COMMERCIAL DRONES: CURRENT STATE OF THE INDUSTRY

For UAS Mapping
Reno 2015

September 29, 2015

Presented by
Colin Snow, CEO and Founder

Copyright 2015 – Drone Analyst
Topics

Forecasts and investment

Growing ecosystem

Regulatory Environment

Challenges and Opportunities
# Headlines: hopes and headaches

<table>
<thead>
<tr>
<th>PARTNERSHIPS &amp; USE CASES</th>
<th>GROWING CONCERNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CyPhy Works Lands Military Deal For “Pocket Drone”</td>
<td>Soaring investment and lagging legislation — it’s a Wild West for drones</td>
</tr>
<tr>
<td>Matternet To Test The First Real Drone Delivery System In Switzerland</td>
<td>Do we need to put drones on a tighter leash?</td>
</tr>
<tr>
<td>How DroneDeploy’s app is about to make farming more efficient</td>
<td>Next Step for Drones: Defending Against Them</td>
</tr>
<tr>
<td>Workmode: Start-up creates Uber-like drone service</td>
<td>Antidrone defense systems are a rising new business as military, aviation concerns mount</td>
</tr>
<tr>
<td>Amazon wants a special air zone for its fancy delivery drones</td>
<td>Tech Firms Collaborating to Make Drone Air Traffic Safe</td>
</tr>
<tr>
<td></td>
<td>2 Airliners Have 100-Foot Near Miss With Drone Above New York</td>
</tr>
</tbody>
</table>

Source: CB Insights. The Future Frontier of Tech
Forecasts: diversity and hype

$2B - $92B
Investment activity: bets and bytes

Source: CB Insights and Drone Analyst
Funded companies by focus

Source: CB Insights.
Start-up funds: mini bets and bytes

$250K-$1M investments in:
1. Sensor hardware
2. Software applications
3. Cloud-based aerial data analysis tools
4. Drone-based services
5. Complete solutions for specific industries

$10 million for:
1. Product and technical resources
2. Platform-level support around the DJI SDK and product APIs
3. Access to preferred demos and beta programs
4. Co-branding opportunities and go-to-market support

Copyright 2015 – Drone Analyst
Growing ecosystem*

Legal – Sec 333  
UAS Insurance  
Operations and Logging  
Flight Readiness

*examples; not an endorsement of services
Incubators and innovators

- **DroneDeploy**: Beyond visual line of sight (BVLOS) autonomy
- **PrecisionHawk**: Low Altitude Tracking and Avoidance System (LATAS)
- **Ericsson**: 5G / Drone communications
- **Measure**: Drones-as-a-service, ROI tool
- **Workmode**: Drone surveys on-demand
- **Intel RealSense**: UAS Traffic Management (UTM)
- **GE Flyovers**: Destination Unknown
- **Qualcomm Robotics Accelerator**
Regulatory environment

FAA Modernization and Reform Act 2012

COA vs Experimental Cert vs Section 333 Exemptions

Six UAS Test Sites

Small UAS Notice of Proposed Rulemaking (NPRM)

Blanket COAs

Micro UAS Rule?

Congressional proposals

Federal privacy acts

State legislation

Local restrictions
Commercial drone operators

- France: 1622
- Canada: 1672
- U.K.: 850
- U.S.: 1658
- Sweden: 395
- Australia: 270

~1800

*Net Sec 333s as of 9/22/2015 | Source: FAA, Drone Analyst
Examples of commercial ops under Sec 333

Transportation
- BNSF

Construction
- Trimble
- Hilti

Electric Grid
- PPL
- Exelon
- Sempra Energy utility
- Consumers Energy

Oil & Gas
- Chevron

Precision Farming
- Topcon
- Wilbur-Ellis

Insurance
- Travelers
- State Farm
- USAA

Source: KPCB
Exemptions by market use case

FAA Section 333 Exemptions Operation / Mission*

- Precision Agriculture: 143
- Inspection / Monitoring: 513
- Mapping / Surveying: 335
- Film / Photo / Video: 1175
- Public Safety / First Responders: 99
- Other: 56

*Many applicants cited more than one operation type

Source: FAA and Drone Analyst
Exemptions by aircraft

There are more hobby-based aircraft flying under Section 333 than purpose-built ones.

DJI market share:
- 70% consumer
- 46% U.S. commercial

Source: FAA and sUAS News
Proposed rules

Key rules from FAA proposal for commercial drones

- Max speed: 100 mph
- Max weight: 55 lbs
- Max altitude: 500 ft.
- Fly during daylight only
- Operator requirements:
  - At least 17 years old
  - Have passed initial, recurring tests
  - Obtain operating certificate
  - Vetted by TSA
- Rules don’t allow for drone deliveries as envisioned (sorry Amazon)
- Must be directly visible by operator

Source: Federal Aviation Administration

Image credit: LA Times, sUAS News
Impact of rules on mapping / surveying

**Opportunities**

- Small mines
- Stockpiles
- Easements
- Shopping centers
- Stadiums
  …etc.

**Challenges**

- Transportation corridors
- Large maps / BLOS
- Fixed wing
- Autonomous flights

Laser imaging

3D imaging

Data for architectural engineering firms
More challenges

Public Acceptance / Risk Acceptance

Certifications/Training

Power/energy - Battery life time

Sense/Detect and Avoid

Communications/Frequency Spectrum

Hi-res data download bottleneck – ITS BATCH!

Legal framework / Privacy

Cyber security / Hijacking via GPS spoofing

Liability and Insurance

Exports Controls - different rules in different countries
What happens next?
Get the complete report

Commercial Drones Report: Current State of the U.S. Industry
http://droneanalyst.com/purchase-research/

12 figures
4 data tables
34 pages
Drone Analyst Research and Advisors is a research and consulting firm supporting all participants in the commercial unmanned aircraft systems (UAS) industry.

We provide research-based insights needed to make critical investment decisions with confidence.

Our focus is on the needs of three constituents:

- **Buyers of UAS technology and services** – to help inform their acquisition decisions
- **Suppliers and service providers** – who need research and insight into buyer needs
- **Investors** – who need to distinguish technical and market viability

This focus, plus research as a foundation and reach into a community of more than 80,000 business executives and innovators through social media and media partnerships, allows Drone Analyst to deliver a high-value, low-risk method for achieving optimal understanding.
This publication is approved for public release and distribution under the terms of the ASPRS UAS Mapping Reno Conference Committee.

Drone Analyst products and services mentioned herein as well as their respective logos are trademarks of Drone Analyst.

These materials are provided by Drone Analyst for informational purposes only, without representation or warranty of any kind, and Drone Analyst shall not be liable for errors or omissions with respect to the materials.

In particular, Drone Analyst has no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and Drone Analyst strategy and possible future developments, products, and/or research directions are all subject to change and may be changed by Drone Analyst at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, research notes, or web content.