# All Roads Lead to:

## AI for the Future of Safe Drone Autonomy

# Opportunity | Why This Matters

**21**

Packages per Year

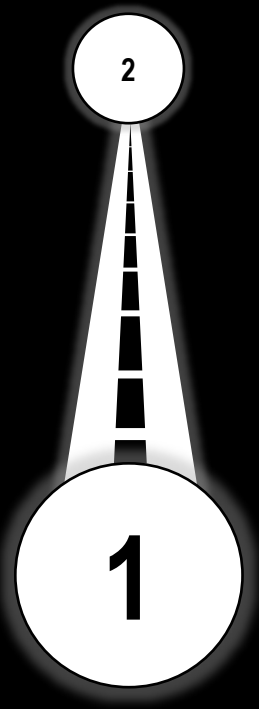
**19 Million**

D2C Packages per/Day

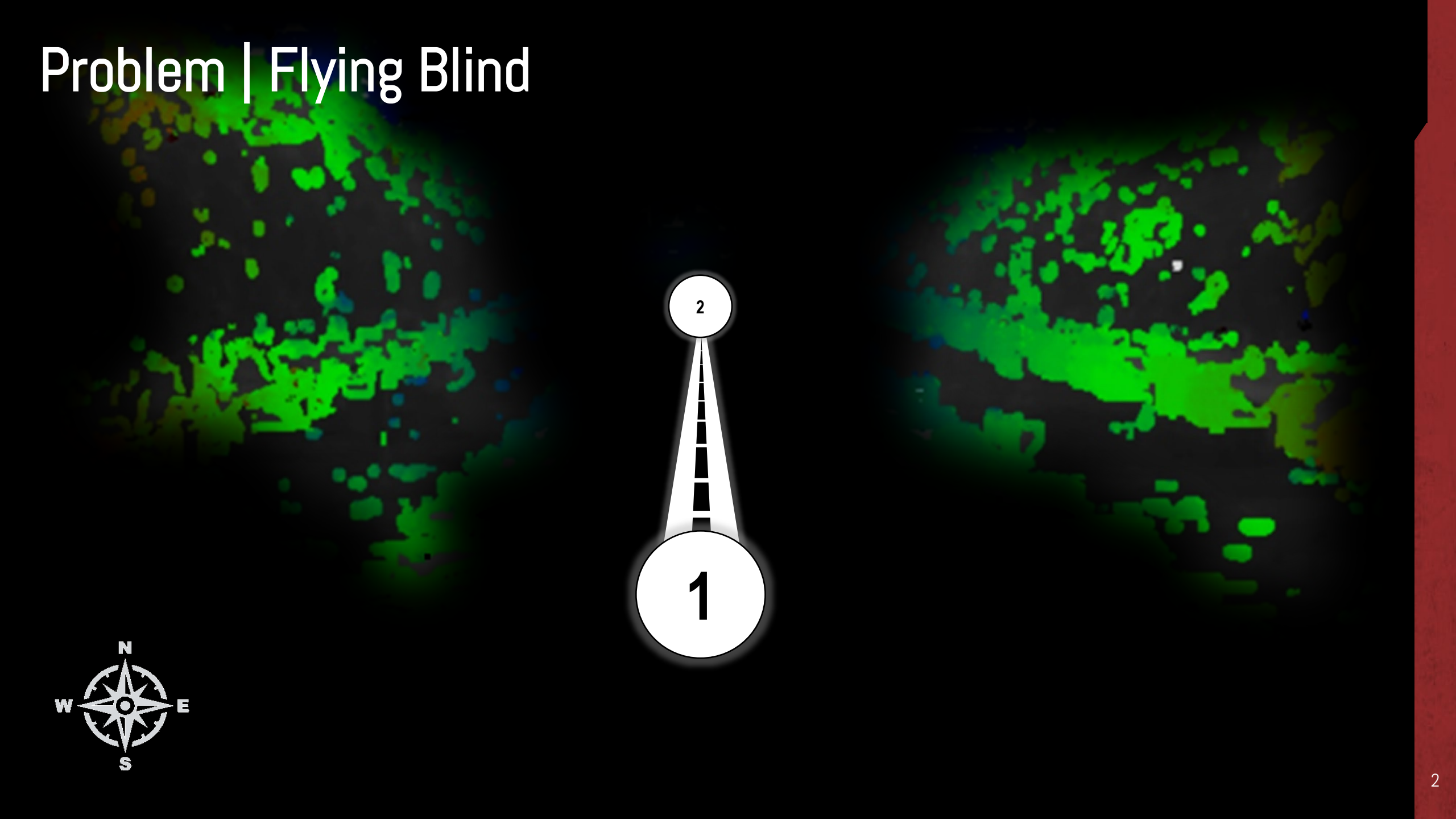
**$43 Million**

Daily D2C Shipping Costs

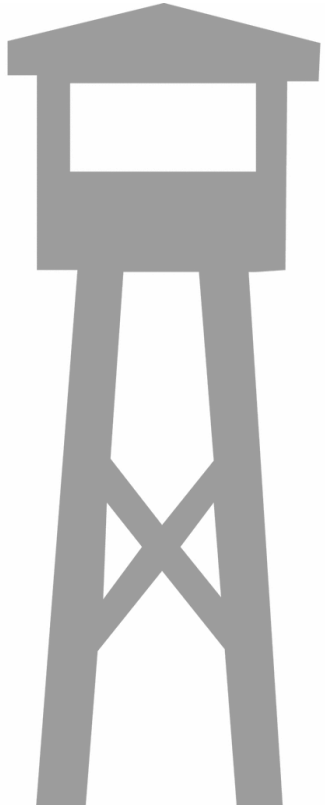
# Problem | Flying Blind

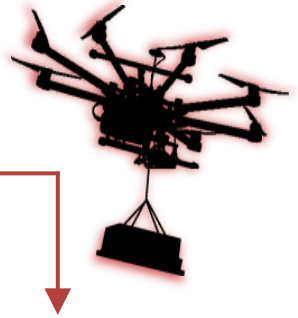


# Problem | Flying Blind

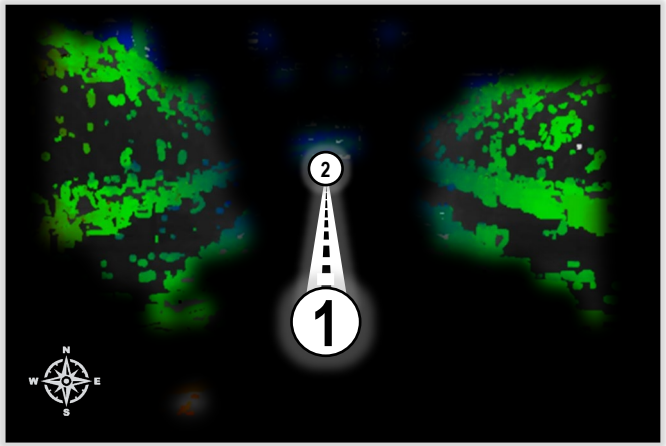


# Problem | Safety & Regulations





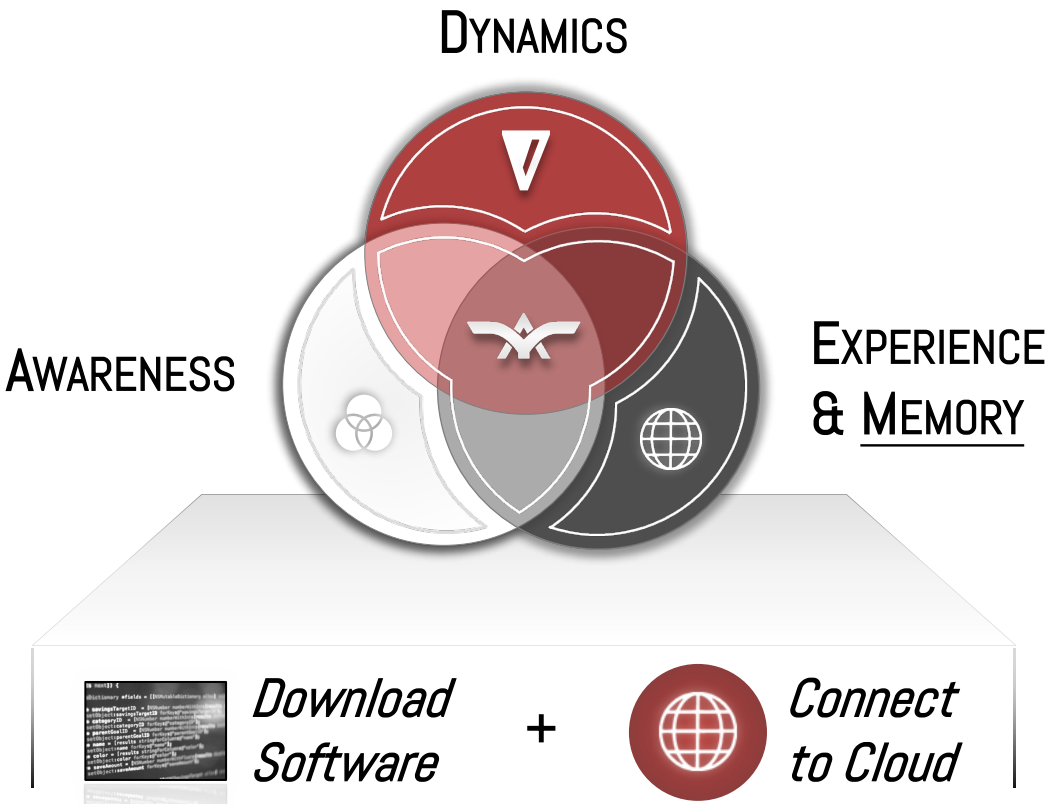
## Not Allowed to Fly



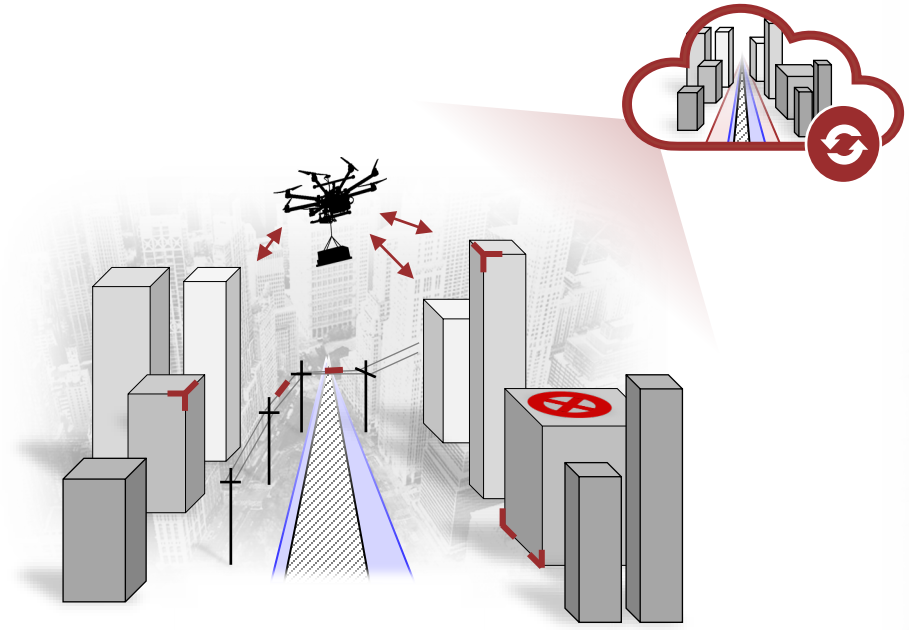
- Can't Remember
- Can't See

# Technology | UAV Vision, Memory & Learning

## UAV Memory




## Drone Connected with Reality



*Spatial Awareness*
*Safe Operations*
*Beyond Sight Autonomy*

# Go to Market | Path to Scale

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## Install our Software

Cargo Delivery UAV

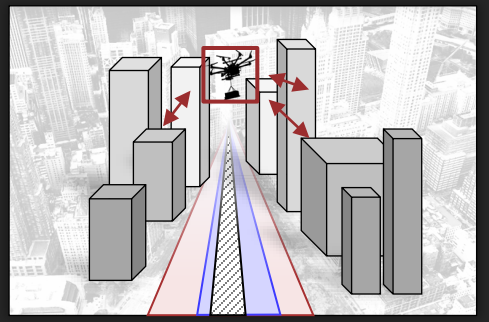
$250/hr + $/UAV

## Setup Distribution w/ Partners

Scale to Many UAV

$/UAV + $/UAV/Month

## Embed Technology



Aerial Highways & Regulatory Framework

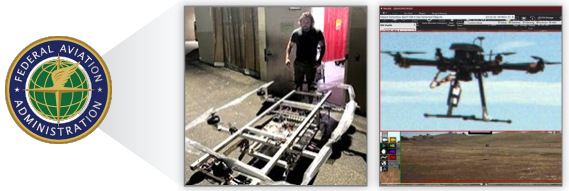
Cloud Subscription

# Traction | Revenue & Partnerships

RHOMAN AEROSPACE

*$550k+ Revenue*
*License Deals*

**CARGO DELIVERY UAV**



*Co-Marketing Agreements*

**SCALE TO MANY UAV**

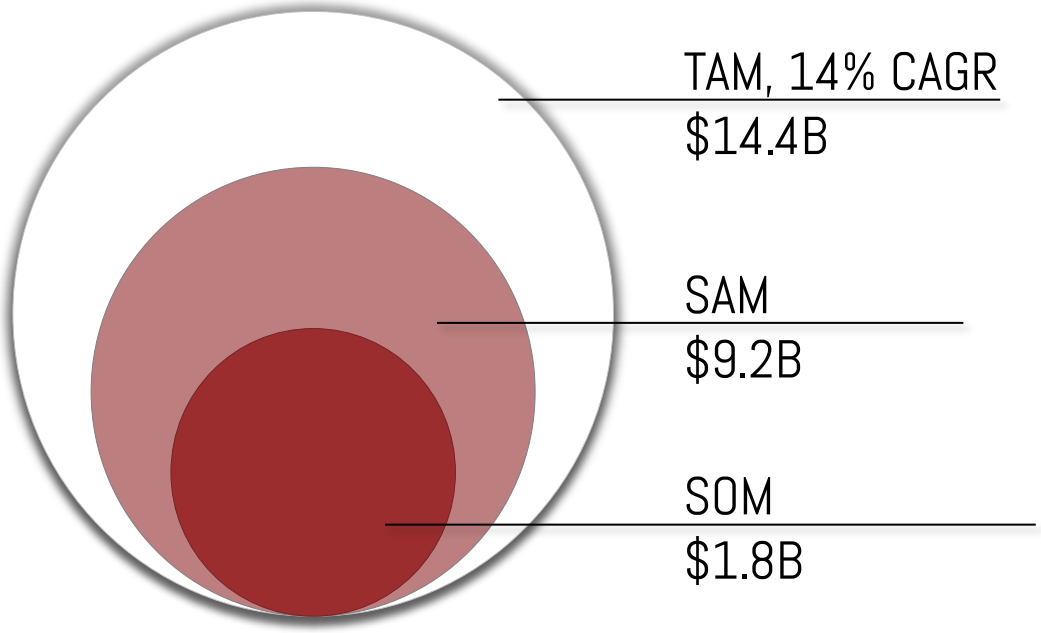
*Air-Space Pilot Programs*
*Regulatory Framework*

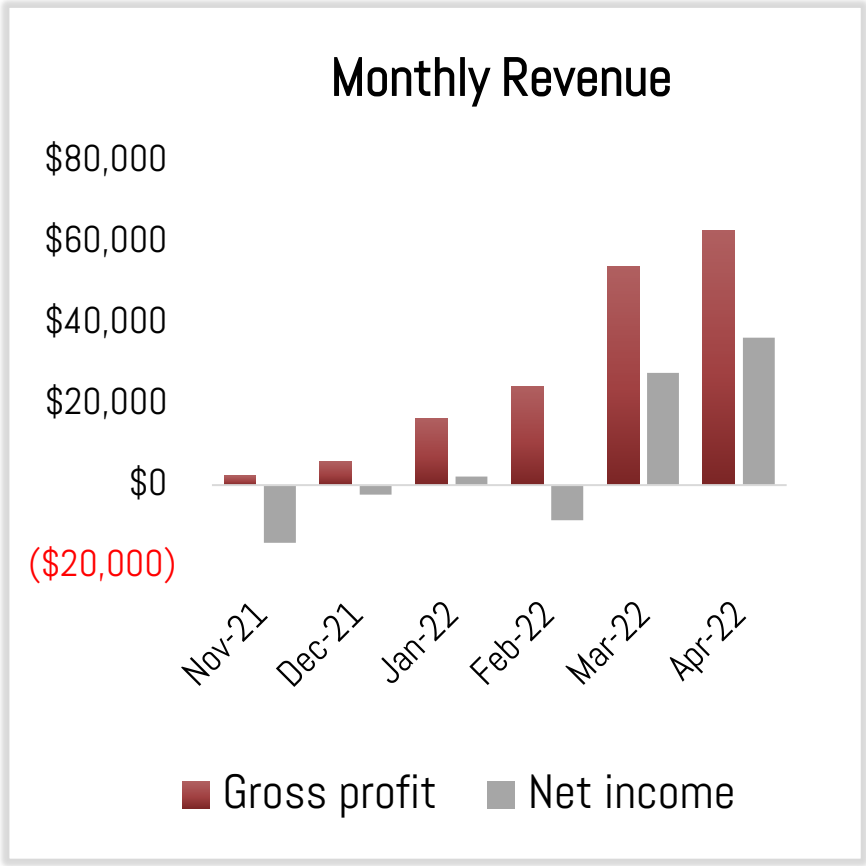
**SAFE AUTONOMY CLOUD**

# Market Opportunity | Save $5.2 Billion Dollars, 2025

RHOMAN AEROSPACE

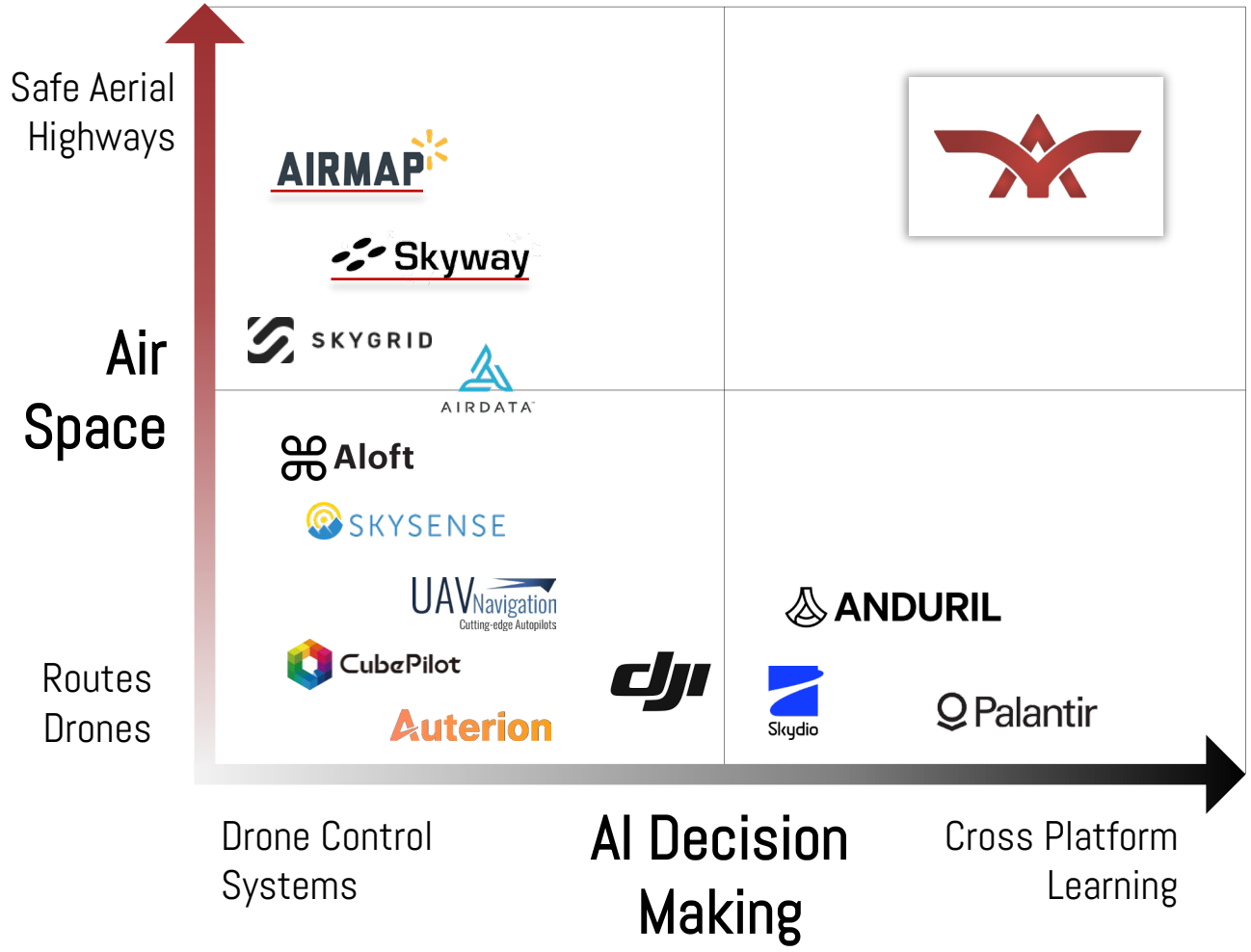
## B2C Last Mile Delivery, 2025



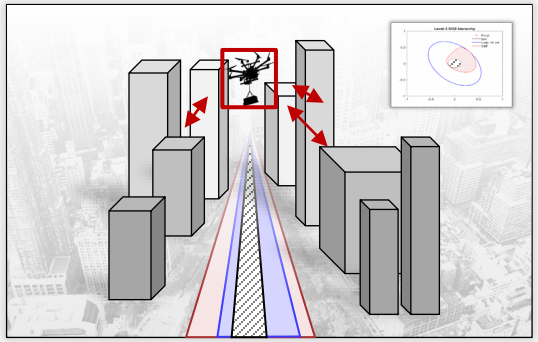




21 Packages per Year? | $433mm/Mo | $5.2B per Year | $1.6mm ARR, 2025

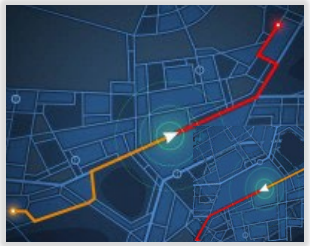
# Competition | Unique Flight Controls



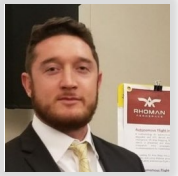

## Rhoman: Added Safety & Autonomy



## Competition: Track & Monitor

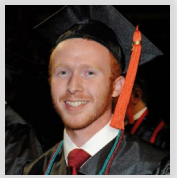


# Team | Experience on Every Front



**Thomas Youmans**
*CEO*
NASA Data Science/
Systems Engineering
US Peace Corps

**Dr. J. Croughan**
*Aerospace & Controls*
PhD Aerospace Eng, USC
BS Aerospace, UC
Berkley

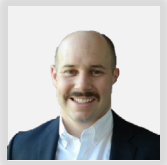


**Garrett Clem**
*Dynamic Cloud Systems*
Dynamic AWS Systems
UAV-Data Integrations
Full-stack

**Dr. Z. Hasnian**
*Machine Vision & AI*
NASA JPL 5 years
Machine Vision and AI
Navigation

**Ritika Singhal**
*Data Science*
M.S. CS, & B.S. CS, USC
Data Science & Machine
Learning

**Dr. A Taylor**
*Control & Robotics*
Adaptive Controls
Walking/Flying Robots
Caltech PhD



**Dr. Brett Lopez +2**
*3D Spatial Data Fusion*
UCLA, Former JPL
DARPT SubT Challenge

**Dr. Aaron Ames +1**
*Adaptive Controls/Barriers*
Caltech, World Leader
Adaptive Controls

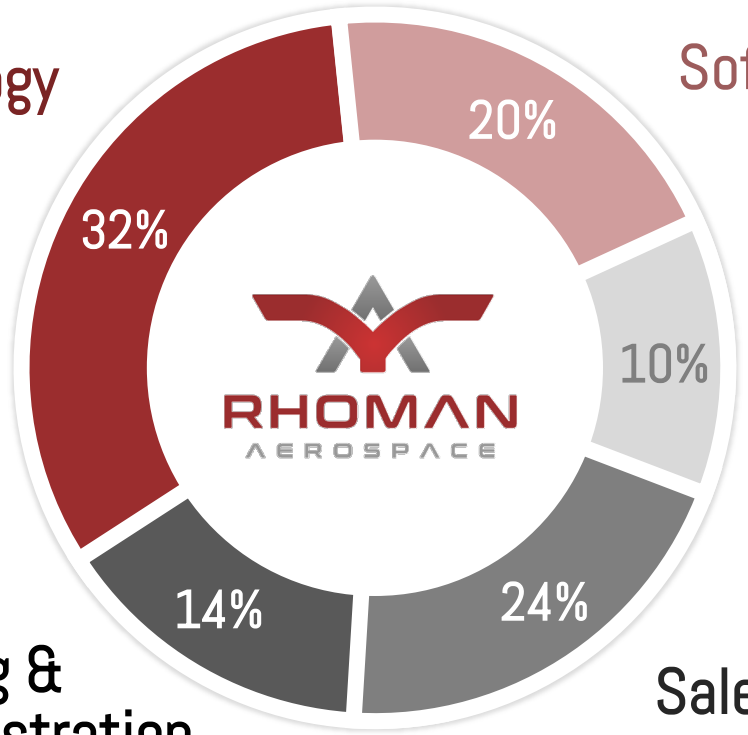
**James Henderson**
*COL, DoD Advisor*
75th Innovation Command
CIO, Harris County, TX

**Maxim Wheatly**
*Startup-Scale*
Exits, Experience scaling
startups/Team, IP-Business

PARTNERS, COLLABORATORS, ADVISORS:

# Path to Series A | Investment <> $1.6mm ARR

## $3mm Seed :: 24-Months




## Results

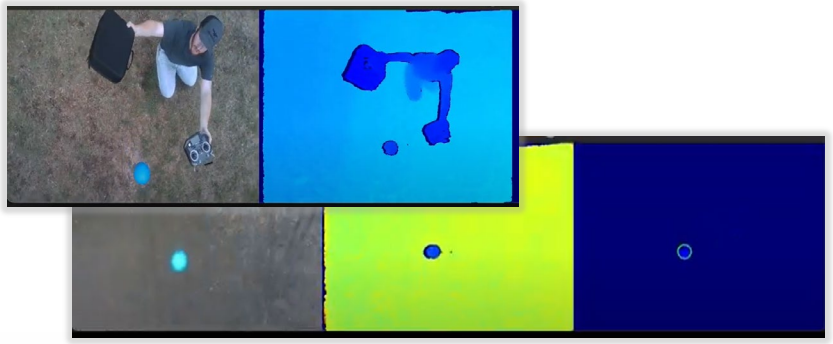
- ✓ $1.6mm ARR
- ✓ Deployed at Scale
- ✓ Walmart & Big-Name Partnerships
- ✓ 2,700 Drones
- ✓ Safe Skies Aerial Highways
- ✓ **Series A**

tom@Rhoman.aero
www.Rhoman.aero

RHOMAN
AEROSPACE

# APPENDIX:

# Technology | Rhoman Software & Hardware



*4 Issued Patents*

*Multiple Pending Patents*

# Competition | AirSpace Competitors → Partners

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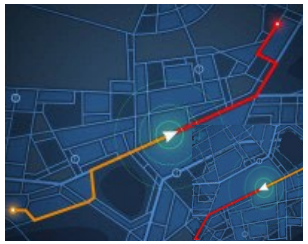
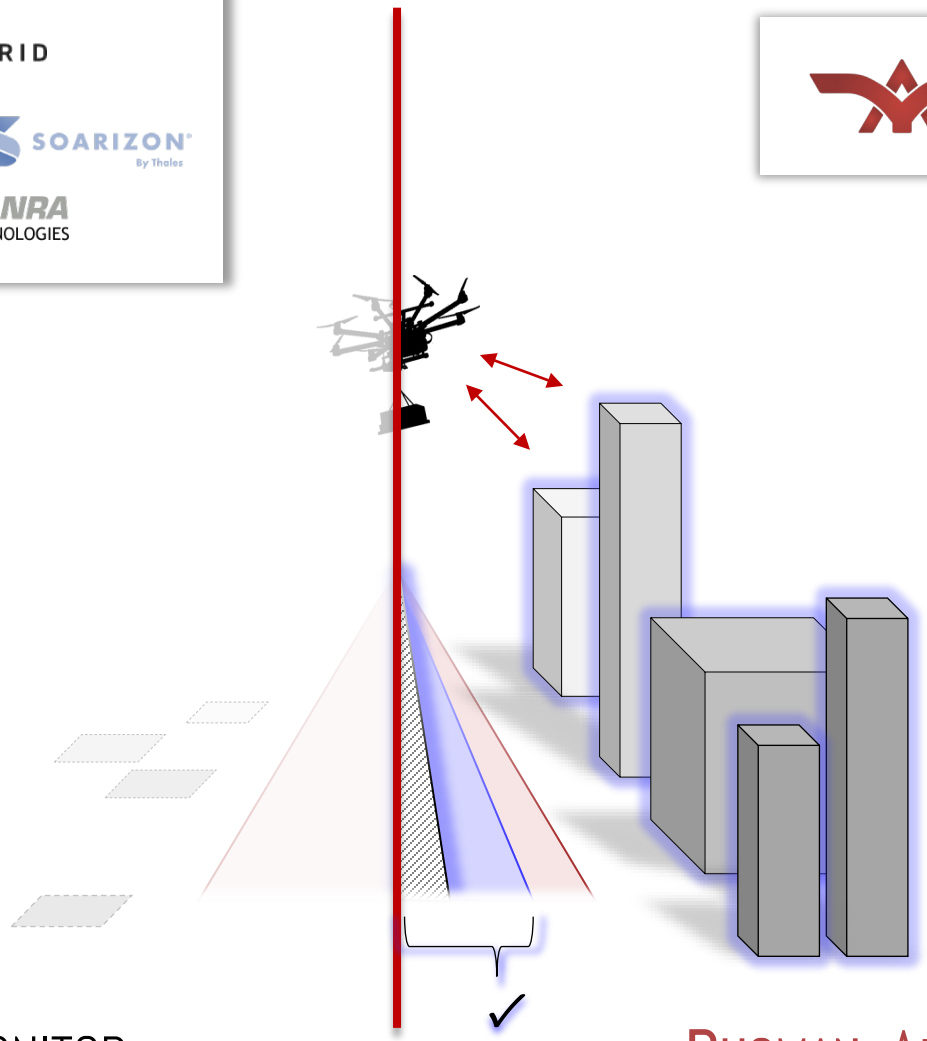
AIRMAP · AIRDATA · SKYGRID · Skyway · SKYSENSE · Aloft · SOARIZON By Thales · DroneSense · AVISION · ANRA TECHNOLOGIES



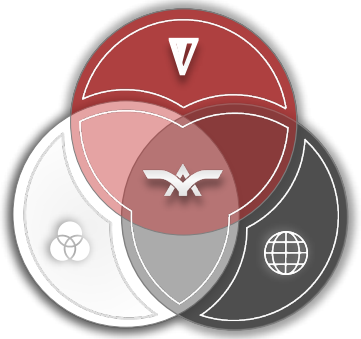
*2D GPS Tracking*

*Air Space Restrictions*



*Added Safety & Capabilities*
*Redundant Positioning, BVLOS*
*GPS Denied Autonomy*

AWARENESS & SHARED MEMORY



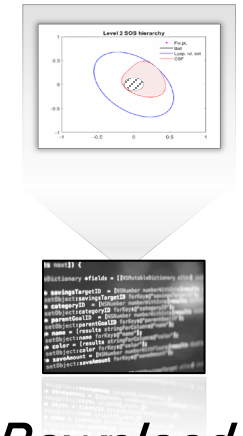
NSF · Skyway · AIRMAP · FAA · Caltech · USC · JPL · Ucla

*4 Patents*

**COMPETITION:** TRACK & MONITOR

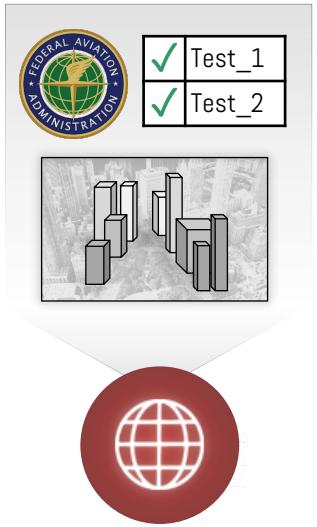
**RHOMAN:** ADDED SAFETY & AUTONOMY

# Solution | Download-and-Fly Safely



*Download Software*

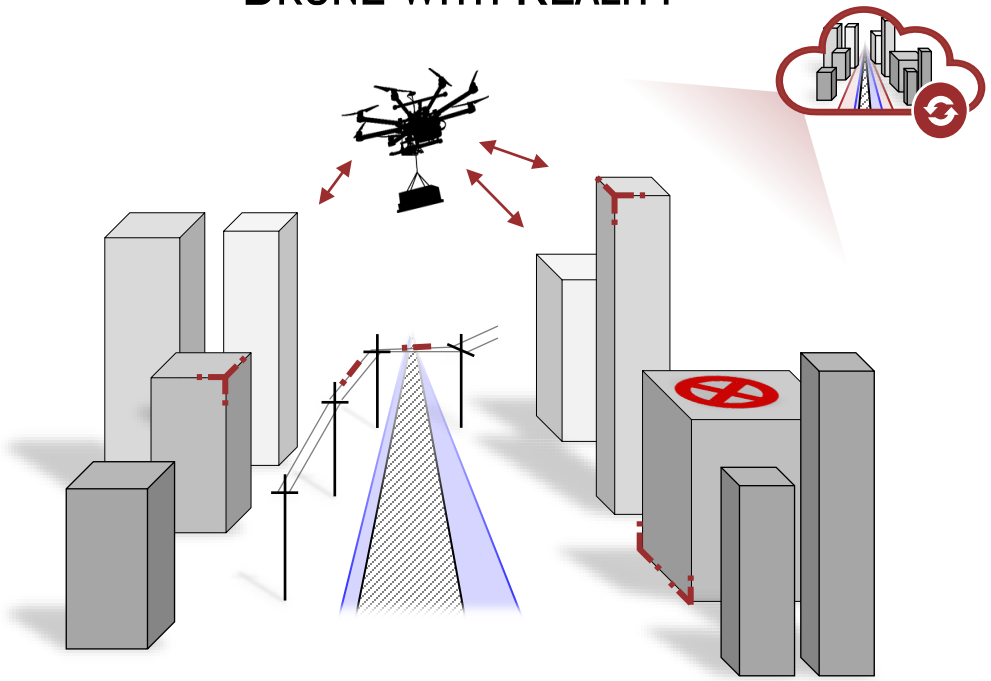
+




*Connect to Cloud*

▶

## AI-Cloud System Connects Drone with Reality

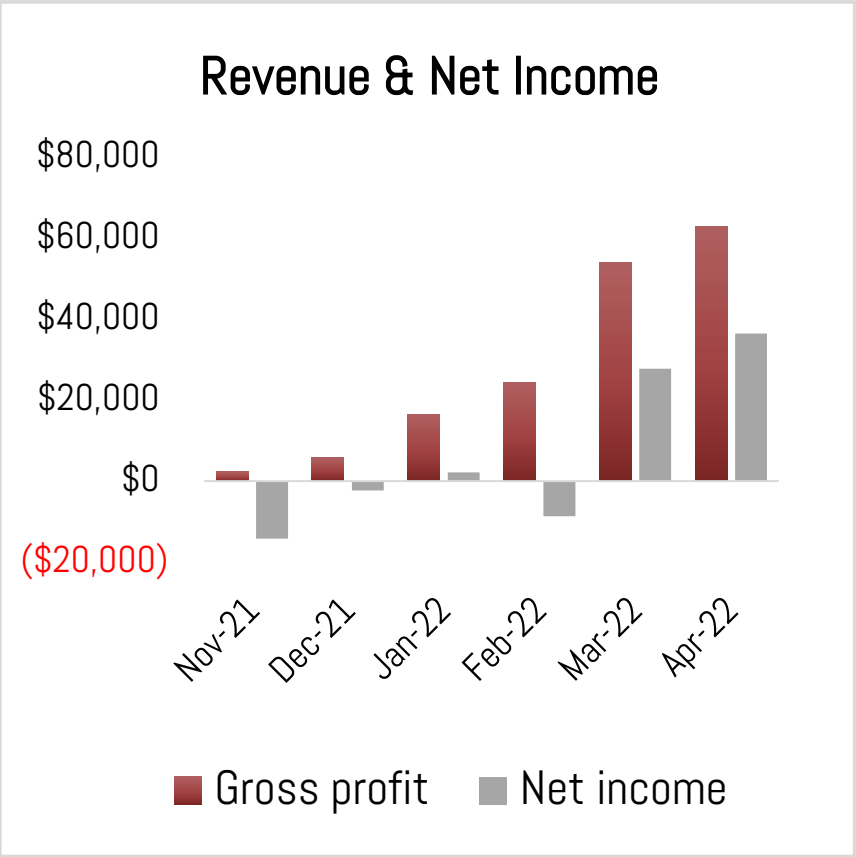


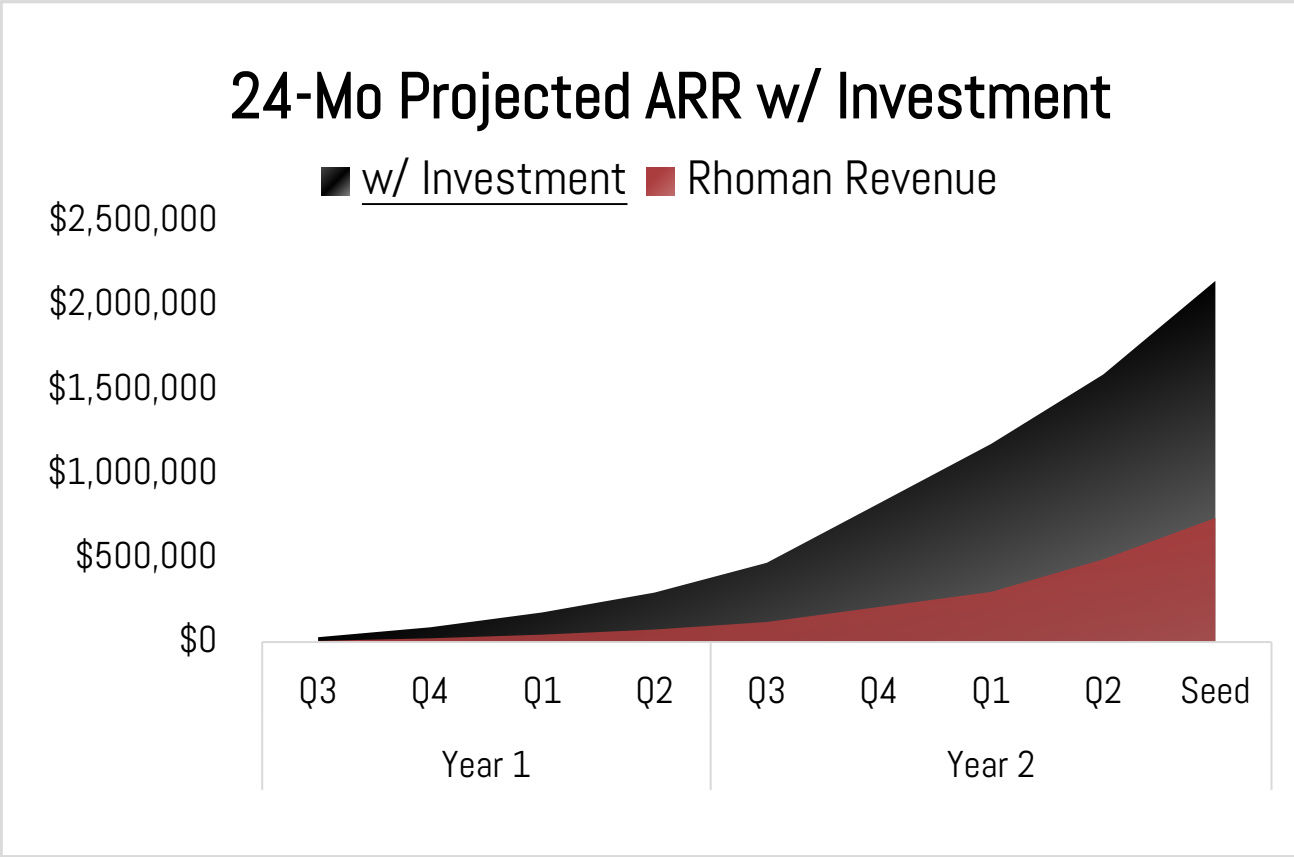
✓ Increase Performance

✓ Safety Tests & Certification

✓ **Redundant Safety Systems Deployed**

# Opportunity | Projections w/ Seed



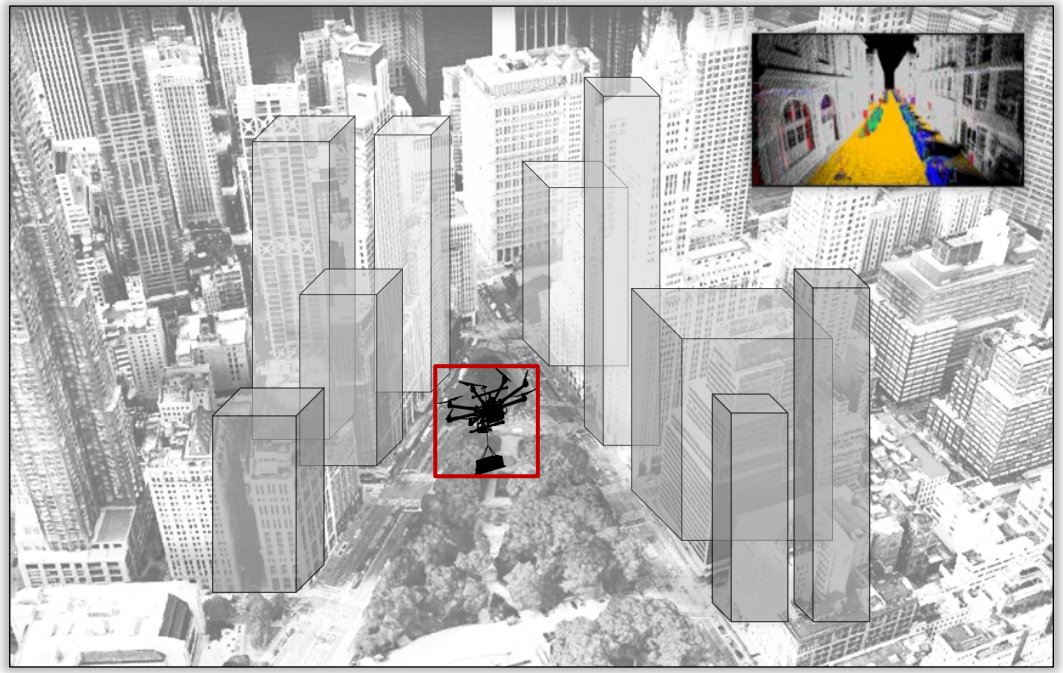

## Current Traction

*Commercial & Gov Customers*

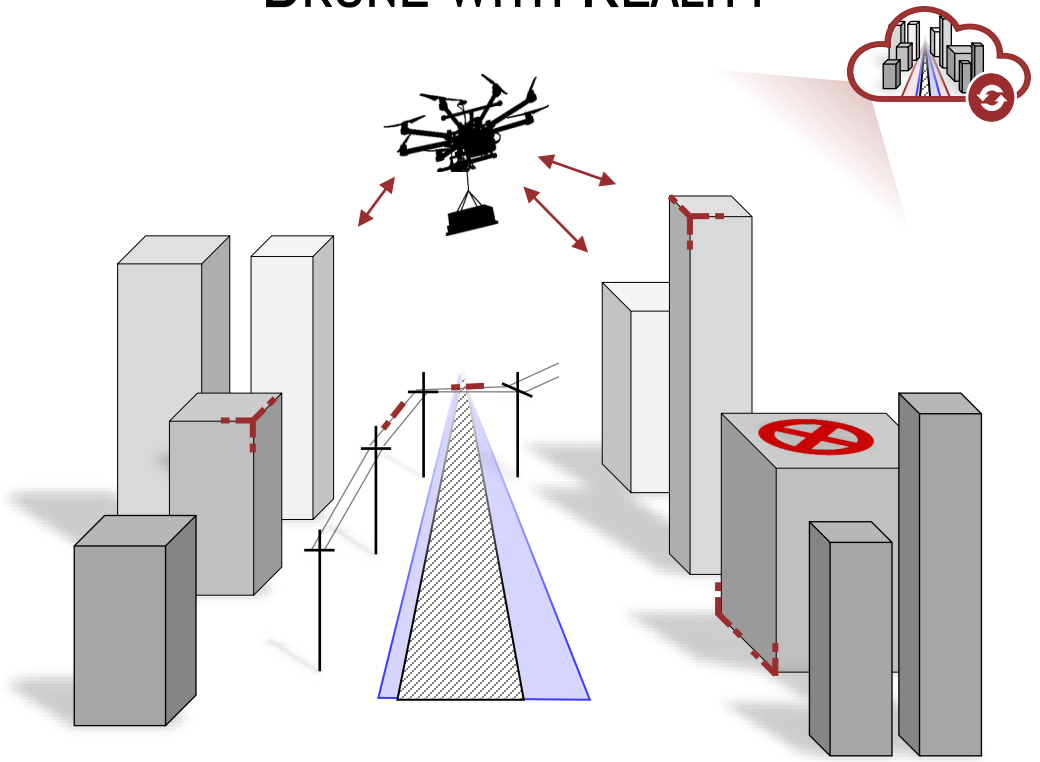
## Future Subscription Revenue w/ Investment

**$1.6mm ARR,** *$49/UAV/mo Cloud Subscriptions*

# Technology | UAV Memory & Learning



## AI-Cloud System Connects Drone with Reality



4 Issued Patents

# Old Paradigm | Drone Safety & Control

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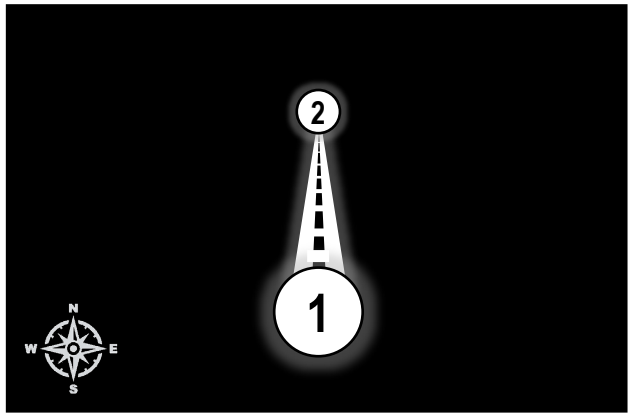
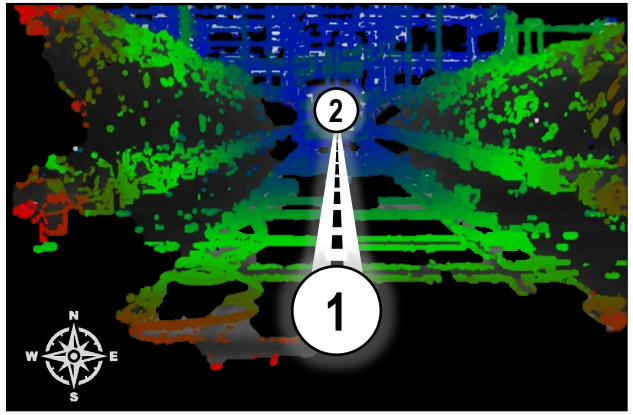
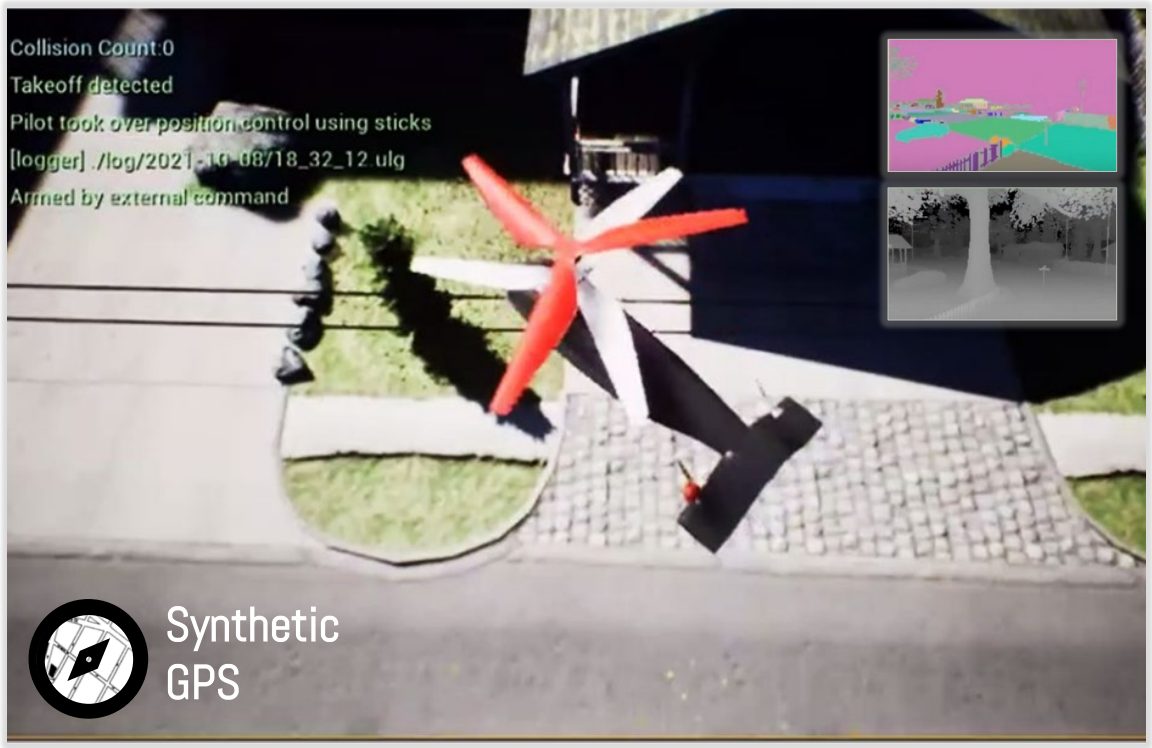
## Standard Flight




GPS + Sometimes Distance Sensors

## Self Aware Flight




Perception | Awareness | "Shared Memory"

# Technology | Flight Muscle Memory

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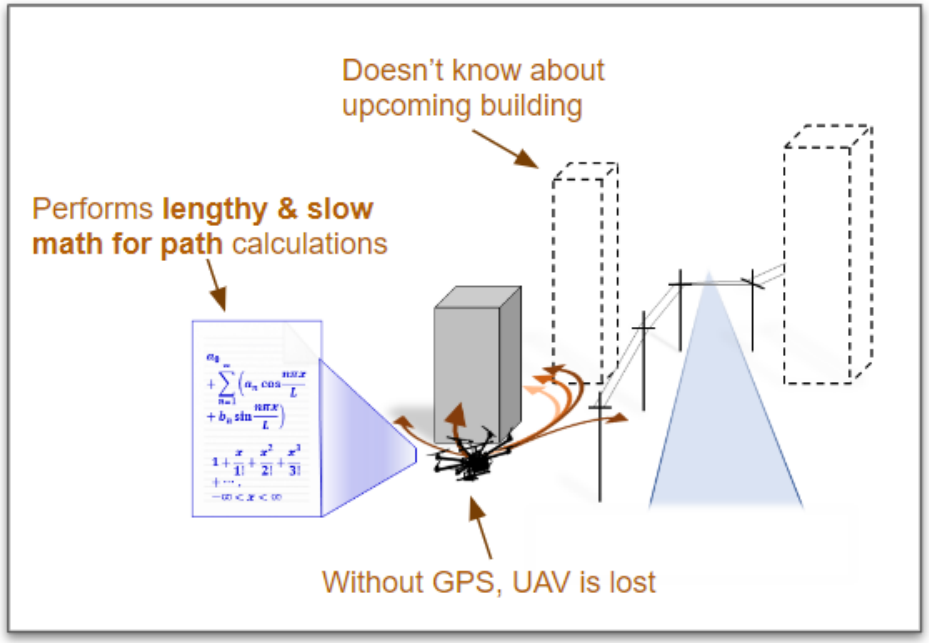
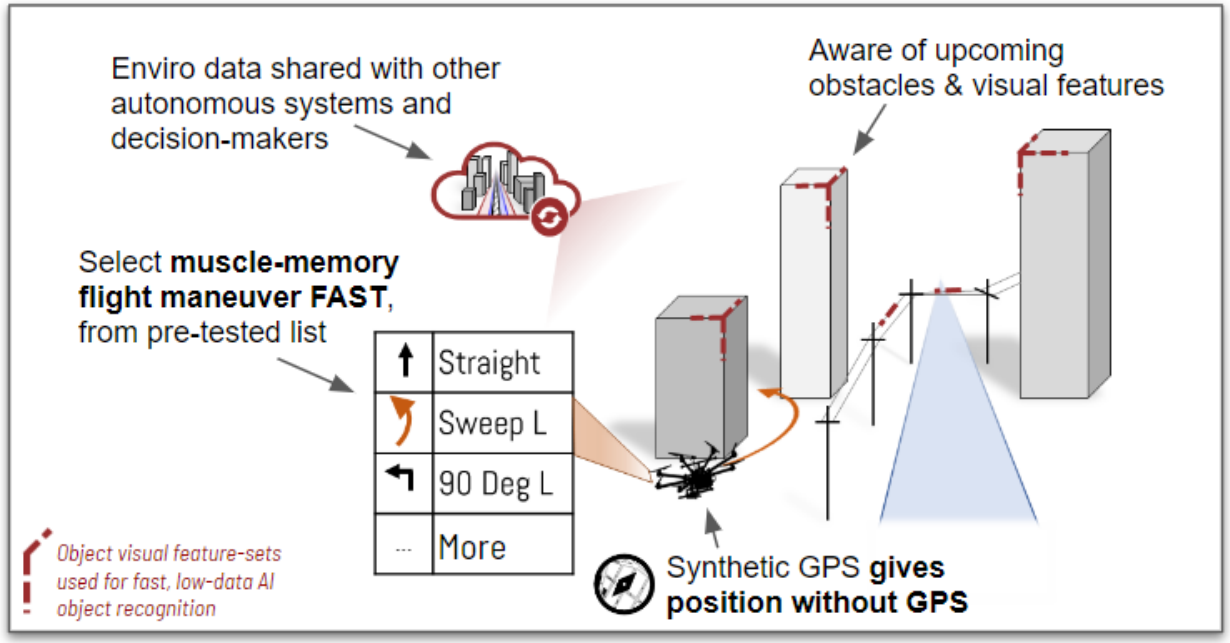
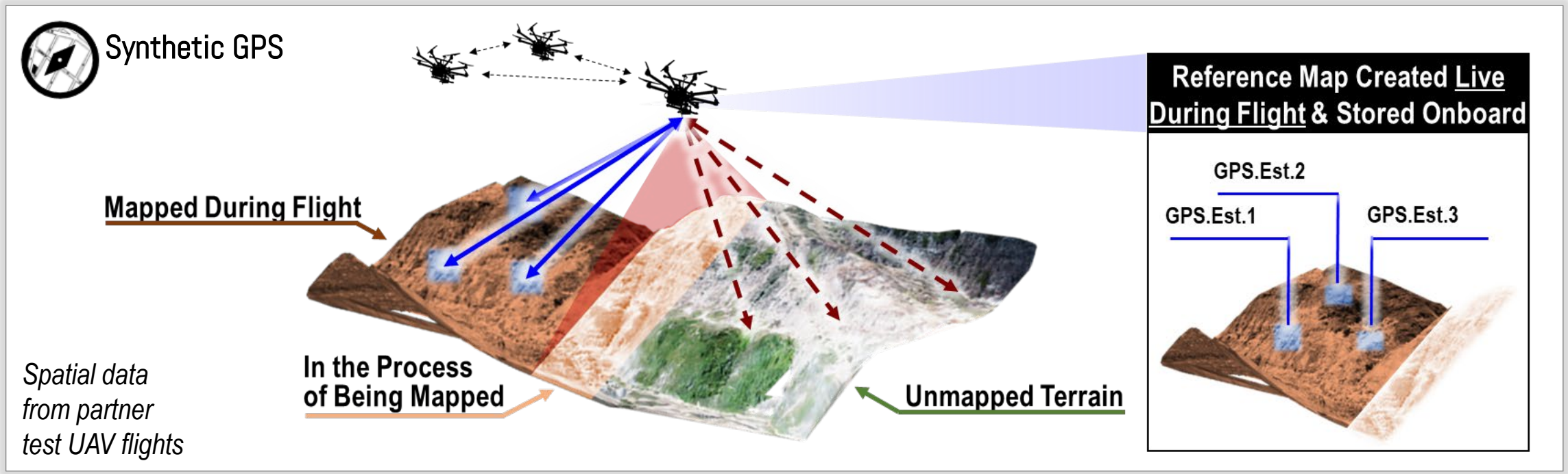
## Status Quo: Slow Path Calculations, Lost




## Solution: Flight Muscle Memory, Synthetic GPS



# Technology | Shared UAV GPS-Denied Autonomy




*Spatial data from partner test UAV flights*

# UAV Cargo Delivery | Saves $250M per Year

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| | Savings per year: | $70M & $270M | | | | $155M | | | $180M & $270M | | | $210M | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline, 500M pckgs 2030, Price point $4.20/dlvry | | Increased Efficiency, Shifting CG, Hanging Payloads | | | Increased Autonomy | | | Shifting CG, Hanging Payloads, Increased Autonomy | | | Increased flight time by 10% Increased deliveries by 10% | | |
| **Drone Package Delivery by 2030, Yearly Estimates** | Delivery Metrics | Revenue/ Cost per Year | Rhoman Efficiencies | Revenue/ Cost per Year | **Savings per Year** | Rhoman Efficiencies | Revenue/ Cost per Year | **Savings per Year** | Rhoman Efficiencies | Revenue /Cost per Year | **Savings per Year** | Rhoman Efficiencies | Revenue /Cost per Year | **Added Revenue per Year** |
| Packages Delivered by Drone, 2030 | 500M | $2.1B | | | | | | | | | | 550M | $2.3B | **$210M** |
| Package Deliveries per Day | 1,388,889 | $5.3M | | | | | | | | | | 1,527,778 | | |
| Deliveries per Drone per Day | 30 | | | | | | | | | | | 33 | | |
| Active Drones per Day | 46,296 | | 41,667 | | | | | | 41,667 | | | 46,296 | | |
| Drones per Operator | 9 | | 9 | | | 15 | | | 15 | | | 9 | | |
| Operators per Day ($75k Annual) | 5,556 | $422M | 4,630 | $352M | **$69M** | 3,086 | $235M | **$155M** | 2,778 | $212M | **$178M** | 5,144 | | |
| **Hardware/Non-Recurring** | | | | | | | | | | | | | | |
| Total Delivery Drones, $10k/Drone | 50,000 | $500M | 45,000 | $450M | **$50M** | | | | 45,000 | $450M | **$50M** | | | |
| Receiving Vessel Cost | $12,500 | | | | | | | | | | | | | |
| Number of Receiving Vessels | 175,000 | $2.19B | 157,500 | $1.97B | **$219M** | | | | 157,500 | $1.97B | **$219M** | | | |

**Shifting CG, Hanging Payloads:** *5%-15% better flight efficiency reduces required drones to meet customer need, drop payloads in tight driveways*

**Increased Autonomy:** *Increased autonomous capabilities mean more drones per operator*

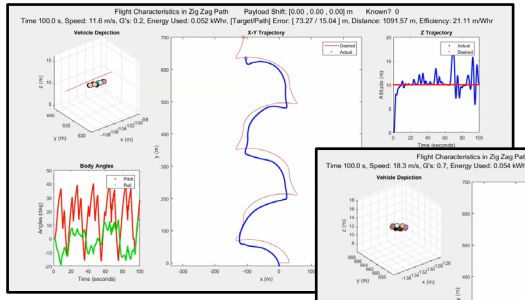
**COMBINE, Shifting CG, Hanging Payloads & Increased Autonomy:** *Fewer drones are needed and operators can handle more drones*

**Shifting CG, Hanging Payloads:** *5%-15% better flight efficiency enables 10% more customers with the same hardware capabilities*

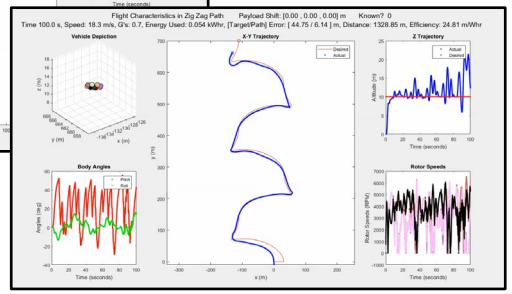
Sources: NASA & McKinsey Study, Ark Investments Study, IEEE The Economics of Drone Delivery, Guest Article, Deutsche Bank/Motley Fool

# Solution | Rhoman Adaptive Flight Controls

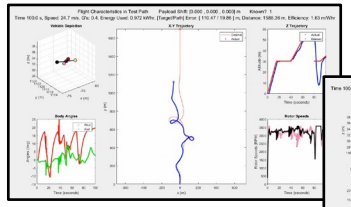
*21.11 m/Whr*



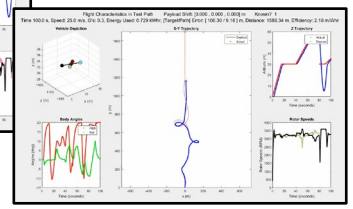
*24.81 m/Whr*



*1.63 m/Whr*



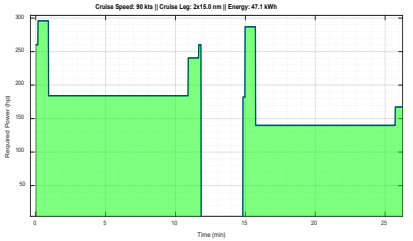
*2.18 m/Whr*

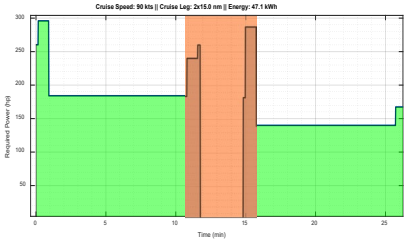


Including
**key payload information** and using our **unique turning methods** makes flight more efficient

Total Energy Saved: **10-30%**

## Benefits of Hovering to Deploy Payload Instead of Landing





| | Takeoff | Cruise | Land | Unload | Takeoff | Return | Land |
|---|---|---|---|---|---|---|---|
| Power Level (hP) | 293 | 184 | 240 | 0 | 288 | 138 | 181 |
| Total Power (hP) (Pwr*Time) | 271 | 1845 | 223 | 0 | 266 | 1384 | 109 |
| Energy Allocation (kWh) | 6.6% | 45.0% | 5.4% | 0.0% | 6.5% | 33.8% | 2.7% |
| Energy Used (kWh) | 3.1 | 21.2 | 2.6 | 0.0 | 3.1 | 15.9 | 1.2 |
| Mins | 0.93 | 10.05 | 0.93 | 2.78 | 0.93 | 10.05 | 0.60 |
| %-Time | 3.5% | 38.3% | 3.5% | 10.6% | 3.5% | 38.3% | 2.3% |

**Hover and Lower Payload**

| | | | |
|---|---|---|---|
| Hover-Power, Lower Payload | 170 | Conservative | |
| Time to Lower Payload | 0.67 | Conservative 40 second | |
| % of Total Energy (47 kWh) | 2.8% | | |
| kW Energy Used | 1.31 | | |

**Energy Savings**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| % Energy Removed | 6.6% | 45.0% | 5.4% | 0.0% | 6.5% | 33.8% | 2.7% |
| kWh Energy Removed | 3.1 | 21.2 | 2.6 | 0.0 | 3.1 | 15.9 | 1.2 |
| % Energy Added | 0.0% | 0.0% | 0.0% | 2.8% | 0.0% | 0.0% | 0.0% |
| kW Energy Added | 0.0 | 0.0 | 0.0 | 1.31 | 0.0 | 0.0 | 0.0 |
| **Total Energy Saved** | | | **4.3 kWh, 9.2%** | | | | |

# Future Scale | Rhoman Cloud

RHOMAN AEROSPACE

## Significant Future Expansion

Machines with Complex Controls & Autonomous Use Cases

### Aerial Taxi Market

$6.6B, 2030

26% CAGR

### Autonomous Cars Market

$1.6B, 2025

$3.2B, 2030

15% CAGR

### Autonomous Robotics Market

$110B, 2025

$221B, 2030

18% CAGR