University of Nevada, Reno

A National Tier 1 University

NAASIC

Nevada Advanced Autonomous Systems Innovation Center

Bridging the Gap from Academia to Industry

Manos Maragakis, Dean – College of Engineering

Warren "Bum" Rapp, Director, NAASIC Business Development

State Plan for Economic Development

Industry/Private Sector

University

State Plan for Economic Development

University

Industry/Private Sector

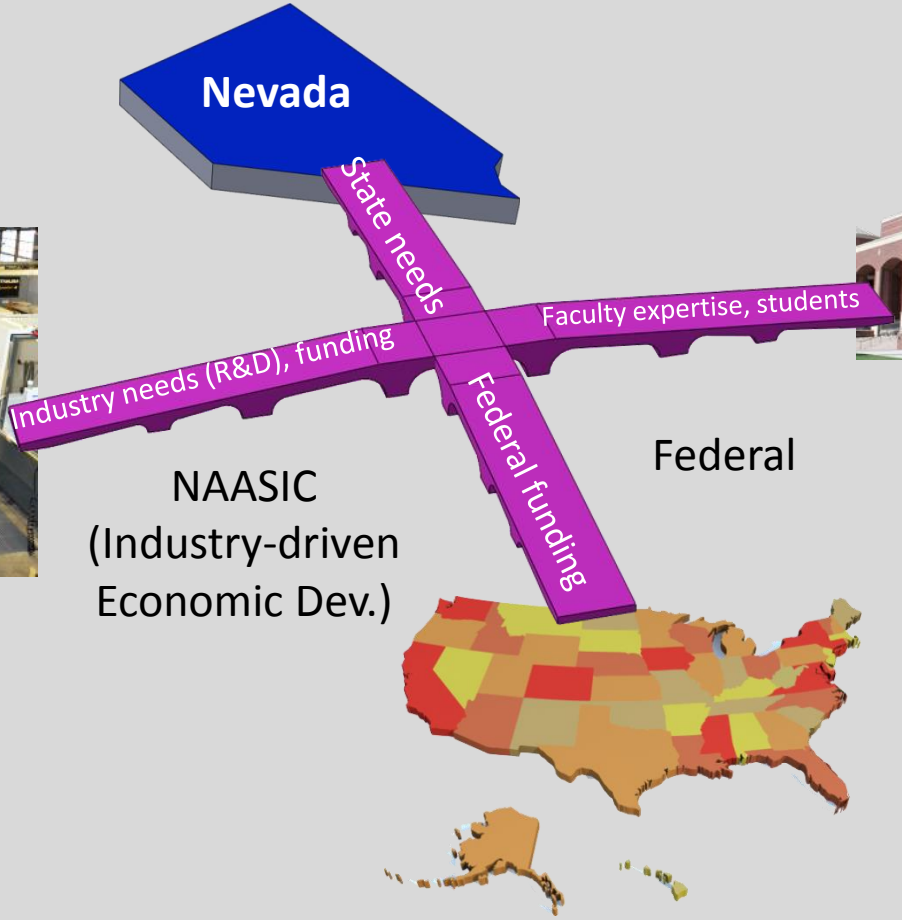
Industry needs (R&D), funding

Faculty expertise, students

NAASIC
(Industry-driven
Economic Dev.)

State Plan for Economic Development

Industry/Private Sector



University

A Vision of National Prominence

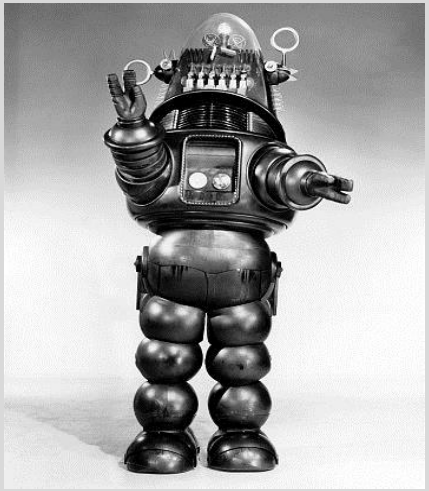
The Nevada Advanced Autonomous Systems Innovation Center (NAASIC) will be a national and a global leader in technology innovation in advanced autonomous systems.

"To spur research, innovation, and commercialization to advance innovation-based economic development in Nevada."

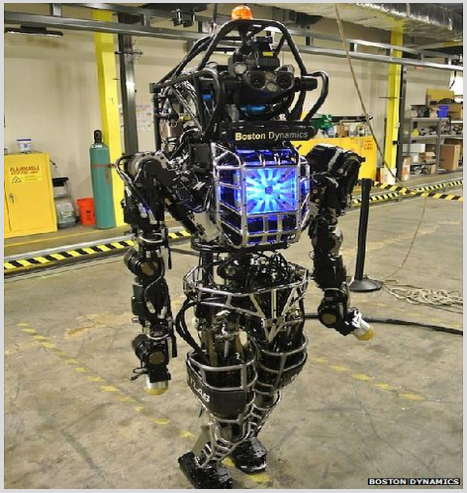
Mission

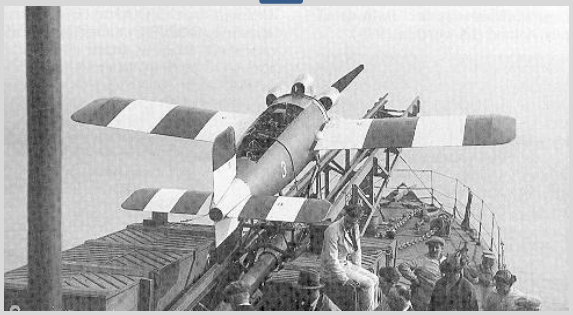
Solve emerging complex problems in the development, application, and commercialization of autonomous systems through unique industry-university partnership, innovation, cooperative research, and entrepreneurship.

Autonomous Systems!



The Industry has come a long way!





(RAE LARYNX) *(UK, 1925-27)*

RQ-170 *Sentinel*

AG-RHCD-80-15

Military Technology Transfer

Department of Defense

100 Billion by 2025

Advanced Autonomous Systems: A Critical Need for Nevada's Economy

Nevada Governor's Office of
ECONOMIC DEVELOPMENT

- One of GOED's focus areas for economic growth in Nevada: aerospace and defense
  - UAV
  - Driver-less road vehicles

- Nevada has unmatched assets:
  - ✓ Excellent operating base locations and testing sites(Creech, Nellis, Reno-Stead, etc)
  - ✓ Available airspace
  - ✓ Excellent climate ideal for testing/R&D

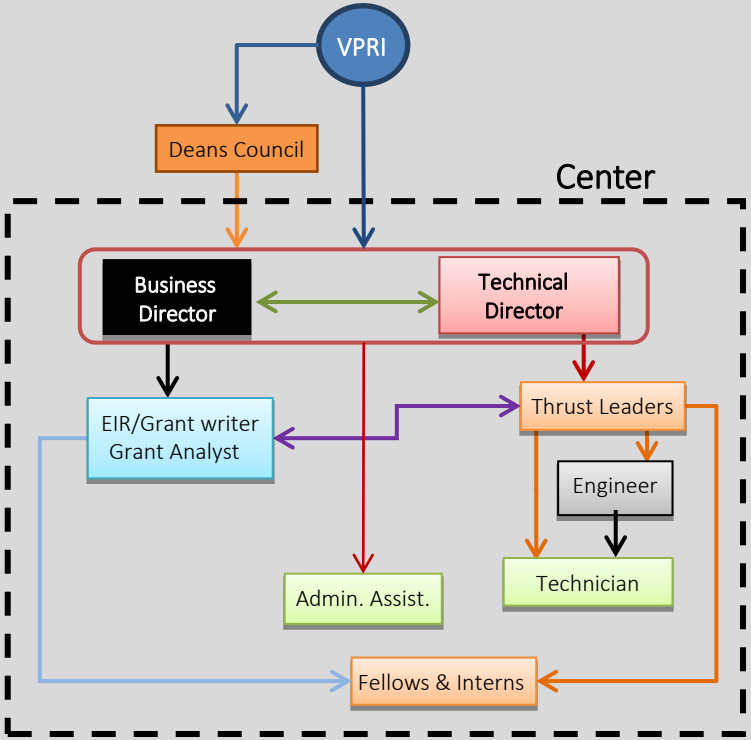
Economic Growth Driven by Emerging Needs

- Advanced manufacturing systems: industrial robots, smart manufacturing machines, warehousing, etc.
- Driver-less road vehicles
- Unmanned aircraft for precision farming, wildfire detection/ monitoring, wildlife conservation, search and rescue, mining, etc.
- Training and workforce development

FAA Chooses Nevada as UAV Test Site

How does the Center work?

Industry/Private Sector



University

Faculty & students

Economic Development: Jobs, Companies, Trained Workforce, Funding, etc.

K-12 Outreach/UNR Engineering Camps

College of Engineering

NAASIC

K-12 Outreach

UAS Jumpstart
Summer Camp

Creating Skilled Cohort for the Future of Nevada

Industry-Supported Capstone Design Projects

Interdisciplinary projects:

- Mechanical engineering
- Electrical engineering
- Computer science & engineering

Industry sponsors

amazon.com

HAMILTON

EBARA

GE

moment skis

Others welcome!

Autonomous Systems Applications

Now What?

UAV Research and Testing

Trimble

INSITU

Flirtey

To Fly

Drone America

NASA

DRI

Desert Research Institute

UNR ⟷ NAASIC ⟷ INDUSTRY

NAASIC

Nevada Advanced Autonomous Systems Innovation Center

UNR ⟷ ***INDUSTRY***

AUVSI

NASA

Trimble

Flirtey To Fly

INSITU

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

KOCH INDUSTRIES INC

Drone America

Altavian Precisely different.

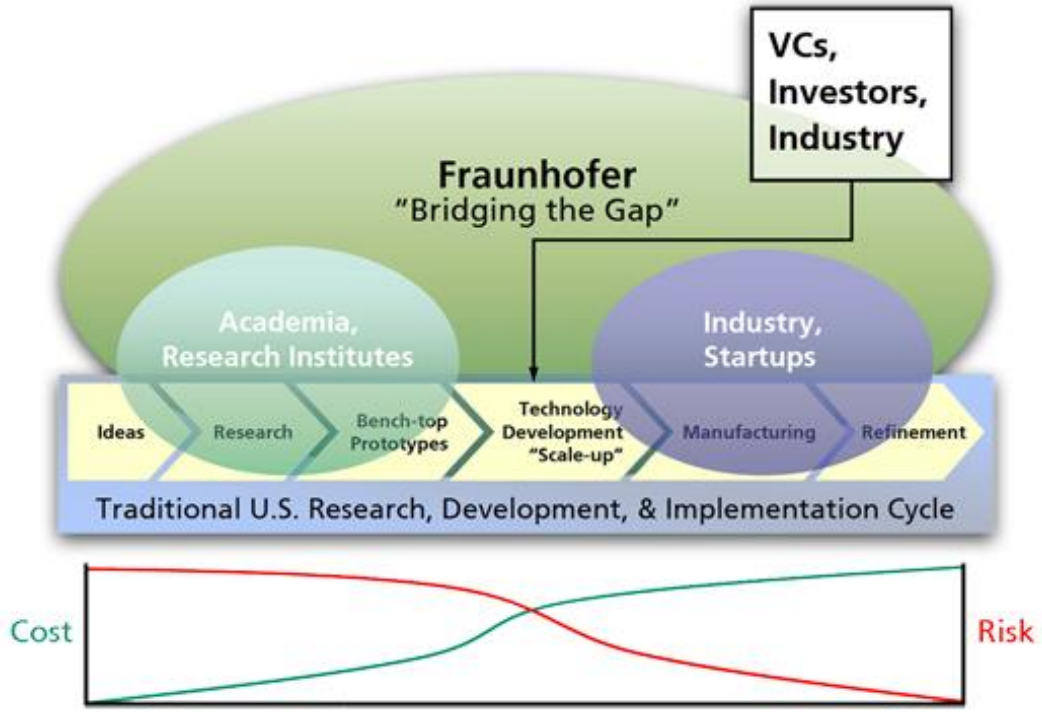
International Partnerships

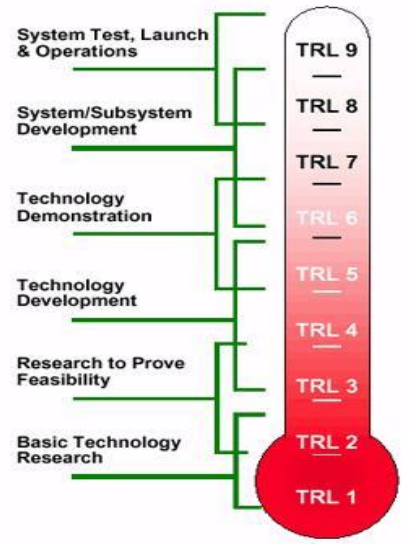
UAV's

Flirtey

- Flirtey flies deliveries - news story

Autonomous Systems Applications





Technology Readiness Level (TRL)

The gap in the middle of this chart is what very few organizations address. This gap, both a **Knowledge gap** as well as a **Funding gap**, greatly slows down the product development cycle. It is precisely this area that Fraunhofer focuses on and has done so very successfully for over 50 years, allowing it to become Europe's largest R&D organization. More concretely, CMI teams up with universities and industrial clients to quickly and cost-effectively move new ideas at the concept stage to the factory or hospital floor.

Flirtey and Fraunhaufer Model

Technology Readiness Level: **5**
High Commercialization Potential/Global Market
Flirtey had completed Prototyping and Initial Testing

<u>UNR Collaboration Benefits to Flirtey</u>
Experienced Researchers on UAV Systems
Kickstart matching funds from University
Indoor & Outdoor testing through UNR & NV Test Site

Test Site: Benefit or Liability

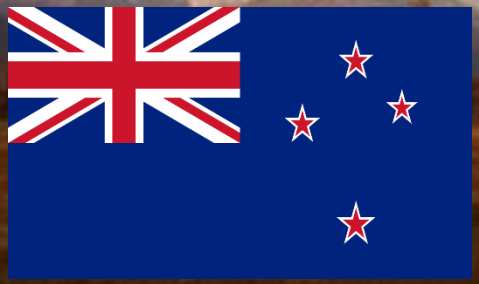
NV only Test Site with DAR
Most Flyable Days
Only entire State Designation

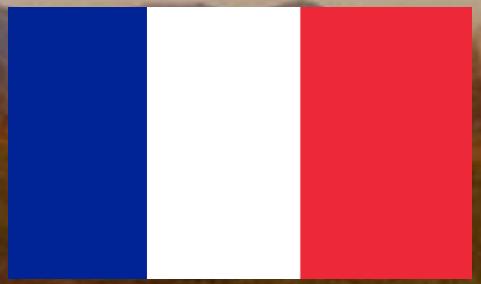
FAA Using Higher Standard for Test Site Approvals

LIABILITY!

UAV testing and commercial market in the U.S was nearly non-existent with FAA restrictions and inability to approve COA's in a timely manner.

Flirtey and other U.S. UAV companies leave the U.S. to test and fly in foreign countries.

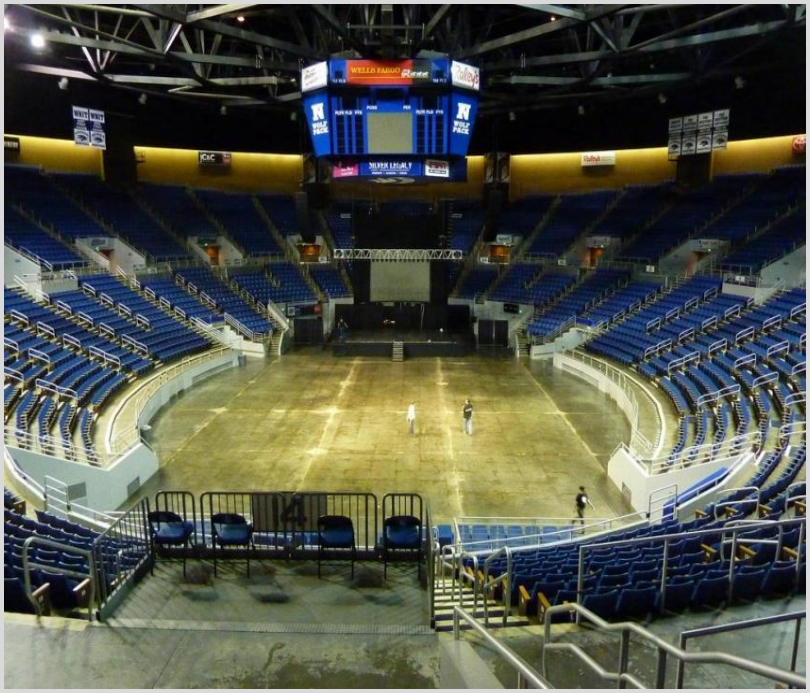




Flirtey Split Operations

U.S. (University of Nevada Reno)

(Indoor Testing)

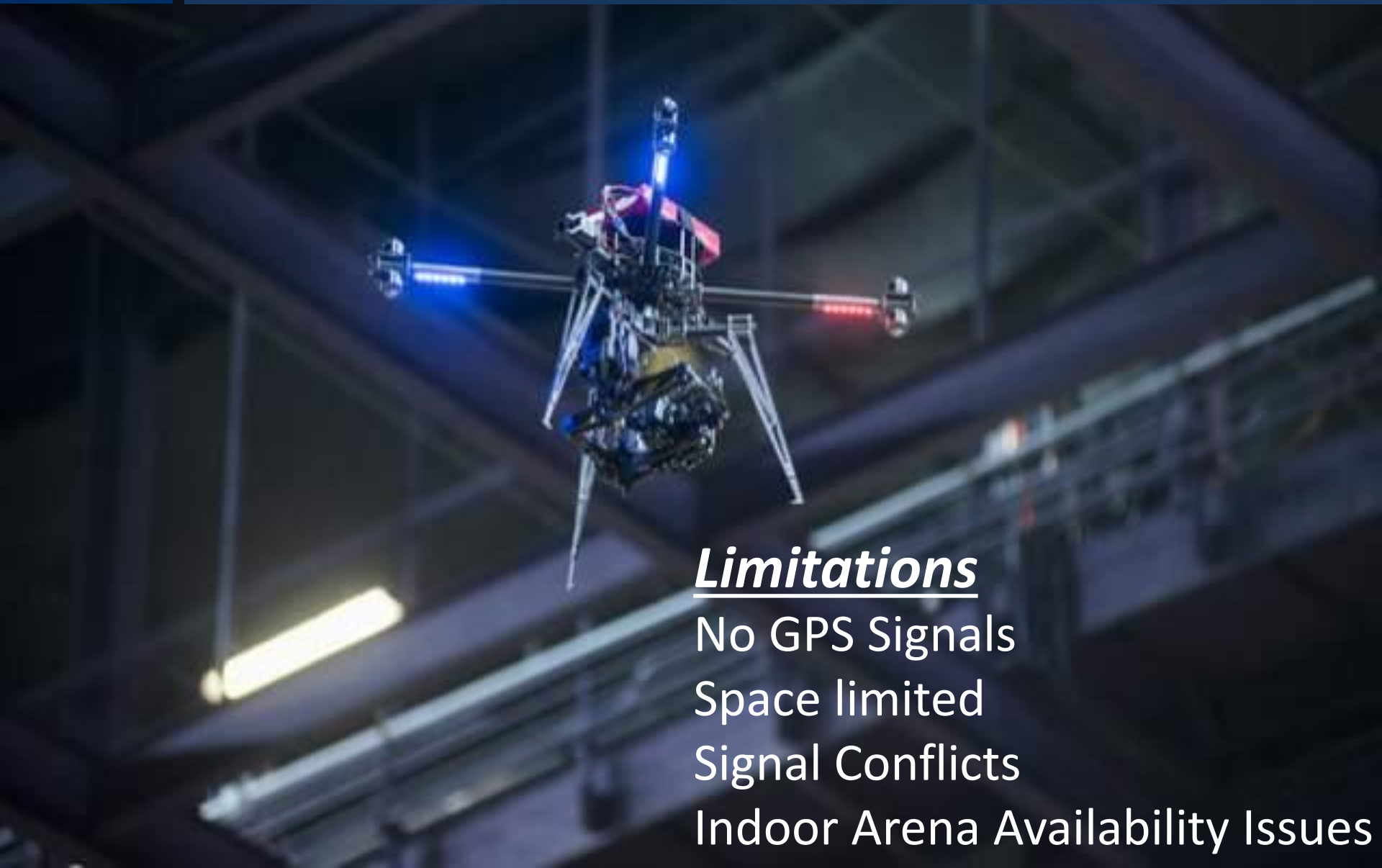


(New Zealand)

(Outdoor Testing)

UAV Indoor Testing being Conducted

(FAA slow to approve COA's)



Limitations

No GPS Signals

Space limited

Signal Conflicts

Indoor Arena Availability Issues

FAA Introduces Interim UAV Policy

The Federal Aviation Administration has established an interim policy to speed up airspace authorizations for certain commercial unmanned aircraft (UAS) operators who obtain Section 333 exemptions. The new policy helps bridge the gap between the past process, which evaluated every UAS operation individually, and future operations after we publish a final version of the proposed small UAS rule.

This policy was put into place in March 1st, 2015. Current results:

Before March 1st, less than (**100**) UAV 333 Commercial Exemptions Approved
Since March 1st, that total has increased to almost **500** Exemptions Approved

Flirtey Summary

1. Successful Product Demo resulted in almost $1M from investors
2. Currently applying through UNR for FAA 333 Exemption/Broad Area COA
3. In Contract with Zookal (Austrailia's Amazon equivalent)
4. University of Nevada, Reno will gain fiscally when Flirtey exits or is acquisitioned.

- Why will Drones replace some traditional package delivery methods?

Drone America

UAV Air Ambulance?

Possible?

Drone America's Resume

NAASIC-Drone America Collaboration

NAASIC Needs Platforms for Research and Testing

Drone America needs Customers and Connections to Industry

Questions?

German “Spectracopter”

Australia’s Flirtey Hexacopter

Amazon Delivery Copter

FedEx Unmanned Cargo Flights