

North Dakota Legislative Interim Economic Impact Committee

UAS – LOCAL/STATE/FEDERAL PARTNERSHIP

UNMANNED SYSTEMS In Grand Forks & North Dakota



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UAS – LOCAL/STATE/FEDERAL PARTNERSHIP

State-Wide Synergies



The Stage is Set

- Global Marketplace
- N.D. Designation as FAA Test Site
- First Test Site Being Activated (Out of 6 Sites)
- UND Unmanned Aircraft System Center of Excellence
- Grand Forks County Enhanced Use Lease – Grand Sky

Marketplace Snapshot

- | | |
|--|---|
| <ul style="list-style-type: none">• In 2011<ul style="list-style-type: none">– 44 countries– 226 companies– 675 aircraft<ul style="list-style-type: none">• 194 in U.S. | <ul style="list-style-type: none">• In 2013<ul style="list-style-type: none">– 57 countries (+30%)– 270 companies (+20%)– 960 UAVs (+40%)<ul style="list-style-type: none">• 144 in U.S. |
|--|---|

Commercial Potential

Once allowed to fly in national airspace system

- AUVSI projects commercial use
 - \$82 billion into the economy
 - More than 100,000 new, high paying jobs
- \$75.6 billion into agriculture/precision ag
- \$3.2 billion to public safety
- \$3.2 billion to other uses
- A system of systems



Precision Ag UAS Factors

- World population predicted to hit 9.2 Billion by 2050
- More than one acre of farmland lost per minute
- Urbanization, desertification, and erosion
- 60% of the world's under-utilized agricultural land is in Africa
- Computerized sensors will drive the future of farm equipment

Future Trends



- The U.S. will remain the largest producer and operator of UAVs in the next decade
 - 45% of global market
- Israel is the world's second largest UAV producer and the largest exporter, selling systems to 49 countries
- Despite tight defense budgets, worldwide demand is projected to increase
- UAS military market will transition from procurement to sustainment

UAS Opportunities

- Test site to drive commercial applications
 - Precision Ag
 - Pipeline & transmission line patrols
 - FEMA & public service
- Logistics and supply functions
- International collaboration & training
- Data center facilities
- Sensor technology upgrades & miniaturization

UAS Uses



UAS Strengths

- Can operate in areas that may be too dangerous for piloted aircraft or ground patrol
- Is far more cost-effective than any manned alternative
- High-definition images can be taken and used locally or transmitted to the control station in real time
- The system is capable of operating day or night

Where is the US Today?

- Illegal to fly unmanned aerial systems for commercial purposes in U.S. airspace
- Congress has directed the Federal Aviation Administration (FAA) to address commercial use by Sept. 2015
- Most UAV operators follow 1981 FAA guidelines for model planes
 - Can not fly higher than 400 feet above the ground
 - Stay away from airports and sensitive areas

FAA Test Site

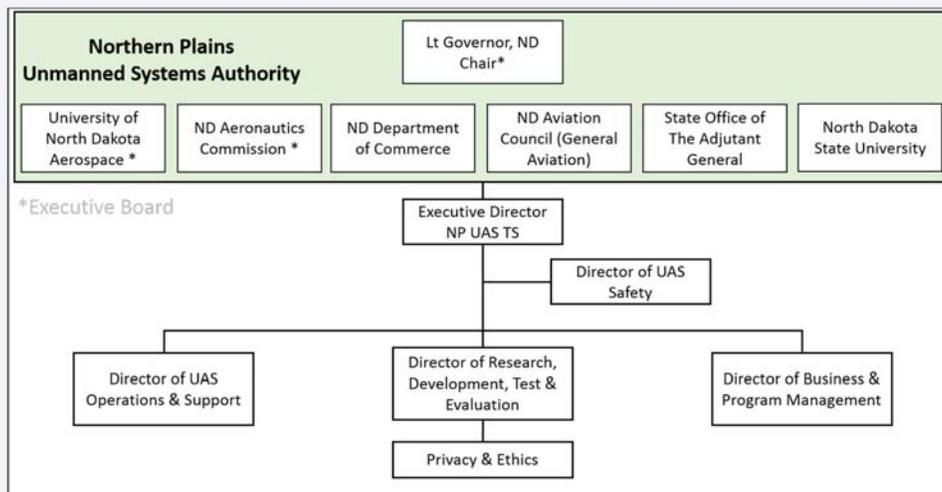
- N.D. selected on Dec. 30, 2013 to be 1 of 6 FAA Unmanned Aircraft Systems (UAS) Test Sites
- First test site to be activated
- For every year integration is delayed, the potential economic impact is more than \$10 billion - \$27.6 million/day

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NPUSA



Funding:

- \$1 M to hire a TS Director and begin standup process
- \$4 M (\$2 M/year) to operate TS
- Funding was approved by both House and Senate appropriations sub-committees

Primary Objective

- The test site's primary objective is to gather information for the FAA to use in developing policies, procedures, standards, etc.

Research & Development

- Initial research focuses:
 - Systems safety
 - Aircraft certification
 - Command & control links
 - Control station layout & certification
 - Ground & airborne sense & avoid
- Initial industry focuses
 - Precision agriculture
 - Energy

Test Site Opportunities

- Provide a Large, Safe, All-Weather Flight Airspace Site to Test:
 - UAS (All Platforms) Certifications
 - Sensors / Payloads
 - Training (Operations, Ratings, and Certifications)
 - Structures / Composites
 - Emerging Technologies (NDSU anti-icing research)
- Provide Test Airspace for Technologies and UAV Platforms Needed to Safely Integrate UASs Into the National Airspace
- Attract the Major Aircraft Manufacturers to North Dakota
- Capture Additional Aerospace Research Funding
- Capture Additional Engineering Research Funding
- Develop Commercial Applications for UASs (Amazon.Com – 60 Minutes)
- Develop National Standards for UAS Operations, Training, Maintenance, and Research
- Develop Security and Privacy Measures and Regulations

Next Steps

- Coordinating with the FAA
- Preparing for initial test site operations
- Recruiting & engaging potential strategic partners
 - Initial industry outreach to ND has been tremendous
- Promoting the Northern Plains UAS Test Site
 - Coordinating efforts of regional stakeholders
 - Consolidating key messaging

UND UAS COE



- Established in 2005
- Provide a conduit between private industry and UAS researchers, promoting commercialization of new UAS related products and services while bringing new UAS related business ventures to North Dakota

Research Partners



MITRE

APPAREO
SYSTEMS

AFRL

THE AIR FORCE RESEARCH LABORATORY
LEAD | DISCOVER | DEVELOP | DELIVER

NORTHROP GRUMMAN



Rockwell
Collins
Building trust every day



Research Funding Summary

CASH TO DATE: \$52.08 million

- State Funding: \$18.85 million
- DoD / FAA Funding \$22.73 million
- Private Sector Cash \$10.50 million

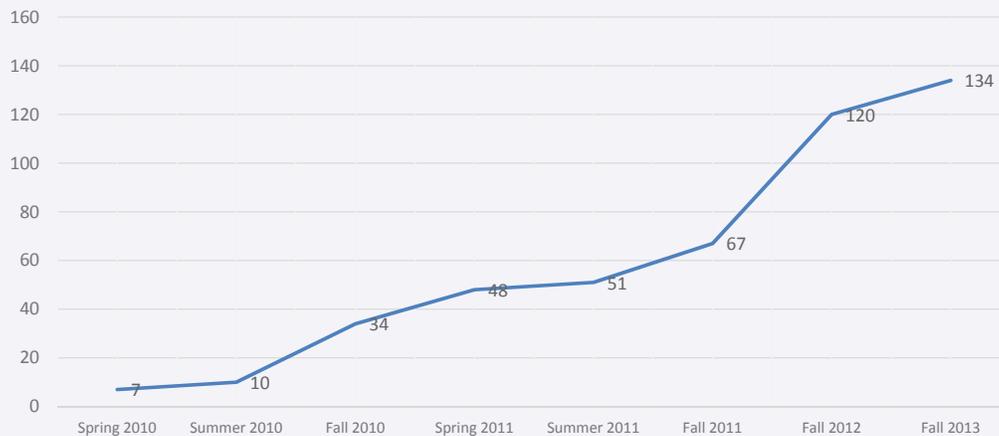
IN KIND TO DATE: \$7.70 million

TOTAL FUNDING TO DATE:

\$ 59.78 million

BSA, Major in UAS

Number of Students



- Officially Offered as a Major in the 2009 Fall Semester

Nowhere but North Dakota

North Dakota has elements needed for UAS growth:

1. Unlimited-uncontested airspace
2. Low population density
3. Northern border proximity
4. Support from the FAA, ND State Aeronautics Commission, local airports and local communities
5. Supportive Federal Legislative Contingent,
6. Commitment from Governor's office, Legislature
7. Existing UAS missions for the US Air Force, ND Air National Guard, Homeland Security, Border Protection
8. Two major research universities (UND and NDSU)
9. A premier 2-year maintenance training community college (NCTC)
10. The largest collegiate flight training program in the country
11. Cold weather climate with a complete range of flying conditions