircraft flying 79 sorties for a total of 827 minutes of flight time. In 2015, we supported 6 projects with 9 different aircraft flying 168 sorties for a total of 1610 minutes of flying time. And in the first quarter of 2016 alone, we have already exceeded the entire previous year's statistics supporting 11 projects with 12 different aircraft flying 172 sorties for a total of 1670 minutes (again this is just for the first quarter of the year). To deal with this increased demand, we continue to leverage personnel from within our team member's organizations, primarily UND and NDSU; and we have hired two full time pilots to serve as Mission Coordinators to support

funded field operations bringing our total to seven full-time positions in Grand Forks - all acquired through competitive processes. Costs associated with all positions will be offset, and conceivably ultimately entirely covered, by external contracts as operations expand.

We continue to pursue unique authorizations from the FAA to set us apart from the other test sites and create opportunities for industry to accomplish whatever operations they may need in the most safe, effective and efficient means possible. For example, we have submitted a risk-based proposal for an authorization that will allow MALE/HALE UAS to operate from the Grand Sky UAS Business Park without the need for ground-based visual observers or a chase aircraft outside of SUA. We expect approval of this proposal and, once obtained, the Grand Forks area will be the only place in the entire nation where flight under these conditions is possible. This is significant because the costs associated to provide visual observers and/or chase aircraft are typically prohibitive for either large or small companies needing to conduct a research project of any significant duration.

Budget Update

The resources committed by North Dakota to the Northern Plains UAS Test Site have been used prudently to maximize our impact on the national industrial effort in collaboration with the broader state efforts to develop the commercial UAS industry and to promote economic development in North Dakota. Because we are receiving no funding from the FAA for the test site program, North Dakota's prospects to build a UAS industry in the state would be dramatically diminished without continued state support.

The 63rd Legislative Assembly appropriated a total of \$5,000,000 to support North Dakota's UAS program during the 2013-2015 biennium: \$1,000,000 was appropriated to fund the state's efforts to obtain NTS designation by the FAA, and \$4,000,000 to operate the test site, contingent upon receiving the designation by the FAA. Our initial efforts were successful and, as previously mentioned, we achieved designation as one of the six test sites on December 30, 2013. We then ceased funding expenses from the \$1,000,000 funding pool and all expenses were subsequently funded from the \$4,000,000 funding pool. Total funds expended from the \$1,000,000 funding pool were \$482,619.07 and the balance of those funds was allowed to be carried-over into the current biennium to support funding operations of the NP UAS TS. Additionally, due to a number of factors, particularly that test site operations started six months later than anticipated due to the unexpected length of the selection process, we had \$1,342,762 of unexpended funds remaining from the \$4,000,000 funding pool that we were also allowed to carry over into the 2015-2017 biennium to support funding operations of the NP UAS TS.

The operating budget for the NP UAS TS for the 2015-17 biennium was estimated at \$4,240,000. The Governor's budget recommendation of \$2,718,620 along with carry-over of unexpended 2013-2015 biennium funds will provide the necessary funds to operate the NP UAS TS through the current biennium. Although we are now earning revenue from both private and public sector clients, our budget request did not rely on external revenue. This was prudent as the nation's commercial UAS market is still in its infancy and we need to ensure that North Dakota continues to play a key role in its development. Earned revenue from NP UAS TS clients will be deposited in the Unmanned Aircraft Systems Program Fund to defray future expenses of the operations of the NP UAS TS.

Economic Impact

As previously reported to you, the March 2013, Association of Unmanned Vehicle Systems International (AUVSI), *The Economic Impact of Unmanned Aircraft Systems Integration in the United States* report valued the UAS global market at \$11.3 billion. Over the next 10 years, the UAS global market will total \$140 billion. The economic impact of US airspace integration will total over \$13.6 billion in the first three years and will grow substantially for the foreseeable future, cumulating to more than \$82.1 billion between 2015 and 2025. Most notably as it relates to the need for continued support for our state's initiatives in UAS, the report also says: "While we project more than 100,000 new jobs by 2025, states that create favorable regulatory and business environments for the industry and the technology will likely siphon jobs away from states that do not."

Recently, Winter Green Research published a new study entitled "*Commercial Unmanned Aerial Systems (UAS): Market Shares, Strategy, and Forecasts, Worldwide, 2012 to 2018*". The report highlights that unmanned aircraft are "perhaps the most innovative, most interesting technology emerging and promise to achieve a more significant aspect of commercial presence. Markets currently at \$363.7 million are anticipated to reach \$2.8 billion by 2018, with growth coming as the lighter and less expensive devices are performing commercial tasks remotely, with less cost and more versatility than is available in any other manner."

Regardless of the source or the accuracy of the forecasts, it is clear that UAS hold tremendous potential to serve the benefit of mankind in countless ways, create lasting jobs, diversify our economy and further advance North Dakota as a leader in technology and innovation making this an area of economic development worthy of continued pursuit – especially with everything that North Dakota has to offer this new industry.

North Dakota's investments in UAS have allowed us to be positioned as a key player and earn a position of influence in the UAS sector. As a result of receiving state funding to continue supporting baseline operations of the NP UAS TS, we have been able to expand our already strong position in the nation and not only enable, but also capitalize on, the blossoming commercial opportunities of UAS. We are just beginning to see a return on investment; and the NP UAS TS is having a positive economic impact to North Dakota both directly and indirectly.

Direct economic impacts include support to multiple agencies, companies, events and personnel including:

- Assisting numerous existing and local start-up businesses related to UAS such as Northrop-Grumman Corporation, BBI International, SkySkopes, Altavian, SmartC2, Botlink, Sharper Shape and the General Atomics Corporation. Many of our efforts are having direct and positive impacts to the impressive growth of the Grand Sky UAS Business Park.
- A 5-year Indefinite Delivery Indefinite Quantity (IDIQ) contract with NASA valued at \$5M. Each of the UAS test sites, exclusively, is able to compete for work under this contract. The NP UAS Test site has already been awarded two contracts under this IDIQ – one for approximately \$200K and the other with a value of approximately \$300K.

- A 5-year IDIQ contract with the FAA's Technical Center also valued at \$5M. Similarly, each of the UAS test sites will be able to compete for work under this contract. No RFP has yet been issued by the FAA against this contract.
- A partnership with the Alliance for System Safety of UAS through Research Excellence (ASSURE) Coalition under the FAA's recently awarded UAS Center of Excellence program. This is an FAA-funded program expected to utilize the UAS Test Sites. Although we have received no RFP's directly by ASSURE, UND has been actively tasked and funded for research by ASSURE.
- Approximately 50 individuals from 20 companies have travelled to North Dakota to meet specifically with the NP UAS TS to learn about opportunities we can offer them.
- The numerous contracts previously mentioned support multiple private sector companies and public entities (either directly or through our research universities) and have a total value for NP UAS TS services of approximately \$615K. It is important to note that some of these services are part of broader contracts for UAS research with either UND or NDSU with a total value of approximately \$3M. Additionally, some of the private sector funded research operations we are supporting have us conducting operations all across the United States that serves to broaden our already strong reputation.
- The 9th Annual UAS Summit held this past year brought approximately 500 people to the Grand Forks area for a 3-day meeting related to UAS with a large focus on the NP UAS TS. In association with this past year's summit, the NP UAS TS hosted a public meeting with the FAA to discuss innovation and opportunities at the Test Site. We expect that the 10th Annual UAS Summit this coming August will be even bigger.
- We entered into a no-cost agreement with Access Spectrum Corporation, providing us unique access to specific radio frequency spectrum that no one else has. We are already seeing movement by industry into this band due to stringent FCC and FAA rules that prohibit transmission in other areas of the RF spectrum.
- Our current appropriation requires us to set aside \$1.2M as a match to incentivize industries to utilize the Test Site. Our program is designed to allow a maximum of \$100K in matching effort to 12 individual companies with hopes that they will ultimately provide a direct economic impact to North Dakota by expanding or growing their businesses here. To date, we have three companies taking advantage of this program.

Indirect economic impacts include:

- The bounty of extremely positive press stories previously mentioned with an incalculable value in advertising alone.
- NDSU and UND are both engaged in multiple funded research projects related to UAS due in part to their connections to the NP UAS TS. Some of these projects will expand into direct contracts with the NP UAS TS to support future flying requirements.
- The reputation of UND Aerospace, bolstered by the reputation and capabilities of the NP UAS TS, has led to private donors committing \$25M to construct a new aviation building in Grand Forks at the University of North Dakota Aerospace. This building is nearly complete and we expect that it will lead to more and more people taking a look at the opportunities related to aviation and UAS here in North Dakota.

Challenges

To deal with some of the pressure from industry and Congress, the FAA has been constantly reorganizing and just recently hired two new senior executives to assist in their efforts in UAS integration. This constant reorganization naturally slows progress as new individuals and organizations take time to become fully functional. In other efforts to deal with these pressures, the FAA has created opportunities for industry to operate UAS outside of the UAS Test Site program – specifically by allowing for aircraft airworthiness exemptions under Section 333 of the 2012 FAA Modernization and Reform Act (FMRA). The FAA has now issued over 5000 airworthiness exemptions to unmanned aircraft allowing operations for civil commercial or research purposes – nearly all of which will be superseded when the anticipated FAA regulation Part 107 (commonly called the small UAS Rule) is released. Additionally, the FAA has entered into numerous Cooperative Research and Development Agreements (CRADA) directly with multiple private industry firms. These CRADAs, however, have many restrictions for their operators. These limitations may provide opportunity for the UAS Test Sites to conduct research beyond the limitations such as when aircraft need to fly higher, faster, carry heavier payloads, or operate in a Beyond Visual Line of Sight (BVLOS) environment.

Another challenge we face is authority to operate on certain bands in the Radio Frequency (RF) Spectrum. UAS require electronic links for both Control and Non-Payload Communications (CNPC) and payload data links. These frequencies need to be interference free and de-conflicted from other users of the particular RF bands we need to utilize. This is a worldwide issue not unique to the UAS Test Sites, but a significant issue worthy of noting. Many agencies at the national level are working on these issues, but we are impacted in the interim. As an example, we currently have two funded projects awaiting approvals to operate due to RF spectrum issues. We have been very proactive with the Federal Communications Committee (FCC), National Telecommunications and Information Administration (NTIA) and the FAA Spectrum Office in gaining authorizations to operate; and our cooperative agreement with Access Spectrum has provided us a unique alternative to offer companies when denied by the FCC, NTIA or FAA Spectrum Office.

Finally, for your awareness, our Other Transaction Agreement (OTA) with the FAA for establishment and operations of the Test Site currently runs through February 2017. We are expecting legislative extension of the national Test Site program through either the 2016 FAA Reauthorization Act or a Continuing Resolution of the 2012 FMRA.

Summary

Our end goal of all of this investment and effort is to ultimately support the development of a new industry in the United States, and position North Dakota as the prime location for UAS companies to establish operations. Already, we have seen notable successes including the Florida-based UAS company, Altavian, selecting North Dakota as the primary location for their UAS manufacturing operations; SharperShape Corporation established their US location in Grand Forks and hiring local staff; the development of Grand Sky UAS Business Park at Grand Forks AFB – with their first anchor tenants, Northrop-Grumman Corporation and General Atomics, both recently celebrating ground-breaking for their buildings and each are in the process of hiring staff. The Additionally, Grand Sky has other clients either already committed or in serious

negotiations for lease options. The NP UAS TS is closely aligned with Grand Sky as well as working directly with their tenants.

The Department of Commerce and the entire NP UAS TS team have been aggressively working to attract private sector businesses into North Dakota to work with the test site. Based upon the actual contracts we already have in place and the multitude of companies involved in mature discussions, we expect that many more will result in business activity for the test site and North Dakota assuring our growth as our experience and reputation grows. Although it is impossible to predict how many clients we may ultimately serve, it is not unrealistic to assume that, at times, we could be challenged with more business than we are able to handle – a great problem to have and we look forward to it. None of these successes and the many accomplishments of the NP UAS TS would be possible without current, and continued, support from the Governor and Legislature.

Madam Chairman, thank you for all your support and the opportunity to be here today and I will be glad to answer any questions.