



# The Full Picture

## Unmanned Aircraft Systems (UAS)

### Insurance & Risk Management

July 23, 2019

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Aon Risk Solution | Aon Broking | Aviation  
Presentation to Aon Full Picture Webinar Series

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# Exposures & Uses

Does my organization have an exposure?

# Is this a toy, a camera, or an airplane?

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Some businesses and their employees may not realize that UAS are considered aircraft, and not mobile equipment or a toy. They may not realize there is no insurance coverage for their ownership, manufacture, or contracting of UAS operators.



# Emerging Risk – Is this a toy or an airplane?

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Like all emerging risks, UAS present a challenge to risk managers and insurers:

## POLL:

**What is your biggest obstacle in managing drone exposures?**

- A. FAA Rules & Regulations
- B. Evolving Risk – Keeping up with the industry and technology available
- C. Difficult to know how much exposure I have
- D. Difficult to communicate across organization



# Litigation

# FAA v. Raphael Pirker

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## First commercial case tried in the United States

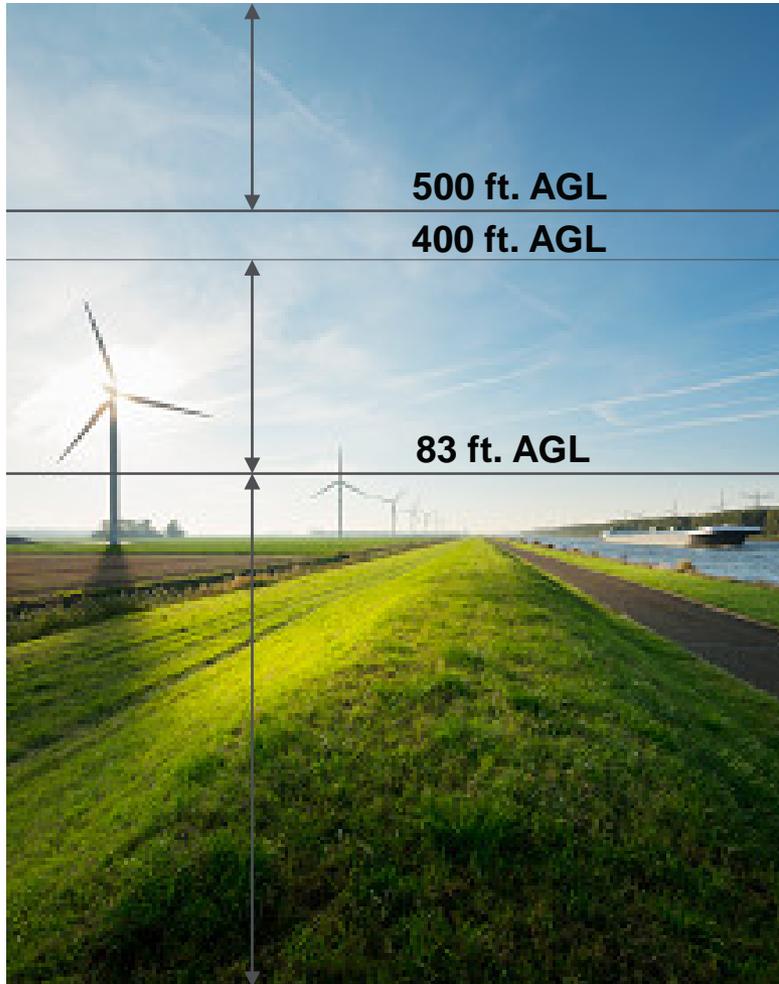
Please see the full NTSB Docket CP-217 for specific information on the case.



### Two Outcomes:

1. **Definition of an “aircraft”:** This case determines that UAS are affirmed as an “aircraft” for purposes of § 91.13(a), which prohibits any “person” from “operat[ing] an aircraft in a careless or reckless manner so as to endanger the life or property of another.” It has further determined that an aircraft is “any” “device” that is “used for flight.”
2. **The FAA can regulate UAS:** Because UAS are considered “aircraft,” the FAA has the authority to regulate aircraft flying within the National Airspace System

# Where can UAS fly?



## Public Airspace – Aircraft

## Public Airspace – Unmanned Aircraft

## Private Property

- Dependent on State and Local Laws
- United States v. Causby – 1946 US Supreme Court case provides case law on where private property rights of airspace end and navigable airspace begins (83 ft.)
- Laws may change with increased UAS traffic

# UAS Litigation in the U.S.

Several Cases have been litigated in the US and Internationally, but overall the lack of litigation makes it difficult to understand exactly how much could be paid in claims settlements.

\* I am not an attorney. These are only examples I am aware of. \*

## U.S. Litigated Cases

- FAA v. Raphael Pirker: UAS are aircraft that are regulated by the FAA.
- Reichert v. FAA: UAS registration for Hobby Use should not be required.
- Singer v. City of Newton: UAS are regulated by federal laws, not local or state laws.
- FAA c. Haughwout: Can guns be attached to privately owned UAS?
- Ellis v. Searles Castle: Groom flew UAS at wedding and injured guest. Guest sued event management company.
- Commonwealth of Kentucky v. Meredith: “drone slayer” man shoots UAS down and is prosecuted for criminal mischief and wanton endangerment. The judge dismisses the case, but goes to federal court.

## Cases Not Yet Litigated In the U.S.

- Personal Injury Liability: Publication of photos or videos
- Invasion of Privacy: the law is unclear where invasion of privacy can occur with UAS. This may not be covered by insurance.
- Products Liability: bodily injury or property damage caused by failure of UAS
- Major Bodily Injury or Death: no major settlements so far for bodily injury or fatalities.
- Mental Anguish: suffering caused by anxiety, distress, trauma, etc. caused by UAS
- Passenger Liability: bodily injury caused by carriage of passenger in UAS
- Cargo Liability: property damage to cargo carried by UAS



# Risk Management

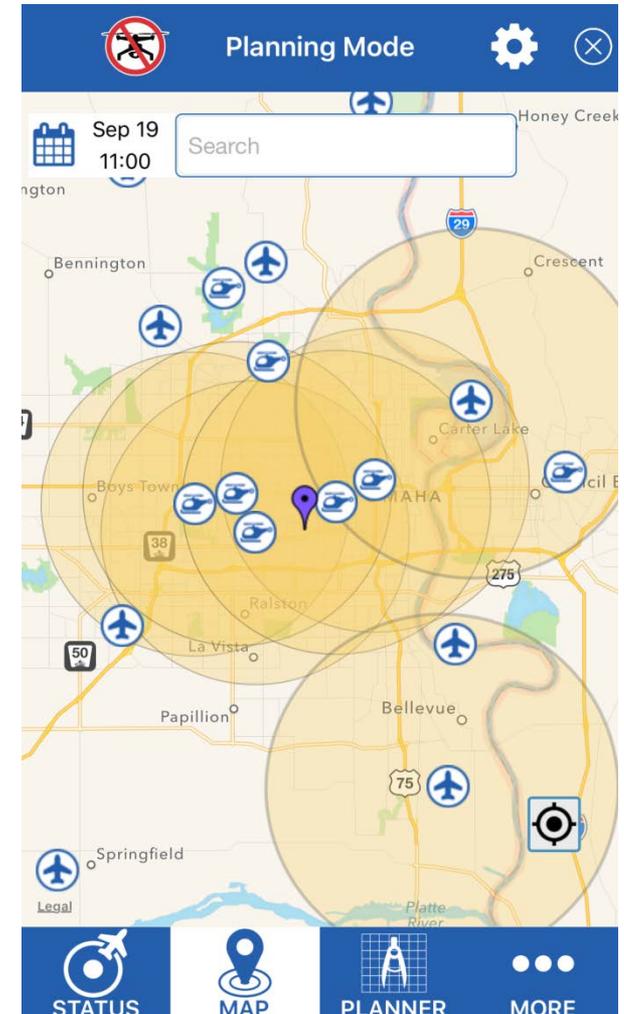
# Fines & Penalties – Not Covered by Insurance

It is important to understand that your insurance policy will never cover:

- The cost of fines or penalties that are imposed as a result of your failure to comply with local and federal laws or negligence/reckless operation.
- Any legal fees and costs associated with defending or settling any fines or penalties
- Illegal activity performed by the insured (including any executive officers, partners, or managing agents), at the insured's direction, or with the insured's knowledge unless otherwise noted in the policy.

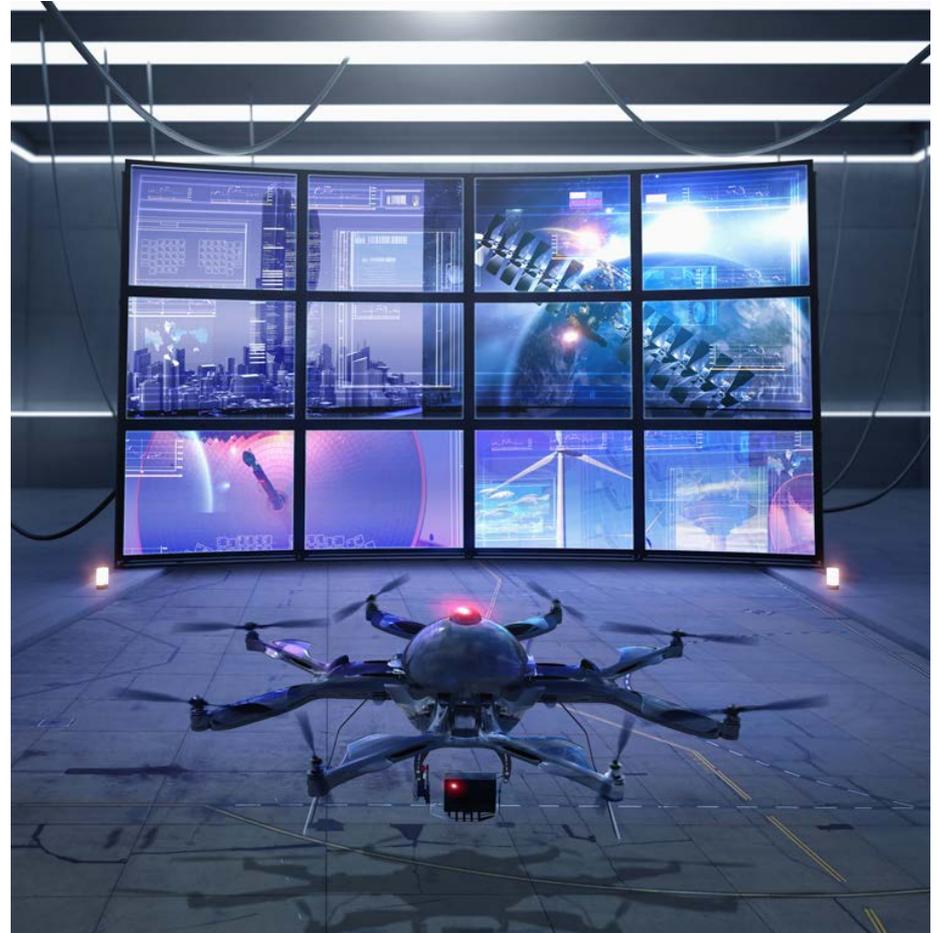
## Cost of Fines & Penalties

- The cost of unlawful or reckless operation of unmanned aircraft can be very expensive. Fines have ranged from several hundred dollars to a record \$1.9M penalty that was recently brought against a commercial operator.



# Risk Mitigation – In House

- Company Policy, Best Practices, & Mass Communication
- Chief UAS Operator and/or committee
- UAS Operator Training
- Standard Operating Procedures (SOPs)
- Google! Many in your organization may be advertising their use online
- Accounting Department
- “No Drone Zone” Signage
- FAA B4UFly Cell Phone App
- UAS Equipment
  - Avoidance & Anti-Collision Technology
  - Batteries – Lithium Ion is highly flammable, but the most popular
  - Capability limiting software
- Insurance Coverage
- Insurer Safety & Loss Control Services



# Risk Mitigation – Non-Owned UAS

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- Company Policy, Best Practices, & Mass Communication
- Accounting Department
- Google / Online Search
- Legal Operation
  - Section 333 and/or COA
  - 14 CFR Part 107
  - Qualified Pilots
- Contractual Agreements
- Certificates of Insurance
- “No Drone Zone” Signage
- Insurance Coverage
- Insurer Safety & Loss Control Services



# “No Drone Zone”

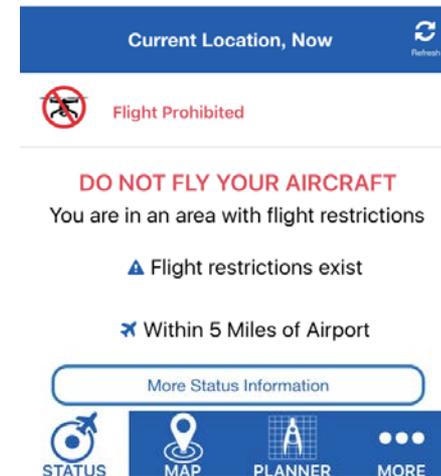
## FAA “No Drone Zone” Signage

Signage indicating areas on your premises where UAS operation is not allowed is effective in limiting the opportunity for UAS losses to occur on their property.



## FAA “B4UFLY” Smartphone App

B4UFLY is an easy-to-use smartphone app that helps unmanned aircraft operators determine whether there are any restrictions or requirements in effect at the location where they want to fly.



## “Know Before you Fly” Website

The Association for Unmanned Vehicle Systems International (AUVSI) and the Academy of Model Aeronautics (AMA) have partnered with the FAA to educate prospective users about the safe and responsible operation of UAS.



# Certificates of Insurance and Contractual Agreements

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- **Limits of Coverage:** Recommend \$5,000,000 Each Occurrence, Minimum of \$1,000,000 Each Occurrence Limit of Liability for:
  - Bodily Injury & Property Damage
  - War Liability
  - Personal Injury Liability – not all operators may be able to obtain this. If they do not use a camera or are not operating in a densely populated area, the client may decide this does not need to be a requirement. Most insurers will not offer more than \$1,000,000 Each Offense/Aggregate.
  - Non-Owned Premises Liability
  - *Higher Limits of Liability may be necessary*
- Insurers require that the client makes a diligent effort to have **Additional Insured** extended.
- **Waiver of Subrogation** for physical damage or indemnification language if this coverage is not purchased by the operator
- May require policy is written with an **aviation insurance carrier**
  - More experience in claims handling
  - Policy wording, terms & conditions specific to UAS and aircraft
- Sufficient **policy territory** – not all policies include worldwide coverage which may be required for your work



# Insurance Coverages

Policy Forms & Coverage Descriptions

# How can UAS exposures be covered?

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## Aviation Policy

- UAS Hull & Liability
- Non-Owned UAS Liability
- Products, Completed Operations, & Grounding Liability

### Advantages

- Experienced aviation claims handling
- Policy form and wording is specific to aviation and UAS exposures
- High limits of liability
- War & TRIA coverage can always be purchased
- No aggregate limits of liability for BI/PD
- Flexibility in coverage options

### Disadvantages

- May be more expensive than a casualty policy endorsement
- A separate application and policy will be required

## Casualty Policy

- Commercial General Liability
- Commercial Excess or Umbrella Liability

### Advantages

- Endorsement added to policy
- A separate application may not need to be required
- Can include owned premises liability
- Best for operations on owned premises and rural areas.  
i.e. building inspections, maintenance

### Disadvantages

- Aggregate limits of liability
- Lower limits of liability
- Less experienced in managing aviation claims
- May not include non-owned UAS
- War, TRIA, physical damage coverage, and automatic attachment may not be available
- UAS losses could incur expensive litigation costs and losses would be included on the policy which could affect the premium.

# Do I already have insurance coverage?

Exposure	Line of Coverage	Do I have coverage already?
Owned UAS	<ul style="list-style-type: none"> <li>• <b>Aircraft Hull &amp; Liability</b></li> <li>• <b>Excess Liability or Umbrella</b></li> </ul>	<ul style="list-style-type: none"> <li>• Must have no airworthiness certificate requirement</li> <li>• Automatic attachment included in policy and reported within required time frame</li> </ul>
Sale of UAS or UAS parts	<ul style="list-style-type: none"> <li>• <b>Products &amp; Completed Operations</b></li> <li>• <b>Aircraft Hull &amp; Liability</b></li> </ul>	<ul style="list-style-type: none"> <li>• Included in Products policy and reported to insurer</li> <li>• Could also be included as an endorsement in Aircraft Hull &amp; Liability policy</li> </ul>
3 <sup>rd</sup> party operation on my premises	<ul style="list-style-type: none"> <li>• <b>Commercial General Liability</b></li> </ul>	<ul style="list-style-type: none"> <li>• Must have no aviation or aircraft exclusion</li> </ul>
Hired UAS operator	<ul style="list-style-type: none"> <li>• <b>Non-Owned Aircraft Liability</b></li> <li>• <b>Excess Liability or Umbrella</b></li> </ul>	<ul style="list-style-type: none"> <li>• Must have no airworthiness certificate requirement</li> <li>• Some policies may sublimit UAS liability</li> <li>• Some excess or umbrella policies may exclude aircraft</li> </ul>
Employee uses their personal UAS at work	<ul style="list-style-type: none"> <li>• <b>Non-Owned Aircraft Liability</b></li> <li>• <b>Excess Liability or Umbrella</b></li> </ul>	<ul style="list-style-type: none"> <li>• Must have no airworthiness certificate requirement</li> <li>• Some policies may sublimit UAS liability</li> <li>• Some excess or umbrella policies may exclude aircraft</li> </ul>

# Coverage Considerations

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## Policy Form

Insurance for UAS can be underwritten in three ways:

- Aviation UAS Policy: The aviation policy may be written specifically for UAS, or the carrier may elect to write this using an Aircraft Hull & Liability Policy or as an Aviation Commercial General Liability Policy (with an endorsement).
- Commercial General Liability Policy: The definition and the UAS (either blanket wording or scheduled) would need to be endorsed to the policy.
- Commercial Excess or Umbrella Liability Policy: This policy would follow excess of another UAS insurance policy or Self Insured Retention (SIR). The definition and the UAS (either blanket wording or scheduled) would need to be endorsed to the policy.

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## Bodily Injury & Property Damage

Per Occurrence vs Aggregate Limit: If the policy is written on a Commercial General Liability form, there may be an aggregate limit. Because litigation for these cases may take years for a settlement to be reached, the limit could be exhausted before your claim can be made. A “per occurrence” limit is preferable

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## Definition of UAS

The Kirker case has defined UAS as an aircraft. Does the policy definition sufficiently include UAS according to the FAA definition?

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## Aircraft Schedule

Does the policy contain blanket coverage for UAS or is the aircraft scheduled? If the UAS are specifically scheduled, is the UAS in operation the exact same aircraft? Does the serial number and model listed in the policy match the aircraft? Each UAS will need to be specifically named in the UAS Hull & Liability policy. If there are many UAS and the insured is not aware of the exact number, blanket wording and timely reporting can be used to ensure all UAS are covered.

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## Airworthiness Certificate Exclusion

Many aviation policies exclude aircraft that do not have an airworthiness certificate. Because UAS do not maintain an airworthiness certificate, this needs to be deleted or a write-back issued for UAS use.

# Coverage Considerations

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## **Non-Owned Aircraft Liability**

This coverage will respond if the primary coverage is exhausted, if the claim is denied, or there is no coverage in place. When a 3<sup>rd</sup> party UAS operator is utilized or when your employees fly or work on a project with a 3<sup>rd</sup> party UAS operator, non-owned aircraft liability that includes UAS operations should be included. A certificate of insurance indicating the Named Insured (and any other entities or broad wording) is added as an additional insured should be obtained from the 3<sup>rd</sup> party operator every time. There may be no coverage when an operator is using the UAS for recreational use or has not obtained the permission of the Named Insured to operate the UAS on owned property.

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## **Personal Injury Liability**

The main concern with personal injury liability is the “violation of an individual’s right of privacy.” We are unsure of how common law, state laws, federal laws, or the Fourth Amendment will apply to the violation of privacy until specific laws are passed or a court case sets precedence. With the technology available, it is reasonable to assume that, even unknowingly, a UAS could violate the presumption an individual has on their privacy because UAS are often able to gain unique vantage points that are often undetected due to their size and quiet operation.

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## **War Liability**

It is possible for a UAS to be misused by an authorized person, stolen or “hacked” and “hijacked” and used for a non-intended purposes, such as sabotage, criminal acts, or terrorism. Depending on the war exclusion in the policy, this coverage may need to be written back into the policy.

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## **Areas of Use**

Most UAS policies will include US territory and will need to be underwritten for any exposures located outside of the territory included in your policy.

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## **Automatic Attachment**

Because there may be owned UAS within your organization that risk management and their insurer unaware of, automatic attachment would be beneficial. However, this is the very reason some insurers do not want to include this coverage extension.

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## **Medical Payments**

In many cases, bodily injury and property damage payments may be very minimal. Medical payments are helpful in satisfying an injured party while also not admitting fault. Medical payments can help to avoid litigation and thus keep losses low.

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# Casualty Policy – ISO Unmanned Aircraft Endorsement Options

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The following policy coverages may be affected and the revisions should be reviewed:

- **Coverage A – Bodily Injury & Property Damage** – “Bodily injury” or “property damage” arising out of the ownership, maintenance, use or entrustment to others of any aircraft that is an “unmanned aircraft.” Use includes operation and “loading or unloading.”
- **Coverage B – Personal Injury Liability** – “Personal and advertising injury” arising out of the ownership, maintenance, use or entrustment to others of any aircraft that is an “unmanned aircraft”. Use includes operation and “loading or unloading.”
- **Non-Owned Aircraft Liability** – Endorsement remains unchanged, but Non-Owned UA are excluded. The following language from the Coverage A & B exclusions also indicate Non-Owned UA is excluded: “This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the offense which caused the “personal and advertising injury”/”bodily injury” or “property damage” involved the ownership, maintenance, use or entrustment to others of any aircraft that is an “unmanned aircraft”.
- **Employees and Volunteer Workers** – Bodily Injury and property damage coverage reduced for employees and volunteer workers, with the exception of an employee or volunteer worker acting as the Named Insured’s real estate manager.
- **Owners and Contractors Protective Liability** – new UA exclusion (including loading and unloading), but still does not specifically exclude autos, watercraft, or aircraft that are not UA.

# Aviation Policy – UAS Hull & Liability

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Policy Form	Exposures that can be covered	Description
UAS Hull & Liability	<ul style="list-style-type: none"> <li>▪ Physical Damage of UAS</li> <li>▪ 3rd Party Bodily Injury &amp; Property Damage</li> <li>▪ Personal Injury Liability</li> <li>▪ Non-Owned UAS Liability</li> <li>▪ Non-Owned UAS Physical Damage</li> <li>▪ Products Liability – Sale of UAS Only</li> <li>▪ Non-Owned Premises Liability</li> <li>▪ War Liability</li> <li>▪ Hangarkeepers Liability</li> </ul>	<p>This policy is intended to cover the actual physical damage to the UAS caused by a covered occurrence and third party legal liability for bodily injury &amp; property damage. This policy can also be purchased without physical damage.</p> <p>Additional coverages can be added to the policy, usually for an additional premium.</p>
<b>Policy Intended to Cover:</b>	Civil or Governmental Use UAS Owner/Operators	

# Aviation Policy – Non-Owned UAS Liability

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Policy Form	Exposures that can be covered	Description
Non-Owned UAS Liability	<ul style="list-style-type: none"><li>Physical Damage of Non-Owned UAS</li><li>3<sup>rd</sup> Party Bodily Injury &amp; Property Damage</li><li>Owned Premises Liability</li><li>Non-Owned Premises Liability</li><li>War Liability</li><li>Hangarkeepers Liability</li></ul>	The non-owned UAS policy is intended to cover losses caused by a UAS that is not owned by the Named Insured, but is used by or on behalf of the Named Insured. For occurrences that occur on your property caused by non-owned UAS operation not completed for or on behalf of the Named Insured., a General Liability policy (discussed below) will respond to coverage.
<b>Policy Intended to Cover:</b>	Contractors of Civil or Governmental Use UAS Operators	

# Aviation Policy – Products, Completed Operations, & Grounding Liability

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Policy Form	Exposures that can be covered	Description
Products, Completed Operations, & Grounding Liability	<ul style="list-style-type: none"><li>▪ Products Liability</li><li>▪ Completed Operations Liability</li><li>▪ Grounding Liability</li><li>▪ Premises Liability</li><li>▪ War Liability</li><li>▪ Hangarkeepers Liability</li></ul>	This policy is intended to provide coverage for property damage and bodily injury losses that may occur as a result of a defective product manufactured by the Named Insured or the work completed by the Named Insured. This coverage may apply to UAS that are homebuilt or modified and sold to a third party.
<b>Policy Intended to Cover:</b>	UAS and UAS components manufacturers, UAS maintenance facilities	

# Aviation Policy – War Liability

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Policy Form	Exposures that can be covered	Description
War Liability	<ul style="list-style-type: none"><li>▪ War, acts of foreign enemies, etc.</li><li>▪ Terrorist acts (not including TRIA)</li><li>▪ Any malicious act or act of sabotage</li><li>▪ Confiscation or seizure under the order of the government or local authority</li><li>▪ Hi-jacking or any unlawful seizure or wrongful exercise of control of the Aircraft</li></ul>	The War, Hijacking, and Other Perils Exclusion is typically included in all aviation policies. Some non-aviation policies will have similar war exclusions. This exclusion write-back is typically added to another policy form. However, there may be cases where the primary insurer is unwilling to offer the coverage or may not be able to provide the capacity to cover very high limits of liability. In this case, a stand-alone policy can be written.
<b>Policy Intended to Cover:</b>	Any policyholder that maintains a UAS related risk.	

# Contact

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# Legal Disclaimer

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**F FIRMATEK**

The word 'Agenda' is written in a large, white, serif font, positioned on the left side of the slide. The background behind the text is a photograph of a utility pole with power lines and insulators.

1 *Firmatek Overview*

2 *Firmatek Current Activities / Future Plans*

3 *Firmatek Benefits to DFW region*

4 *Collaboration*

5 *What can task force do?*

*“Giving Companies Who Build the World Supreme Confidence”*

The title 'Company Overview' is written in a large, elegant serif font. The word 'Company' is in white and 'Overview' is in blue. The text is positioned over a background image of an aggregate processing plant with conveyor belts and large piles of material.

# Company Overview

- **Experience:** Field Mapping services in the Aggregate Mining Industry since 1989
- **Industry Leadership:** Work with 14 of the top 15 aggregate producers in the United States
- **Technical Expertise:** Texas based team of Professional Engineers, Geologists, data processors and technical experts
- **Service Led:** We are committed to providing our clients the key insights and confidence that they need in order to make critical business decisions.



# Geographic Footprint



# Current Activities

- Construction
- Landfills
- Mining



## INFRASTRUCTURE FIELD SERVICES

- DRONE BASED, LIDAR, THERMAL & PHOTOGRAMMETRY DATA CAPTURE
- 360 VIDEO WITH GEO-REFERENCING FOR LINEAR DATA CAPTURE
- PROPERTY MANAGEMENT: ROOF, FAÇADE & PAVEMENT INSPECTIONS
- STOCKPILE MEASUREMENTS, GROUND BASED OR AERIAL DATA CAPTURE



## INFRASTRUCTURE MAPPING SERVICES

- PRE-CONSTRUCTION BASELINE MAPPING
- MOBILE LIDAR MAPPING
- DRONE BASED LIDAR MAPPING DATA CAPTURE
- COASTAL MAPPING DATA COLLECTION
- PROPERTY MANAGEMENT



## INFRASTRUCTURE DATA PROCESSING

- MACHINE CONTROL EARTH WORK MODELS
- MOBILE & AIRBORNE LIDAR DATA PROCESSING
- PHOTOGRAMMETRY & THERMAL DATA PROCESSING
- DATA OUTPUT INTEGRATION WITH CLIENT PREFERRED CAD/ GIS SYSTEMS & FILE FORMATS
- TOPOGRAPHIC BARE EARTH MODELS FOR DESIGN & CONSTRUCTION
- INDEPENDENT 3RD PARTY AGGREGATE VOLUMETRIC & STOCKPILE MEASUREMENTS

## *Future Plans*

- Mid-stream Oil&Gas*
- Utility Companies*
- Facility Management*

A person wearing a blue hard hat and a high-visibility yellow and orange vest with 'FIRMATEK 3D MAPPING SOLUTIONS' and a logo on the back. They are holding a white drone controller. The background is a blurred outdoor setting.

# *Benefits to DFW Region*

- Local Texas Small Business*
- Willing to partner/sub on Prime Contracts (A/E firms, etc.)*
- Regional focus*
- ROI on drone based services to local government entities.*
- Turn-key service provider*
  - Collect, Process, Analyze, Provide Insights*

# Collaboration

- ❑ *Open to partnering with local universities, high schools, etc. to provide training, internships, etc.*
- ❑ *Willing to be part of pilot projects with local organizations to showcase ROI based initiatives*

# Task Force

- ❑ *Task force can help develop initiatives with municipalities to support local small business contracts*
- ❑ *Brand awareness, collaboration, knowledge sharing across the task force to help each organization grow successfully*

*Thank You*

*Questions ?*



# Unmanned Air Transportation

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A green light to greatness.™

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# Presentation Outline

- ❑ Market Drivers, Leaders, and Visionaries
  - ❑ Investors trying tap into market
  - ❑ City Officials
  - ❑ Leaders
    - ❑ US (NASA, FAA)
    - ❑ Europe
    - ❑ Singapore
- ❑ Technologies, Infrastructure, and Initiatives
  - ❑ UTM, Global UTM, UAM
  - ❑ Platforms, Vertiports, Sensors, Power & Communications
- ❑ Public Awareness
  - ❑ Safety, Trust, and Privacy
- ❑ Barriers and Challenges
  - ❑ Public Perception, Trust, Regulations and Legal Aspects

# The Potential Impact of Unmanned Air Transportation on Society

- Traffic
  - Congestion
  - Accidents
  - Commute Times
- Environment
  - Pollution
- Emergency Services
  - Turnaround Time
- Business
  - Package Deliveries
- Critical Infrastructure
  - Monitoring
- Transportation
  - Faster Mobility
- Communities
  - Safety and Security

Major Changes in Lifestyle

# Market Drivers

## Crown Consulting Market Study

- Last-mile Delivery: Rapid delivery of packages
- Air Metro: Public transit options similar to subways and buses
- Air Taxi: Unscheduled/on-demand door-to-door ride-sharing operations

## Booz Allen Hamilton Market Study

- Airport Shuttle & Air Taxi have a total market potential of \$500B at the market entry price points in the best-case unconstrained scenario
- Air Ambulance

## Cities

- Singapore (Germany's Volocopter)
- Los Angeles and [Dallas](#) (Uber's Flying Taxi)

# Platforms & Infrastructure



The City of Dallas has constructed the world's largest urban elevated Heliport/Vertiport. This facility is located in the Central Business District on the south end of the Dallas Convention Center. The Dallas Heliport/Vertiport has a dual deck, accommodating three helicopters plus two vertical-take-off and landing aircraft at the same time. Image sources (DFW Executive Airport)

# Platforms & Infrastructure



Artists' Renderings of Vertiports  
Image Courtesy: Uber and Volocopter

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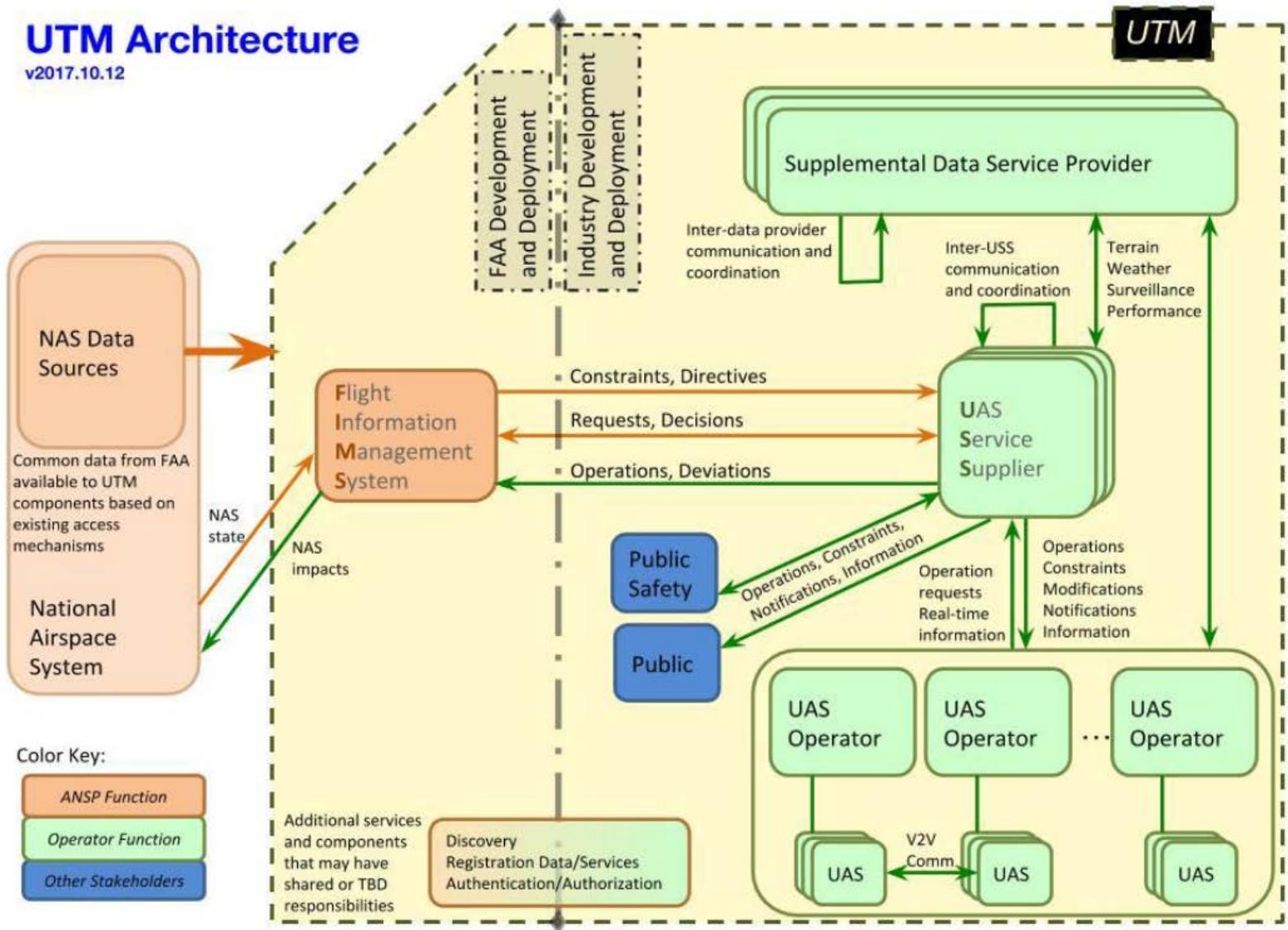
# Readiness Level – Near term

- ❑ Economics: High cost of service (capital and battery costs)
- ❑ Weather: Adverse weather can significantly affect aircraft operations and performance
- ❑ Air Traffic Management: High density operations will stress the current ATM system
- ❑ Battery Technology: Battery weight and recharging times detrimental to the use of eVTOLs for Air Ambulance market
- ❑ Impacts: Adverse energy and environmental impacts (eg: noise) could affect community acceptance

(Source: Booz-Allen-Hamilton Market Study)

# UTM Architecture

v2017.10.12



Provided by NASA

# Challenges, Opportunities, and Solutions

- Public Perception
- Workforce
- Standards
- Best Practices
- Infrastructure
- Legal Aspects
- Regulations
- Certification
- Environment
- Awareness Programs
- Education and Training
- Partnerships
- Collaborations
- Workshops
- Fundamental Research
- Outreach
- Flight Tests
- Data Sharing

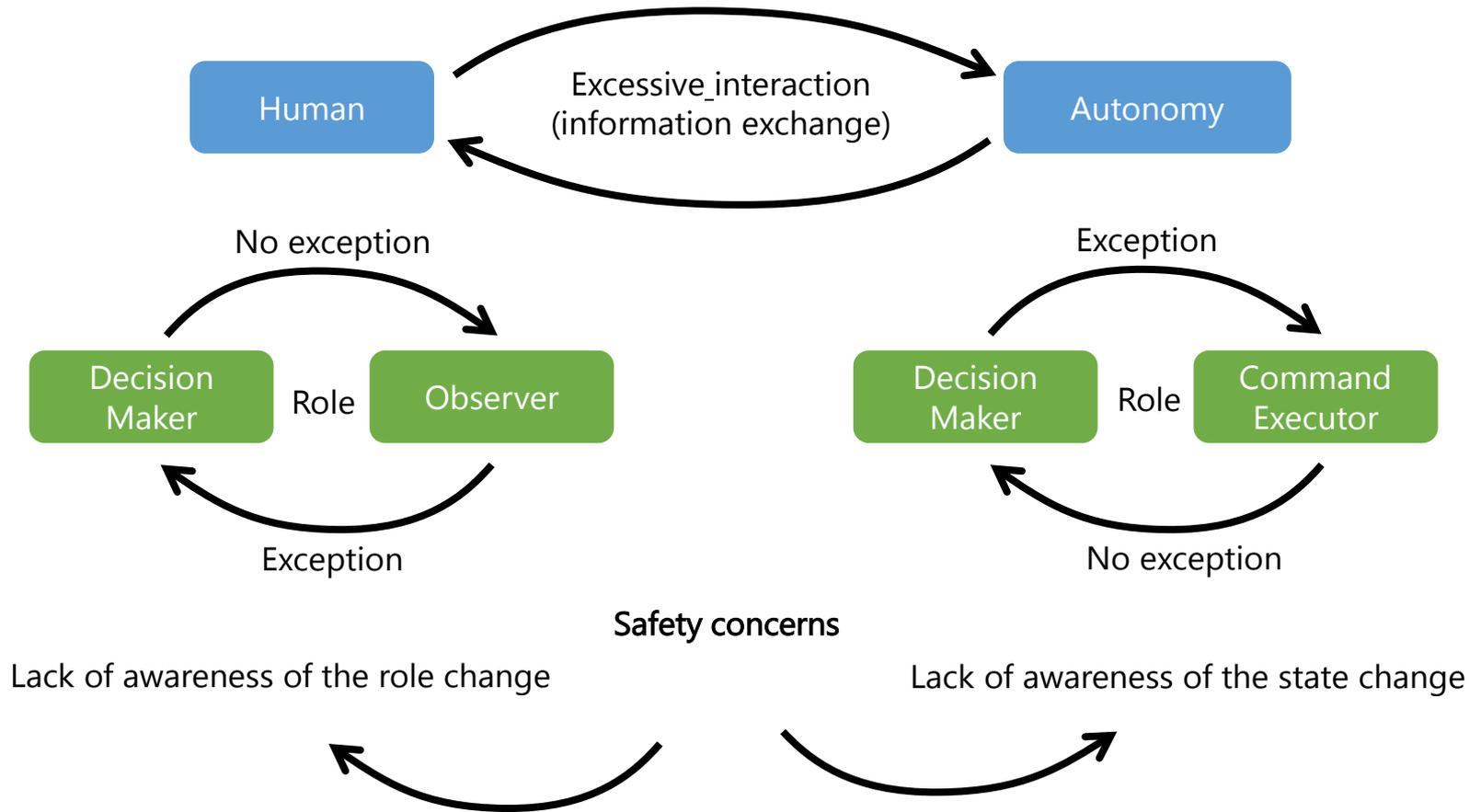
# Evolving Technologies

- Autonomy: Navigation in GPS-denied environment
- Human-Autonomy Teaming: Pilots interacting with UAs
- Communications: Beyond Visual Line of Sight
- Energy Storage: Weight
- GPS: Improved Accuracy
- Sensors: Autonomous operations
- Traffic Management: Integration into National Airspace
- Software Services: Weather Services
- Safety, Security, and Privacy: Identifying Rogue UA

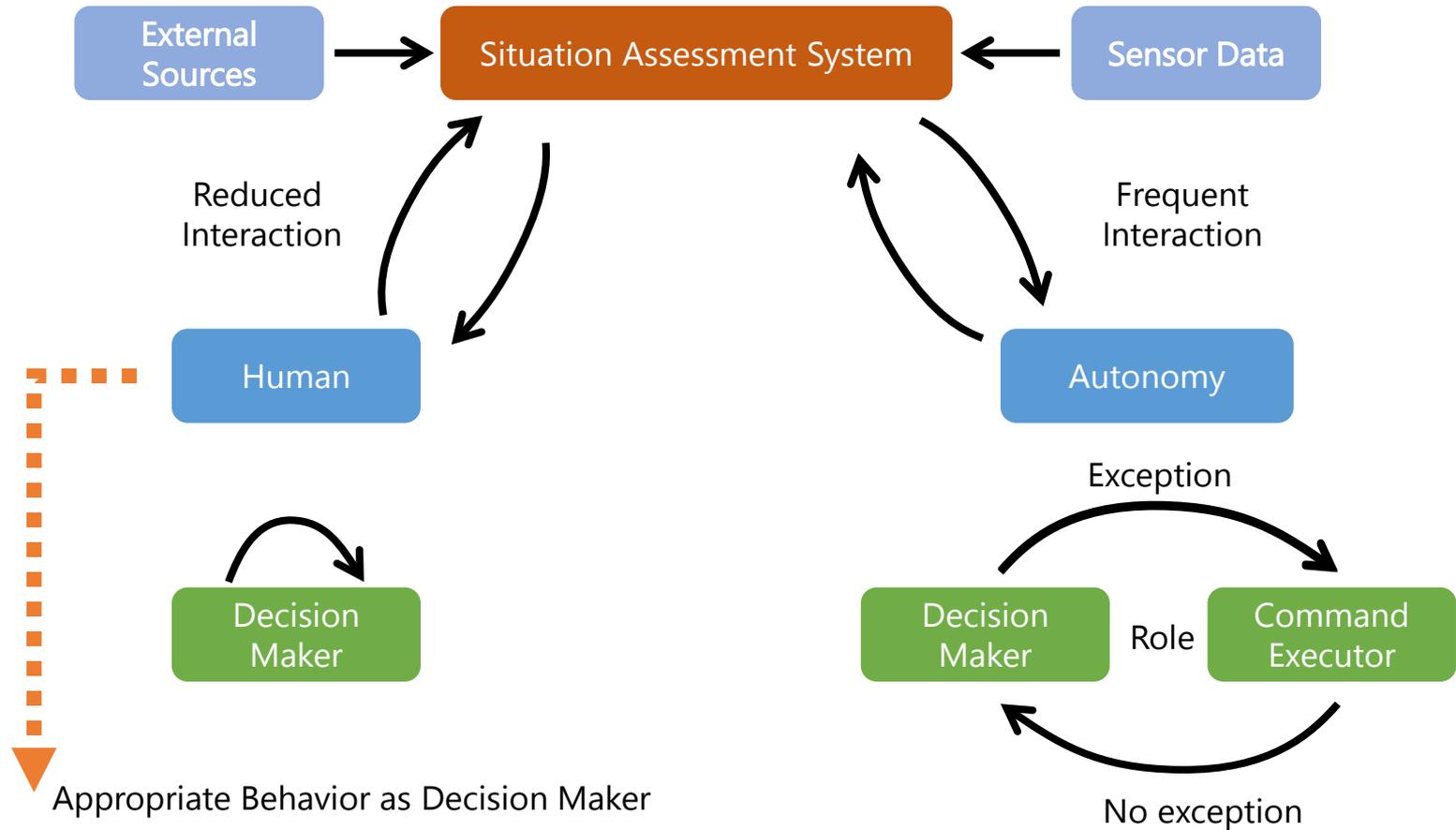
# UTM Test Scenarios

Nominal high density operations in an urban environment have been taking place throughout the day. A weather front is expected to bring rain and high winds to the area within the next two hours. Some operators will have to replan to divert to safe landing areas, others will return to the launch location if within an appropriate distance/time. Some operators will have to update safe landing locations to land safely in time. Concurrent demand for safe landing areas results in conflicts in some cases requiring deconfliction actions. A warning area is established in the forecast impact region that overlaps with some diverting operations requiring a re-plan to avoid the area. Planned operations are also replanned or they are cancelled per operator request to their USS. As the weather front moves in, all vehicles have eventually safely landed and the airspace remains clear until the front moves on. After the front moves on, operations are planned and resume to high density levels for the remainder of the day. (Source: NASA)

# Human-Autonomy Teaming



# Human-Autonomy Teaming



# References

1. NASA's UAS Traffic Management
2. NASS's Urban Air Mobility
3. FAA's Centers of Excellence
4. Market Studies by Crown Consulting and Booz-Allen-Hamilton

A green light to greatness.™

**UNT**®

# COUNTER UAS (CUAS)

Current authorities and status

**Information is publicly releasable and not LES**

## CUAS: WHERE WE ARE TODAY

- UAS can be extremely helpful when used by good actors.
- UAS can also be a form of asymmetric warfare when used by bad actors.
- This is a current threat to the homeland and emergency responders.
- Low cost solutions exist to cause terror, but sophisticated attacks overseas should serve as a bellwether for what is to come stateside.

# HOUTHIS VS YEMENI UAS ATTACK

- <https://www.bbc.com/news/world-middle-east-46822429>
- Fixed wing UAS loaded with explosives.
- Blew up 65 feet off of the ground.
- Shrapnel killed six soldiers and injured twelve.
- Sophisticated: Believed to have been launched approximately 40 miles away and flown at a speed of 70 MPH.
- No current mitigation for local authorities.

## TRACK AND IDENTIFY (CUAS DETECT)

- The FAA and the US Attorney General's office have not said explicitly that tracking using tools like Aeroscope are authorized.
  - The concern is they may violate The Wiretap Act (18 USC 2511).
  - Communication between pilot and UAV could qualify as protected electronic communication. "...such device transmits communication by radio..."
- Legal solutions currently include radar, which requires a license.
  - There are several competent companies that specialize in detecting UAS via radar.
  - One component of a successful UAS track and identify strategy.

## MITIGATION (CUAS ATTACK)

- Only four entities inside of the United States have the express permission to mitigate UAS.
  - Department of Defense
  - Department of Energy
  - Department of Homeland Security
  - Department of Justice
- No locality has the authorization to intentionally mitigate a UAS. Not even with specially trained birds.

## SPECIAL PERMISSIONS

- The Department of Justice can choose to provide CUAS services to localities when requested by the governor of a state for “mass gatherings.”
- The DOJ/DHS cannot delegate the authority to others.
  - Conversation with Special Counsel to Attorney General: credentialed federal task force law enforcement members would not be allowed to operate the equipment. That is a form of delegated authority, which is expressly prohibited in the authorization.
- Most likely these events will be Special Event Assessment Ratings (SEAR) or National Special Security Events (NSSE).

## WHERE DO WE GO FROM HERE

- DOJ/DHS only received their authority in October of 2018, and their first event to leverage it operationally was the Super Bowl.
- More authorities will come online soon, and the Special Counsel to the Attorney General believes that The Department of Interior will likely be in the next round.
- If we (as local entities) want to be included, then we need to do a good job “telling the story” of why we need it.

## SUGGESTIONS AND SUMMARY

- Public safety agencies should be conservative in their adoption of CUAS technology.
- The risk is real, but so is the need to follow the law and protect the civil rights of our citizens.
- Avenues exist to engage with the DOJ to help localities protect citizens during “mass gatherings.”
  - Likely, the more of these requests that occur, the more likely we are to be in the permissions list the next time they are expanded.



# Know Before U Fly

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-UPDATE- JULY 2019



Sharron Rossmark



Maggie Schuster



Evan Merelli

## YourAerialView “Know Before you Fly” Team

Collaborative effort with [Indy RC World](#) and [Women and Drones](#)

# Our take on the Know Before you Fly

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**Purpose:** To present UAS technology to the public and prospective industry individuals in a digestible and approachable fashion.

## **Core Principles**

Family

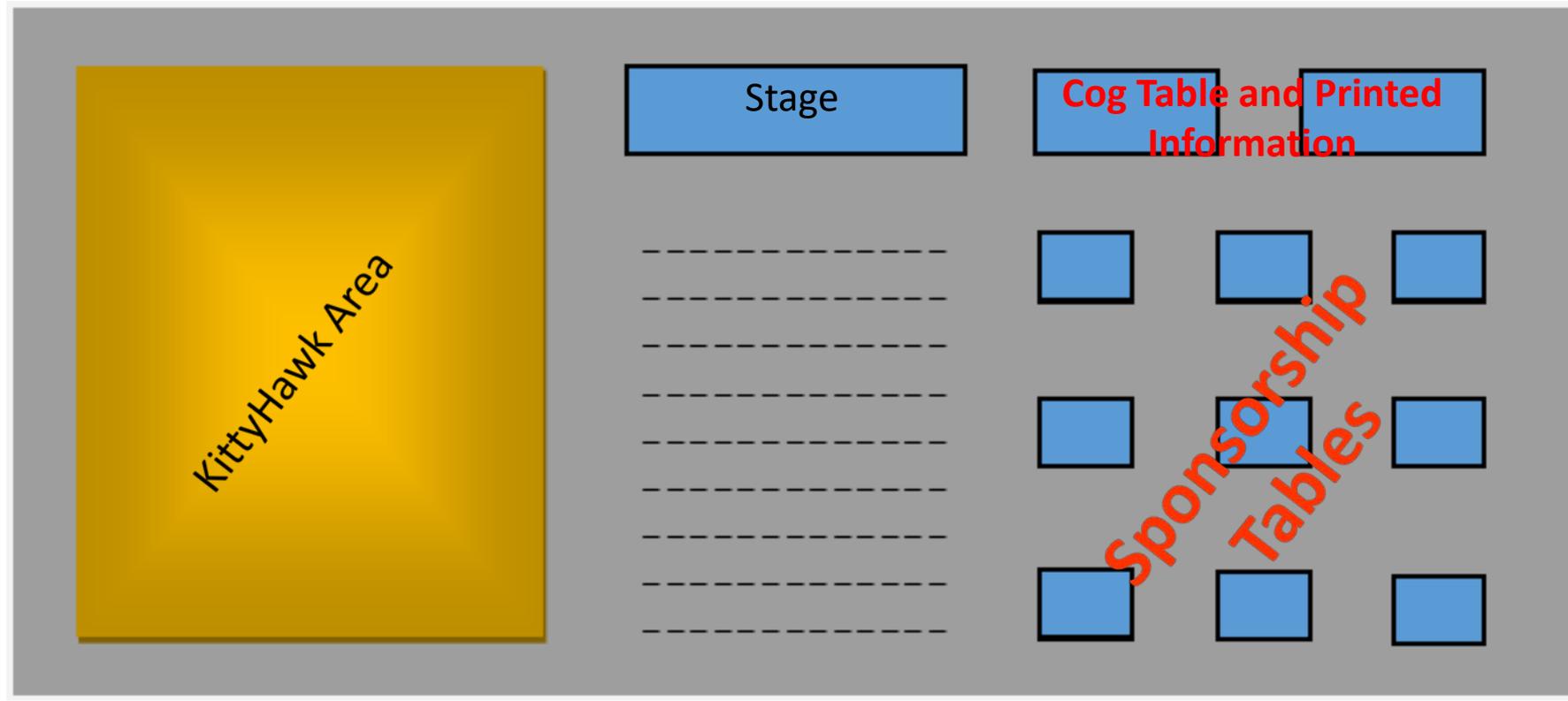
Opportunity

Community

Communication

# Mock Layout

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# Schedule

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## INTRO

Video of drone footage, people flying drones, industries using drones now, future of drones including Bell air taxi. Disclaimer.

Hosts, Welcome, goals for the workshop, all the features of workshop... exhibits, kitty hawks, COG table, resources, fly cage, list different themes. Mention survey,

1<sup>st</sup> giveaway

## MAIN PROGRAM

Keynote speaker gives presentation on selected topics

2<sup>nd</sup> giveaway

## BREAK

3<sup>rd</sup> giveaway

## GENERAL PROGRAM

4<sup>th</sup> giveaway

## KITTY HAWK, EDUCATION AND CAREERS IN DRONES WITH SHARON

Books and simulator, K-12 courses, educator resources, Parent Information and related associations.

## CLOSING

Next Theme, date, location and resources survey and website, what we want for the attendees take away.

Q & A with Hosts and keynote speaker

# Themes

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## **Intro to UAVs**

- FAA Registration
- Components of UAS
- Intro to LAANC
- Recreational vs Industrial UAS

## **Understanding the NAS**

- Airspace Classification
- DFW Sectional Charts

## **Aviation Weather**

- Safe Operating Conditions
- DFW Weather

## **UAS Consumer Guide**

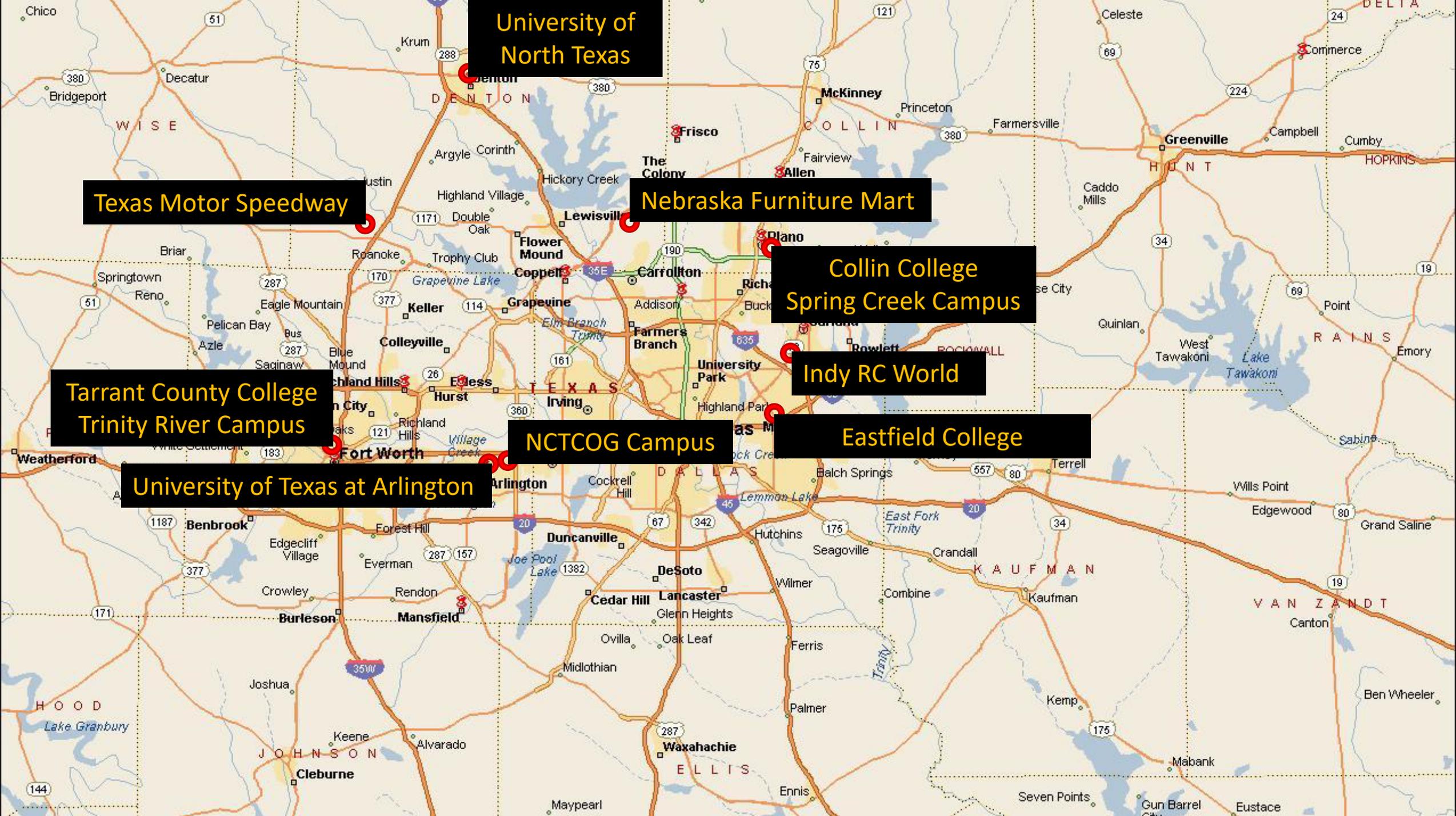
- Career Opportunities
- Resources for Flying, Training, and Logistics
- UAS use with Government Entities

## **Ethical Airmanship**

- Aviation Safety
- Licensing

## **UAS Regulatory Environment**

- Private Citizens rights
- Remote Pilot Rights
- Legislative Update
- Dispelling Misconceptions



University of North Texas

Texas Motor Speedway

Nebraska Furniture Mart

Collin College Spring Creek Campus

Indy RC World

Eastfield College

NCTCOG Campus

University of Texas at Arlington

Tarrant County College Trinity River Campus

# Sponsorships

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## **Sponsorship Industry from both service and retail**

(DJI, Spark, Drone Deploy, Drone Insurance, American Airlines)



## **Sponsorship non-profit, govt. Entities, clubs & Organizations**

(FAA, DFW Drone community, North Dallas Drone Users, AUVSI)



## **Sponsorship Advertising, Radio, TV, Social Networks**

(Channel 8, KVIL, Schools)

# Community Support

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## Survey

Feedback on locations

Top favorite themes

Which Workshops intrigue you?

## Promotional Trailer

3-5 second clips

DFW landmarks preferred

Interaction with Students

Service to the Community

Credit to supporters