



Streamlined Main Dynamics

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# New Age Of Aircraft

Introducing

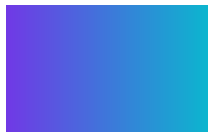




# Solve For Economics First...

## Fuel costs

Traditional aircraft  \$200 / hour



\$10 /  
hour

## Ware & tare

Traditional aircraft  \$250 / hour



\$10 /  
hour



# Democratize

Private aviation today

Wealthy only



Long distance, low frequency



With  $\Lambda\Lambda\sqrt{\alpha}$

Casual to smart casual



High frequency, close to destination





# Removing Infrastructure



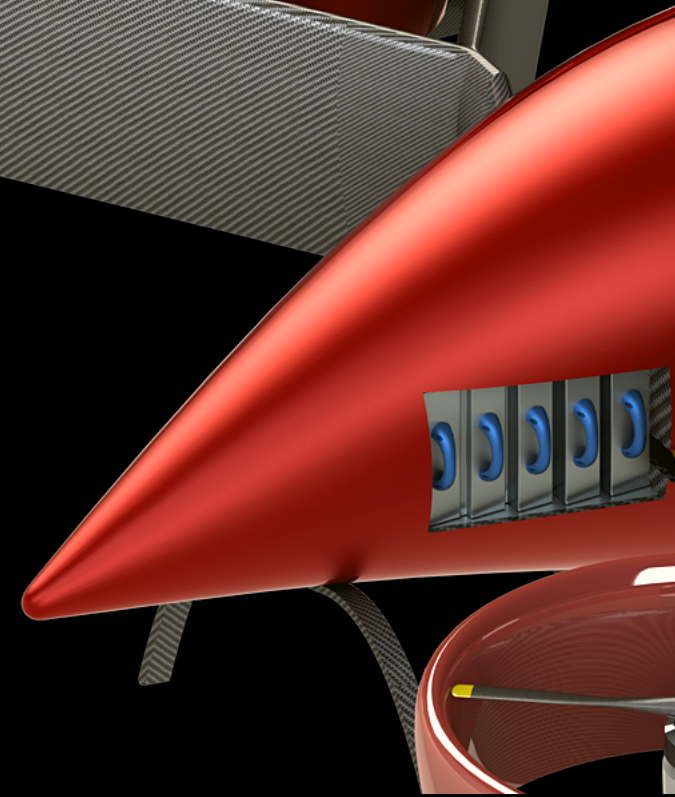
Land in a field or a big back yard  
Forget storing your aircraft hours away  
The aircraft is a mode of transport,  
no need to use another to access it



# Quick hot swap No charging delays

"Electric vehicles don't work,  
they take forever to charge"

It's faster to replace batteries than  
refilling with fuel!





# Snapshot Of Aviation Today



Expensive and highly taxed fuel providing main source of revenue

Highly complex aircraft that are expensive to fly & maintain, spend most of the time in the hanger

Unnecessary runways

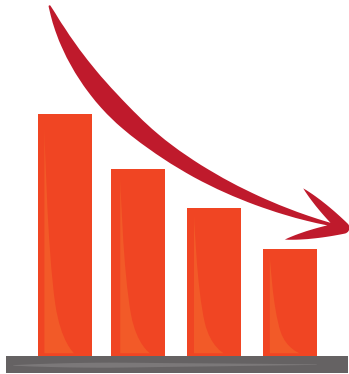
# The disrupted

**135 operators**

Can't compete in costs

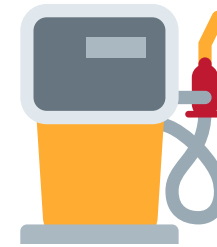


Drop in customer demand



**FBOs & airports**

No fuel revenue

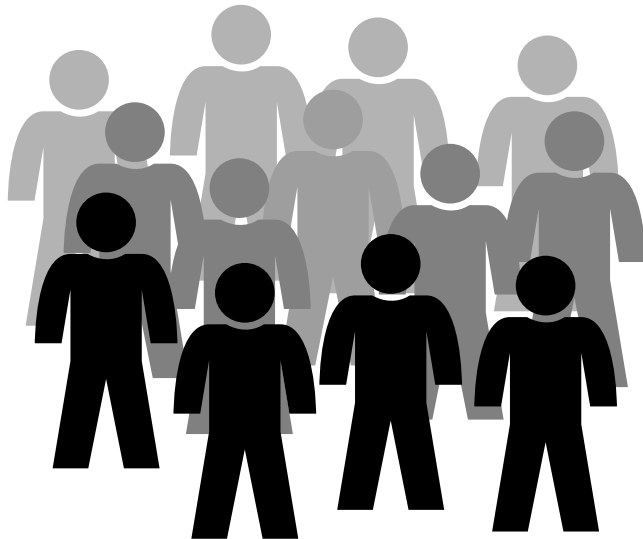


No runway and storage fees



# Working With Aircraft Operators

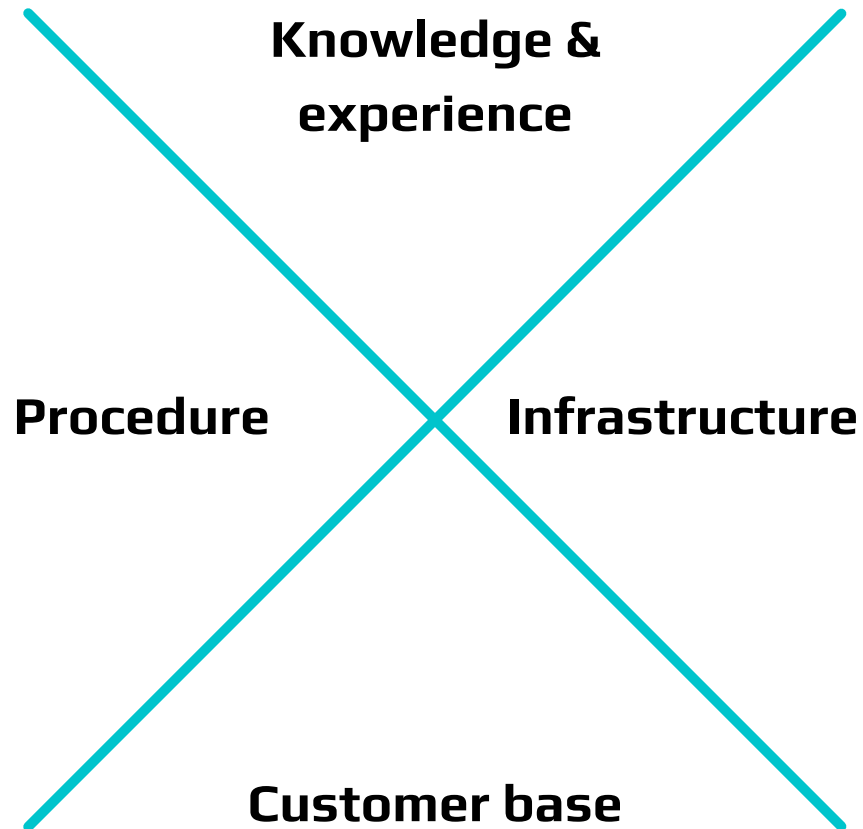
More time flying,  
less in storage



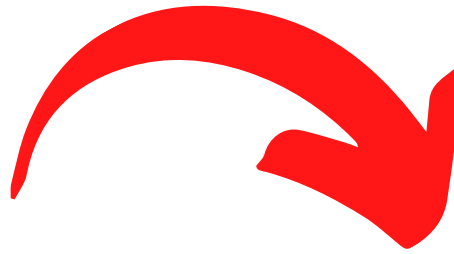
Much larger market



# Working With FBOs & Airports



# Transition Phase 2021





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**DroneTalks**  
Inform and Educate

# Behind the Scenes of the Drone Revolution



Do you know who are the people behind the leading drone initiatives?

What are their motivations?

How do they make their business decisions?



## About us

DroneTalks is an online platform to:

- ✓ Spread ideas and educate in the drone ecosystem
  - ✓ Drive social acceptance for drone services





# How do we achieve our mission?

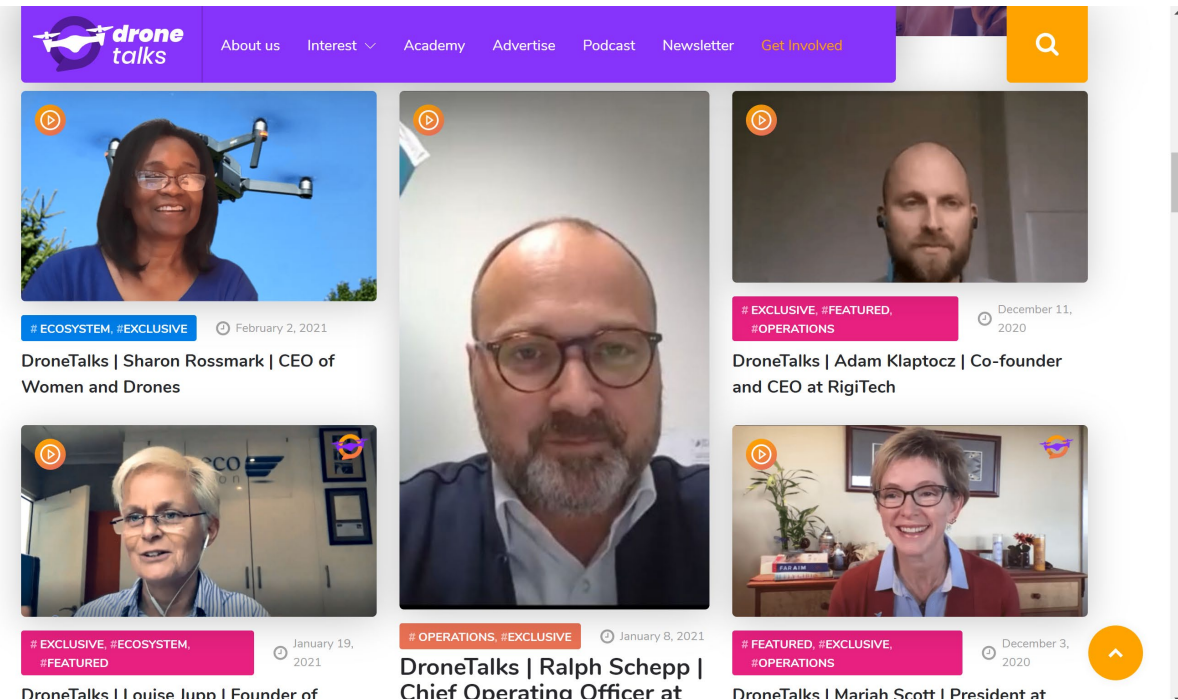
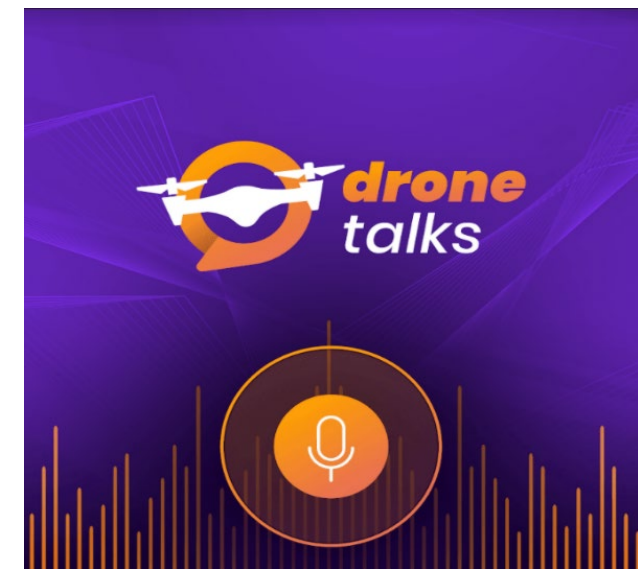
Drone industry leaders share their experience and knowledge on technology, regulatory, business and ecosystem topics openly to enable and foster innovation for a better future.



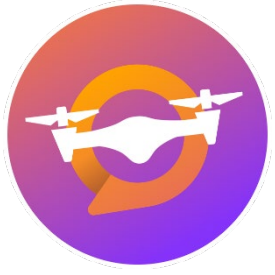


# What do we do?

- Inform and educate
  - DroneTalks Academy
  - DroneTalks Podcasts
  - DroneTalks Video Interviews
  - DroneTalks Mini-Series

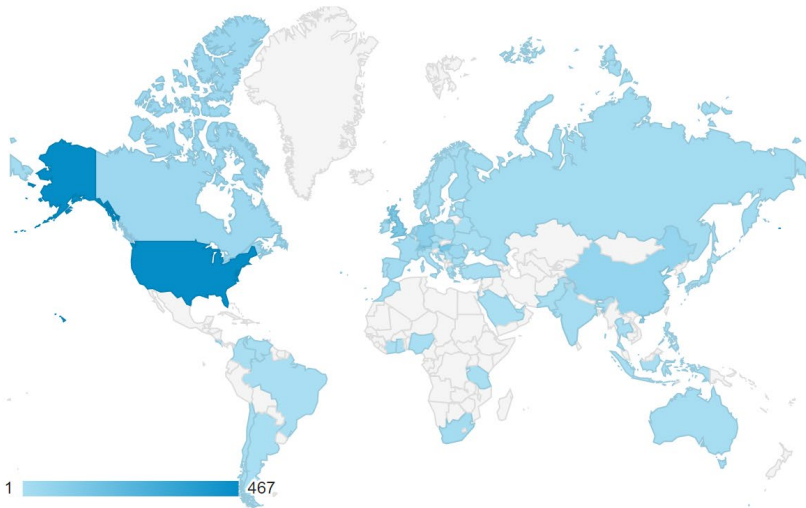






# Quicker than we thought!

- ✓ 7600 K view in 4 months!
- ✓ More than 3 minutes average time on the page!
- ✓ Extra low Bounce rate!
- ✓ Audience:
  - C level executives from the drone, aviation, telecom oil & gas sectors
  - Drone Service Providers
  - Research Bodies
  - UTM stakeholders
  - Governmental bodies, Associations





# Executive one day briefing program

## Programme Modules

### MODULE 1: Stakeholders

Length: 1 hour 40 min

#### Content:

- Regulators
- Key industry players
- ANSPs and UTM providers
- Associations

### MODULE 2: Operations

Length: 1 hour 45 min

#### Content:

- Framework
- JARUS SORA

### MODULE 3: Regulations

Length: 2 hours 15 min

#### Content:

- EASA regulation
- FAA regulation
- Others

### MODULE 4: Technology

Length: 1 hour

#### Content:

- Latest products update
- Complimentary technologies overview
- Communication

- ✓ 1 days, virtual, interactive live session
- ✓ Networking, lifetime community
- ✓ Maximum of 10 people
- ✓ To gain an up-to-date understanding of the drone ecosystem quickly

✓ Start date: 9<sup>th</sup> of March & 8<sup>th</sup> of April





# 360 Overview Diploma in Drones

- ✓ Teachers from the drone ecosystem with real life experiences

- ✓ 7 days, virtual, interactive live sessions
- ✓ 360 ecosystem overview knowledge
- ✓ Networking, lifetime community
- ✓ Small groups

## Programme Modules

### MODULE 1: Technology

Length: 2 days (16 hours)

#### Chapters:

- Hardware and Platforms
- Software
- Communication and Ground Control

### MODULE 2: Operations

Length: 2 days (16 hours)

#### Chapters:

- Concepts of Operation
- Piloting and Operating
- Safety Management
- SORA
- ATM and UTM

### MODULE 3: Regulation

Length: 2 days (16 hours)

#### Chapters:

- America
- Europe
- Asia
- The rest of the world

### MODULE 4: Business

Length: 1 day (8 hours)

#### Chapters:

- Stakeholders Overview
- Business Models
- Business Benefits
- Investor Perspective

- ✓ Start date: 19<sup>th</sup> of April



# Coming soon

- ✓ Online pre-recorded educational short courses with drone experts
- ✓ Programs for schools to drive social acceptance



# Get involved

- Be a speaker at DroneTalks C - level series
- Attend DroneTalks Academy 360 Diploma/One day executive briefing Programs
  - Use: **DRONETALKS20 for 20% off! (valid for 10 days)**
- Be our partner, let us talk about your achievements
- Be our partner, let's organize together our next initiatives
- Educate the world, share our talks
- Volunteer with us!





[www.dronetalks.online](http://www.dronetalks.online)

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# Design of Hexacopter UAV EAGLE-1 Mount System for Future 3D Mapping using LIDAR

BROUGHT TO YOU BY:

THE UNIVERSITY OF TEXAS AT ARLINGTON





# Who we are:



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## MAE Senior Design II Program and Engineering Design Laboratory

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- Co-director, Senior Design Capstone Program.
- Mechanical and Aerospace Engineering
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# Project Overview:

## Project Background:

Team Eagle Eye strives to **design and build** a

**low -cost** UAV drone that will aid in the mapping of 3-dimensional topographic images of earth in real time (survey)

**Maintain LIDAR accuracy** and deliver the imagery for disaster assessment, response, and management.

Our work will focus on developing an unmanned aerial system that will be more cost effective than the **most expensive and common commercialized** UAVs used for topography.

## Fall 2020

### Completed:

- UAV Electronic Selection
- Estimated Weight and Thrust Calculations
- Perform Mount Design & SW Simulations
- Eliminate Errors (Vibrations & LIDAR Scans)
- Select Place Area According to LIDAR specs
- Autonomous flight code

## Winter 20-21

### Completed:

- LIDAR System and configurations
- Linux/Ubuntu Basics
- Python Basics
- Point Cloud Data Software Selection
- Image Reconstruction
- UAV GNC Controls
- Obstacle Avoidance

## Spring 2021

### In Progress:

- UAV Final Electronics
- Final Weight/Thrust Calculations
- Perform Mount design and integrate real time testing
- First Prototype with select electronics
- Ground/flight testing
- Autonomous flight path & code integration
- Final image reconstruction



# Project Goals



Goal 1

Build First  
Prototype



Goal 2

Test/simulate UAV  
prototype



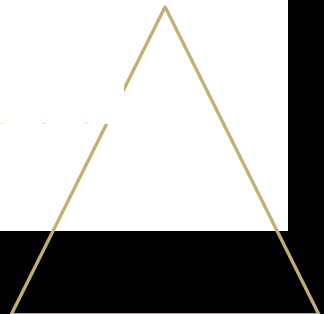
Goal 3

Deliver  
Reconstructed  
LIDAR  
Topography



Goal 4

Compare from  
industry LIDAR  
UAV



# Project Approach

## 1. Frame Type and Material

Carbon Fiber/Aluminum/ABS Plastic

## 2. Mount Design

Corresponds to Lidar adjustment position (FEM/FEA)

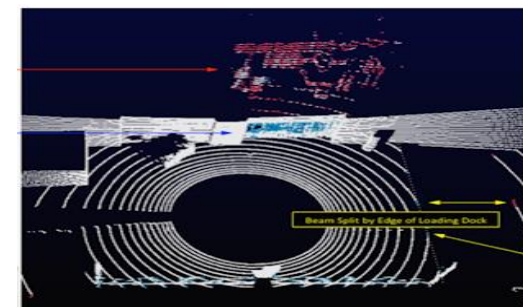
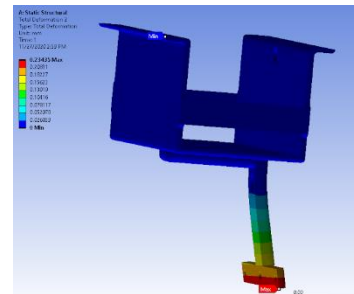
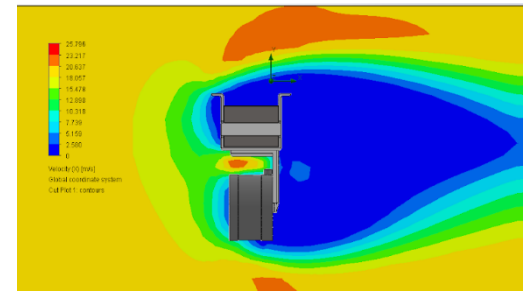
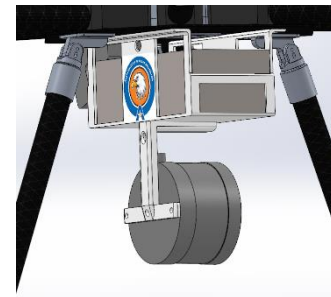
## 3. Flight Analysis/Testing

UTA Ground perspective/Land Perspective

## 4. UAV Circuits & Lidar System

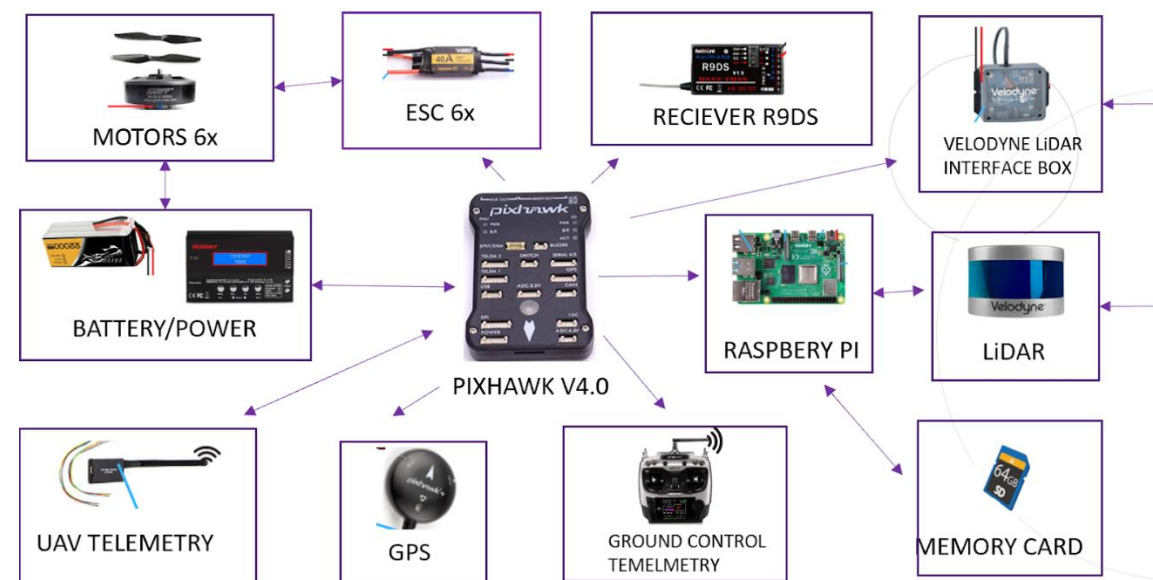
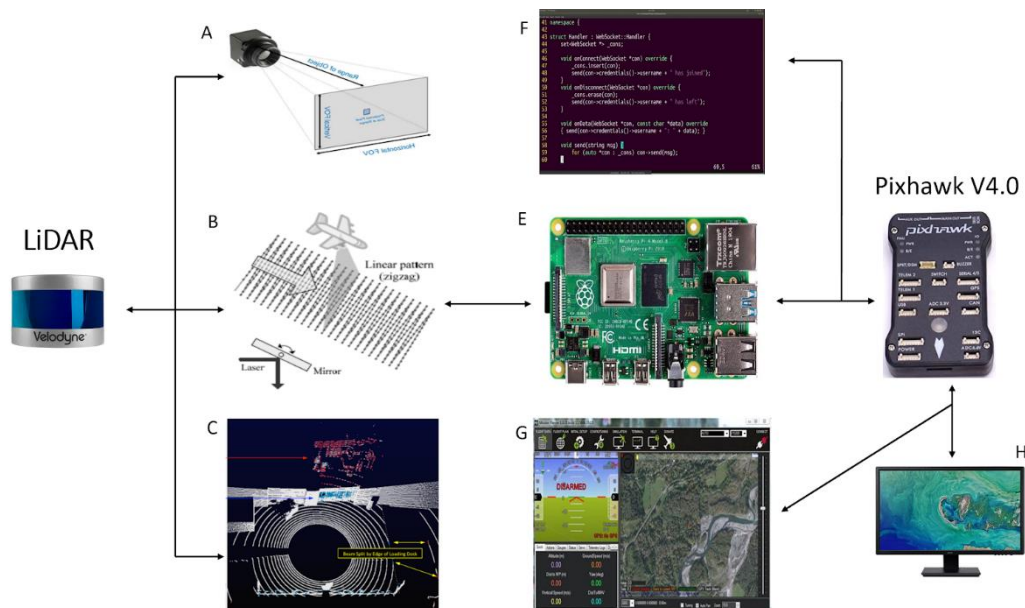
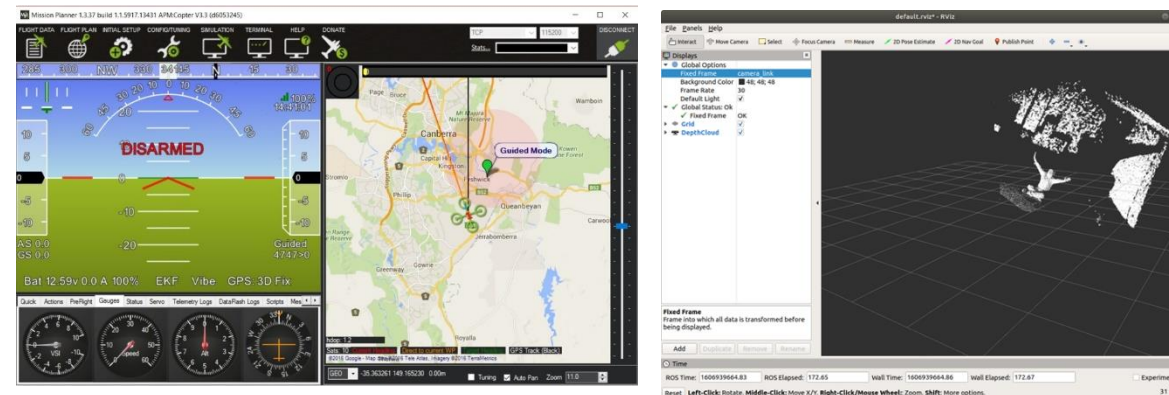
LINUX/ROS/PYTHON/C++/Veloview/MATLAB/

Mission Planner

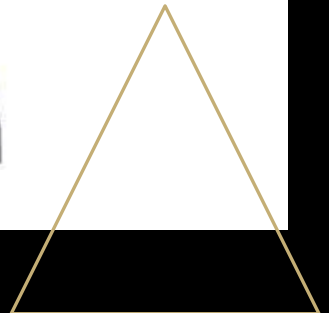


# Project Approach

UAV Circuits & Lidar System:  
 LINUX/ROS/PYTHON/C++/Veloview/MATLAB  
 Mission Planner

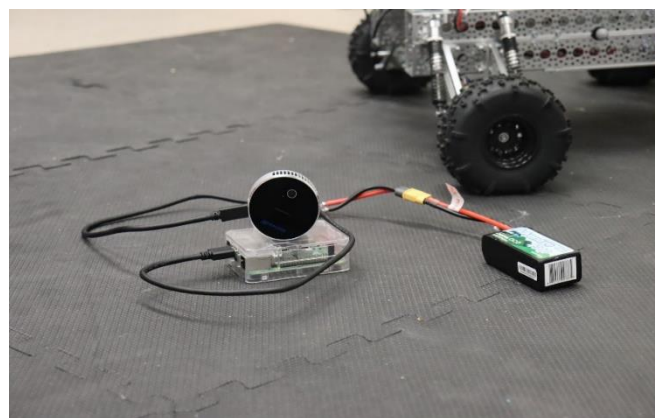
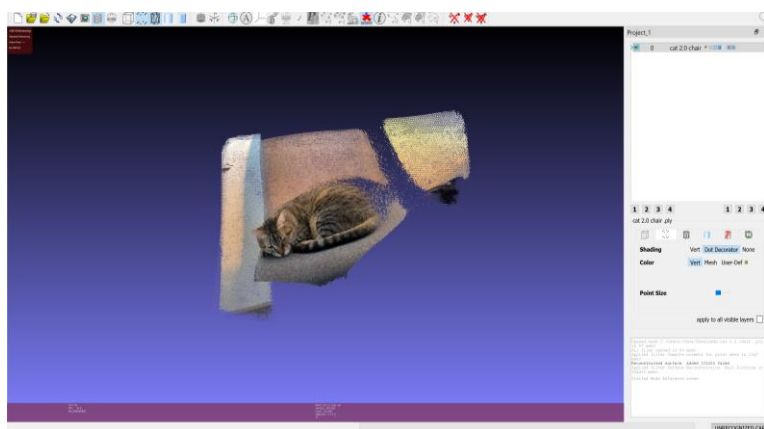
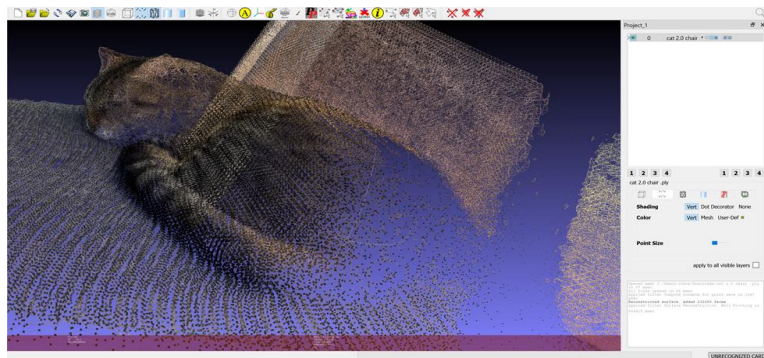


# Project Integration: Design





# Project Integration: Technology



# Budget

LIDAR/Pixhawk: \$0  
Faculty Provided

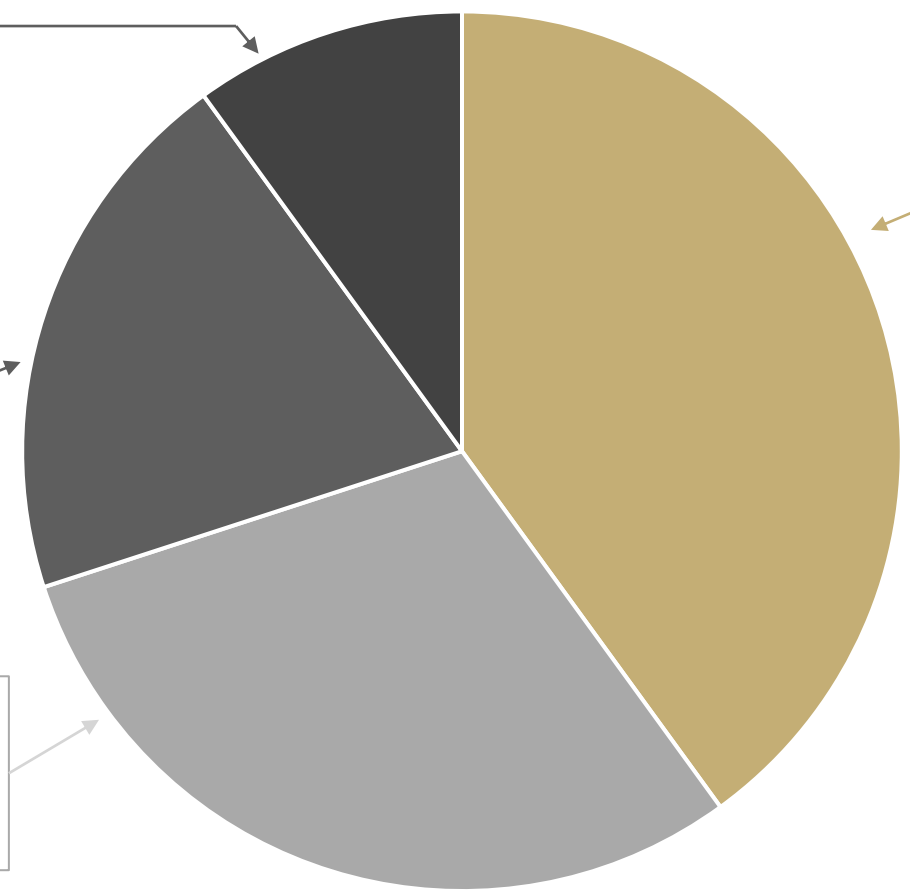
Student Contribution: \$250  
Fixed Value & Non-negotiable

Machining: \$10-\$30  
UTA Printing Sources and  
Facility Use

Materials: \$600-\$1000  
UAV team selected  
electronics & parts  
Estimate

**\*\*\*All items of the  
project will be subject  
to UTA property**

■ Materials   ■ Student Contribution   ■ Machining   ■ LIDAR/Pixhawk





Figures: (a. Row: voice controlled UUV robot system at testing terrain., Dynamics, controls, Robotics, Autonomous System Laboratory (Grad student performing robot testing). (b. Row: UTA Aerospace System Laboratory. (professors discussing UAV design (Professors and grad student performing UAV flight tests)

a



b

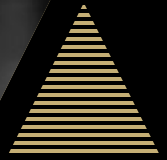


Figures: (a. Row: )UTA Mechanical Engineering Senior Design Laboratory, CSE/EE MakerSpace. (b. Row: UTA Mechanical and Aerospace Engineering Computer Aided Design Room, UTA Mechanical Engineering and Aerospace Engineering Machine Shop (Grad Student beginning shaft cut).

# University Resources







# Questions?

- Project Overview
- Project Approach
- Project Integration
- Budget
- University Resources
- Call to Action



# Thank You



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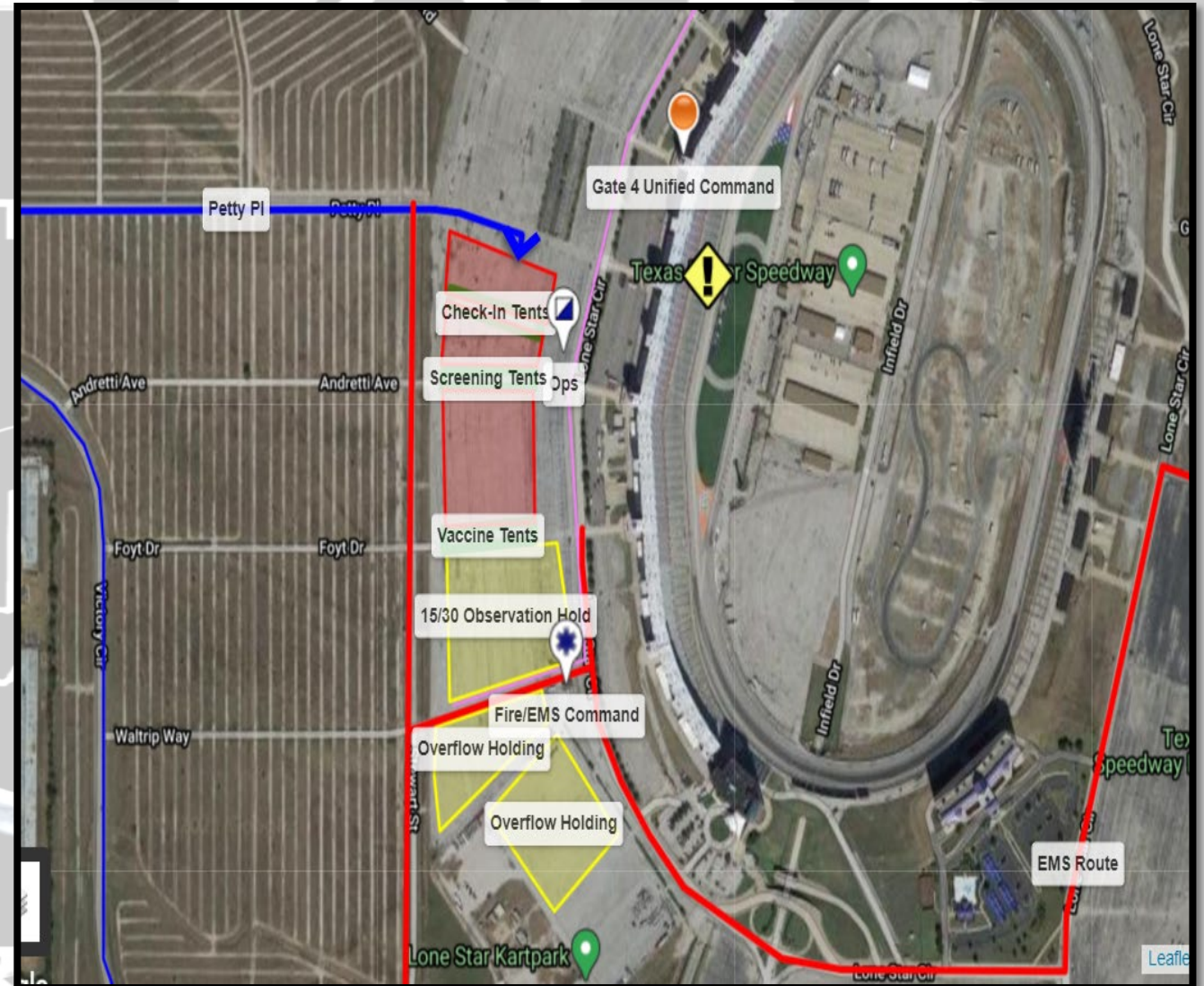
**NTXPSURT UAS Support COVID-19  
Mass Vaccination Event at Texas  
Motor Speedway,  
February, 2, 4, & 5, 2021**

Travis Calendine NTXPSURT Chair

**UNMANNED RESPONSE TEAM**

# Background

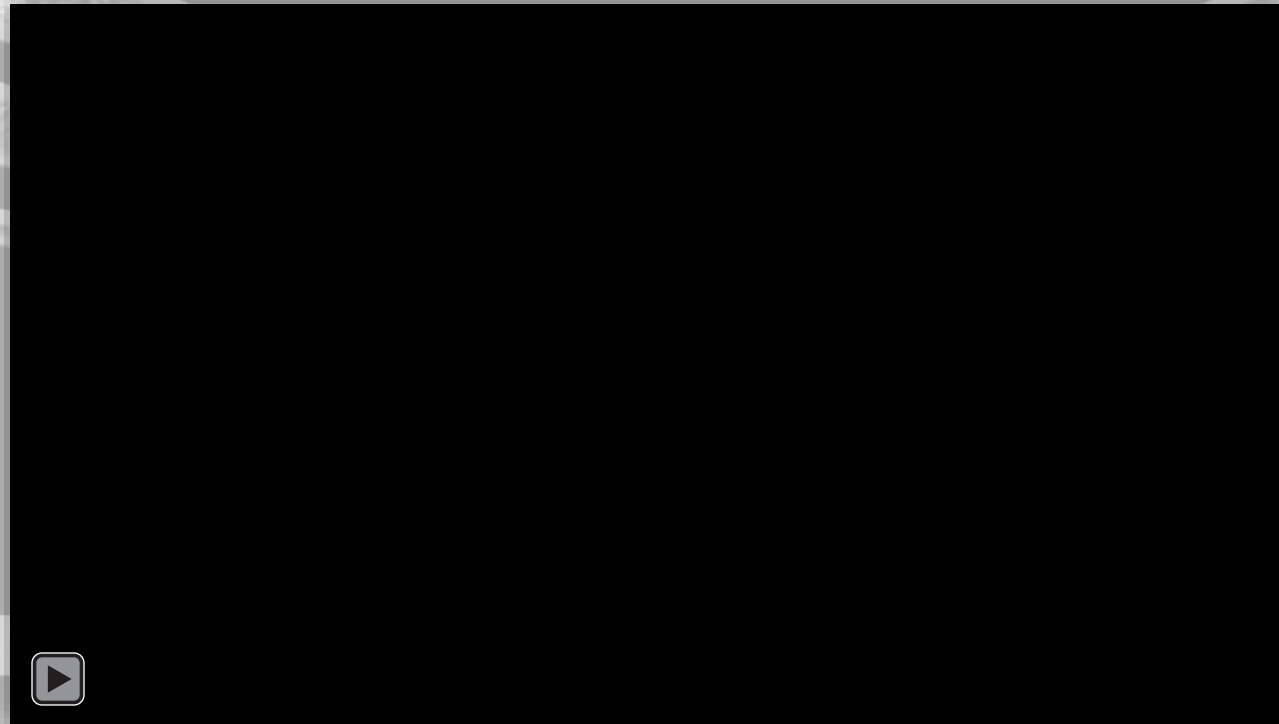
- Denton County Public Health & Emergency Services
- Mass COVID Vaccination Site at Texas Motor Speedway
- Goal to vaccinate 30k in 3 days.
- Over 250 volunteers





# Mission

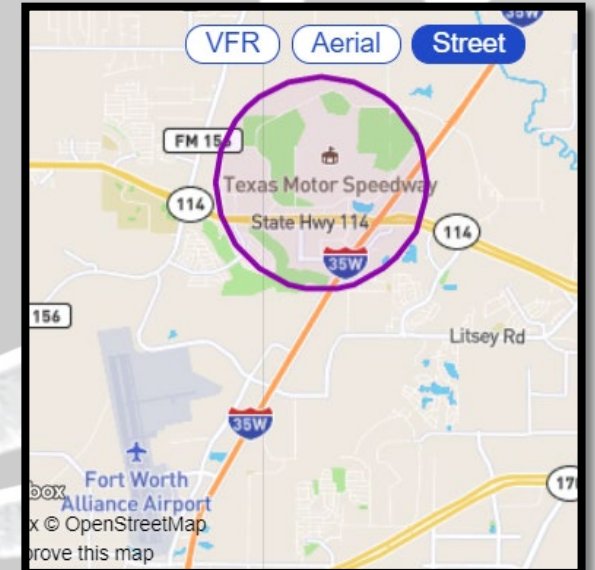
- Provide situational awareness and documentation of the event.
  - Real-time video for command staff.





# Airspace Coordination

- PART 107 Mission
- LAANC
  - 200 ft. AGL
- TMS
  - Coordination with TMS staff
- Media UAS
  - National and local media UAS imagery

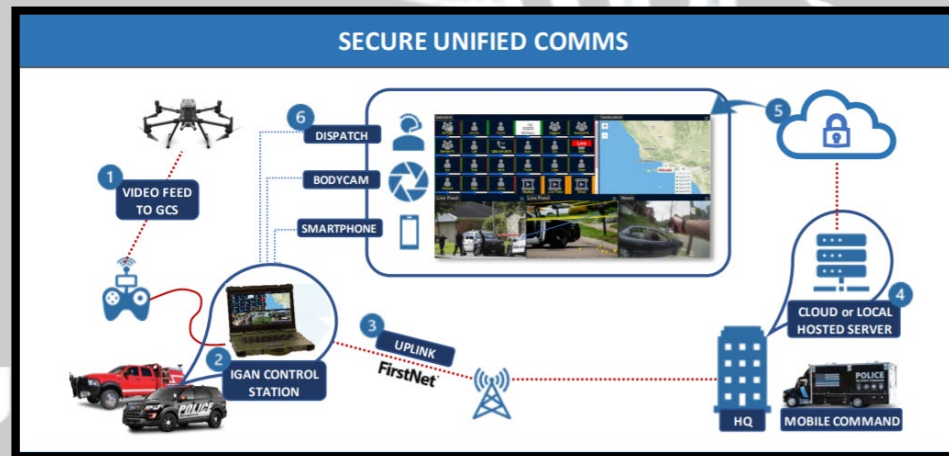


UNMANNED RES

TEAM

# Command Integration

- UAS feed livestreamed to multiple locations.
- CYTTA IGAN Fusion



RESPONSE TEAM





UNMANNED

USE TEAM



# Operations

- Flight Plan
  - Strategic View (Drone Rotations)
  - Site Documentation (Single Drone Mission)
    - Traffic Flow Hyperlapse
    - Shot Flow
- Pilot rotation
- Data management ( Media and PIO)
- Battery Charging Stations
- Internet



UNMANNED RESPONSE TEAM



# C SAFETY



# RESPONSE TEAM



# Logistics

- DJI
  - M210
  - Mavic 2 Enterprise
  - Mavic 2
  - Inspire 1
  - Phantom 4 Pro
  - M600
- Autel Evo 2 dual thermal
- IGAN Fusion

NORTH TEXAS



UNMANNED RESPONSE TEAM

# Lessons Learned

- Strengths:
  - Communications
  - Planning
  - Coordination
  - Flight Operations
- Improvements:
  - Data Management

NORTH TEXAS



UNMANNED RESPONSE TEAM

# NTXPSURT Member Support

## 2/2 Tuesday

- Travis Calendine, Town of Little Elm
- Clay Regan, Midlothian PD
- Chris Vinson, Midlothian PD
- Scott Williamson, Bedford PD
- Wayne Baker,
- Barry Moore,

## 2/4 Thursday

- Travis Calendine, Town of Little Elm
- George Grall, City of Mansfield
- Michael Hill, Cumulus Technologies Inc
- David Dean, NCT 911
- Aaron Loyd, NCT 911
- Kasey Cox, NCT 911
- Joe Brawner, NCT 911

## 2/5 Friday

- Travis Calendine, Town of Little Elm
- James Dumbauld, Midlothian
- Clay Regan, Midlothian PD
- Michael Hill, Cumulus Technologies Inc
- George Grall, City of Mansfield

UNMANNED RESPONSE TEAM



Questions



UNMANNED RESPONSE TEAM



# Legislative Update

Nicholas Allen

North Central Texas Council of Governments

February 23, 2021

# 86<sup>th</sup> Legislative Session (2019)

- FILED & NOT PASSED
  - **HB 2512 (Miller)** – Using UAS to assess unsafe environmental conditions would be allowed
  - **HB 2912 (Zerwas)** – UAS used for disaster preparation would be allowed
  - **HB 3164 (Clardy) / SB 2034 (Hall)** – Would allow UAS to be used 911 services or mapping project
  - **HB 3082 (Murphy)** – Would strengthen penalties for flying above critical infrastructure
  - **HB 3494 (Cole)** - Restricts flight over commercial airports, adds to current critical infrastructure in code; restricts cities and counties from enforcing UAS ordinances

# 86<sup>th</sup> Legislative Session (continued)

- FILED & NOT PASSED
  - **HB 4448 (Springer)** – Would allow images to be used for commercial purposes under FAA guidelines
  - **SB 59 (Zaffirini)** - Commercial delivery by UAS would be allowed
  - **SB 1701 (Whitmire) / HB 4084 (Walle)** – Would restrict flights over schools
  - **SB 2299 (Powell)** – Would restrict flights over military installations and add to list of critical infrastructure in code
- PASSED
  - **HB 2340 (Dominguez)** - Created a study for emergency and disaster management, response, and recovery



# 87<sup>th</sup> Legislative Session

- FILED
  - **HB 1758 (Krause)** - If passed, would make modifying a UAS to carry weapons (explosives, firearms, other) a crime if that system was operated over property not owned by the UAS pilot
  - **SB 149 (Powell)** - Restricts flight over military installations, adds to current critical infrastructure in code
    - Refile of SB 2299 from last session

# The American Security Drone Act of 2021

- ASDA is being reintroduced
- If passed, the bill would prohibit the federal government from purchasing, operating, or funding the purchase or operation of UAS from foreign entities deemed inappropriate by specially appointed officials
  - This applies to communication components and hardware
  - This applies to federal contractors
- The bill has bipartisan House and Senate support

# Questions and Comments

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[www.nctcog.org/legislative](http://www.nctcog.org/legislative)