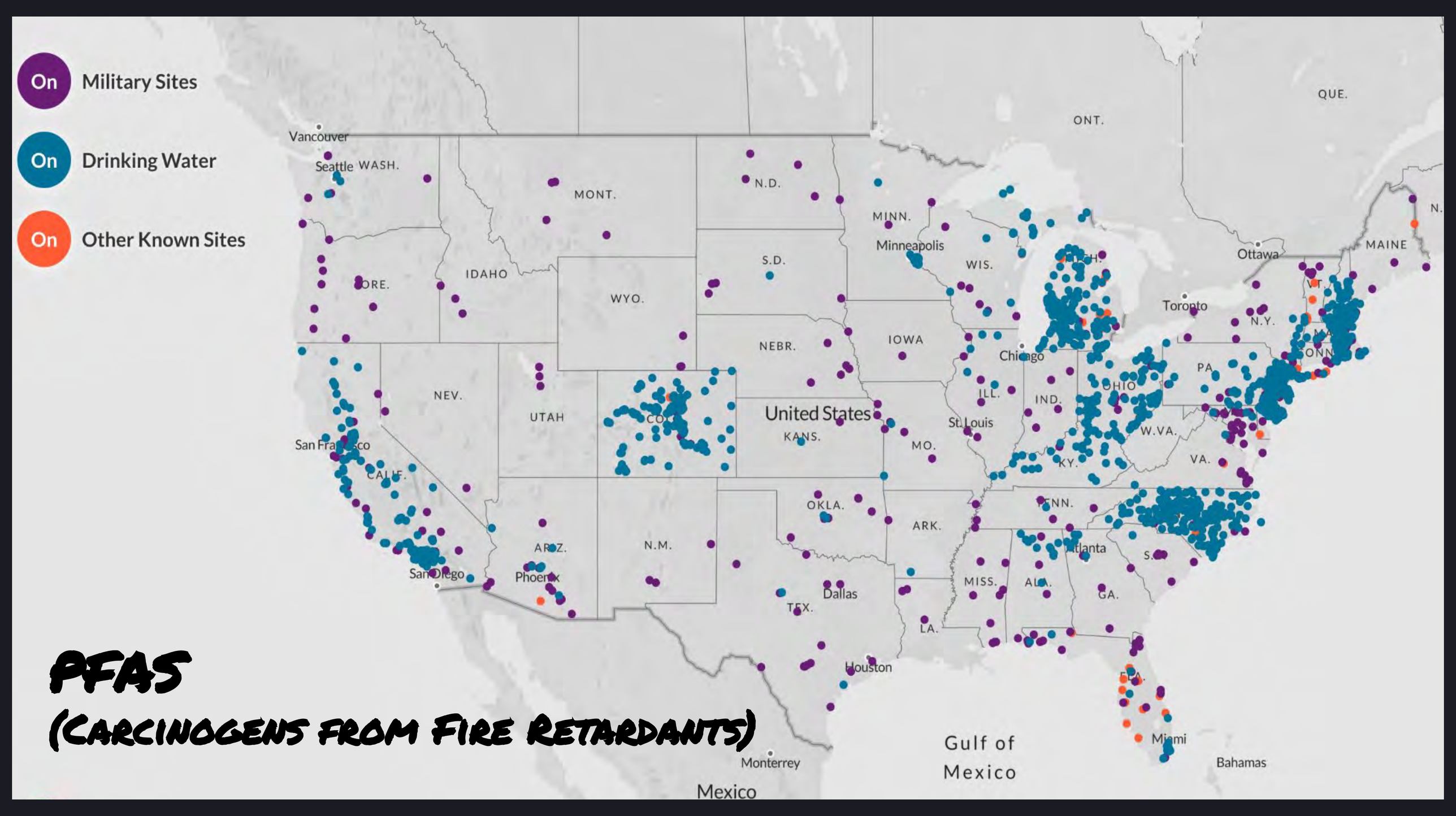
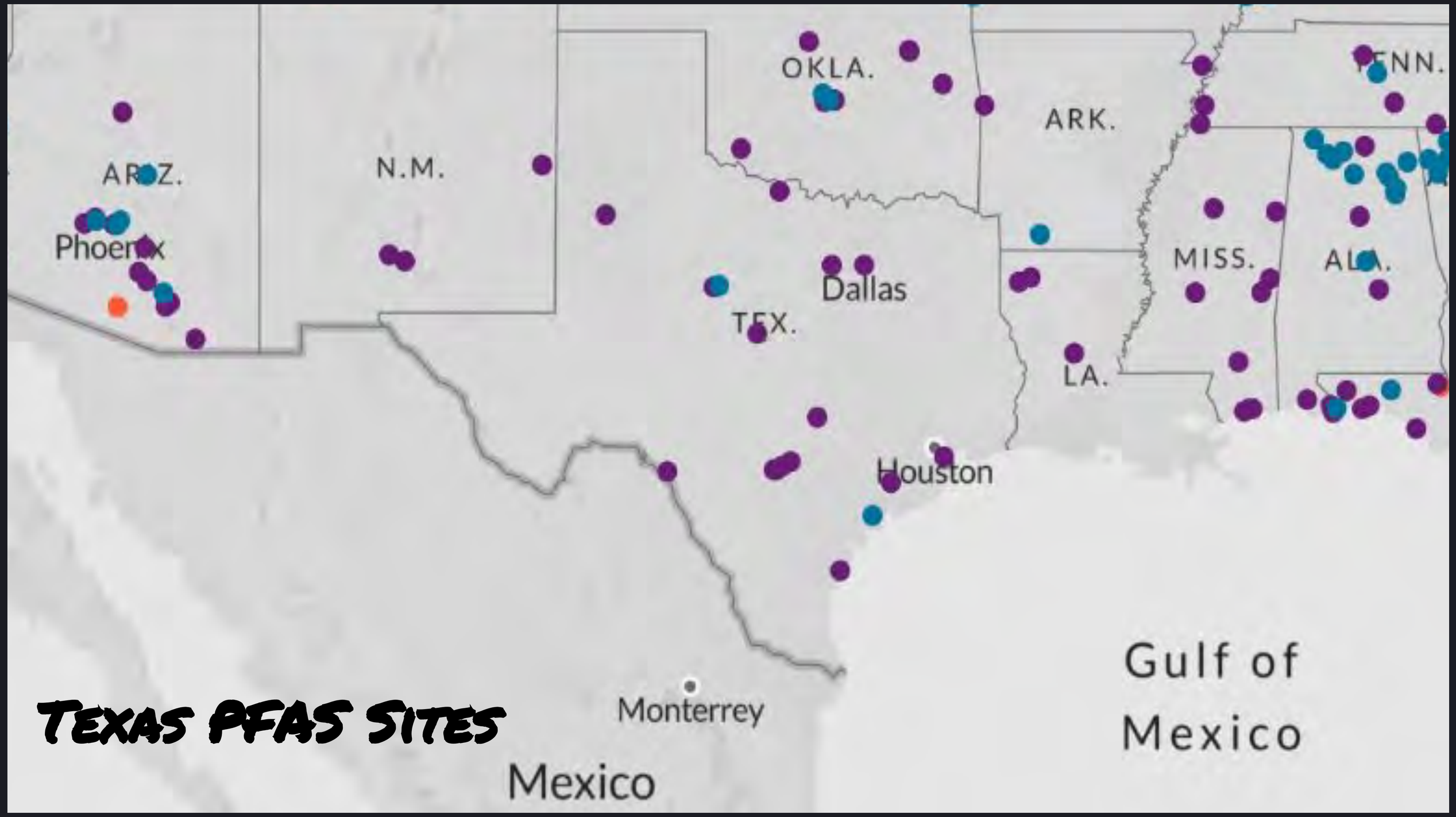
Ensuring clean water requires constant water testing


Blue Green
Algae

Lead + heavy metals

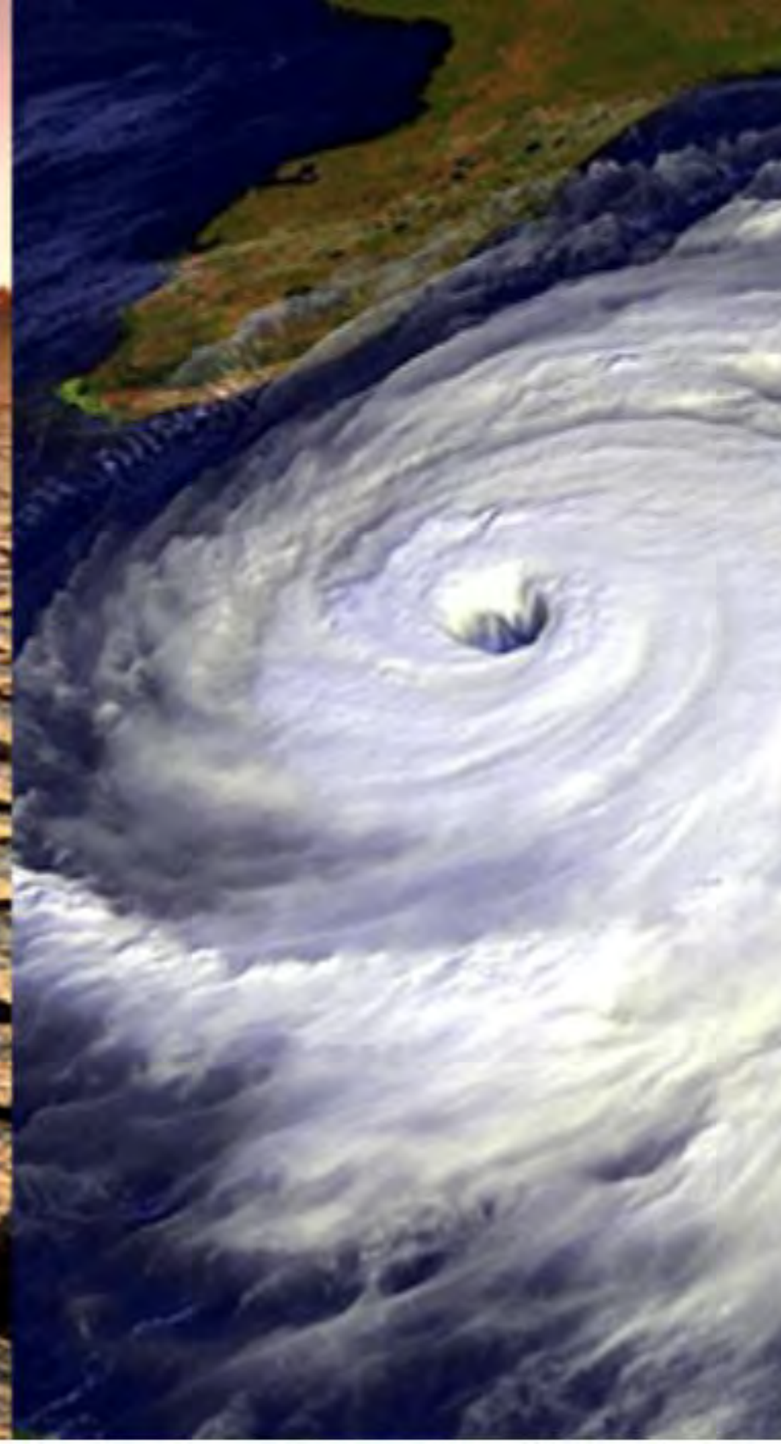

On Military Sites
On Drinking Water
On Other Known Sites
Vancouver
Seattle
WASH.
ORE.
MONT.
IDAHO
WYO.
N.D.
S.D.
NEBR.
NEV.
UTAH
COL.
KANS.
IOWA
MINN.
Minneapolis
WIS.
ILL.
Chicago
IND.
OHIO
MICH.
ONT.
Ottawa
QUE.
Toronto
N.Y.
PA
W.VA.
KY.
VA.
TENN.
MO.
ARK.
OKLA.
MISS.
ALA.
GA.
S.C.
Atlanta
LA.
TEX.
Dallas
Houston
St. Louis
San Francisco
CALIF.
San Diego
Phoenix
ARIZ.
N.M.
United States
Monterrey
Mexico
Gulf of Mexico
Miami
Bahamas
MAINE
VT.
CONN.
PFAS
(Carcinogens from Fire Retardants)



Texas PFAS Sites


COMBINED SEWER OVERFLOW
(FAECAL MATTER, EW)

Climate Change Events



Factors that are overwhelming global water testing demands

Population Growth & Industrialization

Climate Change Urgency

Increased Water Regulations

Texas Boom

Storms/Freezing pipes

Water is the New Gold

We are drowning in dirty water.

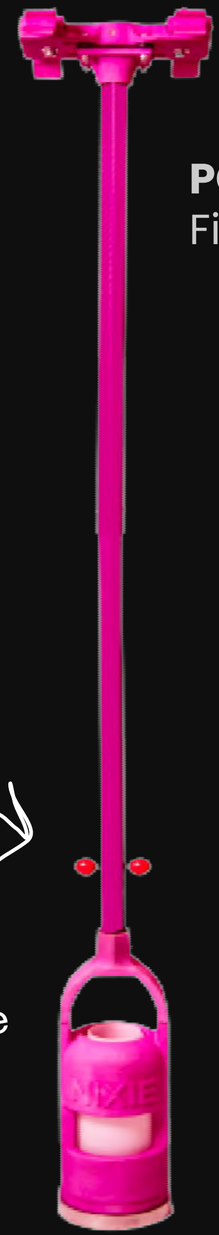
Reign Maker

NIXIE

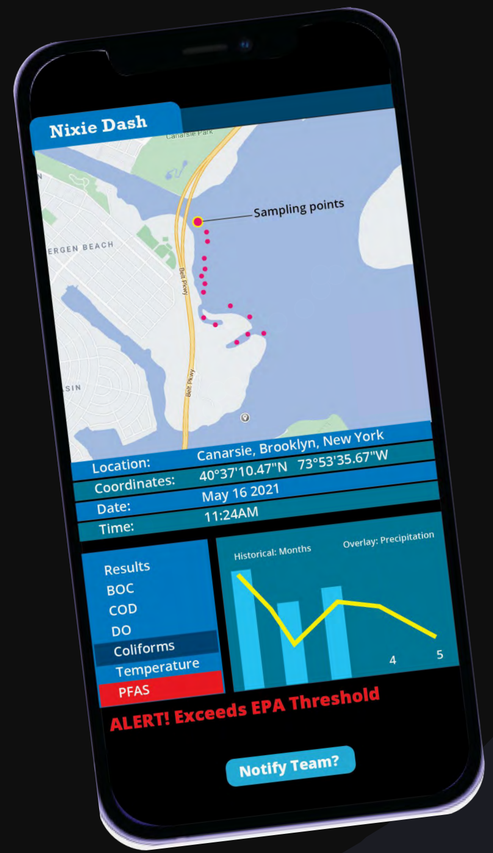
Water Sampling by Air

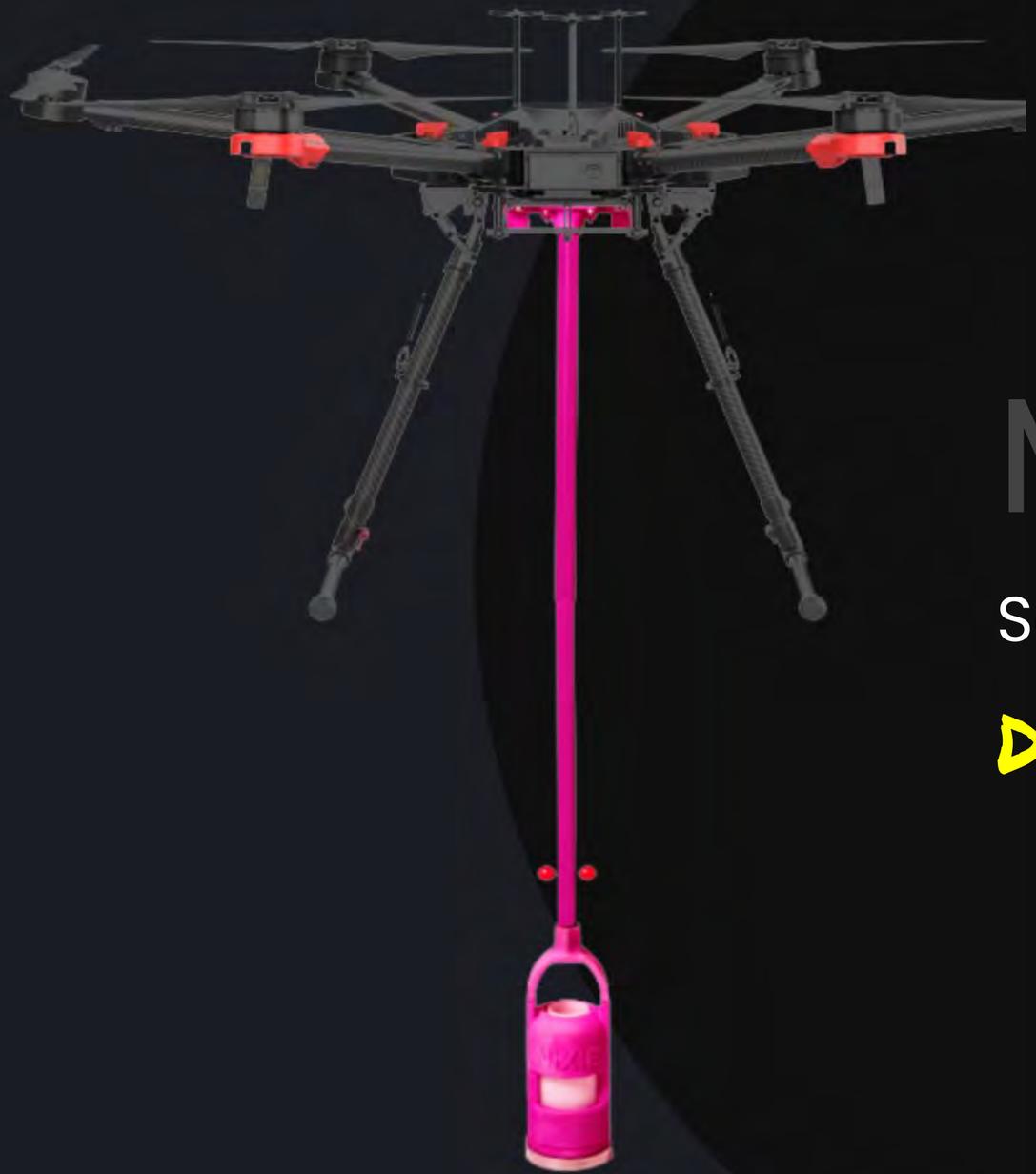
Fly Free and Sample Anywhere.

PCT Application approved:
File No.: 0012831USP/4859



I'm more than just a pretty thing. I'm a revenue generating machine.





Mission

Sampling Water Worldwide, Dip by Dip

DISRUPTING WATER MANAGEMENT

Showing the Nixie for the DJI M600

1 meter in length

NIXIE

Fits standard EPA approved sterile water sampling bottles, 500ml and 250ml bottles

1

Sampling tool
attaches to off-the-shelf drones

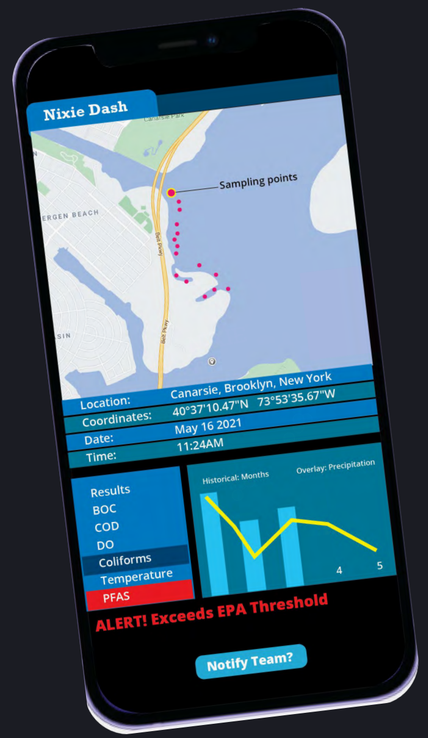
2

Mounted, water sensors

Proteus Instruments and RS Hydro

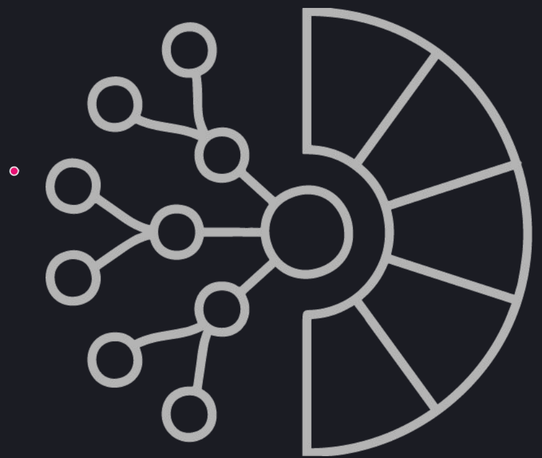
3

Platform automatically captures data



4

Centralized global water database, independent of governments or politics.

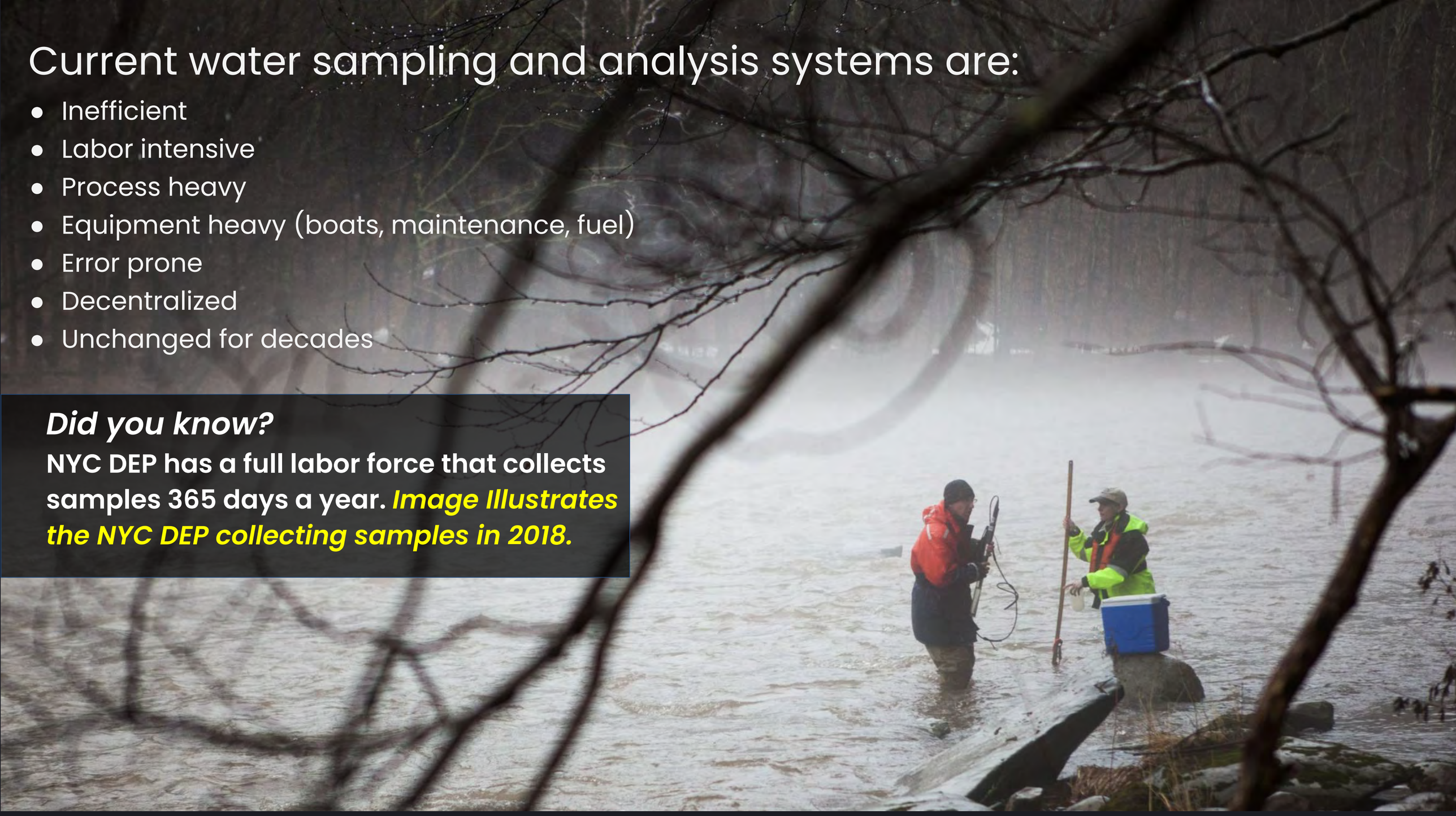


Current water sampling and analysis systems are:

- Inefficient
- Labor intensive
- Process heavy
- Equipment heavy (boats, maintenance, fuel)
- Error prone
- Decentralized
- Unchanged for decades

Did you know?

NYC DEP has a full labor force that collects samples 365 days a year. *Image Illustrates the NYC DEP collecting samples in 2018.*



NYC collects 40,000 of these samples a year.
It costs NYC **over $100** per sample.

NYC collects 40,000 of these samples a year.

~~It costs NYC **over $100** per sample.~~

With Nixie it can be as low as $10

This is What Nixie Does

Reduces cost up to 90%

Removes the human
(human error)

Reduces carbon footprint
(eliminating boats, unnecessary boots and car travel)

Aggregates water data

AND MOST IMPORTANTLY

It democratizes water data collection.

This is a global, centralized, real-time water database that is not limited, managed or controlled by any one government.

IT'S MEANT TO DISRUPT.

The Markets

Who requires water testing?

Local/City/State/Fed
Private Water Utilities
Oil & Gas
Mining
Agriculture
Beverage
Pharma
Shipping
Global Public Health Orgs
Water Security Entities (Gov and NGO)

Nixie Platform- Automated, Mobile Data

Telemetry + Accountability

Time/Date
Location
Name of collector

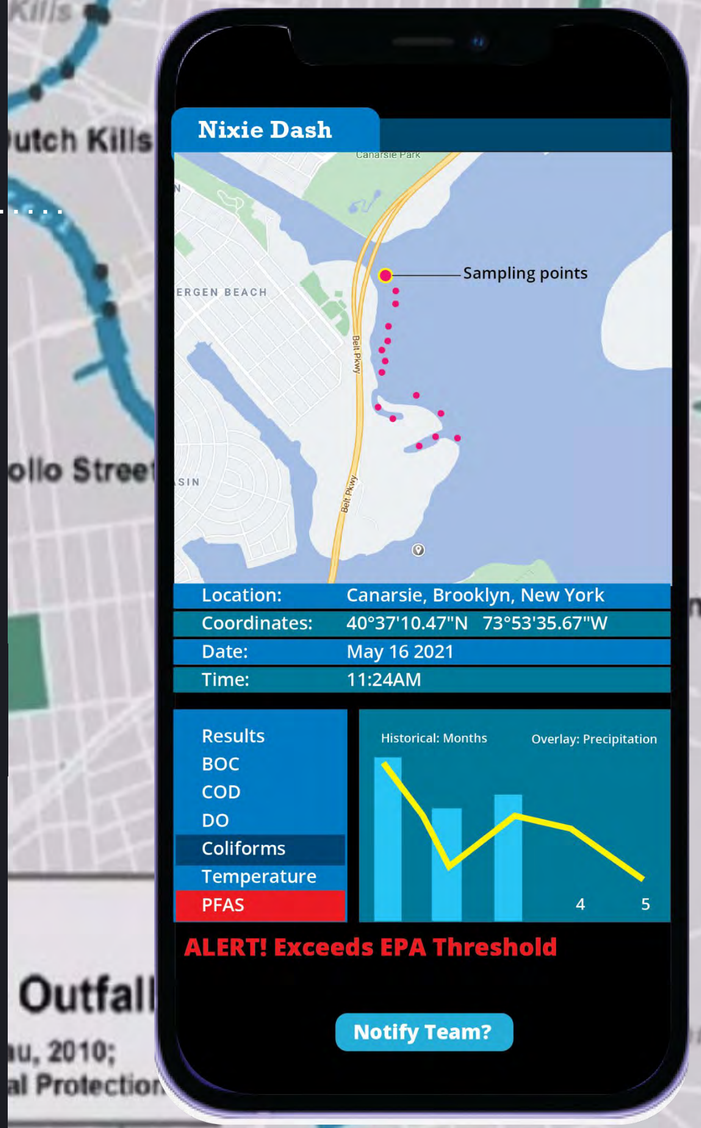
Bluetooth

Water Sensor Parameters

Microbial	Organic	Inorganic	Thermal
-Biological Oxygen Demand (BOD) -Chemical Oxygen Demand (COD) -Total Organic Carbon (TOC) -Dissolved Organic Carbon (DOC) -Coliforms (total, e.coli or faecal) -Dissolved Oxygen (DO) -Temperature -Pressure -Nitrate		-EC/SALINITY/TDS -Chloride -ORP/REDOX -Turbidity -pH -Tryptophan -Crude Oils -Refined Oils -CDOM -fDOM -TDG -Ammonium	

Bluetooth

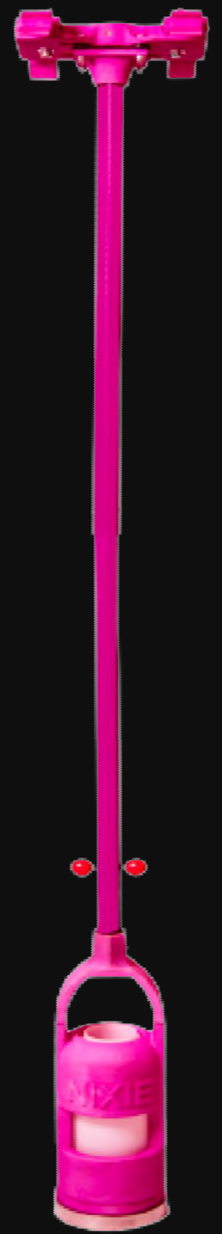
Next Step: Expel the Human



Latitude 40-44'10"N
Longitude 073-57'46"W

NIXIE

Thank You



www.NixieDip.com

info@NixieDip.com

Reign Maker

Overflow Slides

Per Dip Subscription Model

- $50 per dip for 1,000 samples
- $40 per dip for 2,000 samples
- $20 per dip for 4,500 samples
- $10 per dip for 10,000+ samples

We collect the data automatically. It encourages more dips by reducing sampling costs. This leads to more data. *Passive Data Revenue Product*

First worldwide remotely collected, real-time water database.

Our Rebel Team

Reign Maker

Hazen

Bloomberg

Jes Chosid CEO

Reign Maker

Easy Aerial
Above & Beyond

bowl

TRUMPF

Jason Felder CTO

Reign Maker

Kittyhawk

Robert van Gool
Director of Marketing

Our Experience

Water Market

Unmanned Market

Gov Agency Contracting

Mechanical Engineering

Product and Project Management

International Manufacturing

Autonomous System Development

Data Analytics/Visualization

PR/Marketing

Being Rebels with a Cause

Our Advisors

Start-Up Financial Advisor
John J. Joyce, MBA, CPA
-Ambient Corp, President & CEO
-Ericsson, VP Business Operations

Water Advisor
Ilan Juran, PhD
-Executive Director of W-Smart
-Secretary of the Specialists Group on Water Safety & Security Management of International Water Association
-Board of experts of UNESCO
-NYU

Technology & Aerospace Advisor
Ido Gur
-Easy Aerial, Co-Founder/CEO
-Israeli Defense Force, Commander of UAS Group

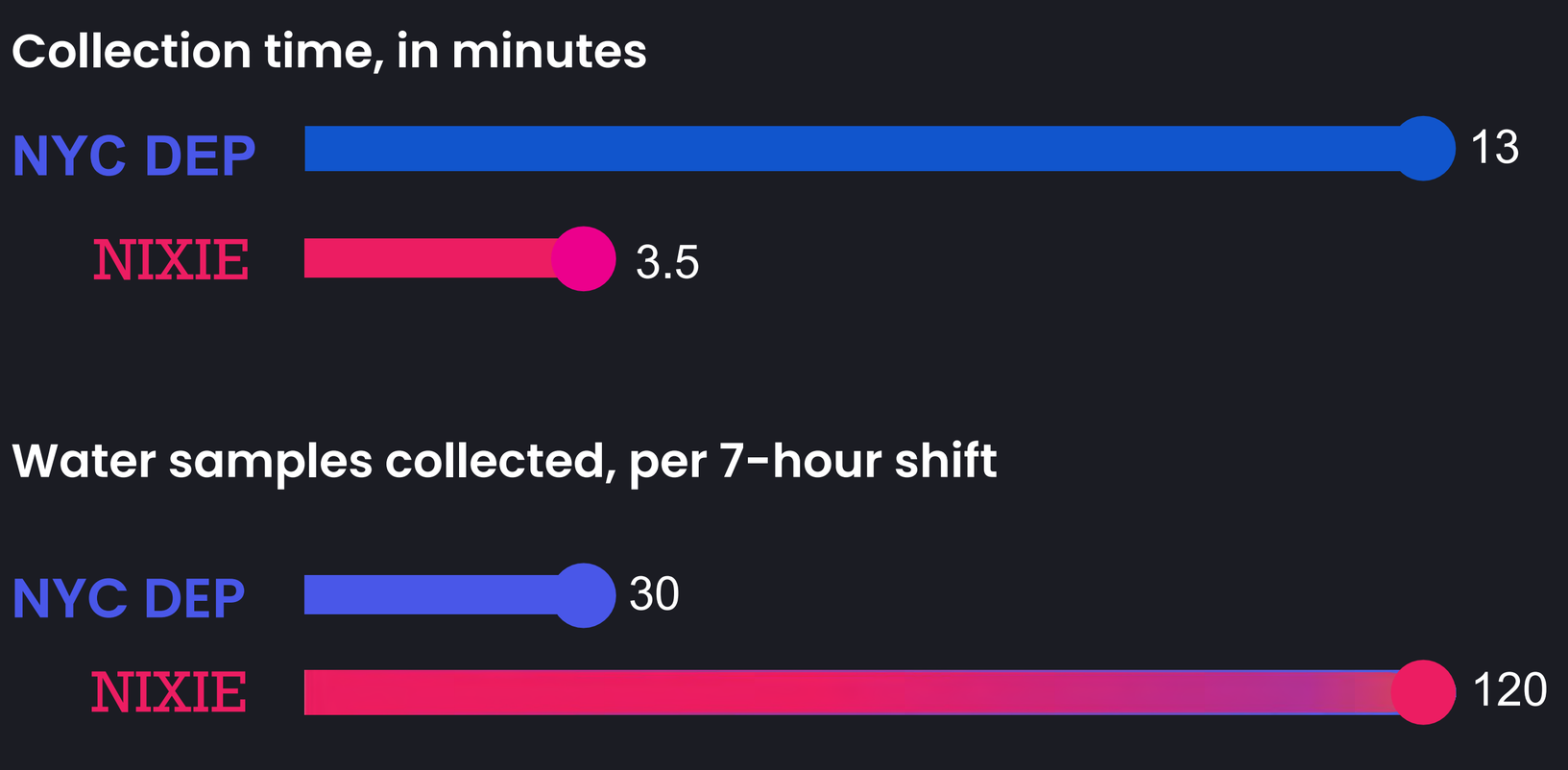
Major Water Pollutants

Microbial	Organic	Inorganic	Thermal
Salmonella Giardia lamlia Norovirus, Cryptosporidium parvum E. coli Covid-19	Petroleum Insecticides Herbicides Detergents Disinfecting cleaners prescription drugs methyl tert-butyl ether (MTBE) (gas cleaning addictive)	Ammonia chemical waste Fertilizers Arsenic Mercury Copper Chromium Zinc barium	Sudden temperature rise or fall
Cause: Older cities with aging infrastructure LIvestock operations contaminated with human or animal waste. Human existence	Cause: Pharma O&G Agriculture consumer choices	Cause: Leaching from waste disposal increased human activity industrial accidents.	Cause: Power plants and industrial manufacturers coolants Release of very cold water from the base of reservoirs into warmer rivers Urban runoff

Even without the Nixie 2.0 water sensors and app platform, Nixie 1.0 reduces water sampling time by **75%**

Typical collection time is about **30** samples a day, *with boats.*

Nixie collects **120.**



Reign Maker

https://www.linkedin.com/in/john-gustafson-7b190b37/

Business Models: Nixie Base Model Vs. Nixie Sensor Model

Nixie Base - Direct Sale

- Direct sale per base unit ($850-$975)
- **Goal:** Sell 14,000 units by Year 5
- Nixie Base develops the new water collection market.

Nixie Sensor- Per Dip Subscription Model

- Nixie Sensor builds off of new market that Nixie Base created
- **Goal:** Lease to buy sensor models, under contract. Which will be ongoing for years using same Nixie Sensor.

  The per dip price cost range:
  $10 per dip for 10,000+ samples
  $20 per dip for 4,500+ samples
  $40 per dip for 2000+ samples

- 3rd Revenue Product: The app collects the data automatically and encouraging more dips by reducing per dip cost leads to more data.
- Worldwide remote centralized and LIVE water database

https://www.linkedin.com/in/john-gustafson-7b190b37/

The Global Water Market is a MONSTER Market

https://www.linkedin.com/in/john-gustafson-7b190b37/

$914.9 Billion

Projected 2023, Global Water Intelligence (GWI), 2018

(Market was $770 Billion in 2018, a **17%** increase
and it will only accelerate from here.)

The Markets

Government and industry mandate water testing

- Local/City/State/Fed
- Private Water Utilities
- Oil & Gas
- Mining
- Agriculture
- Beverage
- Pharma
- Shipping
- Global Public Health Orgs
- Water Security Entities (Gov and NGO)

Pssst...there are 50,000 water utilities in the US alone. (not including 2-3 levels of regional, state and federal authorities.)

(Holy Moly)

Safe Skies Overview

Safe Skies is a non-profit membership-based organization that works with airports, government, and industry to maintain a safe and effective aviation security system. Programs include:

ASSIST	POST	PARAS
Airport Security System Integrated Support Testing	*Performance and Operational System Testing*	*Program for Applied Research in Airport Security*
Conducts independent evaluations of perimeter, access control, and biometrics security technologies and systems	Tracks effectiveness of airport-owned security systems over their functional life cycle	Develops near-term practical solutions to security problems faced by airports

More information at www.sskies.org

Project Overview

PARAS 0031 *Airport Response to UAS Threats*

Research Agency	Woolpert, Inc.	Contract Time	12 Months
Principal Investigator	Zachary Shuman	Funds	$199,917

Project Panel

- Adam Bouchard - TPA
- Jason Byers - DFW
- Frank Capello - FLL
- Cory Chase – PDX
- Collen Chamberlain - AAAE
- Mark Coates - SEA
- Trevis Gardner - TYS
- David Hornsby – DFW
- Bill Marrison - Safe Skies
- Timothy Tyler - MWAA
- Stephan Van Der Merwe – Safe Skies
- Kevin Vandeberg – HSV
- Jeremy Worrall - Alaska DOT

Ex-Officios

- Mike DiPilato - FAA
- Chaz King - TSA

PARAS 0031 Summary of Contents

Airport officials can utilize this guidebook to plan for potential threats and develop their own response plans that incorporate the unique characteristics and structure of their airports.

- Section 1: Planning
- Section 2: Threat Assessment
- Section 3: Response
- Section 4: Recovery
- Section 5: Examples and Case Studies
- Appx. A: Example Tabletop Exercise
- Appx. B: Recurrent Training Test
- Appx. C: Community Engagement Samples

Section 1 - Planning

"At a minimum, a planning document should include roles and responsibilities, training protocols, communication infrastructure, threat assessment, response, and recovery plan to each threat level."

1.1 Stakeholder Engagement

1.2 Training and Exercises

1.3 Leveraging other Resources

1.4 Public Policy Considerations

1.5 Community Awareness and Education

1.6 Detection Systems and Technology

Stakeholders:

- Airport Operators
- Air Traffic Control
- TSA
- Law Enforcement
- Emergency Response
- State Trans. Agencies
- Tenants
- Aircraft Pilots

Section 2 - Threat Assessment

2.1 Threat Assessment Matrix

2.2 Threat Assessment Locations

"A standardized matrix should be used to assess the threat a UAS poses to the airport and its operations. This threat matrix should be developed in the planning stage and incorporated into the airport planning documents and training."

	High (3)	Medium (2)	Low (1)
*Location of UAS	On Airport Property	Less than 2 miles away	Greater than 2 miles away
Number of UAS	Fleet (3+)	Pair/ Small Group (2-3)	Single (1)
Size of UAS	Medium/ Large (55 lbs. +)	Small (2 - 55 lbs.)	Micro (<2 lbs.)
Speed/ Trajectory	Erratic and Unpredictable	Slow Moving	Hovering
Controller Location	Hidden, Obscured or Spoofed	Unknown	Known
Frequency	Persistent	Unknown	Single Operation
Scoring System	High: 14-18 points	Medium: 11-14 points	Low: 6-11 points

Section 3 - Response

3.1 Information Dissemination and Notifications

3.2 UAS Tracking and Locating Strategies

3.3 Operator Contact and Intrusion Mitigation

3.4 Remote ID

"The response should be airport specific, and should be based on threat level. For a response to be successful, numerous stakeholders must work together towards their respective goals."

D.R.O.N.E.

Direct attention to the incident and work to identify individuals involved

Report the incident to FAA and law enforcement

Observe the UAS and maintain visual contact

Notice attributes about the equipment and environment

Execute pre-determined policies and procedures

(Law Enforcement Guidance for Suspected Unauthorized UAS Operations, 2018)

Section 4 - Recovery

4.1 Investigation

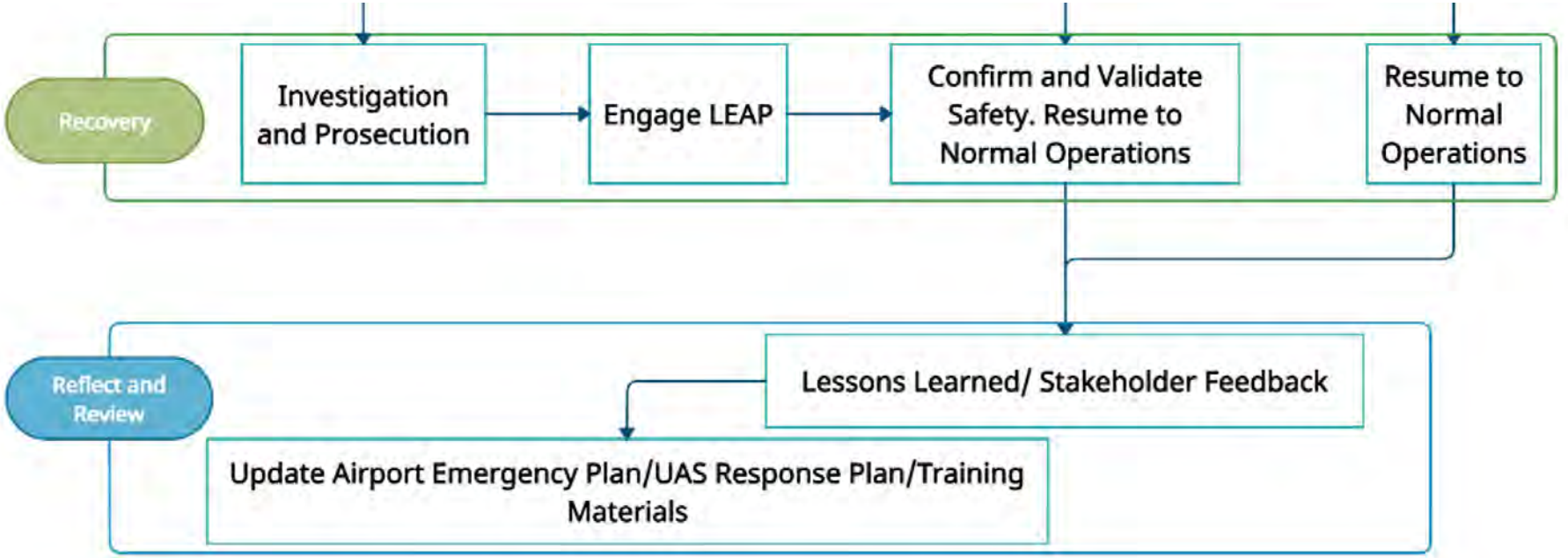
4.2 Communication Strategies

4.3 Near Future Precautions

4.4 Community Involvement

4.5 Reflect and Review

"The level of effort necessary for recovery after a UAS threat is dependent upon the gravity of the incident itself."



Contact Information

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PARAS Program Manager

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Woolpert

Program Director, Aviation

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www.woolpert.com

GRADD VR & LAS3D

Cloud-based 3D visulization, measurement and sharing!

UAS Safety and Integration Task Force Meeting

28 September 2021

GRADD

Presented by GRADD CO.

ABOUT GRADD

3D Modeling, Visualization, Measurement, and Sharing Software Solutions!

POWERED BY GRADD

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STEMDiscoveryZone.com

LAS 3D

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DRONE PILOT TRAINING

GRADD PARTNERS

3D Modeling, Visualization, Measurement, and Sharing Software Solutions!

GRADD

Leica Geosystems

RealityCapture

We provide Free Professional FAA Part 107 Drone Pilot Training!

GRADD

DRONE PILOT TRAINING

For all military families, public safety officers, high school students & high school educators, across the U.S.

Today we will review a crash scene case study & explore: LAS3D & GRADD VR

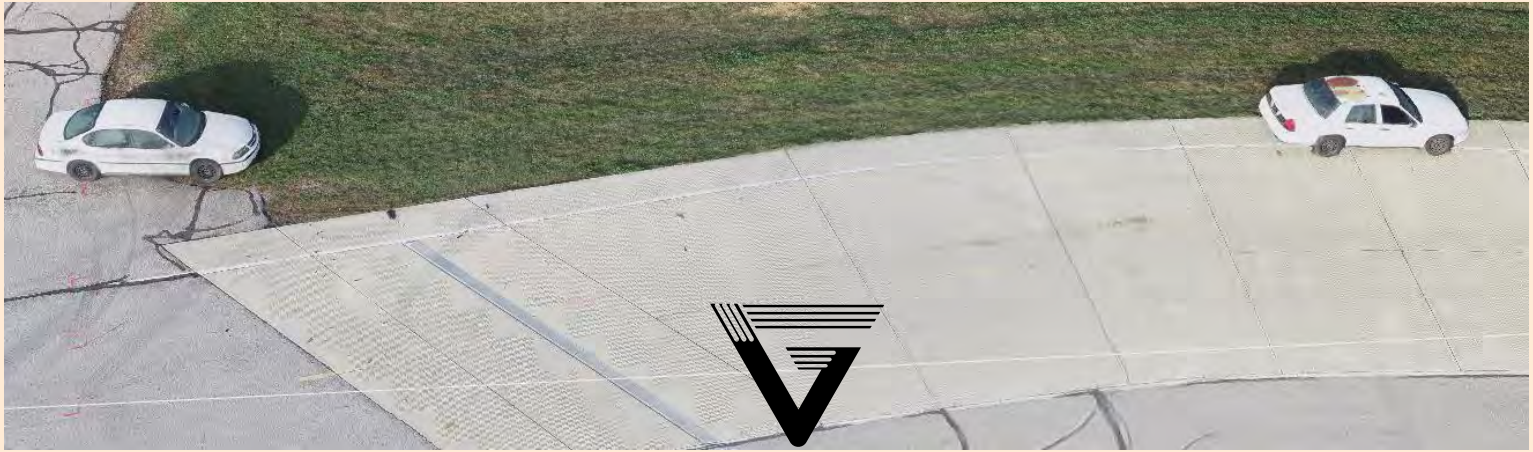
LAS3D

Staged 2-Vehicle Crash Scene Case Study

GRADD in partnership with the Ohio Attorney General's Office

Staged 2-Vehicle Crash Scene Case Study

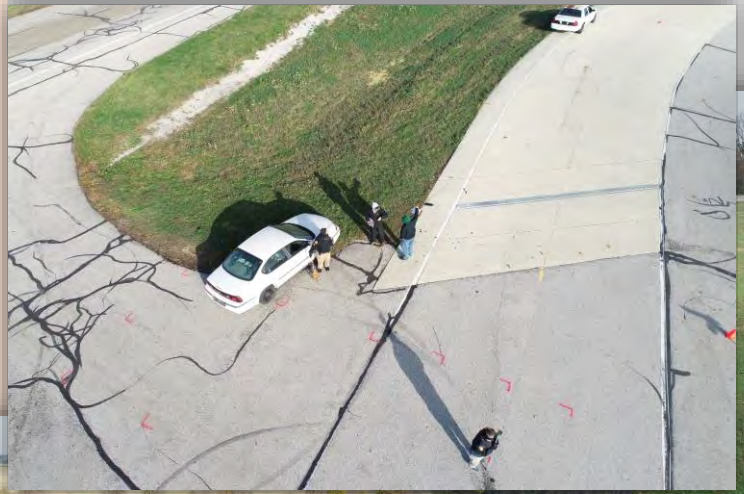
The 3D model of this crash scene was created with only 205 drone images.



GRADD

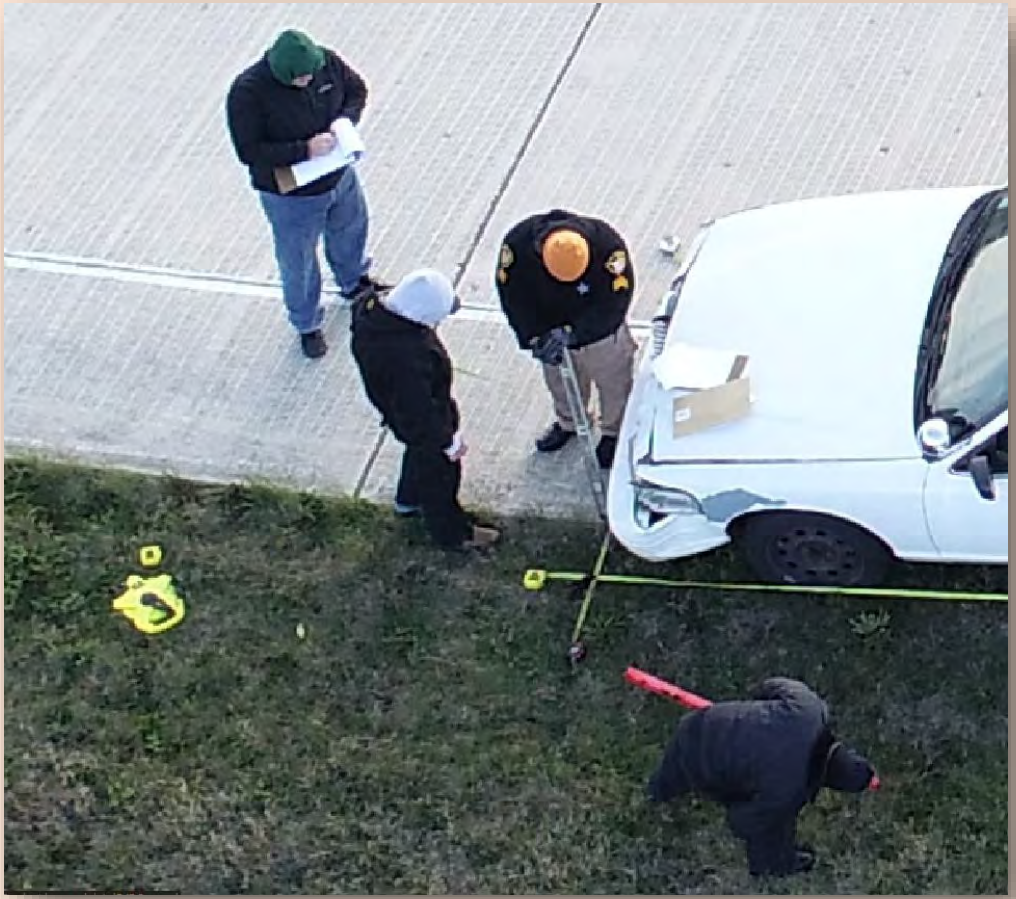
GRADD

Some of the 205 drone images from the crash scene. We used a DJI Phantom 4 Pro.



www.gradd.co

Crash Scene Documentation

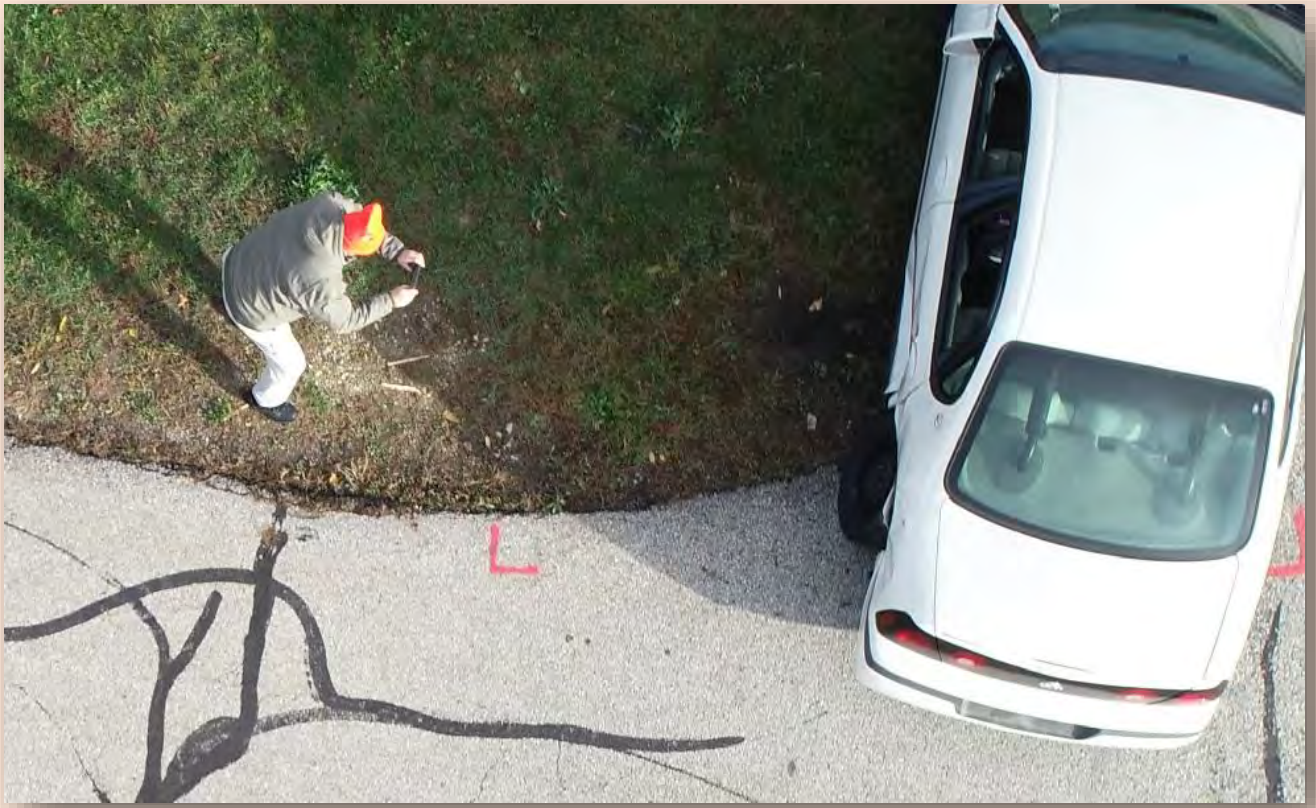


GRADD

Crash Scene Documentation

GRADD

Crash Scene Documentation

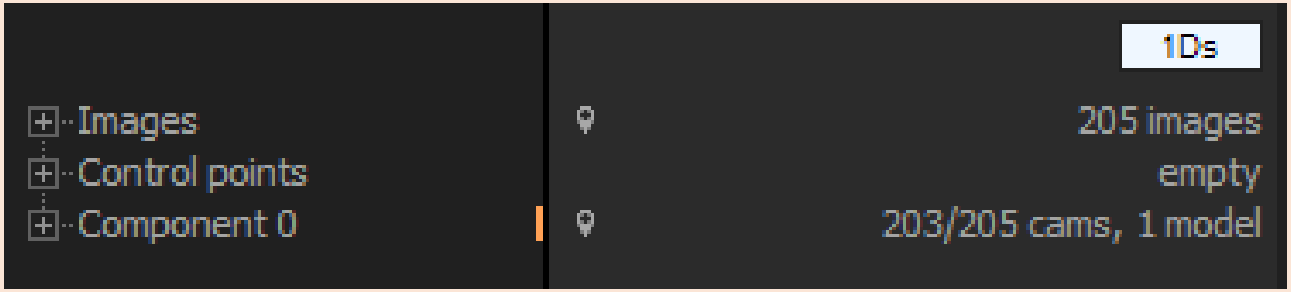


GRADD

GRADD

203 of 205 drone images aligned in a single component

Scientific image capture patterns!



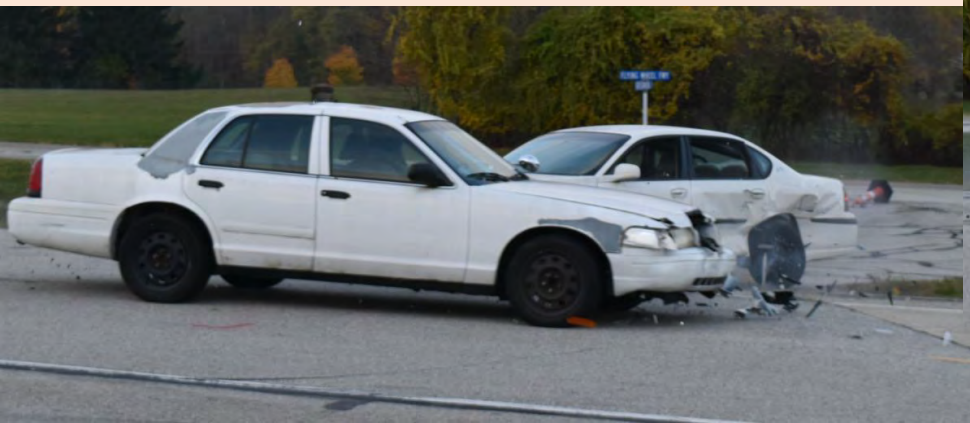
GRADD

Data for this Case Study was Collected in Partnership between GRADD and the Ohio Attorney General's Office

www.gradd.co

GRADD

We used a Nikon D5500 to capture ground photos of each vehicle.



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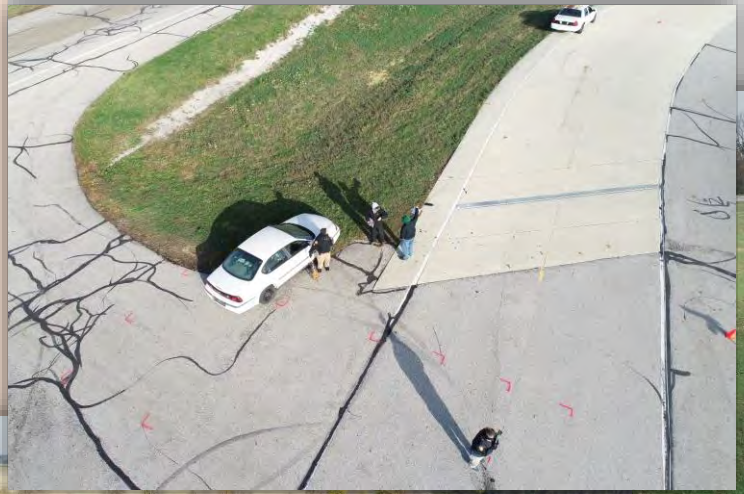
GRADD
GLOBAL ROBOT AND DRONE DEPLOYMENT

GRADD

Some of 205 drone images from the crash scene. We used a DJI Phantom 4 Pro.



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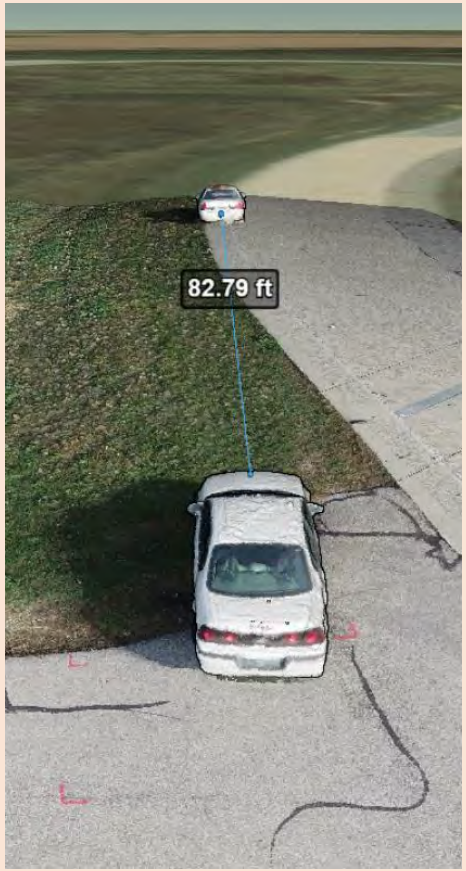
LEICA DISTO S910

CARRY OUT POINT-TO-POINT LASER MEASUREMENTS TO VERIFY ACCURACY OF 3D MODEL FROM AERIAL IMAGES AND GROUND PHOTOS.

CLICK HERE TO LEARN MORE

Typ. distance measuring accuracy	± 1.0 mm
Range	0.5 up to 300m
Measuring units	m, ft, in



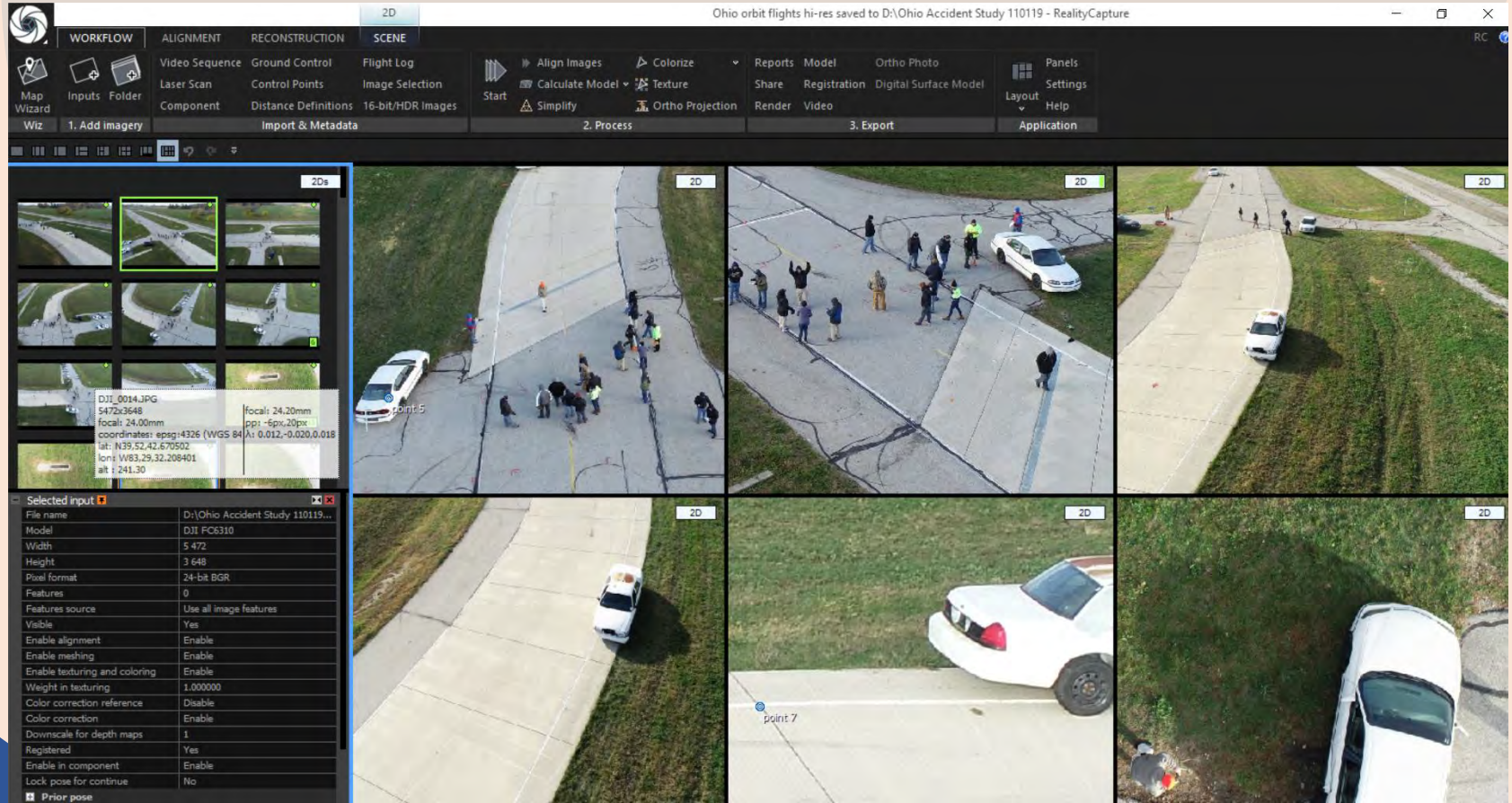
Drone images include people, the 3D model will not.

DJI Phantom 4 Pro

Conducting Orbit Flights Around The Crash Scene & Each Vehicle.

www.gradd.co

Import Drone Images into RealityCapture Photogrammetry Software



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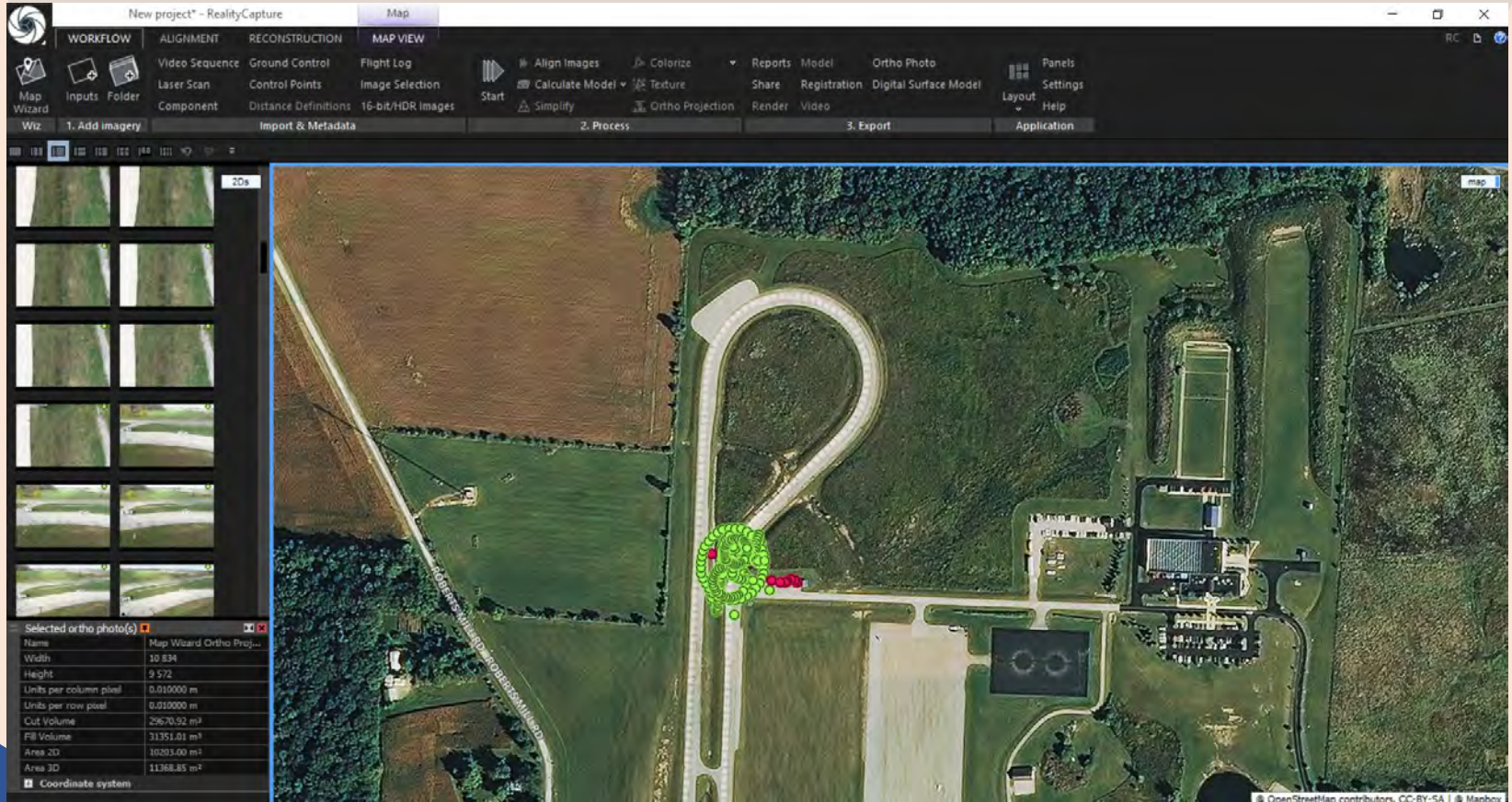
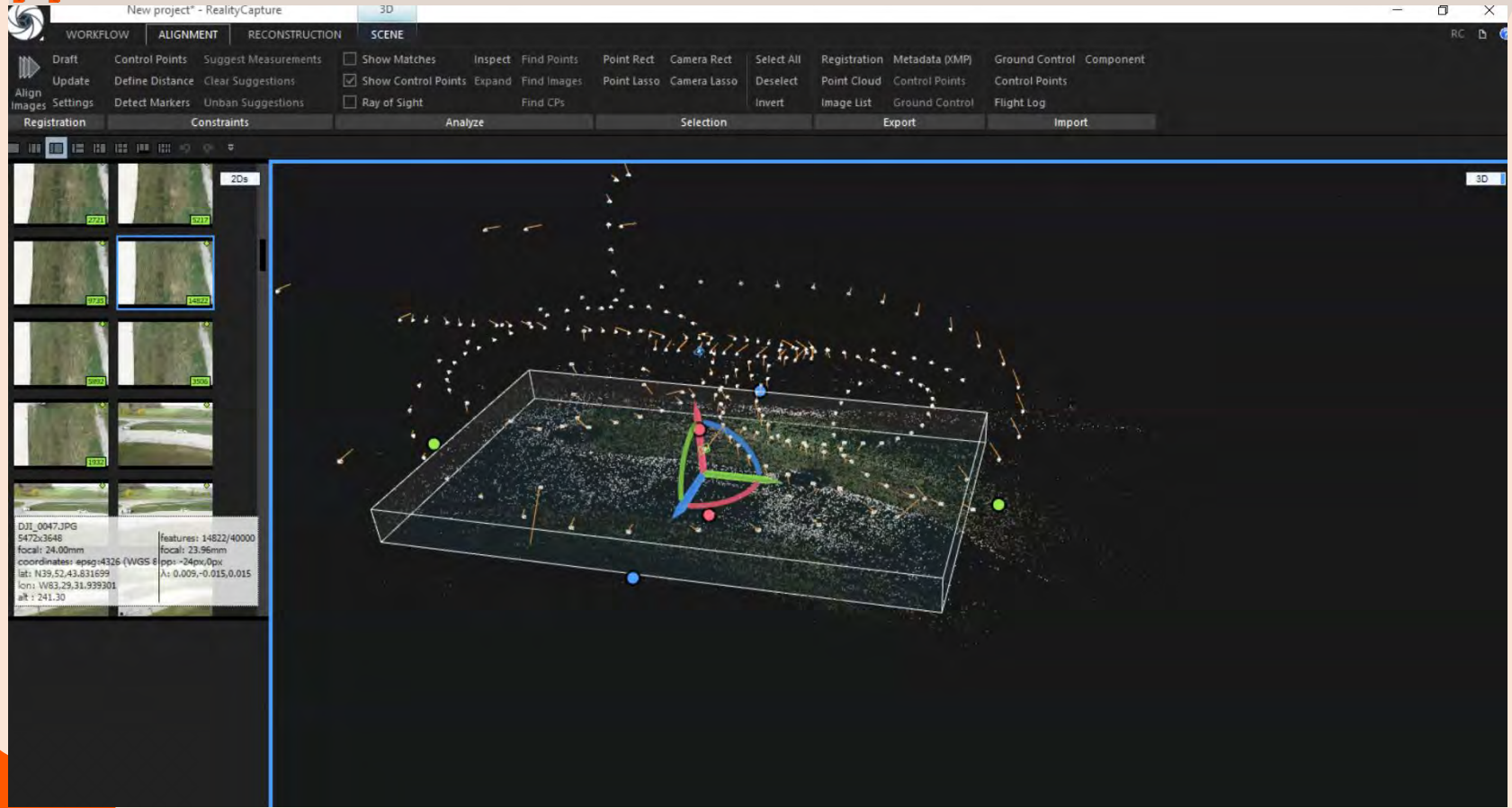
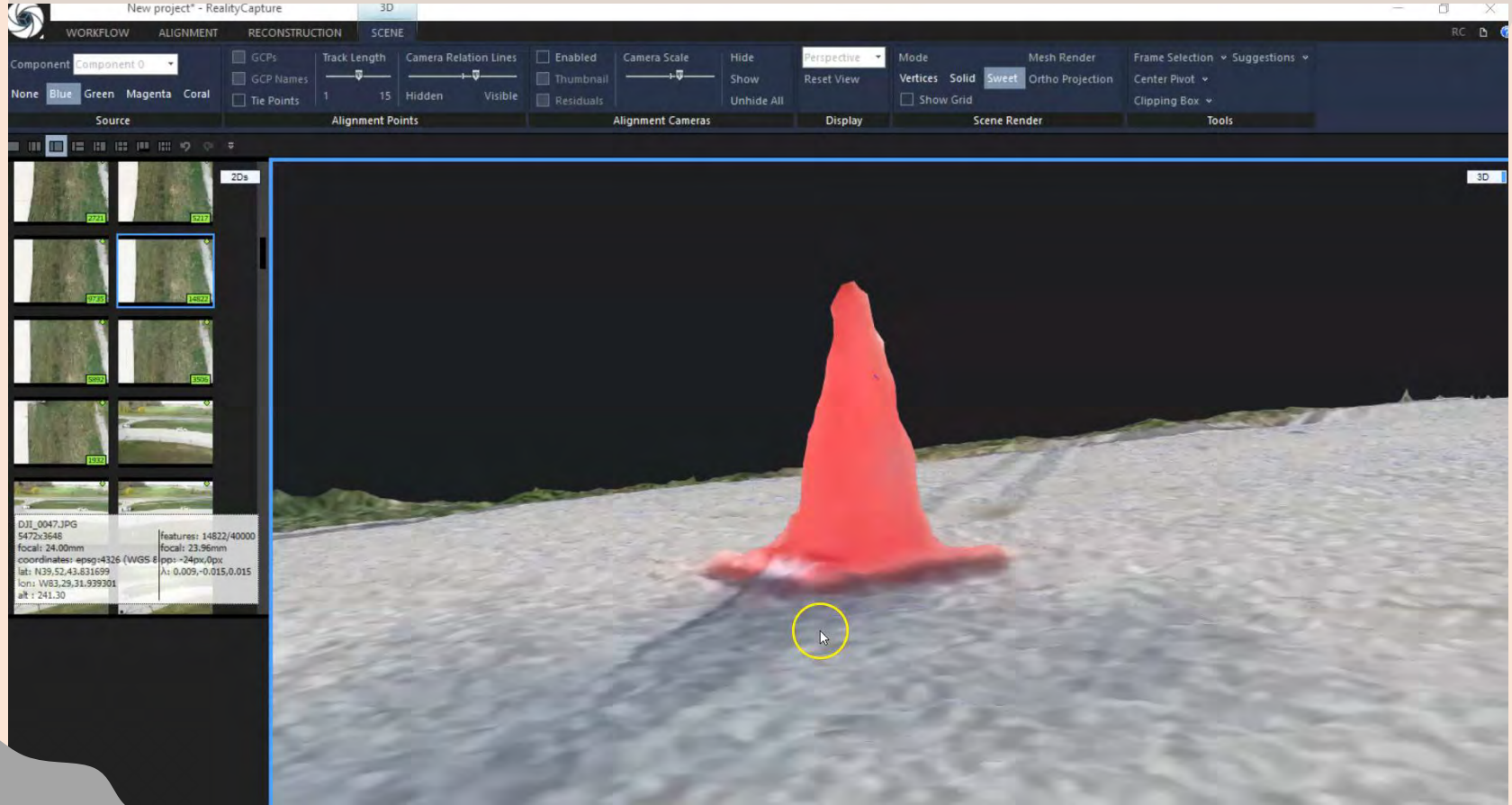
Crash Scene Drone Images Geo-located on the Map in RealityCapture Software



Reconstruction / Texturing in RealityCapture

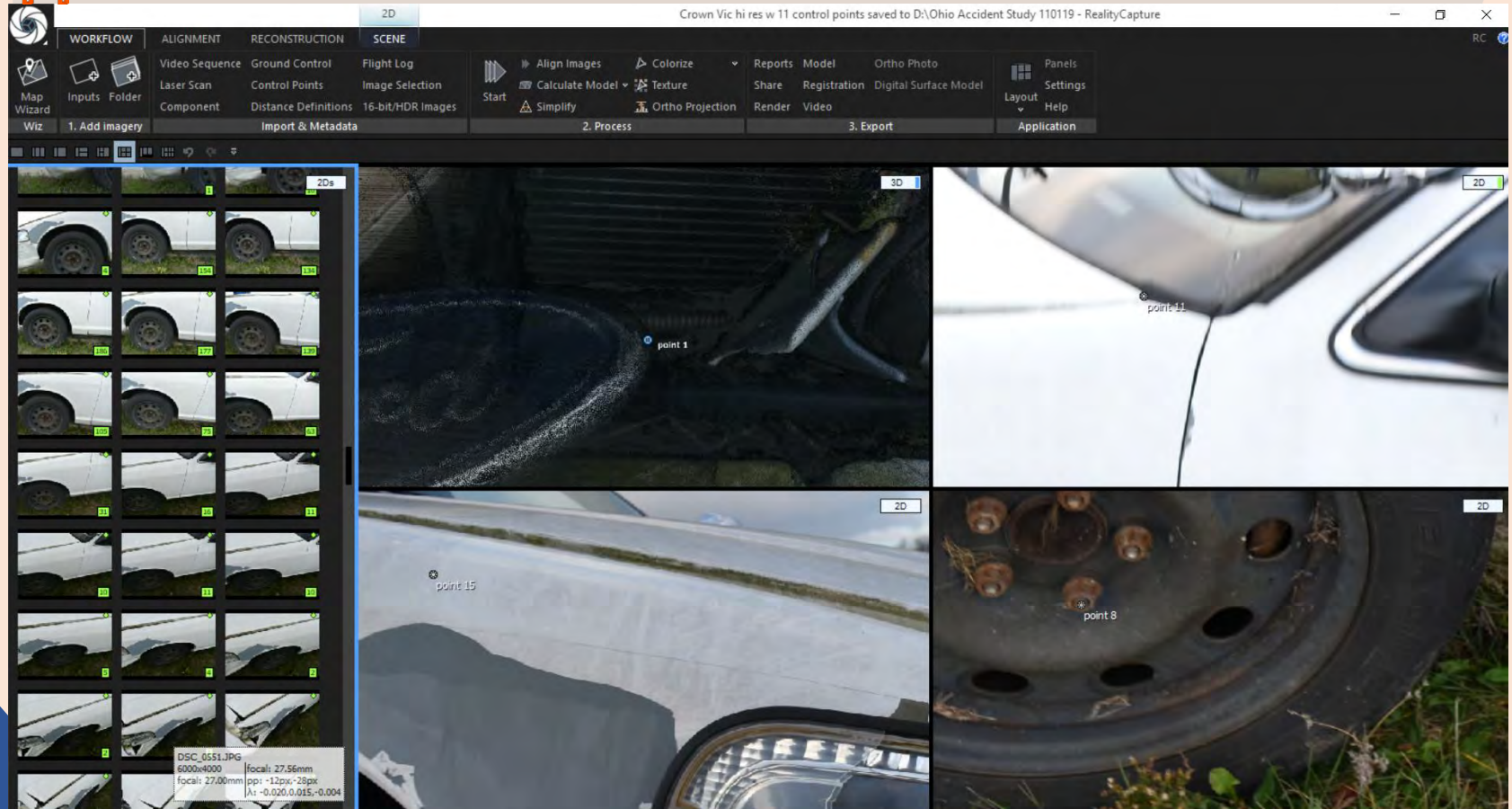


Finished 3D Model of Crash Scene in RealityCapture



Impala 3D Model Inspection in RealityCapture
3D Model Created Using DSLR Images

392 (24.2 Megapixel) DSLR Photos with 11 Control Points of Crown Vic in RealityCapture



www.gradd.co

GRADD

We will virtually (VR) walk around this crash scene and inspect it together.

LAS3D

Then conduct measurements of this crash scene inside GRADD's LAS3D!

GRADD

GRADD VR

Room Name

NCTCOG_28Sept_Meeting

Join Room

Enter On Device

Spectate

Options

Join Room

Back

Avatar Setup

Display Name

Enter Your Name Here

Alphanumerics, hyphens, underscores, and tildes. At least 3 characters, no more than 32

Change Avatar

Accept

Accept

Enter Room

Back

Microphone Setup

Check your microphone and audio before entering.

Talk to Test Microphone

Click to Test Audio

Default - Microphone (Realtek U...

Mute My Microphone

Enter Room

GRADD

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GRADD

GLOBAL ROBOT AND DRONE DEPLOYMENT

[Click here to view and download our White Paper]

GRADD

ABSTRACT

Capture a Crash Scene from Every Angle, using UAS, DSLR cameras, and a Point-to-Point Laser Measurer

GRADD

Thank you

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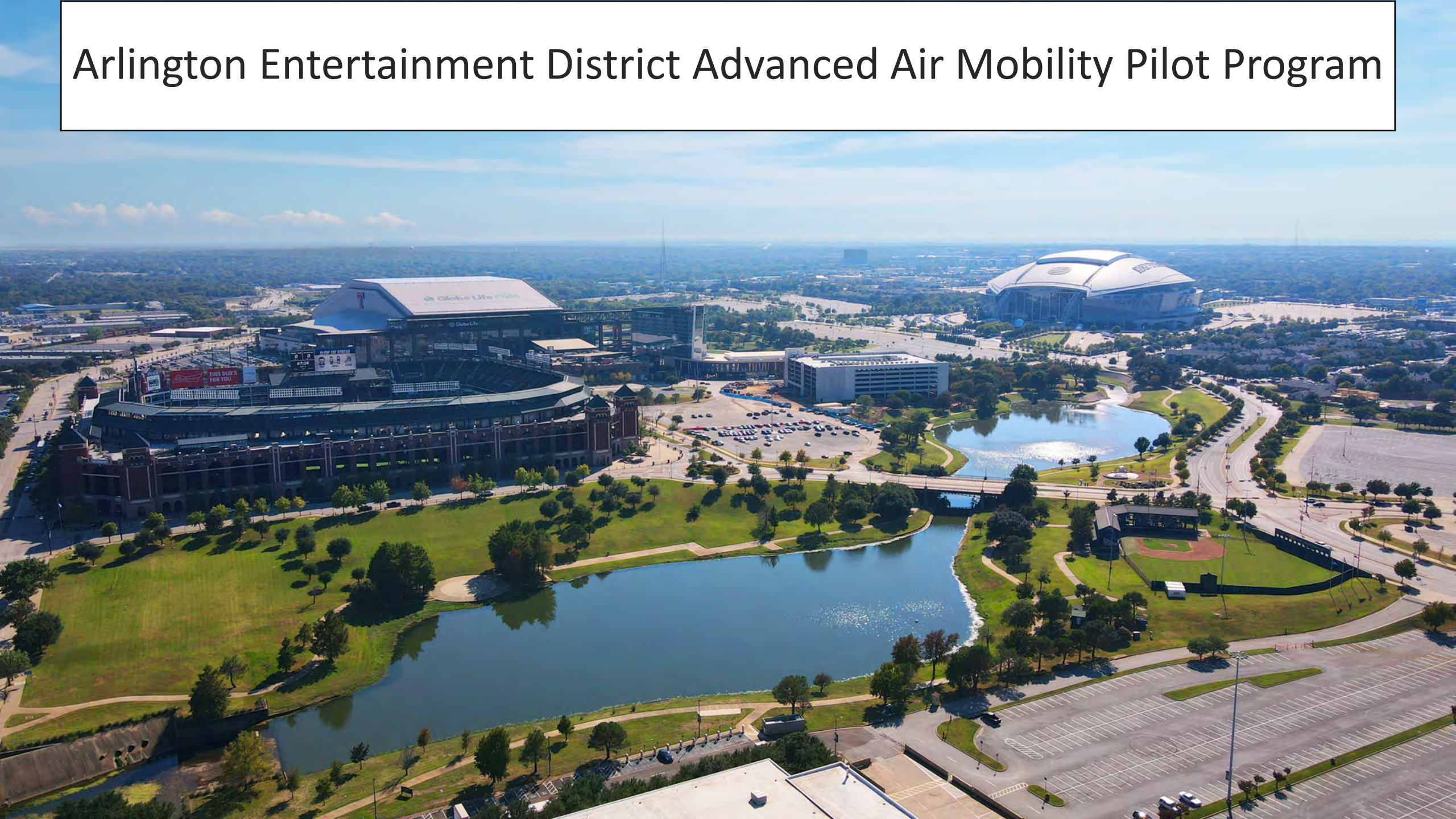
Reza Karamooz
reza@gradd.co

Arlington Entertainment District Advanced Air Mobility Pilot Program



KEY TEAMING PARTNERS

SERVICE PROVIDERS

Hidden Level
Drone Detection

TruWeather Solution
Low Altitude Weather Monitoring

Airspace Link
Airspace and Operations Management

Live Earth
Situational Awareness

AT&T
5G, IOT, and Public Safety Communications

Autonomous Drone Platform*

Detect and Avoid*

OPERATORS

City of Arlington
Tactical Public Safety Operations

NCTCOG Public Safety Unmanned Response Team
Tactical Public Safety Operations

University of Texas at Arlington
Research

Causey Aviation
Small Package Delivery

Flytrex
Small Package Delivery

PROGRAM MANAGEMENT

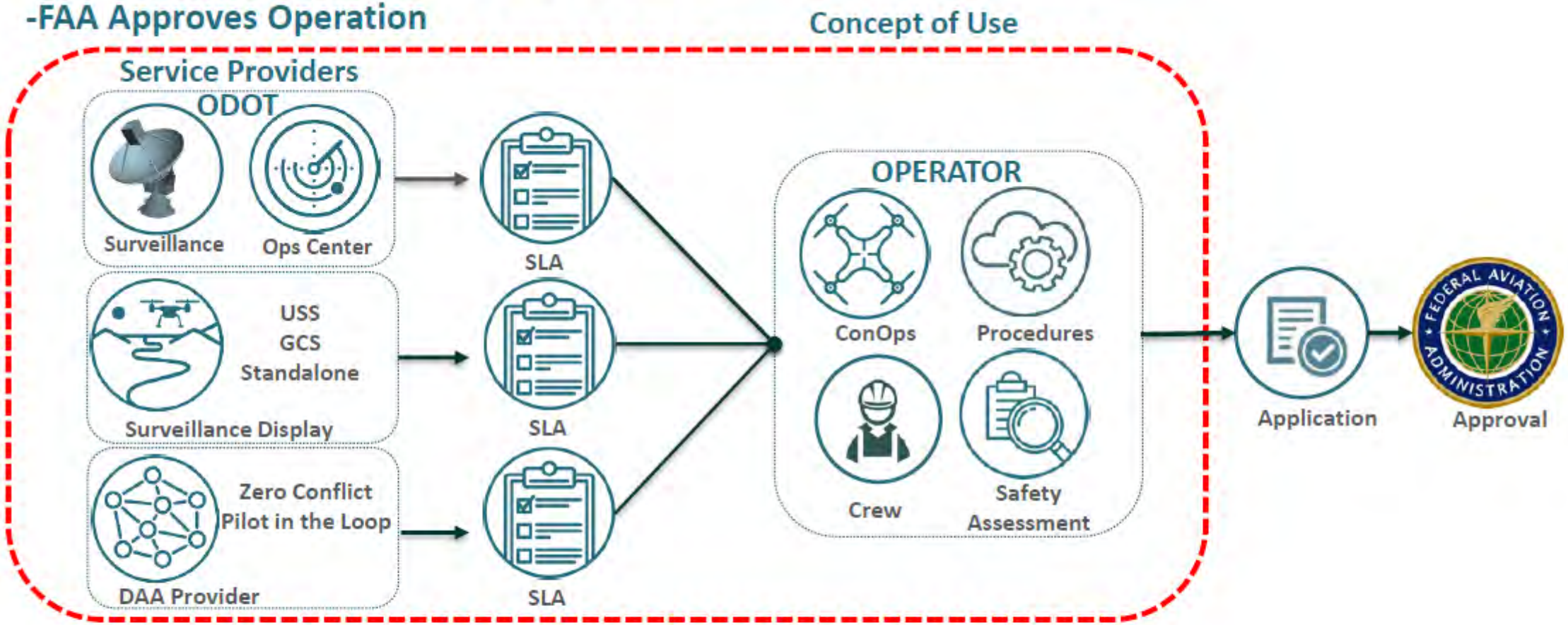
City of Arlington

NCTCOG

University of Texas at Arlington

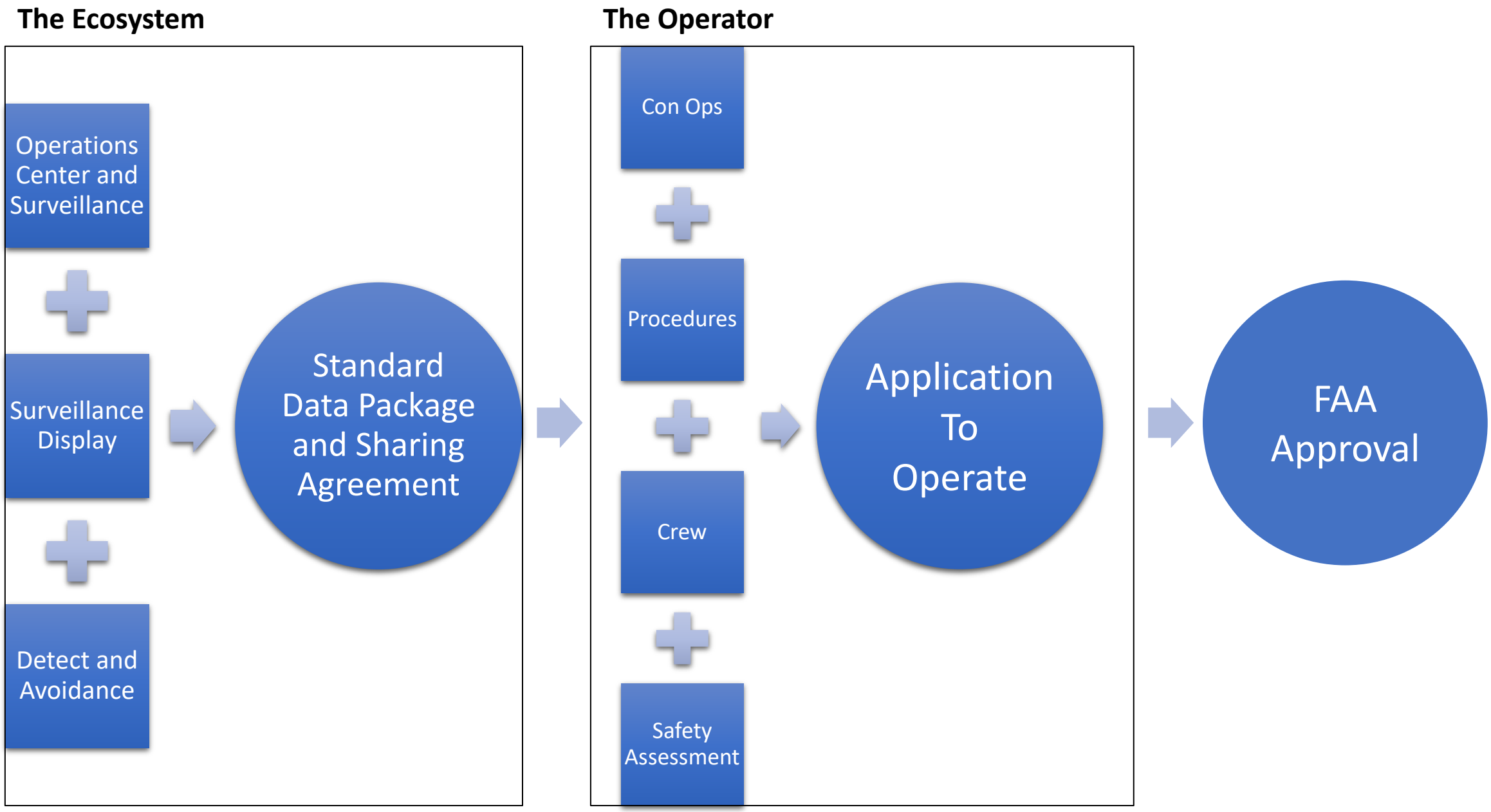
Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere

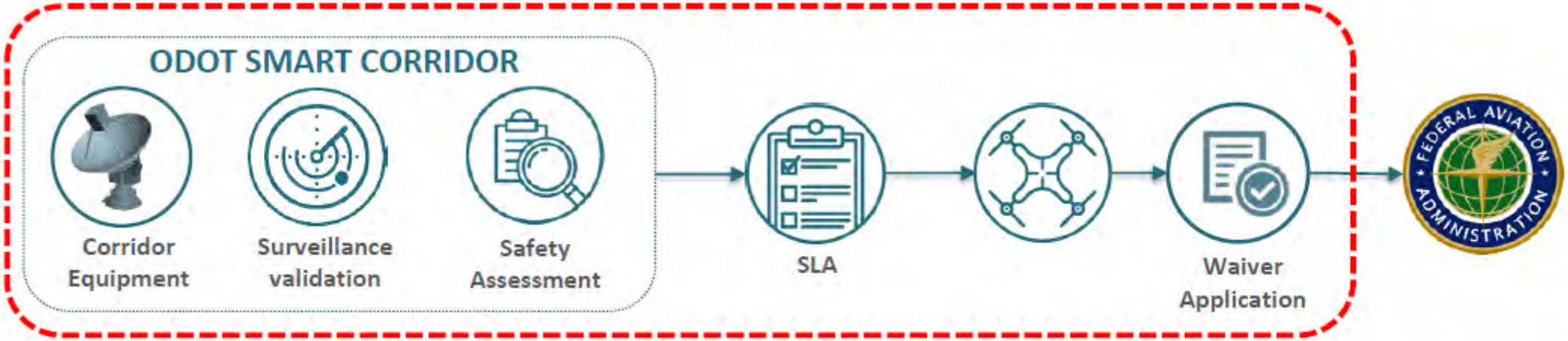
FAA Reauthorization Act 2018 – Section 377
-FAA Approves Operation



THE OHIO STATE UNIVERSITY

UAS OHIO UNMANNED AIRCRAFT SYSTEMS CENTER


The Ecosystem
Operations Center and Surveillance
Surveillance Display
Detect and Avoidance
Standard Data Package and Sharing Agreement
The Operator
Con Ops
Procedures
Crew
Safety Assessment
Application To Operate
FAA Approval



YEAR ONE Schedule

1 PLANNING & INFRASTRUCTURE DEPLOYMENT 5/2021 - 9/2021

- Identify Location for Sensors
- Training Sessions for platforms
- Coordinate with all stakeholders
- Deploy sensors and other equipment
- Plan demonstration activities, schedule and milestones

2 PUBLIC SAFETY LINE OF SITE OPERATIONS 9/2021 - 9/2022

- Public Safety Manned LOS Operations
- Ops over people
- Public Safety Unmanned Response Team (PSURT) Training
- Passive UAS monitoring and reporting

3 OTHER LINE OF SIGHT OPERATIONS 10/2021 - 9/2022

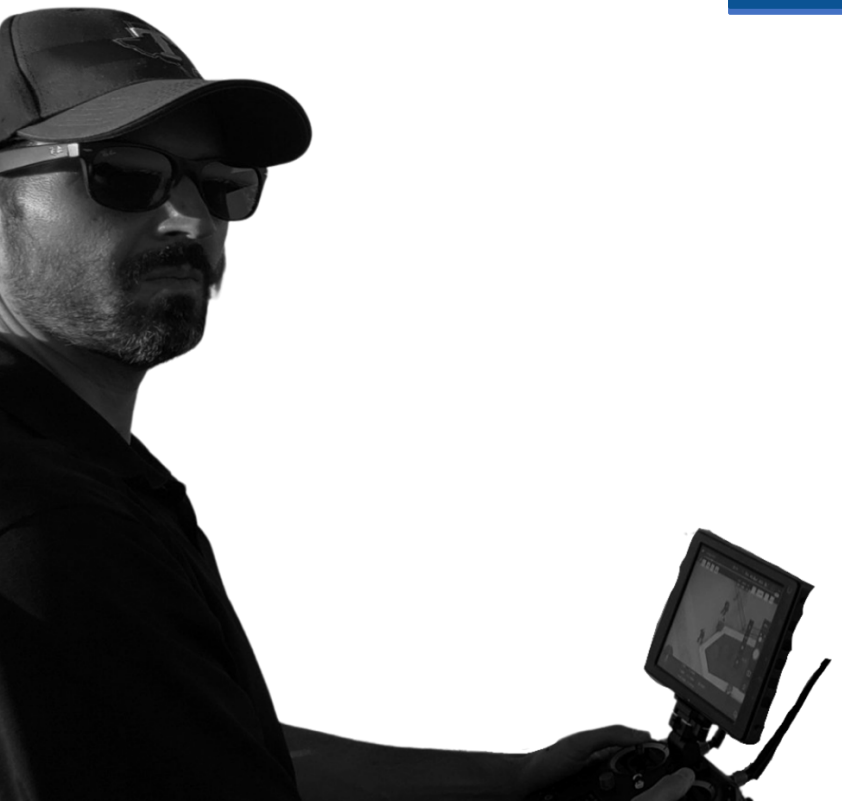
- University Manned LOS Operations
- Other LOS operations, i.e. package delivery

4 PUBLIC SAFETY BVLOS OPERATIONS 11/2021 - 8/2022

- Public Safety BVLOS Operations
- Remote Ops over people
- PSURT BVLOS Training

5 OTHER BVLOS OPERATIONS AND SYNERGIES WITH OTHER SMART CITIES INITIATIVE 1/2022 - 9/2022

- University BVLOS Operations
- Other BVLOS operations, i.e. package
- Integrate with Automated Vehicle Pilot Program



6 CLOSE OUT 9/2022

- Program Evaluations
- Stakeholder Interviews
- Share Lessons Learned with Public
- Examine Available Funding for continued operations

MAY JUNE JULY AUG SEPT OCT NOV DEC — 2021

JAN FEB MAR APR MAY JUNE JULY AUG — 2022

New UAS Community Integration Working Group

The primary goals of the Community Integration Working Group are as follows:

- Characterize community concerns
- Identify current city ordinances and codes regarding Advanced Air Mobility and UAS activity
- Inventory mature applications for city use
    - Inspections
    - Public Safety
    - Package Delivery
        - Goods
        - Medical
- Air Taxi, Air Cargo and Air Ambulance
- Inventory funding mechanism for city use

Upcoming Schedule

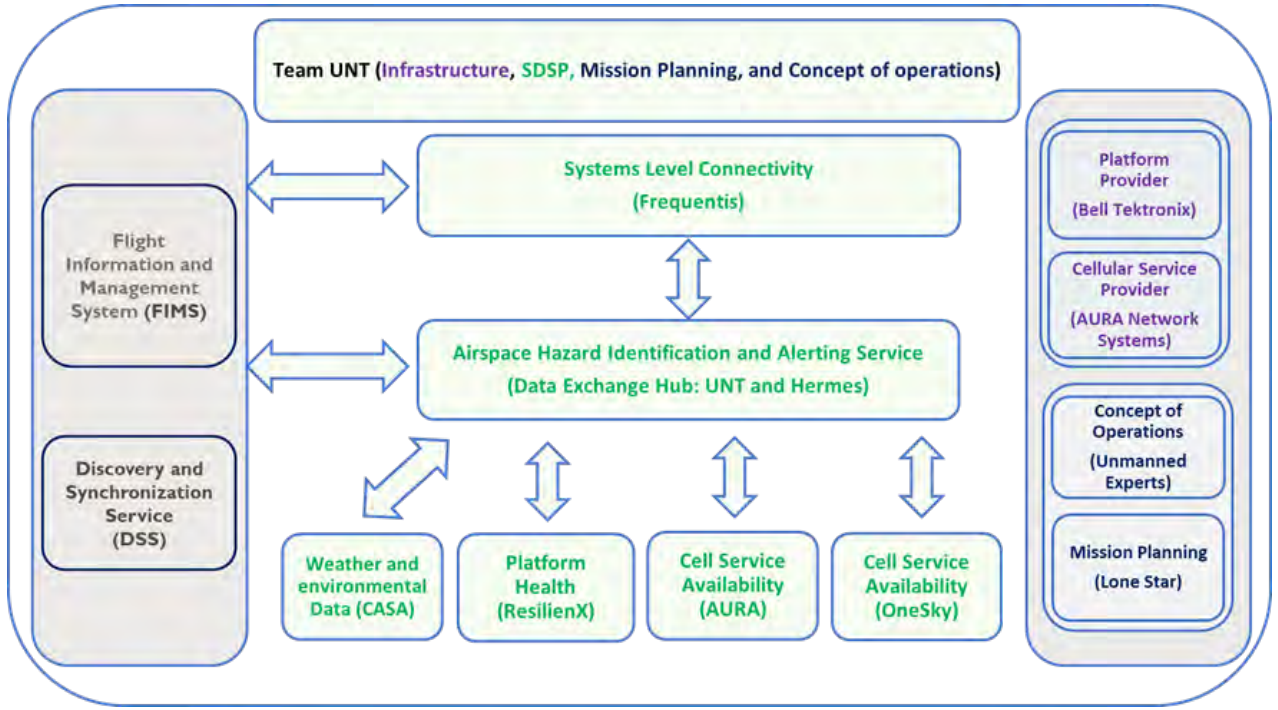
- September 24th – Public Safety
- October 29th – City Operations
- November 19th – TBD

Advanced Air Mobility National Campaign 1

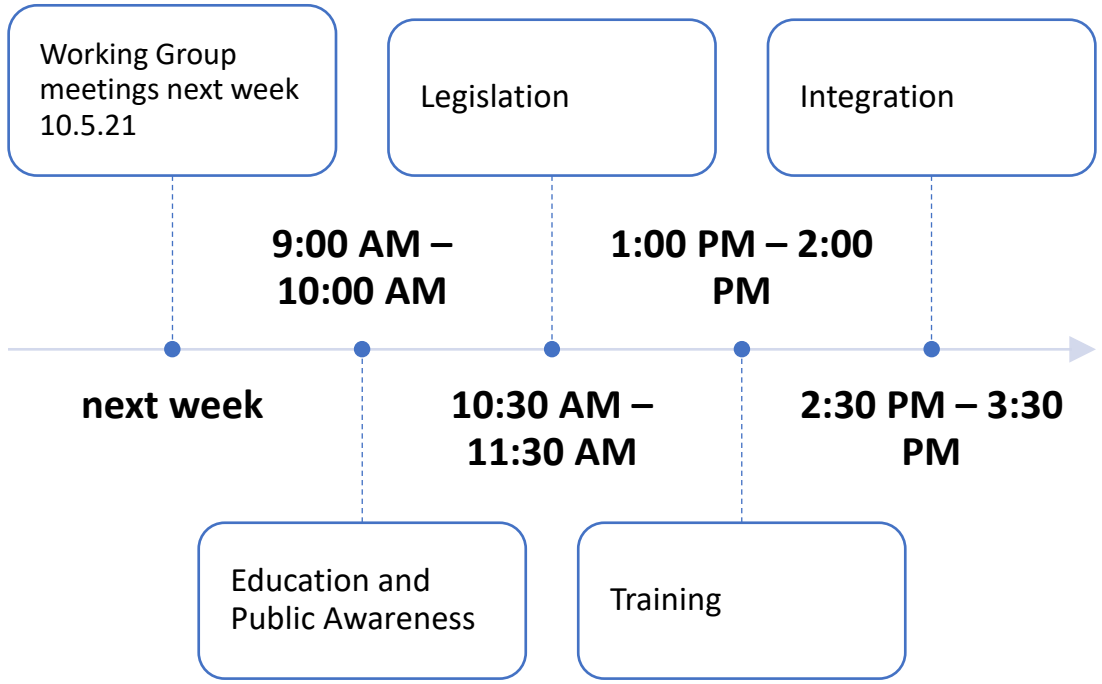
Team

- University of North Texas (Lead)
- Frequentis
- Hermes
- CASA
- ResilienX
- AURA
- OneSky
- Bell
- Unmanned Experts
- Lone Star UAS Center of Excellence

Proposed Framework



Working Groups and Workshop



Know Before You Fly Your Drone Workshop- October 2nd