

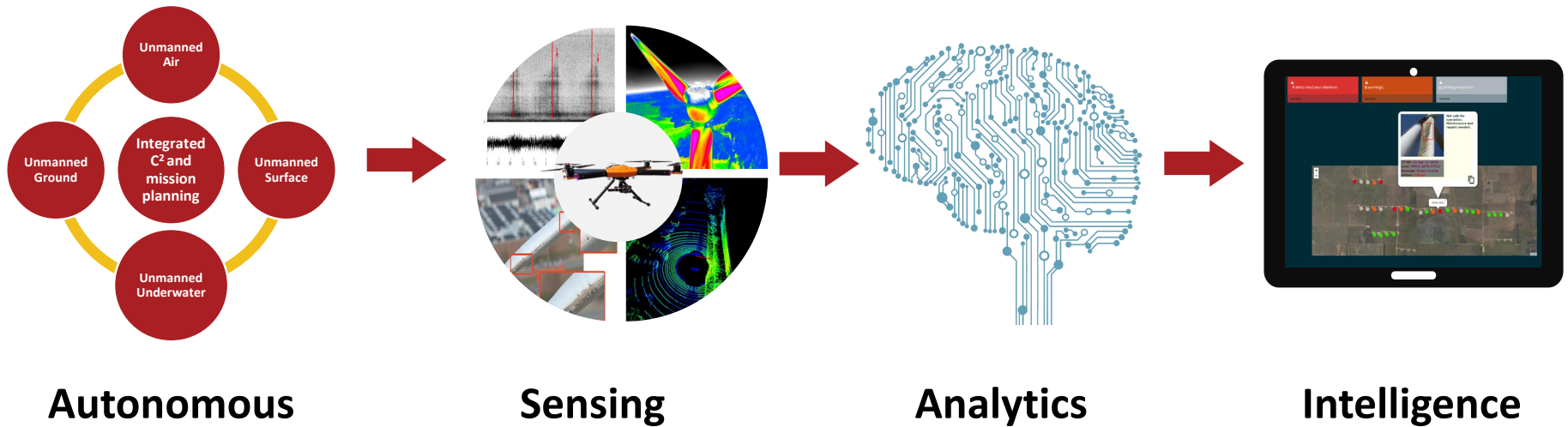
# **Unmanned Aerial Systems Industry Opportunities and Challenges**

**New Mexico State Legislature  
Economic and Rural Development  
Committee**

**Cliff Hudson, CEO  
Emerging Technology Ventures Inc.  
Las Vegas, NM  
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# Emerging Technology Ventures Inc.

- **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



SkyAI GreenAI

# Bottom Line Upfront

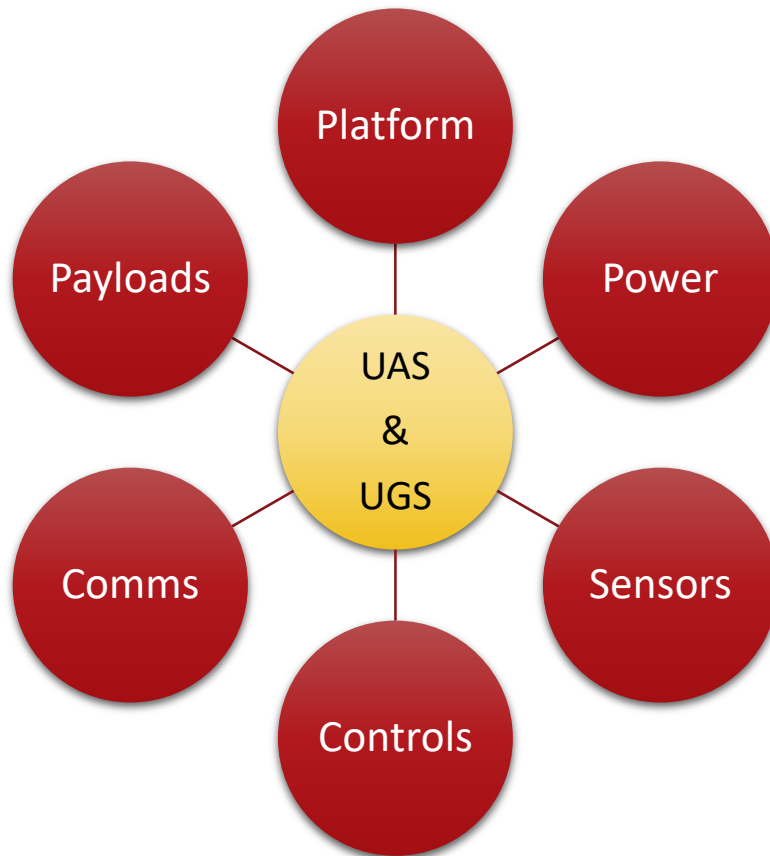
- The UAS industry continues to evolve and experience significant growth with increasing integration into commercial operations
  - Teal Group projects ***\$88.3B UAS market from 2018-2027***
  - Energy, Precision Agriculture, Film, Public Safety, Environmental Management
  - Technology areas are cross-cutting 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

## Public Safety

- Search & Rescue; Firefighting, Disaster Response, Security

## Precision Agriculture

- Crop Inspection; Chemical and Fertilizer Application

## Energy

- Oil & Gas, Wind/Solar Inspection; Pipeline Monitoring

## Logistics

- Package Delivery; Shipping; Warehouse Operations

## Critical Infrastructure Inspection

- Roads, Bridges, & Rail; Utilities; Buildings

## Environmental & Construction Management

- Forest & Range Management; Surveying & Mapping

## Film & Media Production

- Location Scouting; Cinematography; News; Special Events

# Department of Defense Imperative

- 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



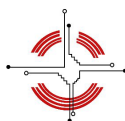
# Ke'yah Advanced Rural Manufacturing (KARMA)



## K.A.R.M.A.

Ke'yah Advanced Rural Manufacturing Alliance

- **KARMA** is a collaboration of industry, academia, and government led by the Navajo Nation



NAVAJO  
TECHNICAL  
UNIVERSITY



NAVAJO TECH  
INNOVATION CENTER



NAVAJO TECH  
CENTER FOR  
DIGITAL  
TECHNOLOGIES



**ETV**



ARROWHEAD CENTER®

- 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

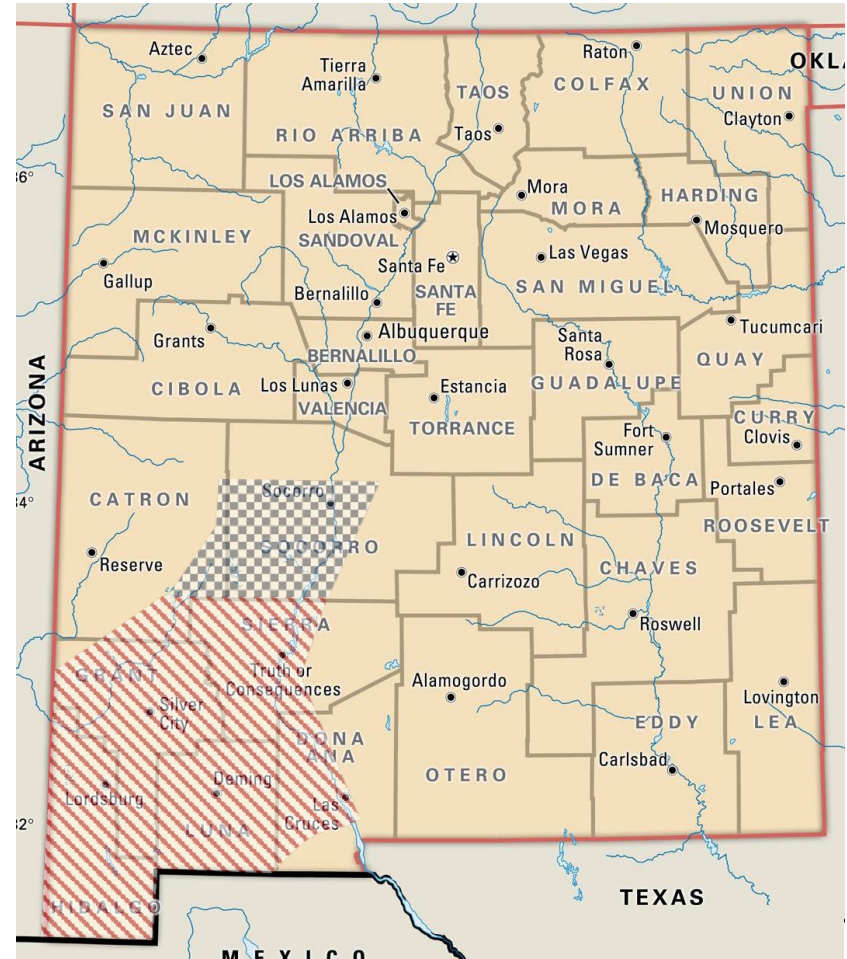


# Infrastructure and Access to Capital

- 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

| Proponent   | COA Status  |
|---|---|
| New Mexico Tech   | Active<br> |
| New Mexico State University Physical Sciences Laboratory (NMSU-PSL) | Active<br> |



# Thank You for the Opportunity!

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