



THE  
NON-MILITARY RPAS MARKET  
**(Commercial & Non-Commercial)**

**Current Status**

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RPAS Usage  
Professional RPAS Operations**

**Professional Market Sectors**

**Aerial Work Sectors**

**Flight Mission Purposes**

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**Examples of Flight Operations &  
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**Current Market Situation**



# The Non-Military RPAS Market (Commercial & Non-Commercial)



## Rules & Regulations

With an ever-increasing number of States bringing out operational rules or regulations, the non-military remotely piloted aircraft systems (RPAS) market is growing substantially. This is very clearly the case in Europe, where the following 28 countries in the European Union (EU) + Norway & Switzerland now have an RPAS regulation in place:

Austria	Belgium	Bulgaria
Croatia	Cyprus	Czech Rep.
Denmark	Estonia	Finland
France	Germany	Greece
Hungary <sup>NR</sup>	Ireland	Italy
Latvia	Lithuania	Luxembourg
Malta <sup>NR</sup>	Netherlands	Norway
Poland	Portugal	Romania
Slovak Rep.	Slovenia	Spain
Sweden	Switzerland <sup>GALLO</sup>	UK

Note: <sup>NR</sup> = Does not have a regulation, but it has operational rules that are applied on a case by case basis.

<sup>GALLO</sup> = Switzerland does not have a RPAS regulation, but a significant amount of commercial & non-commercial RPAS activity takes place under «adapted» model aircraft rules [Guidance for an Authorisation for Low Level Operation of RPAS (GALLO)].

## Certificated Operators

The steadily increasing number of nationally approved or authorized (jointly hereinafter referred to as certificated) commercial RPAS operators in Europe is a positive sign of the European commercial RPAS market development. However, it should be noted that the criteria used to define a certificated commercial RPAS operator vary greatly from country to country.

According to the figures at our disposal (and our best estimates), there are 18 973 certificated civil RPAS operators (companies commercially operating RPAS) in Europe (Aug. 2018), namely:

Austria (198)	Belgium (200 <sup>est</sup> )	Bulgaria (20 <sup>est</sup> )
Croatia (30)	Cyprus (2)	Czech Rep. (24)
Denmark (575)	Estonia (20 <sup>est</sup> )	Finland (33)
France (7032 <sup>est</sup> )	Germany (750 <sup>est</sup> )	Greece (30 <sup>est</sup> )
Hungary	Ireland (30)	Italy (965)
Latvia (20 <sup>est</sup> )	Lithuania (20 <sup>est</sup> )	Luxembourg (10 <sup>est</sup> )
Malta	Netherlands (498)	Norway (300)
Poland (2000)	Portugal (30 <sup>est</sup> )	Romania (20 <sup>est</sup> )
Slovak Rep. (10 <sup>est</sup> )	Slovenia (20 <sup>est</sup> )	Spain (3040)
Sweden (244)	Switzerland (5)	UK (2847)

Note: Company/organisation employing pilots & conducting flight operations with RPAS.

Quantity certificated RPAS operators between brackets.

## Disparity

Currently, there is a large degree of disparity in the following

RPAS-related fields between the EU States:

- Rules & regulations (*often only in the national language*);
- Pilot training (syllabus) & qualification (licence);
- Flight school qualification;
- Operator qualification (licence).

In addition, there is an absence of mutual recognition of RPAS-related rules and regulations, pilot licences, and operator licences between EU States, which makes it extremely complicated and expensive for a commercial RPAS operator registered in one of the EU States to operate in another.

## The DroneRules Project

The DroneRules project ([www.drone.rules.eu](http://www.drone.rules.eu)), which was co-funded by the EU, developed a comprehensive web site for RPAS operators in the EU (+ Norway and Switzerland).

The purpose of this portal is to increase awareness and facilitate understanding with commercial RPAS operators of the legal environment and constraints in relation to light RPAS operations (safety, privacy and data protection, insurance, etc.); there is also specific information for non-commercial operators (incl. hobbyists).

The DroneRules project contributes to facilitating the understanding of the access to the European market for commercial operators intending to use RPAS in their home country, or in other EU countries; it also showcases the opportunities for economic and job market growth that RPAS represent for entrepreneurs and Small & Medium-sized Enterprises (SMEs).

## General Awareness Creation

In this context, as well as in light of the necessary general awareness creation efforts that now have to be undertaken towards the general public, this article proposes an identification and classification of the non-military (civil) RPAS market.

This document proposes:

- A segmentation of the non-military RPAS market in 24 sectors
- The distinction between commercial and non-commercial RPAS flight operations performed in these market sectors
- The 28 flight mission purposes that can take place during commercial and non-commercial flight operations
- Explanations of the indicated market sectors and flight mission purposes

As the flight mission purpose defines the payload required to conduct it, and in order to be complete, it is proposed to split payloads into 2 categories:

- Imaging payloads
  - Non-Imaging payloads
- and examples in both categories are indicated.

In conclusion there is a section indicating the following for each of the 24 market sectors:

- The type of operator (commercial; non-commercial; corporate; governmental)
- The location of the operation [outdoor (open air); indoor (including GPS-denied covered & enclosed spaces)]
- Aerial work sub-sectors
- Examples for each aerial work sub-sector

The objective of this holistic approach is to, within the context of the Global Access Initiative, lay the basis for a common understanding of the non-military RPAS market and its potential, in such a way, that it is comprehensible to all.

### Aircraft Segmentation

A I R C R A F T	Lighter Than Air	Not Power Driven		Free Balloon		R P A S  E x i s t	
		Power Driven		Captive Balloon			
	Heavier Than Air	Not Power Driven		Glider	Tethered Glider		
		Power Driven		Aeroplane	Landplane		
		Tethered & Non-Tethered			Seaplane		
		Power Driven			Amphibian		
		Tethered & Non-Tethered		Rotorcraft	Gyroplane		
		Power Driven			Helicopter		
	Tethered & Non-Tethered		Ornithopter ( <i>flapping wing</i> )				

### Current RPAS Usage

Governmental	M U T U A L I Z A T I O N	Military			✳	N O N  M I L I T A R Y  O P E R A T I O N S
		Non-Military		State Flights <i>Security-related</i>	Customs Police Border Guards Coast Guard	
		VLOS E-VLOS BVLOS RLOS B-RLOS	Not State Flights <i>Incl. Safety-related</i>	Civil Protection Fire Fighters National Mapping Agencies	◆ ◆ ◆	
Non-Governmental	Commercial Air Transport <i>(Transport of Persons &amp; Freight)</i>		Scheduled Air Service Non-Scheduled Revenue Operations Non-Revenue Operations	◆		
	General Aviation		Corporate Operations Flight Training / Instruction Pleasure ( <i>private non-commercial</i> )			
	Aerial Work		Commercial Non-Commercial ( <i>incl. Corporate Ops</i> ) Training / Instruction Other Miscellaneous	◆ ◆ ◆ ◆		
	Leisure		Model Aircraft Recreational Drones Flying Toys	○ ○ ○		
		VLOS = Visual Line-of-Sight RLOS = Radio line-of-Sight	E-VLOS = Extended VLOS B-RLOS = Beyond RLOS	BVLOS = Beyond VLOS		
Symbols		✳ State Flights	◆ Not State & Professional Flights	○ Leisure Flights		

### Professional RPAS Operations

AERIAL WORK	
<b>Commercial &amp; Non-Commercial</b> ( <i>Incl. Corporate Operations: Conducted by a corporate entity for its own purposes</i> ) <i>An aircraft operation in which an aircraft is used for specialized (flight) services such as agriculture, construction, photography, surveying, observation &amp; patrol, search &amp; rescue, aerial advertisement, etc.</i> <i>(Chicago Convention, Annex 6 Part 1, Chapter 1.H9)</i>	
<b>Flight Training / Instruction</b> ( <i>Private &amp; Commercial</i> )	- Duo ( <i>student instruction by licensed pilot</i> ) - Solo ( <i>unaided student flight</i> ) - Check ( <i>qualification verification of pilot license holder</i> )
<b>Other Miscellaneous</b> ( <i>Private &amp; Commercial</i> )	- Test / Experimental - Demonstration - Ferry / Positioning - AirShow/Race
COMMERCIAL AIR TRANSPORT	
<b>Commercial &amp; Non-Commercial</b>	- Freight:   - Internal Loads - External Loads - Persons



**PREAMBLE**

This article identifies and classifies the non-military RPAS market. It proposes a segmentation of the non-military RPAS market sectors, the commercial and non-commercial RPAS flight operations performed in these market sectors, as well as terms (& explanations) for each of the indicated market sectors and flight mission purposes. As the flight mission purpose defines the payload required to conduct it, and in order to be complete, a high level categorization of payloads is also proposed.

**PROFESSIONAL RPAS MARKET SECTORS**

The market sectors in which non-military RPAS applications (commercial & non-commercial) currently take place, or probably will take place in the future, are (in alphabetical order):

Aerial Photography, Audio-Visual Production, Advertising
Agriculture, Fishery / Pisciculture, Forestry
Audio-Visual Production, Advertising, Arts
Cinema & TV Industry
Construction & Real Estate
Environmental Protection & Conservation
Entertainment & Artistic Expression
Flight Training / Instruction
Heritage Site & Historical Monument Management
Humanitarian Aid
Insurance ( <i>Accident &amp; Claim Investigation</i> )
Maintenance
Mining & Exploration
Miscellaneous - Demonstration - Ferry/Positioning - Air Show/Racing
News Gathering & Broadcasting
Policy Compliance & Obtaining Legal Proof
Public Safety
Public Security & Law Enforcement
Research & Science
Remote Operations - Sensing
Remote Operations - Non-Sensing
Transport
Utility Companies ( <i>Public &amp; Private</i> )
Leisure & Sport - Flying Toys - Recreational - Model Aircraft

**Explanation of Terms**

**Aerial Photography, Audio-Visual Production, Advertising**

Flight operations relative to the production of aerial imagery for educational & publicity & informational purposes.

**Agriculture, Fishery/Pisciculture, Forestry**

Flight operation relative to farming (crop cultivation & livestock breeding), inshore & offshore fishing, fish farming, tree cultivation.

**Audio-Visual Production, Advertising, Arts**

Flight operation relative to the production of aerial imagery for educational & publicity purpose, and flight operations for artistic expression 19/06/2017.

**Cinema & TV Industry**

Flight operations for the cinema & TV industry relative to the production of feature & documentary films and the creation of special effects.

**Construction & Real Estate**

Flight operations for various purposes relative to all phases

of construction & related promotional & sales activities. All applications except maintenance.

**Entertainment & Artistic Expression**

Flight operations for public entertainment purposes and for artistic expression.

**Environmental Protection & Conservation**

Flight operations carried out with the purpose to contribute to maintaining or restoring the quality of the natural environment and protecting wildlife.

**Flight Training/Instruction**

Flight operations carried out by flight schools for the purpose of training/instruction of drone pilots, and flights conducted to maintain pilot competence.

**Heritage Site & Historical Monument Management**

Flight operations (incl. maintenance) relative to the conservation & documentation of historical sites & monuments.

**Humanitarian Aid**

Flight operations carried out within the context of natural & man-made disasters by or for non-governmental organisations (NGOs) with the purpose to assist people in need.

**Insurance (Accident & Claim Investigation)**

Flight operations carried out by or for insurance companies.

**Maintenance**

Flight operations conducted for maintenance purposes [of aircraft (hull), antennae, breakwaters, bridges, buildings (internally & externally), cable cars, canals & locks, chimneys, cooling towers, dams, dikes, flare stacks, harbours, holding tanks, houses & buildings (thermal isolation mapping), industrial installations (.e.g. powerplants; refineries), infrastructure, objects, pipelines, powerlines & pylons, quarries, railway cars, railway overhead power lines, railway tracks, rivers, roads & highways, roofs, runways, ships, shipping locks, ski slopes, solar farms, structures (incl. offshore platforms), tunnels, wind turbines].

**Mining & Exploration**

Flight operations related to exploration (incl. oil & gas), mining and quarry exploitation. All applications, except maintenance.

**Miscellaneous - Demonstration**

Flight operations carried out for regulatory (certification) authorities or potential customers.

**Miscellaneous - Ferry/Positioning**

Delivery flights for the purpose of returning a drone to its base of operations, delivering a new drone from its place of manufacture to its customer, flying a drone from one base of operations to another or flying a drone to or from a maintenance facility for repairs, overhaul or other work.

**Miscellaneous - Air Show/Racing**

Flight operation carried out within the context of a public air show or drone race.

**News Gathering & Broadcasting**

Flight operations carried out for journalistic purposes.

**Policy Compliance & Obtaining Legal Proof**

Flight missions conducted to verify compliance with specific government policies and/or to obtain specific legal proof of non-compliance.

**Public Safety**

Flight operations carried out by or for civil protection/defence, emergency services, fire brigades & firefighting services, public services, rescue services and utility companies, relative to safety of the general public.

**Public Security & Law Enforcement**

Flight operations carried out by or for municipal, regional or state police, border guards, coast guard, custom authorities, harbour authorities.

**Remote Operations - Sensing**

Flight operations with drones equipped with imaging & non-imaging payloads for remote sensing purposes other than indicated in this list.

**Remote Operations - Non-Sensing**

Flight operations with drones equipped with non-imaging

payloads, or without any payload, for specific purposes other than indicated in this list.

**Research & Science**

Flight operations conducted for private or public research or scientific purposes. Includes flight operations carried out for the purpose of testing, experimentation, or validation of new concepts and/or technologies for company internal assessment purposes.

**Transport**

Flight carried out for the carriage & delivery of goods or persons.

**Utility Companies (Public & Private)**

Corporate entity or governmental agency performing a public service subject to governmental regulation (e.g. communications, gas, railways, transportation, water management). All applications, except maintenance.

**RPAS FLIGHT OPERATIONS (AERIAL WORK)**

Non-military RPAS flight operations fall into two categories:

- Commercial: Flights carried out by companies for paying customers.
- Non-Commercial: Flights carried out by companies or organisations without external financial compensation from customers.

Non-commercial operations include Corporate Operations, which should be understood as: Flights carried out by companies or organisations to meet their own internal requirements.

**RPAS FLIGHT MISSION PURPOSES**

The flight mission purposes of commercial and non-commercial flight operations can be categorized as follows:

Advertising	Aerial Acrobatics & Special Effects	
Aerial Photography & Film / Video		Deterring
Dispensing	Exploration	Identification
Inspection	Localisation	Mapping
Manipulation	Measuring	Monitoring
Observation	Patrolling	Relief Flight
Search & Rescue	Sensing	Special Purpose
Spotting	Spraying	Surveillance
Surveying	Testing	Tracking
Transport - Goods	Transport - Persons	Water Bombing

**Explanation of Terms**

**Advertising**

Towing publicity banners, skywriting, airships with publicity projected from inside on the inside of the external envelope or publicity banners mounted on the outside of the envelope.

**Aerial Acrobatics & Special Effects**

Flights for the cinema & TV industry, as well as for public entertainment purposes.

**Aerial Photography & Film/Video**

Production of aerial photography, film/video footage for the production of films, documentaries, advertisements/video clips, printed publications, or news broadcasting (news illustration on TV).

**Broadcasting**

Distribution of video via television to a dispersed audience.

**Deterring**

Flight operation with the purpose to chase animals (e.g. birds) from specific sites.

**Dispensing**

Aerial distribution of solids (e.g. capsules, fertiliser, granulates, insects, pamphlets, pellets, seedlings, seeds, other).

**Exploration**

The act of searching the earth's surface and sub-surface with

the intent of finding minerals, oil, etc.

**Identification**

The process of recognizing as being a certain person or thing or activity.

**Inspection**

Examination with the intent to find faults, errors, problems, malfunctions or specific phenomena.

**Localisation**

Supplying the geographical coordinates of activities, faults, errors, malfunctions, equipment, structures, persons, livestock or specific phenomena.

**Manipulation**

The modification of a direction or position, or the displacement, of an inert object.

**Measurement**

The process of measuring using a particular standard.

**Mapping**

Process of creating a diagrammatic representation (incl. 3D modelling).

**Monitoring:**

Observation on a regular basis over a period of time.

**Observation**

Examination of an activity, person, group, area or phenomena.

**Patrolling**

Searching for a specific activity, person, group or phenomena.

**Relief Flight**

Flight carried out for humanitarian purposes to transport relief supplies such as food, clothing, shelter, medical and other items during or after an emergency and/or disaster.

**Search & Rescue**

Looking for missing persons.

**Security**

A combination of measures, as well as human & material resources intended to safeguard against unlawful acts

**Sensing**

Looking for & analysing or defining the geographical coordinates of phenomena & transmitting or registering them.

**Skypainting**

Flight carried out by a swarm of aircraft or a single aircraft equipped with various types of lights and/or other devices (e.g. smoke generators) to create an aerial spectacle. A computer generates and controls the master flight plan, the airborne lights and the smoke output.

**Skywriting**

Flight carried out by a swarm of aircraft or a single aircraft to create an written aerial message using lights and/or other devices (e.g. smoke generators) on the aircraft involved. A computer generates and controls the master flight plan, the airborne lights and/or other devices.

**Special Purpose**

Flights serving a specific purpose [e.g. communication & WIFI relay; (tethered) aerial electricity generation]

**Spotting**

Looking for an activity, object, person, group or phenomena & registering their geographical coordinates.

**Spraying**

The process of spreading liquid substances [e.g. insecticide, fertiliser].

**Surveillance**

Close observation of an activity, person, group, area or phenomena.

**Surveying**

Detailed inspection of a geo-referenced section of the earth's surface (incl. structures) with the purpose to study or measure altitudes, angles, distances, phenomena & structures flown over, and recording them.

**Testing**

Ascertaining a capability or correct functioning.

**Tracking**

The process of following something or someone.

## Transport

Flight carried out for the carriage & delivery of goods or persons.

## Validation

Confirmation by examination & provision of objective evidence that the particular requirements for a specific intended use are fulfilled.

## Water Bombing

Flight carried out to discharge large quantities of liquid on a fire with the intent to extinguish it or stop it from spreading.

## RPAS PAYLOADS

**Payload** Elements on a remotely piloted aircraft (RPA) that are not necessary for flight, but are carried for the purpose of achieving specific mission objectives.

**Imaging** Elements on a RPA that permit the capture of imagery (and in some cases tracking) and the recording or transmission of such data. Imaging payloads (gimballed & non-gimballed) include:

- Digital Photo Camera (bracket-mounted)
- Electric-Optical (EO) - Infrared (IR)
- Near Infrared - Corona Effect Imager
- Light Detection & Ranging (LiDAR)
- Flash LiDAR - Hyperspectral
- Laser Scanner - Light Intensification
- Linescanner - Multispectral
- Multi Layer Laser - Radar
- Solid State Photon Counter
- Synthetic Aperture Radar

**Non-Imaging** Elements on an RPA that permit the capture of non-imagery data and the recording or transmission of such data (e.g. sensors in the following domains: atmospheric, audio, frequency, laser, locational, mineral content, meteorological, moving target indicator, particle analysis, phenomena analysis, radiation analysis), as well as elements permitting:

- Communication relay
- Data recording
- Dispensing systems (solids)
- Emergency beacon detection
- Manipulating/robotic arm
- Spotlight
- Spraying systems (liquids)
- Water bombing system

## EXAMPLES OF FLIGHT MISSION PURPOSES PER MARKET SECTOR

### Commercial & Non-Commercial

#### AERIAL PHOTOGRAPHY, AUDIO-VISUAL PRODUCTION, ADVERTISING

<b>Operators</b>	Commercial	Corporate
<b>Location</b>	Outdoor & Indoor	Tethered & Non-tethered
<b>Sub-Sector</b>	<b>Aerial Photography</b>	
Observation	[e.g. private customers: marriages] [e.g. journalistic & documentary purposes]	
<b>Sub-Sector</b>	<b>Advertising</b>	
Advertising	Publicity in or on airships (indoor & outdoor) Towing of publicity banners	
Skywriting		
<b>Sub-Sector</b>	<b>Audio-Visual Production</b>	
Cinema & TV	[e.g. athlete performance training/evaluation] [e.g. special effects] [e.g. public rallies, sporting events; rock concerts]	
<b>Sub-Sector</b>	<b>Artistic Expression</b>	
Entertainment		
Skypainting		

## AGRICULTURE, FISHERY/PISCICULTURE, FORESTRY

<b>Operators</b>	Commercial	Corporate
<b>Location</b>	Outdoor & Indoor	
<b>Sub-Sector</b>	<b>Agriculture</b>	
Deterent	[e.g. protecting high value crops from birds]	
Dispensing	[e.g. fertiliser pellets, pollination agents, seeding, seedlings, capsules with useful insect larvae]	
Identification	[e.g. disease, insects/parasites]	
Inspection	[e.g. conformity with agricultural policy; crop growth vigor; crop health; crop maturity; crop yield; disease; parasites; seedling growth density; soil erosion; soil moisture requirement; water leaks (irrigation piping); weed growth; wildlife/pest impact]	
Inspection	Meteorological damage impact & mapping ( <i>drought, hail, icing, lightning, rain, snow, temperature, tornados, wind</i> )	
Inspection	Post Natural Disaster ( <i>drainage, earth quake, flooding, forest fire, hurricane, mud/land slide, tornado, tsunami, volcano eruption</i> )	
Localisation	[e.g. very young animals, bird nestings ( <i>plow planning</i> ); crop disease; insects/parasites; livestock; soil erosion; weed growth; where to fertilise; where to use insecticide; wildlife]	
Mapping	[e.g. diseased crops; field delineation; hydrogrammetric; irrigation control; parasite control; pest control; re-seeding; selective fertilising; selective harvesting; selective insecticide spraying; selective irrigation; soil density & composition; weed control]	
Measurement	[e.g. slope angles; hygrometric; volumetric]	
Monitoring	[farm equipment; machinery & facilities; livestock]	
Spraying	[e.g. fertilizer; insecticide/pesticide; water]	
Tracking	Livestock	
<b>Sub-Sector</b>	<b>Fishery/Pisciculture</b>	
Localisation	Fish schools, algae	
Monitoring	Fish pens, oyster farms, algae proliferation	
Inspection	Meteorological damage impact ( <i>icing, lightning, temperature, storms</i> ) Ecological impact	
<b>Sub-Sector</b>	<b>Forestry</b>	
Localisation	[e.g. tree disease]	
Identification	[e.g. disease, insects/parasites]	
Inspection	[e.g. conformity with agricultural policy; tree growth vigor; tree health; tree maturity; disease; parasites; seedling growth density; soil erosion; soil moisture requirement; water leaks ( <i>irrigation piping</i> ); weed growth; wildlife/pest impact]	
Inspection	[e.g. Meteorological damage impact mapping ( <i>drought, hail, icing, lightning, rain, snow, temperature, tornados, wind</i> )]	
Inspection	[e.g. Post Natural Disaster ( <i>drainage, earth quake, flooding, forest fire, hurricane, mud/land slide, tornado, tsunami, volcano eruption</i> )]	
Localisation	[e.g. animal/bird nestings ( <i>harvest planning</i> ); tree disease; insects/parasites; soil erosion; where to use insecticide; wildlife]	
Mapping	[e.g. tree growth delineation; hydrogrammetric; irrigation control; parasite control; pest control; selective harvesting; selective insecticide spraying; selective irrigation]	
Measurement	[e.g. slope angles; hygrometric; volumetric]	
Monitoring	[e.g. farm equipment; machinery & facilities; livestock]	
Spraying	[e.g. fertilizer; insecticide/pesticide; water]	
<b>Sub-Sector</b>	<b>CINEMA &amp; TV INDUSTRY</b>	
Operators	Commercial	Corporate



Location Outdoor & Indoor Tethered & Non-tethered  
**Sub-Sector** **Aerial Acrobatics**  
**Aerial Film/Video Footage**  
**Special Effects**

CONSTRUCTION & REAL ESTATE

**Operators** Commercial Corporate  
**Location** Outdoor  
**Mission Purposes**  
 Advertising  
 Deterrent [e.g. avoiding birds to nest on construction sites]  
 Mapping [e.g. 3D modelling; construction planning; construction reporting]  
 Measuring [e.g. construction planning; construction reporting; topographic survey]  
 Patrolling [e.g. perimeter security]  
 Photography [e.g. real estate agencies]

ENVIRONMENTAL PROTECTION & CONSERVATION

**Operators** Commercial Non-Commercial  
 - Public Authorities  
 - Corporate  
**Location** Outdoor  
**Mission Purposes**  
 Inspection [e.g. biodiversity; coastal erosion; invasive animal species detection; invasive plant species detection; pollution impact];  
 Monitoring [e.g. aerial pollution; ecosystem impact; glacier; iceberg; ice cap; maritime ice flow; maritime pollution; salt water seepage; terrestrial pollution]  
 Patrolling [e.g. wildlife conservation & anti-poaching]  
 Sensing [e.g. algae proliferation; atmospheric measurements]  
 Spraying [e.g. insect control]  
 Tracking [e.g. wildlife counting]

ENTERTAINMENT & ARTISTIC EXPRESSION

**Operators** Commercial Non-Commercial  
 - Corporate  
 Private Person  
**Location** Outdoor & Indoor  
**Flight Purpose**  
 Advertising Skypainting Skywriting  
 Miscellaneous [e.g. aerial shows, racing]

FLIGHT TRAINING/INSTRUCTION

**Operators** Commercial Non-Commercial  
 - Corporate  
 Private Person  
**Location** Outdoor & Indoor  
**Flight Purpose**  
 Duo Student instruction by licensed pilot  
 Solo Unaided student flight  
 Check Qualification verification of pilot license holder

HERITAGE SITE & HISTORICAL MONUMENT MANAGEMENT

**Operators** Commercial Non-Commercial  
 - Public Authorities  
 - Corporate  
**Location** Outdoor & Indoor  
**Mission Purposes**  
 Aerial Photography & Video  
 Inspection [e.g. site or monument erosion]  
 Mapping [e.g. historical site; 3D modelling of historical building or structure]  
 Measuring [e.g. pollution impact]  
 Monitoring [e.g. evaluating environmental impact]

Patrolling [e.g. search for & discovery of archeology sites]  
 Surveying [e.g. pre- & post restauration]

HUMANITARIAN RELIEF

**Operators** Non-Commercial  
 - Public Authorities  
 - Private [e.g. Red Cross; Red Crescent]  
 - NGO (Non-Governmental Organisation)

**Location** Outdoor & Indoor

**Mission Purposes**

Inspection [e.g. Post Natural Disaster (*earth quake, flooding, forest fire, hurricane, mud/land slide, tornado, tsunami, volcano eruption*)]  
 [e.g. Post man-made disaster (*industrial mishap, civil war, revolution, war*)]  
 Localisation [e.g. injured persons; missing persons]  
 Mapping [e.g. 3D modelling; reconstruction planning]  
 Relief Flight  
 Search & Rescue  
 Spotting [e.g. searching for boats with illegal immigrants]  
 Transport Medical supplies

INSURANCE (Accident & Claim Investigations)

**Operators** Commercial Non-Commercial  
 - Corporate

**Location** Outdoor & Indoor

**Mission Purposes**

Inspection [e.g. buildings & structures; infrastructure; maritime accident - inshore; maritime accident - offshore; aircraft crash; fire; industrial accident; railway accident; road/highway accident]  
 Inspection [e.g. Meteorological damage impact & mapping (*drought, hail, icing, lightning, rain, snow, temperature, tornados, wind*)]  
 Inspection [e.g. Post natural disaster (*drainage, earth quake, flooding, forest fire, hurricane, mud/land slide, tornado, tsunami, volcano eruption*)]

MAINTENANCE

**Operators** Commercial Non-Commercial  
 - Corporate  
 - Public Authorities

**Location** Outdoor & Indoor

The performance of tasks required to ensure the correct functioning and/or safety of an installation, machine, means of transport, system (continuing airworthiness of an aircraft), including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair, e.g. relative to the following:

Aircraft (hull)	Antennae	Bridges
Buildings	Cable Cars	Canals
Chimneys	Cooling Towers	Dams
Dikes	Flare Stacks	Harbours
Holding Tanks	Ind. Installations	Infrastructure
Mines	Offshore Platforms	Pipelines
Powerlines	Quarries	Railway Cars
Railway Powerlines	Railway Tracks	Rivers
Roads & Highways	Roofs	Runways
Ships	Shipping Locks	Ski Slopes
Solar Panel Farms	Structures (various)	Tanker Tanks
TeleCom Towers	Tunnels	Wind Turbine Farms

**Mission Purposes**

Aerial Video	Deterrent	Inspection	Mapping
Measuring	Monitoring	Photography	Surveillance
Testing	Validation		

MINING & EXPLORATION

**Operators** Commercial Non-Commercial

- Corporate

**Location** Outdoor & Indoor

**Mission Purposes**

Exploration

Measuring [e.g. Volumetric (*gravel, sand pits, quarries*)]

Inspection [e.g. ecological impact; infrastructure; maintenance; perimeter; mine shaft]

Patrolling [e.g. perimetric security]

MISCELLANEOUS (Private & Commercial)

**Operators** Commercial Non-Commercial  
- Corporate

**Location** Outdoor & Indoor

**Sub-Sector** **Demonstration**  
Flight operations conducted for regulatory (*certification*) authorities or for potential customers.

**Sub-Sector** **Ferry/Positioning**  
Delivery flights for the purpose of returning a drone to its base of operations, delivering a new drone from its place of manufacture to its customer, flying a drone from one base of operations to another or flying a drone to or from a maintenance facility for repairs, overhaul or other work.

**Sub-Sector** **Air Show / Race**  
Flight operation carried out within the context of a public air show or drone race.

NEWS GATHERING & BROADCASTING

**Operators** Commercial Corporate

**Location** Outdoor & Indoor

**Sub-Sectors** **Television & Journalism**

Aerial Video Indoor & outdoor

**Cinema & TV Industry**

**Operators** Commercial Corporate

**Location** Outdoor & Indoor

Cinema & TV [e.g. aerial shots (indoor & outdoor)]

Cinema & TV [e.g. special effects]

POLICY COMPLIANCE & OBTAINING LEGAL PROOF

**Operators** Commercial Non-Commercial  
- Public authorities  
- Corporate

**Location** Outdoor & Indoor

**Mission Purposes**

Inspection [e.g. agriculture; emission control; legal matters; treaty compliance]

Validation [e.g. agriculture; emission control; legal matters; treaty compliance]

PUBLIC SAFETY

**Operators** Commercial Non-Commercial  
- Public authorities

**Location** Outdoor & Indoor Tethered & Non-tethered

**Sub-Sectors** Civil Protection, Critical Installations, Disastre Management, Fire Fighting

**Mission Purposes**

Deterent [e.g. Chasing birds away from sites for sanitary reasons]

Inspection [e.g. critical infrastructure (*bridges, dams, dikes, piers, tunnels*), re-Intervention; post fire; post forest fire; post natural disaster; post industrial disaster]

Mapping

Monitoring [Forest Fires - Fire start detection; fire zone]

Observation [e.g. Public gatherings (*entertainment; sporting events; political rallies; rock concerts*)]

Search & Rescue [e.g. inshore & lakes; mountains; post natural disaster; post industrial disaster]

Transport [e.g. blood, medical supplies]

PUBLIC SECURITY & LAW ENFORCEMENT

**Operators** Non-Commercial  
- Public authorities [Police, Border Guard, Coast Guard, Customs, Forest Guards, Gamekeepers (*Anti-Poaching*), Judiciary]

**Location** Outdoor & Indoor Tethered & Non-tethered

**Mission Purposes**

Aerial Photography & Video	Analysis
Detection	Classifying
Relay	Identifying
Localisation	Medical Supply
Observation	Patrolling
Recognition	Relief Flights
Spotting	Surveillance
Validation	Delivery Non-lethal Ordnance
	Inspection
	Monitoring
	Photography
	Situ Assessment
	Tracking

REMOTE OPERATIONS - SENSING

**Operators** Commercial Non-Commercial  
- Corporate

**Location** Outdoor & Indoor Tethered & Non-tethered

**Sub-Sectors** Communication Infrastructure  
Oil & Gas (*offshore*) Production Facilities  
Railways

Also: Construction; Maintenance & Management; Mining & Exploration; Utility Companies

**Mission Purposes**

Aerial Photography & Video

Inspection Maintenance-related (e.g. antennae; buildings; chimneys; cooling towers; corrosion; dams; emissions; flare stacks; furnaces & boilers (*indoor*), offshore facilities/platforms; pipelines (*gas, oil, water*); powerline cables (*corona effect*); powerline surroundings (*invasive plant growth*); powerline towers; quarries (*volumetric*), roofs, solar panel farms; structures (other); telephone repeater towers; thermal isolation; wind turbine farms (*turbine blades*))

Inspection Post industrial accident & post blasting

Mapping

Monitoring [e.g. ecological impact]

Surveillance [e.g. perimetric security]

Testing [e.g. of aircraft by their manufacturers]

Validation [e.g. of payloads by their manufacturers]

RESEARCH & SCIENCE

**Operators** Commercial Non-Commercial  
- Corporate

**Location** Outdoor

**Sub-Sectors**

Agriculture	Fishery/Pisciculture	Archeology
Atmospheric	Biology	Botany
Climatology	Earth Sciences	Ecology
Environmental	Geomatics	History
Meteorology	Oceanography	Photogrammetry
Wildlife Conservation		

◆ Multiple flight mission purposes

SERVICES FOR PRIVATE CITIZENS

**Operators** Commercial  
- Private individual

**Location** Outdoor & Indoor

**Mission Purposes**



Aerial Video [e.g. birthday party, wedding]  
 Inspection [e.g. for insurance claim proof]  
 [e.g. thermal isolation of homes]  
 Photography [e.g. birthday party, wedding]  
 Spraying [e.g. pest control (wasp nests)]

TRANSPORT

**Operators** Commercial Non-Commercial  
 - Corporate

**Location** Outdoor

**Mission Purposes**

Emergency Supply Delivery (e.g. defibrillators)  
 Freight [inside aircraft (e.g. parcel & cargo delivery)  
 Freight [outside aircraft: container (e.g. parcel delivery);  
 suspended bulk (logging)]  
 Persons [e.g. air taxi; ambulance]  
 Medical Supply Delivery (e.g. blood samples; vaccines)  
 Relief Flight

UTILITY COMPANIES (Public & Private)

**Operators** Commercial Non-Commercial  
 - Corporate

**Location** Outdoor & Indoor Tethered & Non-tethered

**Sub-Sectors**

Aerial Electricity Generation Communication Relay  
 Construction Planning Cable Cars  
 Electricity Plants Pipelines - Gas  
 Pipelines - Oil Pipelines - Water

Powerlines Railroads  
 Roads & Highways Solar Panel Farms  
 Telephone Repeater Towers WIFI Relays  
 Aerial Wind Energy Generation Wind Turbine Farms  
 ♦ Multiple flight mission purposes

LEISURE & SPORT

**Operator** Private Persons

**Location** Outdoor & Indoor

**Sub-Sectors**

**Flying Toys**

**Recreational Flying** [including racing (*can be commercial*)]

**Model Aircraft**

EDITOR'S NOTE

This is a living document. It will be added to, modified and improved as time progresses, and will be made publically available on:

[www.rps-info.com](http://www.rps-info.com) [www.rpas-regulations.com](http://www.rpas-regulations.com)  
[www.rpas-conference.com](http://www.rpas-conference.com) [www.rpas-civops.com](http://www.rpas-civops.com)

The submission of suggestions for improvement, modification, and additional application examples is highly appreciated. They should be addressed to Peter van Blijenburgh - [pvb@rps-info.com](mailto:pvb@rps-info.com)

The RPAS market sector & mission purpose explanations indicated in this article are available online ([www.rps-info.com](http://www.rps-info.com)) in the following languages: Chinese, English, French, German, Italian, Japanese, Polish, Portuguese, Spanish.

THE CURRENT MARKET SITUATION

PROFESSIONAL RPAS MARKET SECTORS  
 Ranking in Current Order of Importance

%	
11,92	Aerial Photography, Audio-Visual, Production, Advertising
10,02	Construction & Real Estate
7,71	Maintenance
6,24	Research & Science
5,34	Environmental Protection & Wildlife Conservation
5,06	Flight Training / Instruction
5,65	Agriculture, Fishery/Pisciculture, Forestry
4,58	Utility Companies (Public & Private)
4,41	Remote Operations - Sensing
4,39	Cinema & TV Industry
4,37	Miscellaneous - Demonstration
4,23	Heritage Site & Historical Monument Management
3,96	Mining & Exploration
3,66	Public Safety
3,23	Entertainment & Artistic Expression
2,66	News Gathering & Broadcasting
2,59	Insurance (Accident & Claim Investigation)
2,49	Public Security & Law Enforcement
2,02	Humanitarian Aid
1,76	Policy Compliance & Obtaining Legal Proof
1,42	Remote Operations - Non-Sensing
1,19	Miscellaneous - Air Show / Racing
0,59	Transport
0,36	Miscellaneous - Ferry / Positioning
100%	Total

PROFESSIONAL RPAS MISSION PURPOSES  
 Ranking in Current Order of Importance

%	
12,32	Aerial Photography & Film / Video Footage
11,36	Mapping
9,01	Inspection
6,66	Measuring
6,51	Surveying
6,43	Monitoring
5,53	Testing
4,78	Localisation
4,16	Observation
4,03	Sensing
3,54	Identification
3,41	Surveillance
2,81	Search & Rescue
2,71	Validation
2,38	Patrolling
1,99	Spotting
1,81	Tracking
1,73	Exploration
1,55	Advertising
1,03	Special Purpose
0,98	Relief Flight
0,96	Dispensing
0,93	Aerial Acrobatics & Special Effects
0,93	Spraying
0,67	Manipulation
0,65	Deterring
0,62	Transport - Goods
0,26	Sky Painting
0,18	Water Bombing
0,08	Sky Writing
0,03	Transport - Persons
100%	Total

The percentages indicated in these two tables reflect the result of a survey conducted by Blyenburgh & Co in 2017-18 and covering over 1000 RPAS operators in 67 countries.