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Global Outlook of Aviation & Drones

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AEROSPACE ARIZONA

GLOBAL OUTLOOK IN AVIATION & DRONES

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FUTURE OF AVIATION

What will define the next few years in aviation -

- Drones
- Artificial Intelligence & Robotics
- Cyber Security
- Environmental Change
- Big Data
- Emerging Technologies
- In Flight Services
- Apps

AVIATION FORECAST

The aviation industry supports 65.5 million jobs around the world.

The aviation industry supports $2.7 trillion (3.6%) of the world's gross domestic product (GDP)

By 2036, global air transport is forecast to support 97.8 million jobs and contribute $5.7 trillion to the global economy.

Aviation is now going beyond mobility between continents and cities – it is starting to impact mobility within cities.

Emerging technologies are reshaping with robotics, artificial intelligence, the internet of things, unmanned aircraft systems and the push for hybrid and electric airplanes

WHO IS USING DRONES/UAS

Drones are small remotely controlled aerial vehicles, i.e., unmanned aircraft systems.
Some common applications of Drones

- Agriculture
- Construction
- Emergency Services
- Film Making
- Environmental
- Insurance

Common agencies to use drones are:

- Department of transportation
- Emergency management
- Public safety
- Department of Agriculture
- Universities

FACTORS THAT INFLUENCE UAS GROWTH

The future of the drone industry is still up for debate in many ways, since it depends on five factors that will dictate its value and influence

- First, and perhaps most vital, is the issue of **Public Acceptance.**
- **Regulations** will continue to determine the viability of different applications
- **Training & Standards** will be needed in the future to ensure safety
- **Technological Capabilities** will enable new drone applications
- **Economic Development** will determine whether the applications will have a viable customer base

PATH FORWARD FOR DRONES

Line of Sight (In Progress)

Regulations currently restrict drones to very low-level airspace and require human operators to watch and guide them

Beyond Visual Line of Sight (Working Towards)

New regulations and standards in the next few years will permit drone flights that go beyond the line of sight, creating demand for larger, more sophisticated drones.

Remote Operations (Near Future)

Once the technology is proved safe, we expect that regulators will allow remote operation, making it possible for drones to inspect hundreds of miles of power lines and deliver mail and parcels from remote locations.

Self Piloted Aircrafts (Future)

The final frontier of airborne drones is pilot-optional planes. This would need totally reliable long-distance wireless data communications

STANDARDS FOR TRAINING & CERTIFICATION

Organizations like ASTM, AUVSI, ANSI, ISO, etc. are working to coordinate and accelerate the development of the standards and conformity assessment programs needed to facilitate the safe, mass integration of UAS into the national airspace system (NAS)

Standards currently published or under revision/development including - operations over people; extended and beyond visual line of sight operations; operational risk assessments, etc.

ASTM PARACHUTE STANDARDS

Specification defines the design, fabrication, and test requirements of installable, deployable parachute recovery systems (PRS) that are designed to be integrated to lessen the impact energy of the system.

Standard requires an autonomous triggering system to detect failures and deploy the parachute without relying on the pilot as well as a flight termination system.

To meet the standard, parachute systems will need to pass a 45 deployments for multi-rotors through which they need to prove the effectiveness of the system.

REMOTE ID

Remote ID is an important layer of technology utilizing hardware and software solutions that will enable drones to be identified while operating.

The two ways of remotely identifying drones, will be known as Standard Remote ID and Limited Remote ID, and drones incapable of Remote ID will operate in areas known as FAA-Recognized Identification Areas (FRIAs).

Standard Remote ID UAS use both network and broadcast Remote ID, while Limited Remote ID UAS use only network.

Any UAS used for commercial operations under Part 107 and any recreational UAVs 0.55 pounds and over will require Remote ID.

For privacy considerations, it is proposed that end-users have the option to use a Session ID that is randomly generated for every flight

CURRENT GLOBAL DRONE DELIVERY

United States

- FAA UAS Integration Pilot Program has given opportunities to companies like UPS, Wing, Zipline, Flytrex, etc. to use drone for delivery
- UPS – Matterent first company to do routine medical drone delivery for revenue

United Kingdom

- UK is moving faster than the US to approve the widespread deployment of commercial drones.
- Amazon has made significant advancements here

Europe

- European Union is in the process of creating laws to regulate commercial drone-flying corridors of airspace called U-Space to allow a wide deployment of drone delivery services.
- Matternet now works with the government mail system, Swiss Post, to deliver emergency medical supplies

CURRENT GLOBAL DRONE DELIVERY

Canada

Drone Delivery Canada works with the Canadian government to test long-distance drone delivery flights that go out of the operator's sight and are able to operate at night.

Ireland

Manna Aero starting to delivery fast-food via drones

Africa

Zipline International works with the government of Rwanda and Ghana to deliver medical supplies using drones

Australia

Wing has been approved by Australian Civil Aviation Authority to operate ongoing drone deliveries in North Canberra and Logan.

Singapore

Airbus has begun shore-to-ship trials in Singapore with its Skyways parcel delivery drone.

UAS INTEGRATION PILOT PROGRAM

Established by **US PRESIDENTIAL MEMORANDUM**

TEST and **EVALUATE** various models of state, local and tribal government involvement in the development of regulations

ENCOURAGE UAS operators to develop and test new innovative UAS CONOPS

INFORM development of federal guidelines and regulatory decisions on UAS operations nationwide

UNIQUE USE CASES

- Hurricane Response
- Wildlife Mitigation & Monitoring
- Aerial Herbicide Application
- Fire Drones for Fire Fighting

HURRICANE RESPONSE

Drones demonstrate a great value during Hurricane response:

- Update conditions to get people off the road.
- Monitor evacuation routes and traffic.
- Gather and push real-time information on infrastructure and road conditions.
- Post-storm damage assessment for repairs.
- Assist with search, rescue and cleanup has helped speed disaster recovery.

WILDLIFE MITIGATION & MONITORING

The world's increasingly busy airports face a growing threat of birdstrikes and wildlife hazards, partly due to expanding urban environments and bird populations, but also due to the global growth of airport traffic.

Collision between birds and planes is an issue that airports and air transportation agencies have been taking very seriously.

Estimated $900+ million in damage to U.S. civil and military aircraft annually.

Over 250 people have been killed worldwide as a result of wildlife strikes since 1988.

AERIAL HERBICIDE/PESTICIDE APPLICATIONS

Agricultural drone technology has been improving in the last few years -

- Minimizes volume of chemical output in comparison to traditional aerial application
- Non-Invasive treatment approach
- Targeted treatment
- 40-60 Times Faster Than Manual Spraying
- Reduced risk of chemical exposure

FIRE DRONES FOR PRESCRIBED FIRE

Drones can help administer ‘Prescribed Fire’ which is beneficial as it -

- Removes unwanted species that threaten species native to an ecosystem
- Reduces hazardous fuels, protecting human communities from extreme fires
- Minimizes the spread of pest insects and disease
- Improves habitat for threatened and endangered species
- Recycles nutrients back to the soil

AEROSPACE ARIZONA

Aerospace Arizona Association promotes and advances the unmanned industry throughout the State of Arizona through actions focused on advocacy, education, networking and partnerships.

Contact us:

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AIRAVAT AVIATION SOLUTIONS

Airavat provides Unmanned systems program management and training support to commercial companies and government agencies in the United States and abroad

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