To the Mayor and Members of the City Council

SUBJECT: CITY OF FORT WORTH DRONE USE

The purpose of this Informal Report is to provide information regarding the advancements of drones, their benefits and the various platforms in which they are used.

At present, the following City of Fort Worth Departments are utilizing drones.

- **Police:** Owns ten drones, including small ones for indoor use. Used for Intel, surveillance, search and rescue, training and monitoring. Certain missions can provide enhanced capabilities and reduce risk to officers, while being more cost effective than helicopter use.

- **Water:** Owns one drone. Used for inspections and monitoring of water and sewer line infrastructure. Efficiency in discovering and correcting situations that haven't been previously observed.

- **IT Solutions:** Owns one drone. Used for inspections of radio towers. Immediate efficiency seen by the reduction of tower climbs to inspect storm damage.

- **Fire:** Owns two drones. Scout structure fires, wildfires, etc., conduct damage assessments, reconnaissance during search and rescue.

Other Departments that have expressed interest:

- **Code Compliance**: Detect mosquito breeding areas, identify illegal dumping areas and substandard buildings
- **Park and Recreation:** Inspection of parks and golf courses
- **Property Management:** Inspection of City property, and structures
- **Planning & Development:** Assessing the City's urban tree canopy and associated effects. Inspection of construction sites and zoning issues
- **Public Events:** Photography for marketing
- **TPW:** Inspection of runoff during flood incidents, construction projects
- **Aviation:** Monitoring, surveillance and inspections of facilities, property and wildlife

Drones (also known as Unmanned Aircraft Systems, UAS) are becoming more technologically advanced, translating into enhancements to safety, security and efficiency. While drones have the capability to carry payloads, current Federal Aviation Administration restrictions require visual line of sight, payloads of 55 pounds or less, and appropriate certifications (Federal Aviation Regulation Part 107 small UAS rating).

A considerable amount of work has been done to create an internal drone program for the City of Fort Worth through IT Solutions and collaborative efforts with other departments. This includes a UAS management system that will maintain pilot and equipment flight logs, the creation of an

To the Mayor and Members of the City Council

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Administrative Regulation (in draft form), and a City Ordinance (also in draft form). The purpose of the Administrative Regulation and City Ordinance would be to establish citywide policies and procedures regarding unmanned aerial systems—for City owned drones and third party operators. Department representatives, along with Legal staff, are currently reviewing these documents. Once this process is completed, the approval process will begin with the City Manager's Office.

In conversations with various CFW staff, research has shown that most of their deployment applications were met with drones that typically cost $800 to $2,000. Depending on the frequency of use, the option to enter into an agreement with a third-party vendor or interdepartmental agreement is also available. In our research, third party vendors usually start at $150/hour for basic services, however they often require a four (4) hour minimum to deploy a drone for each request, bringing the minimum cost of a single drone mission to $600.

In comparison to traditional flight operations, the efficiency of drones is also realized, as the price of manned flight typically starts at $180 per hour in a small, fixed wing aircraft and $2,000 per flight hour in a rotary wing.

The benefits of drone use within the various City Departments was clear to those currently using this technology. Increased situational awareness, decreased costs, and increased safety to City staff were realized with minimal impact to current operating procedures. Therefore, the City Manager's Office is recommending the continued use and support of drone use for continued improvements to safety and efficiency.

David Cooke
City Manager

TEXAS A&M UNIVERSITY CORPUS CHRISTI | LONE STAR UAS CENTER OF EXCELLENCE & INNOVATION

Lone Star Urban Air Mobility Proving Ground

(Pre-Decisional)

North Central Texas Council of Governments (NCTCOG)

December 2018

TEXAS A&M ENGINEERING TEEX EXTENSION SERVICE

NUNSCP NATIONAL UNMANNED AIRCRAFT SYSTEM CREDENTIALING PROGRAM

The Urban Air Mobility Vision

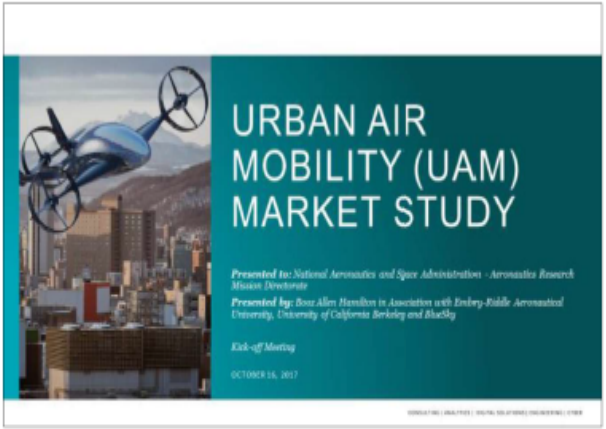
Industry Day Participants

- **47** Aircraft Developers
- **23** Comm/Nav/Surveillance Providers
- **22** Integrated Automation & Operations Developers
- **18** ATM Developers (both traditional and UAM)
- **12** Universities
- **10** Fleet Operations Providers
- **10** Test Site Representatives
- **8** Manufacturers
- **6** Propulsion System Developers
- **5** Media
- **5** Federal Agencies
- **5** Local Governments
- **5** Airspace Designers
- **3** Vertiport Designers
- **2** Trade Associations

HALE UAS
UPPER CLASS E AIRSPACE
MARKET: LARGE UAS & HALE
LARGE UAS
LARGE UAS
CLASS A AIRSPACE
MARKET: THIN / SHORT HAUL
AIRPORT
URBAN VERTIPORT
SMALL AIRPORT
MARKET: URBAN AIR MOBILITY
DRONEPORT
DISTRIBUTION CENTER
MARKET: SMALL / MEDIUM UAS

UAM Market Studies

- ARMD has funded two Urban Air Mobility market studies that included several air taxi/metro models, air ambulance, and last-mile package delivery
- Studies include:
  - A range of urban areas and business models, technology requirements, legal and regulatory barriers, social acceptance issues
  - Assumptions for issues such as autonomy, batteries, weather, infrastructure, operating costs, passenger adoption rates, etc.
- Generally speaking, UAM markets were found to have viable and profitable use cases.
  - By ~2028 "air metro" could be profitable and by ~2030 result in ~750M annual passenger trips in 15 metro areas
  - Air ambulance model may not be profitable, but have high impact on public good
  - By ~2030 "last mile package delivery" could be profitable and result in ~500M deliveries annually
  - Large variability across studies based on differences in assumptions, e.g., infrastructure



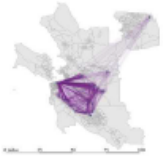
Grand Challenge (GC) Series Overview

Vehicles

functional UAM vehicles with threshold level of demonstrated airworthiness

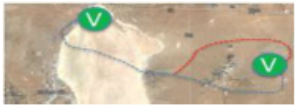
Airspace Management

airspace and air traffic management technologies and services built and simulated to a threshold level of UAM ATM requirements



Safety and Integration Scenarios

airworthiness processes and realistic UML-4 scenarios designed in concert with the FAA, with range(s) and Testbeds as a UAM proving ground



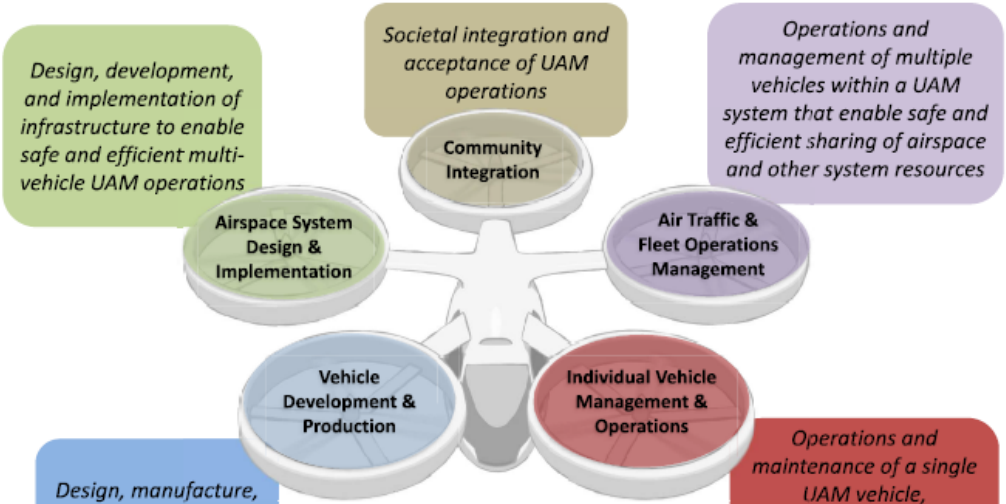
Stakeholder Integration

societal integration and acceptance of UAM Operations including public acceptance, supporting infrastructure, operational integration, standards organizations, the local regulatory environment, etc.

Industry Provided | NASA Provided | Ecosystem Wide Support

Bringing UAS to America's Skies
All Information is LSUASC Proprietary

UAM Vision and Framework



Urban Air Mobility (UAM) Vision
Revolutionize mobility around metropolitan areas by enabling a safe, efficient, convenient, affordable, and accessible air transportation system for passengers and cargo

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Bringing UAS to America's Skies
All Information is LSUASC Proprietary

Stakeholder Integration

Societal integration and acceptance of UAM Operations including public acceptance, supporting infrastructure, operational integration, standards organizations, and the local regulatory environment

Stakeholders	Grand Challenge Relationship
Supporting infrastructure	Infrastructure elements such as vertiports and charging stations could be provided by stakeholders
Local communities	Opportunities to perform in local communities via ranges and Test Sites. Considering surveying and other public acceptance campaign initiatives
Operational integration	Connectivity and infrastructure requirements for smart city initiatives, multi-modal, etc.
Standards organizations	Strategic partnership with standards organizations to support development of a complete requirement and standards set to enable UAM vehicles, airspace, vertiports, infrastructure, etc
Local government	Local regulators will have the opportunity to assess complete lists of current local regulations and consider ways to approach legislation and long-term planning consideration for the future

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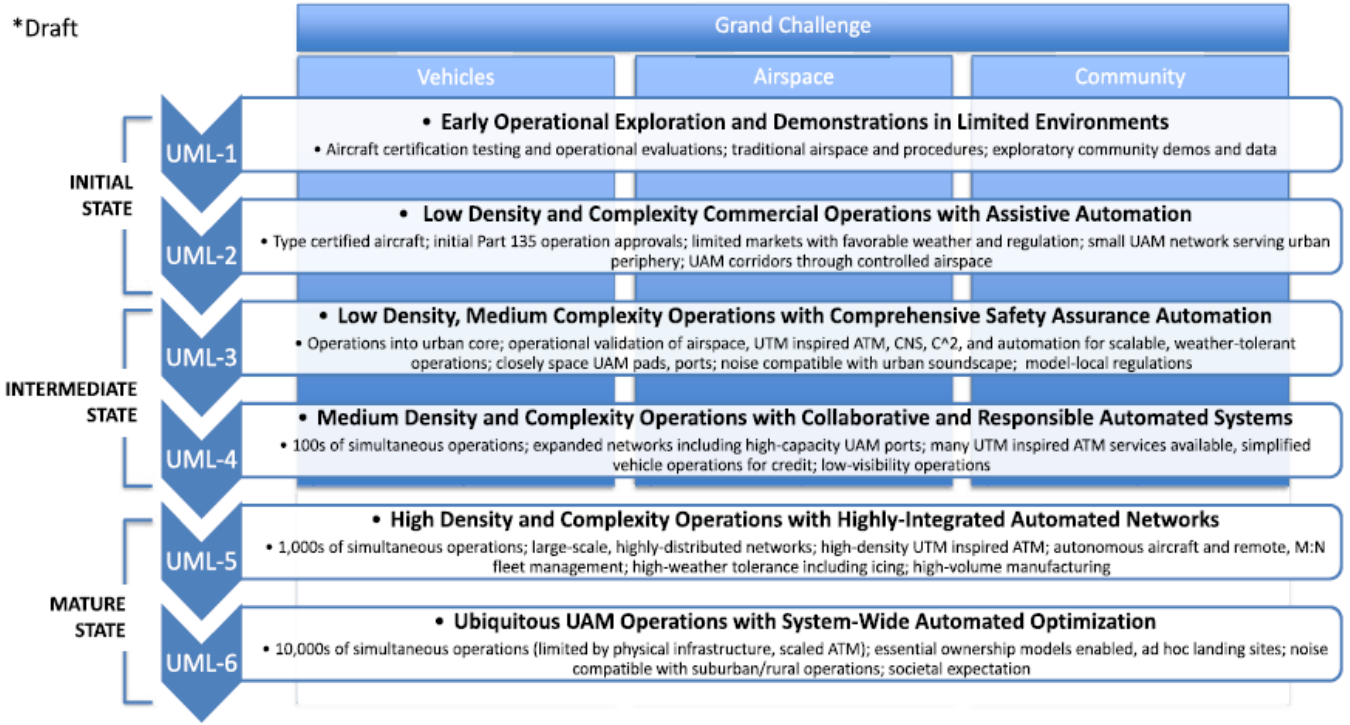
UAM Maturity Levels (UML)



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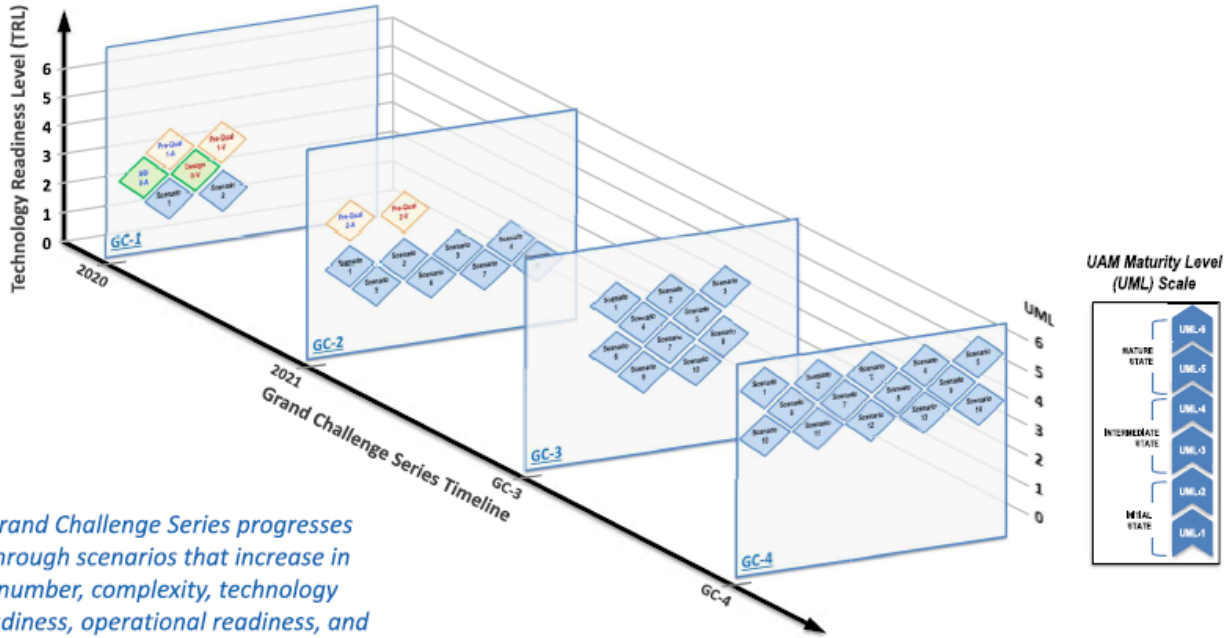
Grand Challenge Series Progression



Grand Challenge Series progresses through scenarios that increase in number, complexity, technology readiness, operational readiness, and standards and regulatory emphasis

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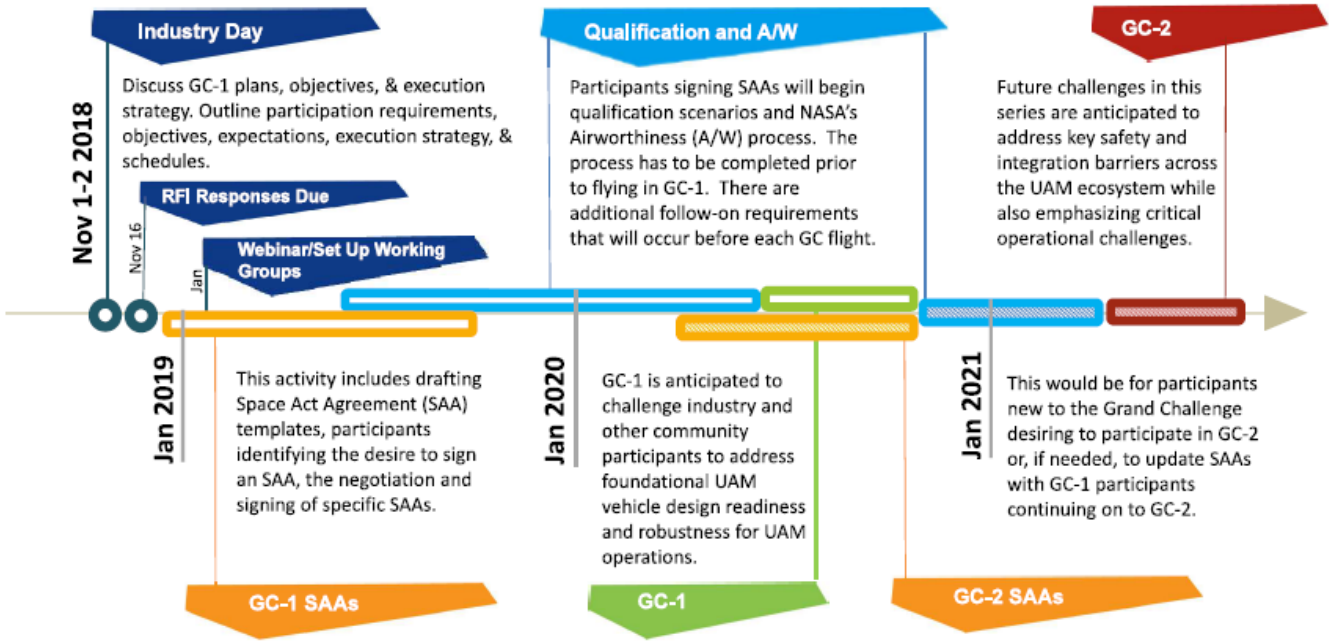
NASA UAM Grand Challenge Timeline



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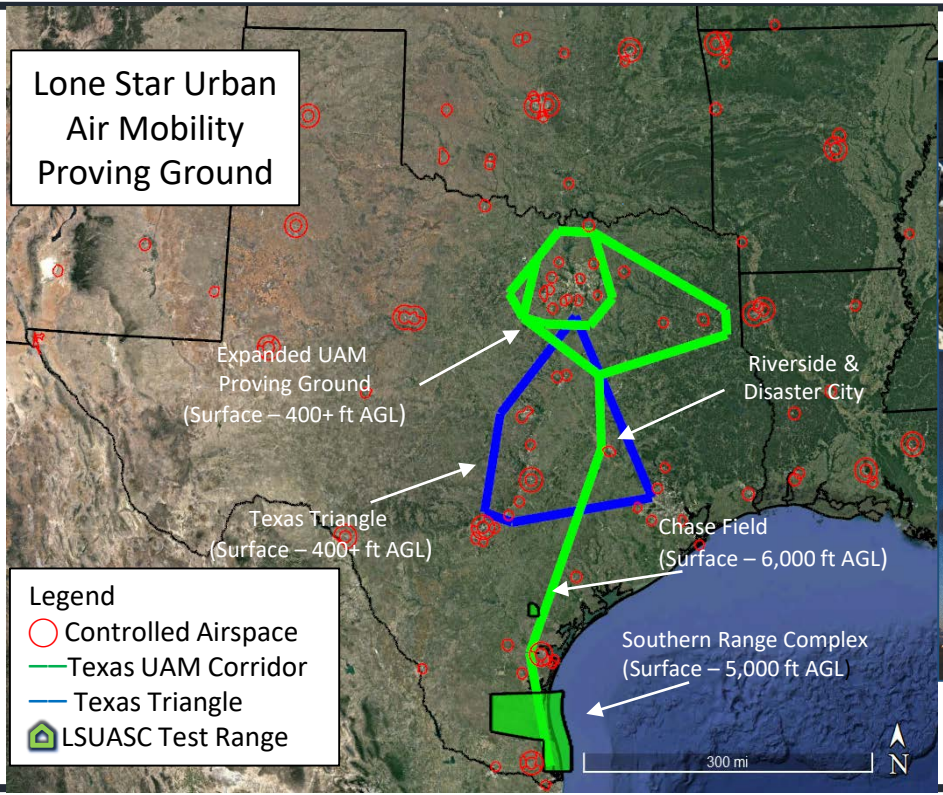
Lone Star Urban Air Mobility Proving Ground (Snapshot)

- Goal: Provide the UAM Community of Practice, OEMs, ECOSYSTEM Vendors and Providers (DAA, C2, UTM-Like Tools, Urban Communities, User-Stake Holders) with an opportunity to begin exploring the art of the possible.
- UAM GC 1 2020 Edwards Air Force Base
  - LS UAMPG Offers OEMs and Ecosystem Providers opportunity to conduct systems and flight testing “prior” to NASA GC1
  - LS UAMPG offers NCTCOG Team opportunity to attract NASA to Texas for GC 2 and beyond

Texas Test Ranges and Infrastructure
National Class G



Our Mission Control Center

Remote C2 for UAS Night Operations

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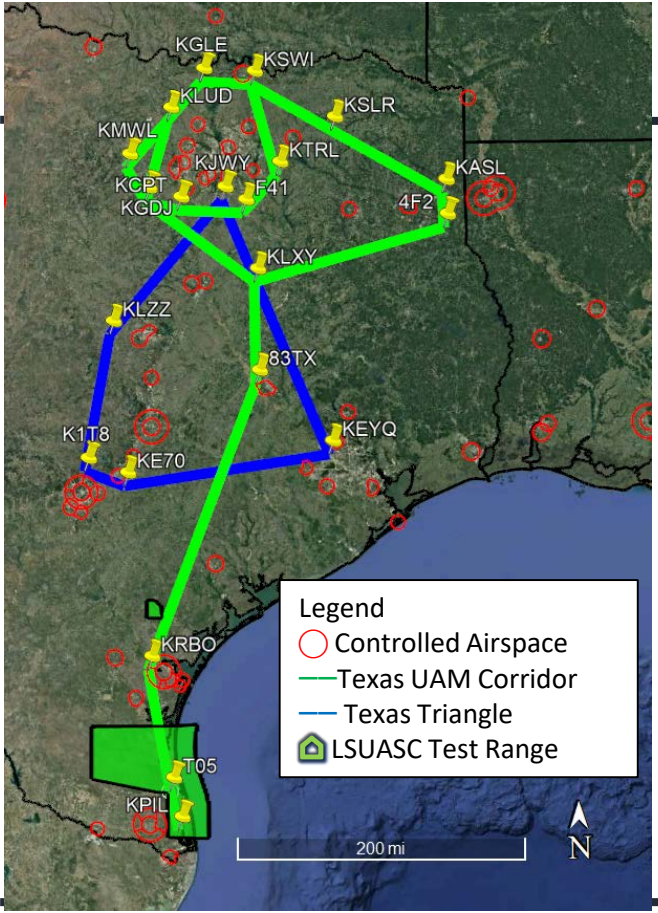

Texas UAM Corridor

KPIL – Port Isabel Cameron County Airport, Port Isabel, Texas
T05 - Charles R Johnson Airport, Port Mansfield, Texas
KRBO - Nueces County Airport, Robstown, Texas
83TX - Texas A & M Flight Test Station Airport, Bryan, Texas
KLXY - Mexia-Limestone County Airport, Mexia, Texas
KGDJ - Granbury Regional Airport, Granbury, Texas
KLUD - Decatur Municipal Airport, Decatur, Texas
KGLE - Gainesville Municipal Airport, Gainesville, Texas
KSLR - Sulphur Springs Municipal Airport, Sulphur Springs, Texas
K07F - Gladewater Municipal Airport, Gladewater, Texas
KE70 - Huber Airpark Civic Club LLC Airport, Seguin, Texas
K1T8 - Bulverde Airpark, San Antonio, Texas
KEYQ - Weiser Air Park, Houston, Texas
KLZZ - Lampasas Airport, Lampasas, Texas
KLWY - Mid-Way Regional Airport, Midlothian/Waxahachie, Texas
4F2 - Panola County Airport-Sharpe Field, Carthage, Texas
KASL - Harrison County Airport, Marshall, Texas
MWL - Mineral Wells Airport, Mineral Wells, Texas
KCPT - Cleburne Regional Airport, Cleburne, Texas
K41 - Ennis Municipal Airport, Ennis, Texas
KTRL - Terrell Municipal Airport, Terrell, Texas

All Information is LSUASC Proprietary

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The Urban Air Mobility Vision

UAS Legislation

UAS SAFETY AND INTEGRATION TASK FORCE MEETING

DECEMBER 11, 2018

RTC Legislative Program

RTC position on UAS *(Draft – Approval expected Dec. 13)*:

- Support the collaboration between local governments, the military, the State and FAA to advance regulations for the safe operations of unmanned aircraft vehicles

86th Texas Legislature

Bill pre-filing began Nov. 12

SB 59 (Zaffirini-D): *Relating to certain images captured by an unmanned aircraft*

Amends Texas Government Code 423.002(a): It is lawful to capture an image using an unmanned aircraft in this state:

(22) if the image is:

(A) captured for the purpose of delivering consumer goods that were ordered through an Internet website or mobile application and the operator of the unmanned aircraft is authorized by the Federal Aviation Administration to conduct operations within the airspace from which the image is captured; and

(B) directly related to the purpose described by Paragraph (A), including images captured for purposes of navigation or ensuring public safety.

Questions

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NCTCOG

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kroy@nctcog.org

UAS Safety and Integration Task Force

CONTRIBUTING COMMITTEES AND WORKING GROUPS

UAS
Unmanned Aircraft Systems
Safety+ Integration

North Central Texas
Council of Governments

Working Groups

Education and Public Awareness

Legislation

Training

Integration

Each Working Group will be tasked with the following:

1. Identifying Issues
2. Provide Recommendations
3. Who on the Task Force can act on solution?
4. Is the Solution Scalable?
5. How could the solution be funded?
6. Determine Working Group Leaders
7. Report all findings to Task Force

Education and Public Awareness

Working Group Members

Bryan Archer	Galaxy UAV/AUVSI
Candy Slocum	North Central Texas InterLink, Inc.
Chad Sparks	Bell
Charles Gbadebo	Skystream Aerial, LLC
Jordon Carmona	City of McKinney
Karen VanWinkle	Arlington Municipal Airport
Mark Hays	Dallas County Community College District
Peter Morgan	US Navy-FAA Liaison Officer
Romeo Durscher	DJI
Ron Poynter	OnPoynt Aerial Solutions
Ruedi Schubarth	LeTourneau University
Wayne Sanderson	Mineral Wells Airport
Wes Jurey	UAS Werx
Kenneth Bergstrom	NCTCOG - Transportation

- Issues
  - Reckless recreational users
  - Lack of Airmanship
  - Public Awareness
- Possible Solutions
  - Know Before You Fly Workshops
  - Informational Brochures

Legislation

Working Group Members

Aaron Barth	City of Fort Worth
Candy Slocum	North Central Texas InterLink, Inc.
Chad Sparks	Bell
Chuck Allen	American Airlines
Jamie Moore	Johnson County
Paul N. Wageman	Winstead PC
Peter Morgan	US Navy-FAA Liaison Officer
Romeo Durscher	DJI
Amanda Wilson	NCTCOG - Public Involvement

- Issues
  - Lack of Police Enforcement Power
  - Lack of Local Jurisdiction
- Possible Solutions
  - Model Ordinance
  - State Law Mirror Federal Law (New Reauthorization Language)

Training

Working Group Members

Aaron Barth	City of Fort Worth
Candy Slocum	North Central Texas InterLink, Inc.
Chad Sparks	Bell
Chuck Allen	American Airlines
Jamie Moore	Johnson County
Paul N. Wageman	Winstead PC
Peter Morgan	US Navy-FAA Liaison Officer
Romeo Durscher	DJI
Ernest Huffman	NCTCOG - Transportation
Jessica Mason	NCTCOG - Emergency Preparedness
David Dean	NCTCOG -911
Kasey Cox	NCTCOG -911

- Issues
  - Lack of Trainers
  - No Standardization
  - Limited Labor Pool
- Possible Solutions
  - Create Standardized Training
  - Promote drone programs at all education levels
- Existing Groups
  - PSURT Committee and Team
  - UAS Werx

Integration

Working Group Members

Karen VanWinkle	Arlington Municipal Airport
Michael Smith	Bell
Chad Sparks	Bell
Paul Sichko	DFW Airport
Robbie Terrell	DFW Airport
Romeo Durscher	DJI
Mark Hays	Dallas County Community College District
Aaron Barth	City of Fort Worth
Jordon Carmona	City of McKinney
Wayne Sanderson	Mineral Wells Airport
Peter Morgan	US Navy-FAA Liaison Officer
Paul N. Wageman	Winstead PC
Charles Gbadebo	Skystream Aerial, LLC
Ernest Huffman	NCTCOG - Transportation
Kathrine Powers	NCTCOG - Environment and Development

- Issues
  - Remote ID
  - Flying over people
  - BVLOS
  - Automation
  - Air Taxi Integration
- Possible Solutions
  - Flight Testing
  - Planning Studies
  - Unmanned Traffic Management
- Existing Groups
  - Lone Star UAS Center of Excellence & Innovation
  - Uber Elevate/Bell

Meeting Schedule

Option 1

Working Group Kickoff Day- January 8th

Education and Public Awareness

- 1st Session 8-10am

Legislation

- 2nd Session 10-12pm

Training

- 3rd Session 1-3pm

Integration

- 4th Session 3-5 pm

Meeting Schedule

Option 2

Working Group Kickoff Week January 7th -10th

Education and Public Awareness

- January 7th 10am – 12pm

Legislation

- January 8th 10am-12pm

Training

- January 9th 10am-12pm

Integration

- January 10th 10am-12pm

Next Steps

- Working Group Participants
- Determine Working Group Leaders
- Working Group Meeting Schedule

Questions?

UAS Safety and Integration Initiative

Know Before You Fly Workshops

UAS
Unmanned Aircraft Systems
Safety + Integration

North Central Texas
Council of Governments

What are the Workshops?

- Six workshops for general public interested in recreational and commercial UAS operations
- Locations throughout the Dallas-Fort Worth region
- Promote FAA Know Before You Plan Resources
- Promote various regional UAS initiatives and resources
- Each workshop will last approximately 4 hours

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Workshop Content

- UAS legislative and regulatory environment
- Difference between recreational and commercial pilots
- Education on Part 107 and how it applies to the recreational user
- UAS Safety and Airspace knowledge
- Introduction to FAA's Know before you fly resources
- Introduction to FAA LAANC process
- Training resources
- Best Locations to fly

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Workshop Content

- Part 107 and how it applies to the Commercial User
- Insurance resources
- Professional UAS pilot training resources
- Market opportunities in area
- Career options in area

Workshop Trainer Requirements

1. Ability to teach a minimum of six workshops
2. Ability to collaborate with other training companies, industry and local government
3. Create course content outline
4. Outline should include concept for different themes for each workshop based on location
5. Explain the training process
6. Provide number of instructors
7. Provide qualifications for personnel/instructors

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Workshop Booklet

- Agenda
- Key information
- Pilot resources
- Sponsorship page
- Training options (sponsored pages)
- Airport contact information page

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Unmanned Aircraft Systems
Safety+ Integration

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Council of Governments

Sponsorship Opportunities

Two separate sponsorship options

Overarching Sponsorship

Your company name and logo used in workshop communications

Featured as an Know Before You Fly Workshop Sponsor on the NCTCOG Website (logo - with link to sponsors website)

An exhibitor table to display your organization's materials each workshop

Full page in the program

Lower Tier Sponsorship

Highlighted in Booklet

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