Unmanned Aerial Systems Industry Opportunities and Challenges

New Mexico State Legislature
Economic and Rural Development Committee

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Las Vegas, NM
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Emerging Technology Ventures Inc. (ETV) is an engineering, design, prototyping, and integration services company founded Feb. 2014 in Alamogordo, NM

Company Mission: To provide autonomous, integrated sensing, and prognostic & predictive analytics for timely, actionable intelligence in complex environments including precision agriculture and critical infrastructure inspection.
Bottom Line Upfront

• The UAS industry continues to evolve and experience significant growth with increasing integration into commercial operations
  • Teal Group projects $88.3B UAS market from 2018-2027
  • Energy, Precision Agriculture, Film, Public Safety, Environmental Management
  • Technology areas are cross-cutting and can leverage research and development ongoing in New Mexico’s laboratories and academic institutions
  • The US manufacturing base is limited and offers significant opportunity for growth in rural New Mexico communities
    • New Mexico has an extensive toolset of resources and incentives that could be coalesced to capture market share

• Challenges exist on both the State and Federal level
  • Workforce Development, Infrastructure, Access to Capital, Synergy across Rural Communities which require a focused effort
  • Integration of UAS into the national airspace (FAA) and State/local airspace integration including privacy

• The Unmanned Ground Systems (UGS) industry, while lagging UAS, offers significant future growth opportunities
  • Research and Markets projects growth from $2.7B in 2018 to $7.0B by 2025
  • Common core technologies are shared between UAS and UGS
Opportunities

Unmanned Aerial Systems Industry
UAS/UGS Subsystems
Opportunity Below the System Level

Cross-Cutting Technologies Offer Diverse Opportunity
- Platform
  - Composites, Machining
- Power
  - Batteries, Fuel Cells
- Sensors
  - Cameras, LiDAR, GPS
- Controls
  - Electro-Mechanical, Software
- Communications
  - Radios, 5G, SatCom
- Payloads
  - Package Handling, Sprayers, Manipulators
## Commercial Opportunities

<table>
<thead>
<tr>
<th>Category</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Safety</td>
<td>• Search &amp; Rescue; Firefighting, Disaster Response, Security</td>
</tr>
<tr>
<td>Precision Agriculture</td>
<td>• Crop Inspection; Chemical and Fertilizer Application</td>
</tr>
<tr>
<td>Energy</td>
<td>• Oil &amp; Gas, Wind/Solar Inspection; Pipeline Monitoring</td>
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<tr>
<td>Logistics</td>
<td>• Package Delivery; Shipping; Warehouse Operations</td>
</tr>
<tr>
<td>Critical Infrastructure Inspection</td>
<td>• Roads, Bridges, &amp; Rail; Utilities; Buildings</td>
</tr>
<tr>
<td>Environmental &amp; Construction Management</td>
<td>• Forest &amp; Range Management; Surveying &amp; Mapping</td>
</tr>
<tr>
<td>Film &amp; Media Production</td>
<td>• Location Scouting; Cinematography; News; Special Events</td>
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June 10, 2019: By the authority vested in me as President by the Constitution and the laws of the United States (US) of America, including section 303 of the Defense Production Act of 1950,……….., I hereby determine, pursuant to section 303(a)(5) of the Act, that the **domestic production capability for small unmanned aerial systems is essential to the national defense.**

Further, **purchases, purchase commitments, or other action pursuant to section 303 of the Act** are the most cost-effective, expedient, and practical alternative method for meeting the need for this critical capability.
DoD Cornerstone OTA

- **Cornerstone Other Transaction Authority (OTA)** is a DoD program to assess and strengthen the US manufacturing industrial base and supply chain resiliency for critical technologies.

- Stimulate and support research and assure a **robust and resilient manufacturing industrial base for UAS** including:
  - Enable cross DoD platform leveraging of the UAS systems and technologies that will directly enable improved UAS cost and supplier resiliency.
  - Develop critical UAS subsystems including RF sensor, EO/IR sensor, power/propulsion, hardware and software prototypes.
  - Expand the current UAS defense industrial base to meet critical system line-replace unit (LRU) supply requirements.
Challenges and Resources

Unmanned Aerial Systems Industry
Workforce Development

• A *trained, sustainable* workforce is essential for rural economic growth
  • STEM outreach, mentorship, internships complement formal training
  • Industry skills forecast shapes curriculum development to enable responsive, relevant workforce training
  • NMEDD Job Training Incentive Program (JTIP) provides outstanding support to small businesses
Ke’yah Advanced Rural Manufacturing (KARMA)

- KARMA is a collaboration of industry, academia, and government led by the Navajo Nation
- KARMA focuses on developing entrepreneurship in Advanced Manufacturing and Technology to further economic opportunity on the Navajo Nation
- KARMA combines technical education and workforce opportunities to support the Navajo people by uniting hi-tech manufacturing skills and Navajo culture
ISO 9001:2015 Registration

- The International Organization for Standardization (ISO) with 164 national standards bodies, standardizes products, services, and systems to ensure quality, safety, and efficiency.

- ISO registration is a critical discriminator and enabler to companies competing against US and International suppliers.
  - Boeing, Raytheon etc., and Federal agencies (DoD, NASA, NNSA) require/prefer ISO registration.

- NMEDD offers **New Mexico 9000** training classes in collaboration with the NM MEP.
  - Focused on understanding the standard, writing Standard Operating Procedures and Work Instructions, and internal auditing ($550 - $3,300).
  - Certification through independent registrars ranges from $5K - $10K.
New Mexico Small Business Assistance Program (NMSBA)

• The NMSBA Program provides New Mexico small businesses facing technical challenges access to the unique expertise and capabilities of Los Alamos and Sandia national laboratories.

• Challenges solved by using NMSBA are wide ranging and include manufacturing processes, testing, design, consultation and access to special equipment or facilities.

• Up to $40,000 in support available per rural business as a result of recent legislative changes.
Infrastructure and Access to Capital

• Regional *rural manufacturing parks* to support manufacturing startups and scaled growth with increasing market demand would remove a key capital-intensive barrier for small businesses

• Capital requirements for equipment supporting manufacturing facilitation is significant
  • NMEDD’s *NM Collateral Assistance Program (CAP)* is a key capital access tool for small business

• Infrastructure to support testing of systems in operationally relevant environments is a limiting factor
  • FAA Certificates of Waiver or Authorization (CoA) currently held by NMSU and New Mexico Tech
  • Expansion to statewide CoA’s under academia or state agency (NMDot, NMDPS) would facilitate greater access
### Current CoAs to Support Testing

<table>
<thead>
<tr>
<th>Proponent</th>
<th>COA Status</th>
</tr>
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<tbody>
<tr>
<td>New Mexico Tech</td>
<td>Active</td>
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<tr>
<td>New Mexico State University Physical Sciences Laboratory (NMSU-PSL)</td>
<td>Active</td>
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Thank You for the Opportunity!

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