

SUMMARY OF ITEM FOR ACTION
INFORMATION OR DISCUSSION

TOPIC: Featured Startup: Airgility

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: Thursday January 25, 2018

SUMMARY: Airgility designs and manufactures unmanned aerial systems (UAS). They were started by UMCP alumni utilizing UMCP licensed technology. They will provide a synopsis of their technology and business.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: There is no fiscal impact

CHANCELLOR'S RECOMMENDATION: n/a

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742



airgility

One Platform
Multi-mission

What We Do

Airgility is a leading designer & manufacturer of unmanned aerial systems (UAS).

Our flagship product, the HorseSHU, is a transitional Vertical Takeoff & Landing (VTOL) aircraft capable of precision hover & high speed forward flight using its patent pending thrust vectoring lifting body design.



One Platform
Multi-mission

The Problem

The fastest growing market for drones is for commercial use...but available technology is mostly limited to consumer and military options.



CONSUMER

2M Sold in 2016

COMMERCIAL

40% CAGR through 2020

MILITARY

90% of Spend

Retro-fitting Existing Technology Doesn't Work

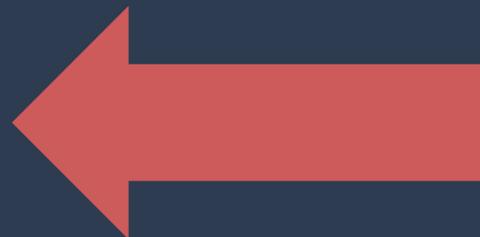


NOT IDEAL

- Range
- Payload Flexibility
- Speed
- Resiliency

IMPRACTICAL / IMPOSSIBLE

- Simply not cost effective



One vehicle designed for many missions

Range - Payload - Speed - Flexibility

Increased ROI - lower training & maintenance costs



Product

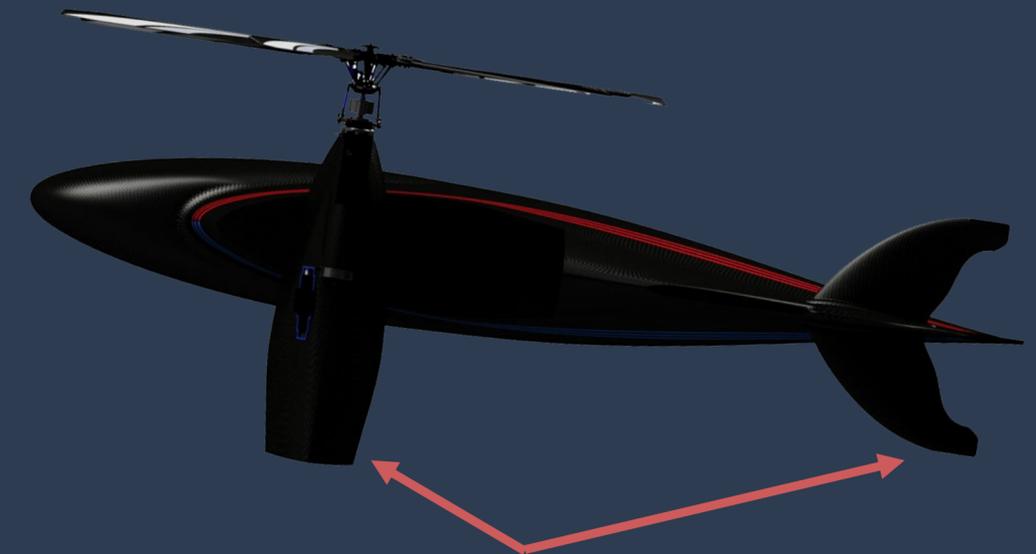
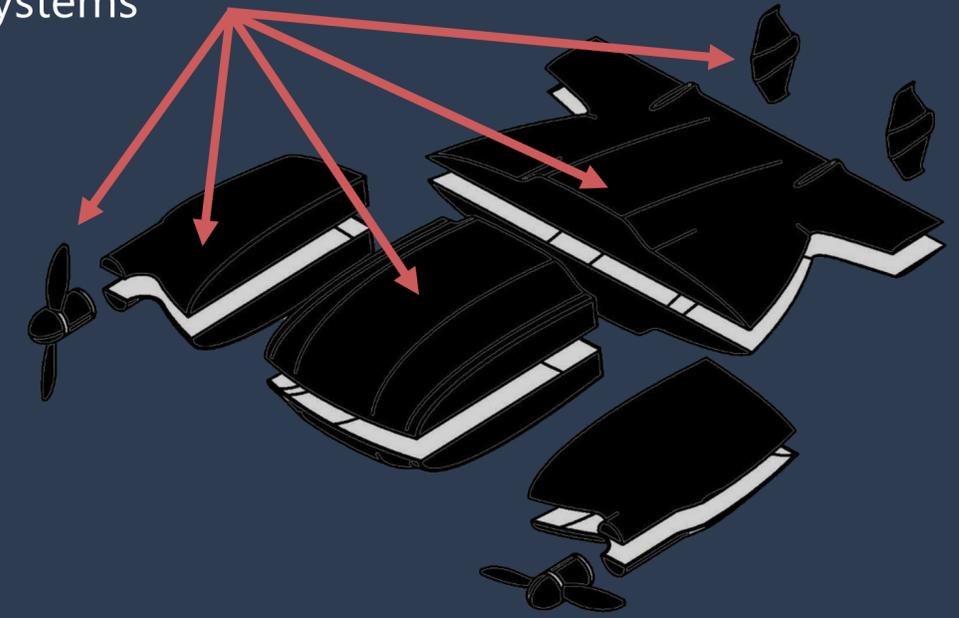
External Propulsion

Externally accessible, and unobstructed air cooling



Modular Shell Construction

Discretely compartmentalized sub-systems



Tilting Outboards

Counter-rotating rotors tilt up for vertical flight, and tilt down for efficient forward flight

No Landing Gear

Default prone landing position eliminates need for heavy landing gear

Prototype



Prototype

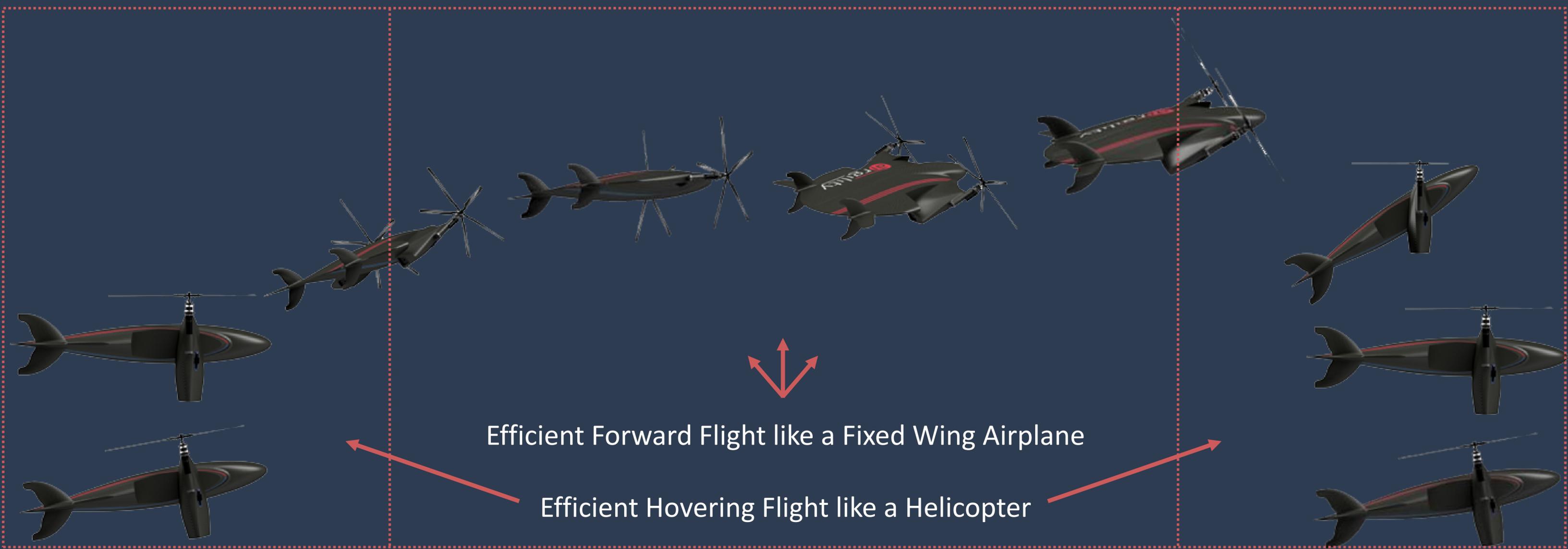


Flight Dynamics

1 Vertical Take-off & Forward Flight Transition

2 Mission Flight Segment

3 Vertical Flight Transition & Landing



miniSHU

Vehicle Specs.

Wingspan	~14 in
Length	~16 in
Max Wt.	~3.5 lbs
Payload Wt.	~6 oz
Max Speed	~55 mph

- 1. Center Section** – Avionics / Communication / Sensors / Payload
- 2. Tilting Nacelles** – Propulsion / Landing System
- 3. Aft Section** – tripod tail sitting design



- **3D Printed Shell Construction**
- **Specialized for one-way missions due to low price point, like drone hunting.**

miniSHU Prototype



Technology Differentiators



MARKET SCALABLE



High Lift/Drag Ratio
@ high AoA:

- Lower power consumption for all AoA
- Greater flight time
- Lift generation at high AoA



PAYLOAD FLEXIBILITY



Adaptable to current
and future tech:

- Competitive in previously reserved markets: fixed wing, helicopter, multi-rotor
- Long market stay potential



MULTI-MISSION



Customizable to
customer needs:

- Wide payload flexibility in weight and volume
- Wet or Dry Propulsion
- Single point training and maintenance



EXOSKELETON SHELL



Robust construction:

- Hollow body for large internal volume
- Light-weight shell
- Minimal part count
- Molded complex shapes



MODULAR SUB-SYSTEMS



Adaptable to current
and future tech:

- Easily re-configurable center and outboard sub-sections
- Low-cost sub-system mods w/out entire vehicle overhaul

Intellectual Property

Utility patent application (WO201704093 – being licensed from UMD)

While there are a plethora of drone related patents, none combines the lifting wing, vectored thrust, and exoskeleton design to produce a combination of payload weight & volume with long range, high speed and overall practicality of a solution the market demands.

Industry – Drone economy

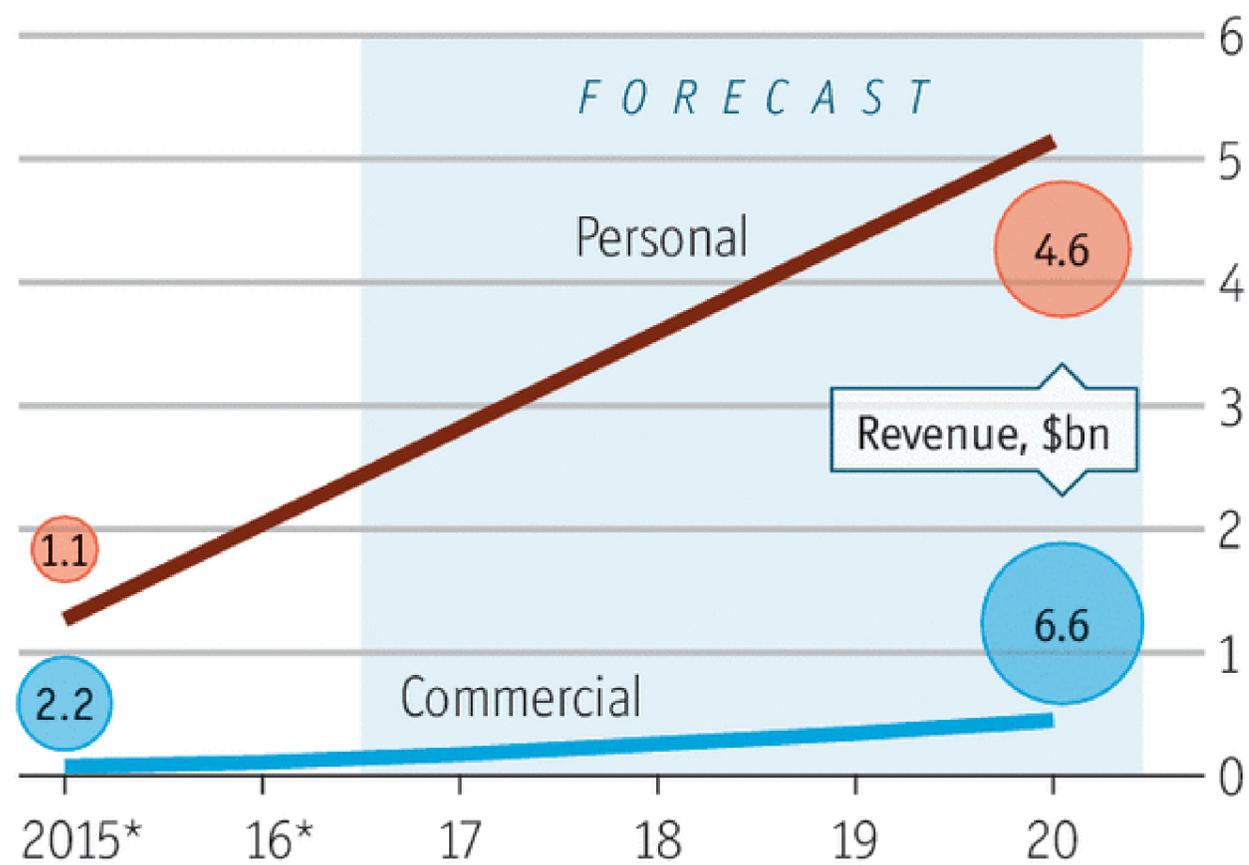
MANUFACTURERS	TERRESTRIAL IMAGERY & MAPPING	MARKETPLACE
PRECISION AGRICULTURE		NAVIGATION & AUTONOMY
INSPECTION & MONITORING		AIRSPACE MANAGEMENT
	MILITARY & DEFENSE	

Industry – Civilian Drones

Pointing skywards

Civilian drones, worldwide

Number, m

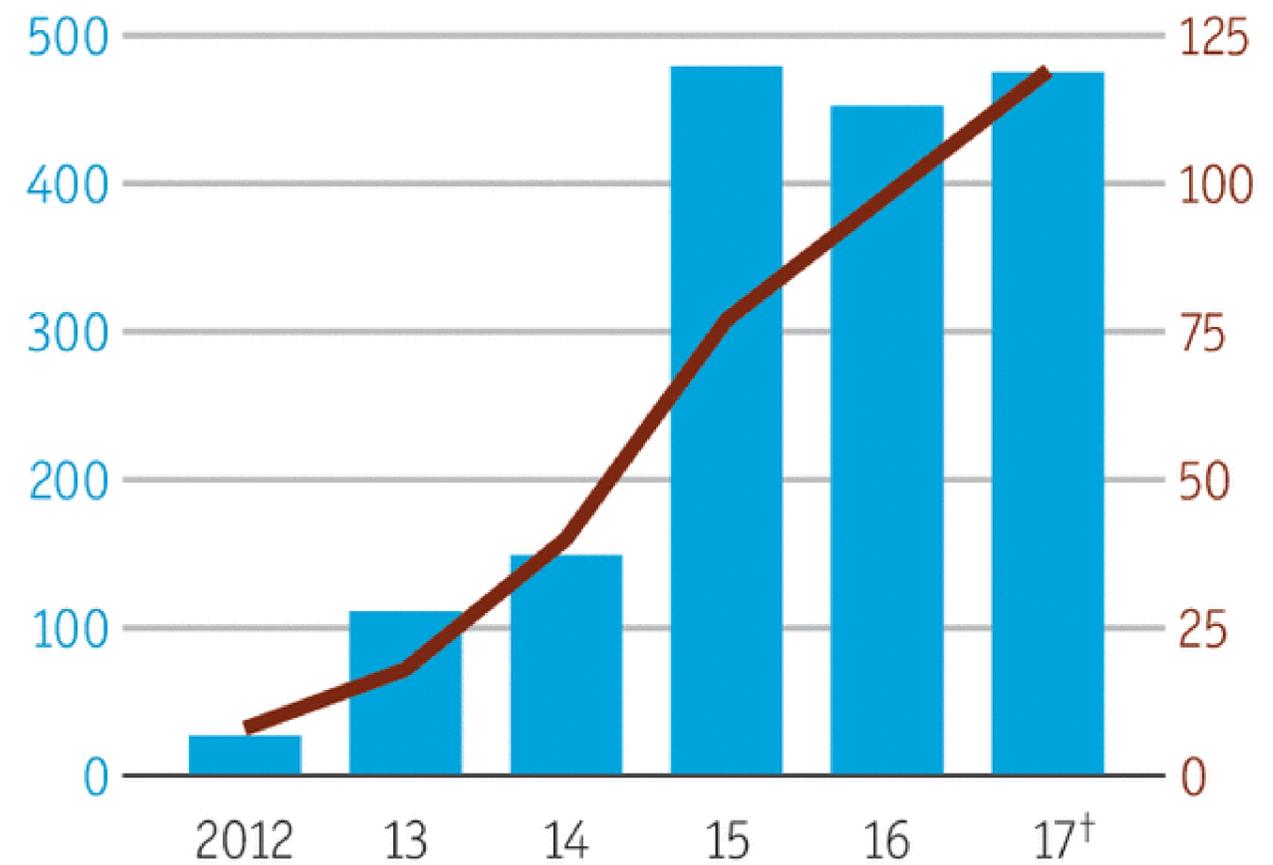


Sources: Gartner; CBInsights

Economist.com

Disclosed funding, \$m

Number of deals



*Estimate †Forecast

UAV Market 2017-2021

Military

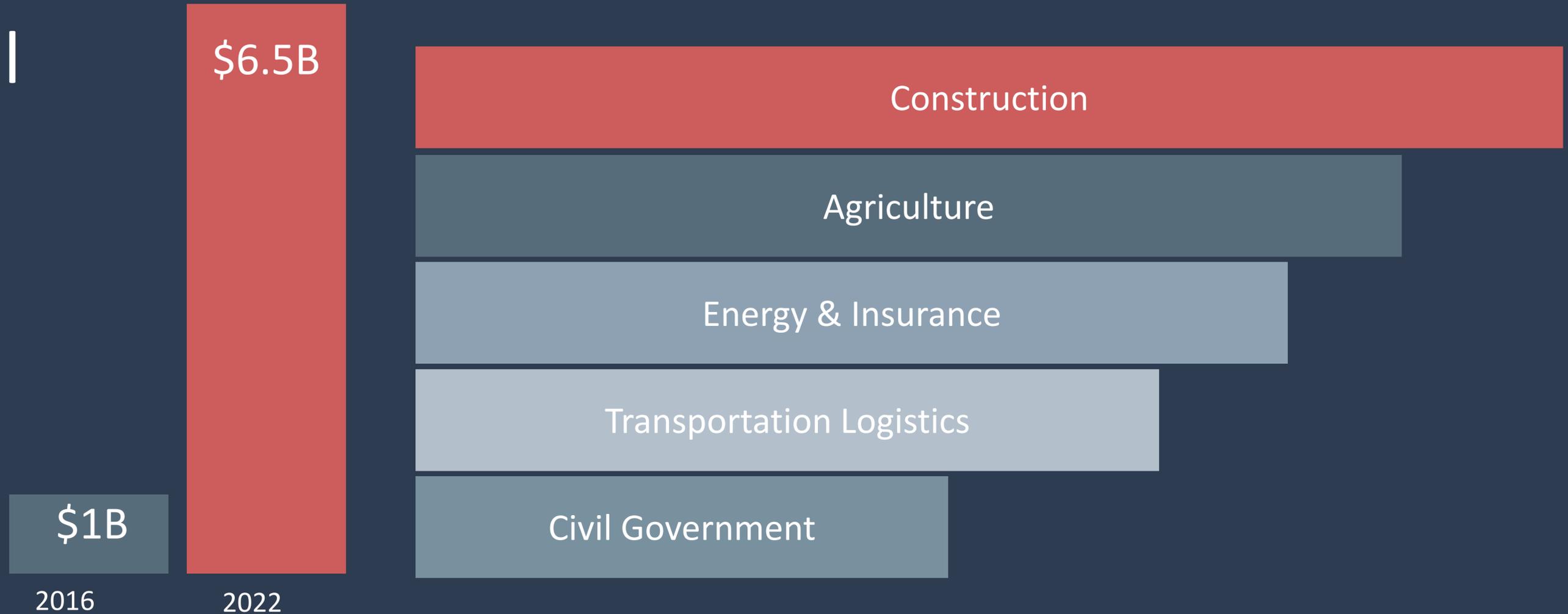
\$29.9B US TAM
\$70.1B Global TAM

Commercial

\$20.5B Global TAM

U.S. Commercial Major Sectors

Through 2022



How it started



The Founding Team



EVANDRO
VALENTE

CTO & CoFounder

Leads Product

- 11 years Aerospace Engineering Faculty, University of Maryland
- 15+ years UAV vehicle design, fabrication, advanced composites, assembly & integration and flying
- M.S. Aerospace Engineering, University of Maryland



PRAMOD
RAHEJA

CEO & CoFounder

Leads Business

- Captain, United Airlines
- 27 years aviation operations experience
- 12,000+ commercial flight hours
- B.S. Aerospace Engineering, University of Maryland
- Serial Entrepreneur

Team



SCOTT STRIMPLE
Chief Pilot/
Director of Flight
Operations

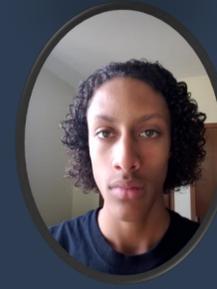
- Captain, United Airlines
- 27 years aviation operations experience
- 25,000+ commercial flight hours
- Unmanned Systems Commission, State of Virginia
- Task Group Lead, FAA Standards



JAMES KING
Engineer,
Flight Controls &
Autonomy

- B.S., Aerospace Engineering
- M.S. Candidate, Aerospace Engineering, Univ of Maryland
- Focus: Autonomous Vehicles and Flight Controls

UMCP INTERN TEAM



Advisors



NAVIN GANESHAN

Chief of Product, Gemini Data
IOT, HW, SW, Drones, Security



ELLEN CHANG

Founder
Lightspeed Ventures



TOM MAST

VTOL Expert, American
Airbus & Bell Helicopter
Design Engineer



GLEN HELLMAN

Executive Leadership & go
to market advisor



DR. JEWEL BARLOW

Director of UMD Wind
Tunnel



DR. INDERIT CHOPRA

World renowned rotorcraft
expert

UNITED 

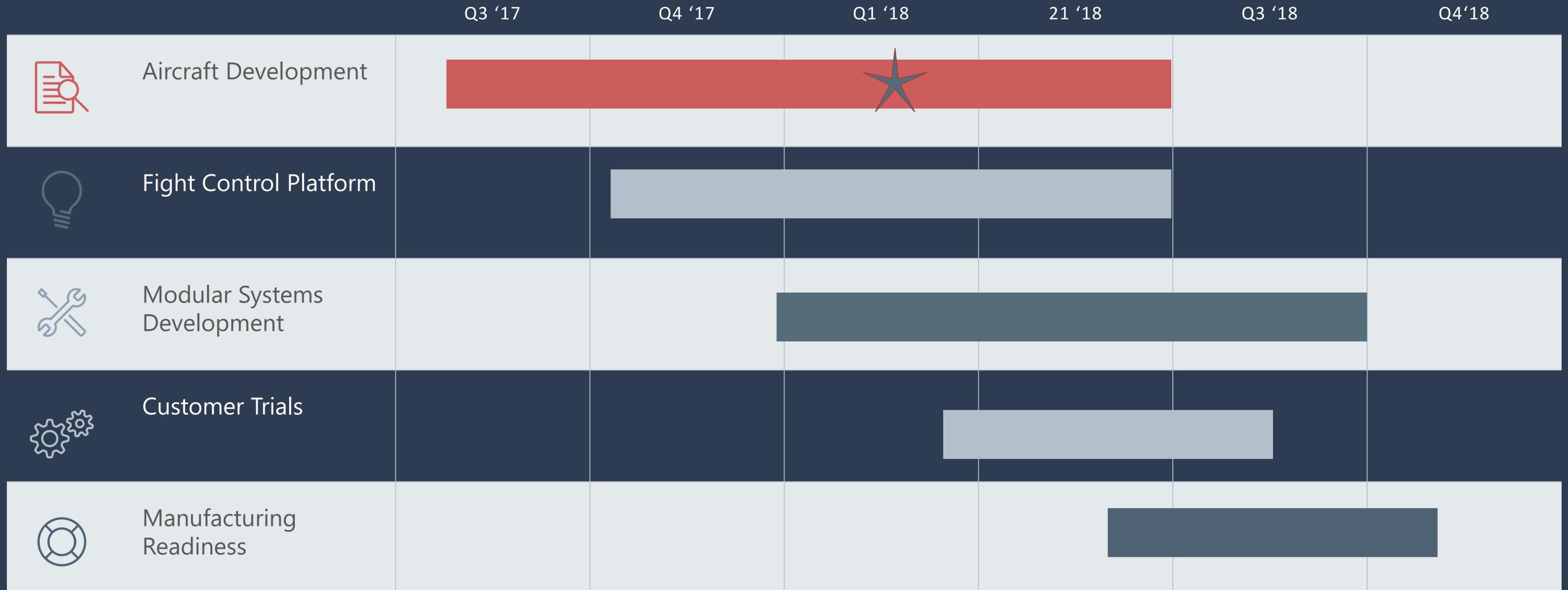
 AIRBUS
HELICOPTERS

Bell
Helicopter
A Textron Company

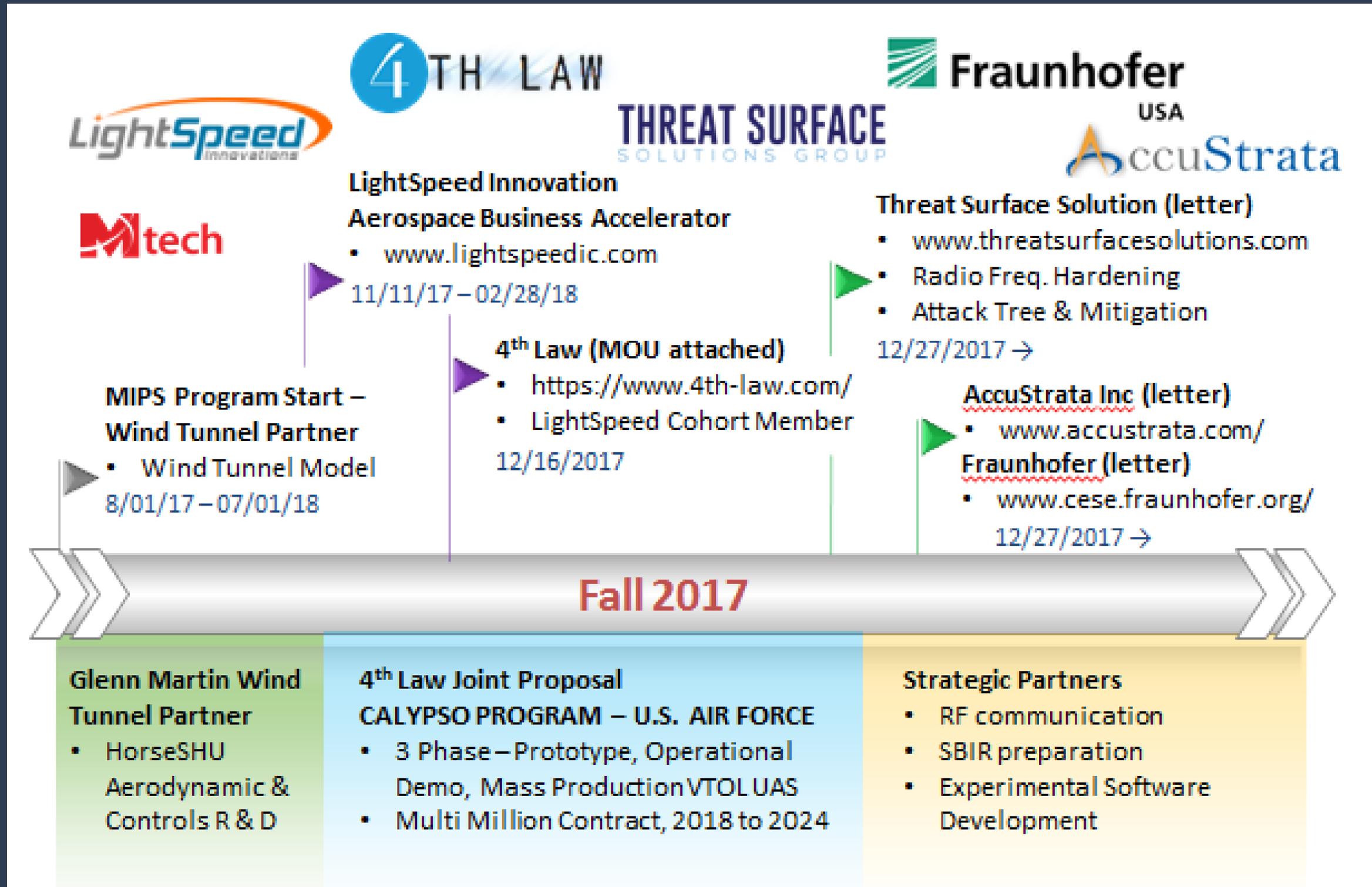


DARPA

Product Milestones



Business Milestones



Partner/Customer Feedback



“We believe there could be immediate revenue as a result of their finalized design and demonstration.”

Katey Grogan,
HurleyIR



“The versatility of the design is allowing the integration of leading edge RF, sight, and sound sensors, without sacrificing aerodynamics”

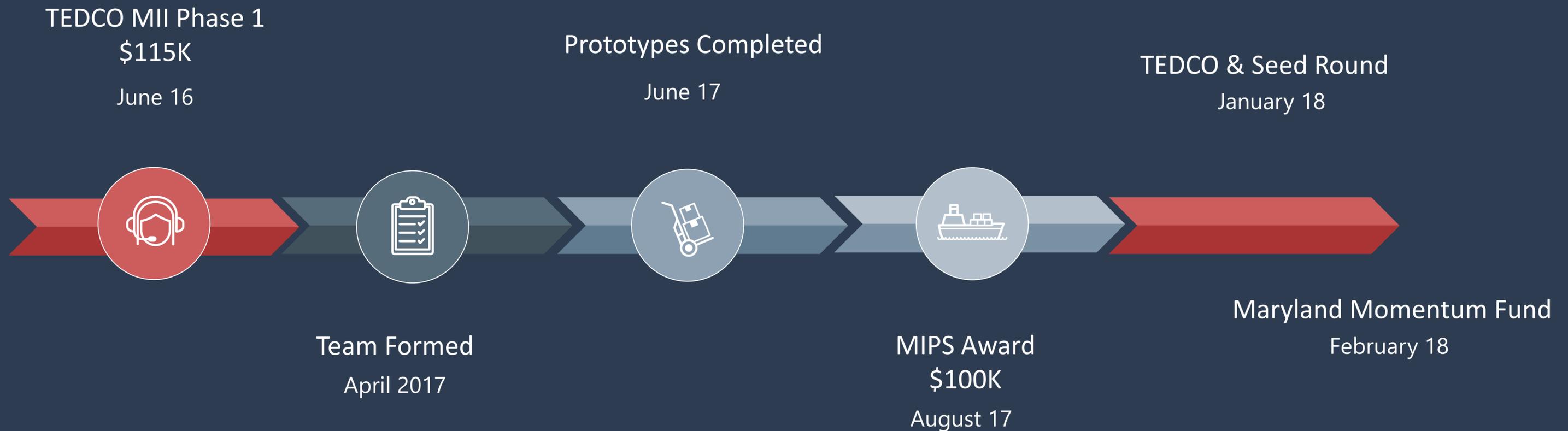
Colin Bowers, Co-Founder
Threat Surface Solutions Group



“The HorseSHU UAS designed by Airgility, Inc. is an invention that expands mission and market opportunities”

Brian Golden
Chief Product Officer & Co-
Founder
Iris Unmanned

Fundraising & Future Planning





Future Growth Plans



UAS TEST SITE

Airgility currently has manufacturing capability here in College Park. Our vision is to expand our in house manufacturing production and help grow the Maryland economy.

- Grow into larger space in hubZONE somewhere near College Park or Baltimore area**
- Establish a presence near the UM UAS Test Site**

BENEFITS:

- New jobs in manufacturing, engineering, operations, marketing and support.**
- Increased tax base**
- Maryland becomes a leader in manufacturing**

To accomplish this requires key partners and financial support to establish the facilities, purchase/lease the equipment, and connect with work force development programs to ensure a steady supply of skilled trades professionals.