



# NEW YORK UAS & AAM ECOSYSTEM

THE FUTURE OF AIR MOBILITY



# NUAIR OVERVIEW

- Nonprofit established in New York State in 2013
- Manage (1 of 7) FAA-designated UAS Test Sites in the United States on behalf of Oneida County
- Broader Alliance with Massachusetts DOT and Michigan MUASC
- Developing UAS commercial operations in New York State, foundational for Advanced Air Mobility (AAM)
- Staff with decades of manned & unmanned experience
  - FAA Designated Safety and Aircraft Certification Resources
  - SME's
    - RF & Radar
    - Wireless Communication Engineers
    - Policy and Regulations
    - Safety Management Systems
  - Certified Pilots manned and unmanned aircraft
- Through our work with the FAA, NASA, private industry, standards bodies and international organizations we're defining the future of aviation







# ENABLING ADVANCED UAS/AAM OPERATIONS

NUAIR provides expertise to develop, perform and validate operations within the National Airspace System (NAS)

- Develop safety cases
- Integrate the associated elements
- Obtain uncrewed aircraft approvals for operations
- Perform uncrewed commercial drone operations

## Small UAS

- Nationwide Class G Airspace up to 1200' AGL
- KRME Class D up to 2500' AGL
- Oriskany 4 x 8 mile, BVLOS up to 1000' AGL

## Large – UAS/OPA

- Griffiss (KRME) Class D up to 2500' AGL
- SYR Radar Approach Control System (RAPCON) 50 x 100 miles up to 10,000' MSL





# ACCELERATING THE COMMERCIALIZATION OF UNMANNED ADVANCED AIR MOBILITY

NUAIR is the Centerpiece of the UAS/AAM Technology Cluster



# ACCELERATING THE COMMERCIALIZATION OF ADVANCED AIR MOBILITY FOR ECONOMIC & SOCIETAL BENEFIT

*Through its regulatory relationships, industry leadership and public and private partnerships, NUAIR is shaping the future putting disruptive technologies to work for the benefit of New York state and Industry*

## UAS Industry & Regulators



+ UAS Industry



**Over 60 Industry, State, University, Private, Public Sector Alliance Members**

## Integration, Implementation and Commercialization



## Engaged Beneficiary Organizations focused on Social & Economic Impact



- 70 State and Local agencies
- Accident Recreation
- Motorist & Highway safety
- Environmental and Conservation
- Search & Rescue



Private Pharma Co.

- High Value & Urgent Delivery
- Improving Healthcare Equity
- Increase access to emergency care



Thruway Authority

- Bridge Inspection
- Motorist & Highway safety
- Traffic congestion
- Future UAS Services



NYSERDA

- Gov.'s OSW Project Implementation
- Operations and Maintenance



- Tunnel Inspection
- UAS Detection & Security
- Motorist & Highway safety



NY Power Authority

- Utility infrastructure
- Canal Infrastructure

## UAS Services enablement Private and Government Sector



- Operations Over People
- Special Aviation Certification
- EVLOS Operations
- BVLOS Operations



AIRIAL ROBOTICS



Collaborative Low Altitude Integration Effort (CLUE)

## Enabling Advanced Air Mobility



- Vertiport Operations Center
- Design, develop and Integrate SW to manage Airspace, Airside and Terminal operations
- Montreal, Sao Paulo, and Dubai



# CERTIFICATE OF AUTHORIZATION (COA)



Federal Aviation  
Administration

- **Definition:** an authorization issued by the Air Traffic Organization to a public operator for a specific UA activity.
  - Upon applying FAA conducts a comprehensive operational and technical review.
- What makes the FAA COA so special?
  - A COA gives a greater degree of autonomy to the drone operator
  - An operator or organization with a COA may be able to fly a drone under conditions that would have otherwise been restricted even with a Part 107 drone license.

# EXAMPLES OF NUAIR COLLABORATIVE DEVELOPMENT

## NUAIR SME Process

Problem Unmeet Requirements

Market Commercial Solutions

Development

Test Approve

### Upstate Medical

- Staffing shortages
- Time critical delivery needs

- Autonomous Air-Ground Delivery Solutions
- Flying multiple daily flights between multiple facilities

- Multiple test runs / data collection
- Safety case and FAA COA

- UAS Demos in actual environment
- Air to Ground robot hand-offs

### NY State Thruway Authority

- High Cost of bridge inspection
- Employee safety
- Traffic Delays
- Difficulty in position for data collection

- Identified proper equipment
- Provided Pilots
- Cooperative inspections

- Multiple flights with NYSTA
- Data integration with current methods and tools

- UAS NYSTA program will be solely operational in-house by 2023 with reduced cost to services

### UAS Traffic Management Field Test (UFT)

- Airspace Access Prioritization
- Deconfliction
- Public Safety
- Situational Awareness

- UAS Service Suppliers (USS) Tested
- Multiple shakedown events
- First Responder participation

- Test cards designed, test run
- Unanticipated disruptions tested
- Effectiveness measured

- Multiple USS now able to give prioritized airspace access to first responders

### Commercial Outcome

Operational Flights Daily reducing Staffing Needs

First Region Deployed; Remaining by Aug 2023

Deployed Dynamic Airspace Priority Access



# FULLY EQUIPPED FOR COMMERCIAL OPERATIONS AND TEST

Command, Navigation, and Surveillance (CNS)

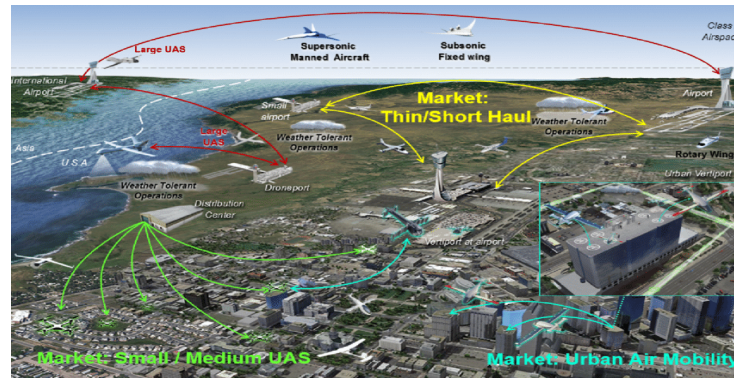


BVLOS Use Cases Use Cases

Airspace Management



Flight Authorizations



NUAIR UAS/AAM Ecosystem



Infrastructure



Uncrewed Traffic Management (UTM)



Flight Planning



Weather Sensing



A continuous array of systems and technology flow in and out of the operational environment

# NUAIR AAM TESTING ECOSYSTEM

## SME'S, BVLOS, FOUR SEASONS, OVER LAND/WATER, 5-G, SKYDOME

### SUBJECT MATTER EXPERTISE

Classification 3+ UAS | Over 4,000+ test flights & 800+ flight hours



- **Airworthiness Assessments**
- General Mission Processes and Briefing Requirements
- Launch and Recovery (L/R) Procedures
- **Internal Safety Review Board (ISRB) with on-site Designated Airworthiness Representative (DAR)**
- Flight Readiness Review (preflight, test plans, operations, aircraft review, sensor/equipment review)
- **BVLOS Operational Standards and Documentation**
- Part 107 and Public Aircraft Operation (PAO) COA's (160+), Waivers, Exemption, Certification Attainment
- Environmental Condition Requirements and Weather
- **Communications Oversight | Command Center Support**
- **Overall FAA regulation road mapping with estimates on timing**

- ATC Integration
- UAS Service Supplier (USS)
- UAS Traffic Management (UTM)
- Counter Drone (C-UAS)
- Command and Control C2, Operational Data
- Radio Frequency (RF) Communication
- Surveillance | Position Targeting, Detect & Avoid
- **GPS Denial / Degradation (Skydome)**
- Realistic assets, environments
- Dual-use airport, Griffis International & Syracuse
- Airport electric charging station
- Only test site with designated Bespoke 5G network
- Clue System co-located at AFRL/RI



### TESTING INFRASTRUCTURE



# QUESTIONS?

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## NUAIR supports the UAS industry infrastructure, capabilities and rapid transition for Advanced Air Mobility (AAM) operations in the National Airspace System (NAS)

A Nonprofit  
Established in 2012



## Designated FAA UAS Test Site & 50 Mile UAS BVLOS Corridor

- ◆ Only FAA designated UAS test site located at International Airport
- ◆ Fully instrumented 50-mile UAS/AAM Corridor
- ◆ Over 4,500+ test flights & 1250+ flight hours
- ◆ Unmanned Traffic Management Operations Center for real-time and remote access monitoring of all flight operations activity
- ◆ Urban & rural airspace authorizations
- ◆ Corridor covers a UAS supportive population of ~700,000 people
- ◆ Facilitated 160+ COA's, Waivers, Exemptions
- ◆ FAA Designated Airworthiness Representative (DAR)

## Infrastructure & Capabilities

- ◆ Broad Communications capabilities including bespoke 5G Network
- ◆ Multi-technology sensor network - 10 ADS-B, & Ground based RADAR systems (9-fixed, 1-mobile)
- ◆ Skydome the largest indoor test facility in US supporting SWARM and GPS denied operations
- ◆ UAS Ecosystem Commercial & Federal | Tech Garden | Genius NY | AFRL/RI Facility proximity
- ◆ Mixed use Airspace Class, C, D, G
- ◆ eVTOL Charging infrastructure

## NUAIR is enabling Unmanned Air Mobility

- ◆ Advanced UAS Operations
  - ◆ Beyond Visual Line of Sight
  - ◆ Operations over People
  - ◆ Night Operations
  - ◆ Remote ID
  - ◆ CONOPS & Safety development
  - ◆ Pilot Training
  - ◆ Safety Management System
- ◆ Safe Integration of UAS into the National Air Space
  - ◆ Advanced Air Mobility AAM
  - ◆ UAS Traffic Management (UTM)
  - ◆ Detect and Avoid (DAA)
  - ◆ GPS Denied Operations
  - ◆ Counter Drone (C-UAS)
  - ◆ Communications
    - ◆ Command and control (C2)
    - ◆ Operational Data

**Over 60 Industry, State, University, Private, Public Sector Alliance Members**

# OPERATIONAL BVLOS CORRIDOR WITHIN A MULTIMODAL ENVIRONMENT

Portfolio of actual operations, use cases and approvals for conventional and autonomous commercial systems

## Environment to Operate (Airspace, SMEs, Pilots, DAR)

- Immediate availability for flight operations conducted in 50-mile BVLOS corridor, flights through class C, D, and G airspaces
- BVLOS low altitude flights plus larger platforms with chase plane (class 3+ UAS)
- Dual-use Airports, Griffiss International & Syracuse
- Simultaneous, coordinated and integrated flights with FAA ATC Towers

## Surveillance and Comms to Operate (5G, LTE, Radars, C2)

- Control and Command Center
- UAS Service Supplier (USS) | UAS Traffic Management (UTM)
- Counter Drone (C-UAS)

## FAA Authorization to Operate (160+ COAs, large-small platforms)

## Data Collection, Analysis, Reporting Capabilities

