

# Non-Military UAS Applications - Current & Potential

## Customs & Coast Guard Missions

Coastal patrol	India USA	Long endurance UAS development ongoing
On-shore border patrol		Interest expressed by authorities - USEP study
European Union maritime surveillance		
National maritime surveillance	Australia Malaysia	Aerosonde (Aerosonde, Australia) operated for Coast Guard Eagle (optionally piloted aircraft)
European Union on-shore border patrol		Interest expressed by authorities - USEP study
National on-shore border patrol		Interest expressed by authorities - USEP study

## Civil Security Missions

Avalanche survivor search		Interest expressed by authorities - USEP study
Coastal water surveillance		Interest expressed by authorities - USEP study
Maritime search & rescue		Interest expressed by authorities - USEP study

## National & European Union Civil Security

Maritime surveillance		Interest expressed by authorities - USEP study
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## Municipal Fire Brigade Missions

Fire-related monitoring & investigation	UK	AirRobot (AirRobot, Germany) operated in UK
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## Regional Fire Brigade Missions

Forest fire detection & monitoring	Hungary	Szendro Fire Brigade
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## National Fire-Fighting Missions

Forest fire detection & monitoring	USA	Ikhana (General Atomics, USA) deployed by NOAA
Natural disaster monitoring		Interest expressed by authorities - USEP study

## Civil Security & National Police Missions

Contamination measurement		Interest expressed by authorities - USEP study
Systematic search operations		Interest expressed by authorities - USEP study
Natural disaster monitoring		Interest expressed by authorities - USEP study
Flood monitoring		Interest expressed by authorities - USEP study
Emergency medical/food supply		Interest expressed by authorities - USEP study

## Police & Homeland Security Missions

Information gathering (incl. inside buildings)		Interest expressed by authorities - USEP study
Aerial crime scene inspection		Interest expressed by authorities - USEP study
Special & anti-terrorist operations		Interest expressed by authorities - USEP study
	Canada	Predator (General Atomics, USA) deployed by Canadian Defence Forces during G7 summit
	France	- Cocinelle (Technisolar, France) experimented by GIGN - Elytre (Sirehna, France) experimented by Ministry of Interior
	Israel	Aerostar & Aerosky operated over Gaza by Aeronautics Defence Systems, Israel for Israeli Ministry of Defence
Counter-drug operations		Interest expressed by authorities - USEP study
	USA	Predator A (General Atomics) deployed by DHS on the southern US border
Urban & sub-urban law enforcement		Interest expressed by authorities - USEP study
	France	ELSA (Sirehna, France) procured by Ministry of Interior; delivered April 2008.
	Germany	Carollo (Mavionics, Germany)
	Italy	Interest expressed by authorities
	UK	AirRobot (AirRobots, Germany) being experimented with by Merseyside Police.
Pre-intervention information gathering		Interest expressed by authorities - USEP study
Urban riot control		Interest expressed by authorities - USEP study
	France	Survey 2500 (EADS DS, France) deployed for Ministry of Interior in 2007
Perimeter surveillance & defence		Interest expressed by authorities - USEP study
Hostile protest monitoring		Interest expressed by authorities - USEP study
	France	Hunter (IAI, Israel) deployed by French Air Force during G7 summit
	Switzerland	Ranger deployed by Swiss Air Force for the Ministry of interior for the Ministry of interior
Criminal investigation		Interest expressed by authorities - USEP study
Surveillance of large public gatherings		Interest expressed by authorities - USEP study
	France	Hunter (IAI, Israel) deployed by French Air Force during D-Day commemoration
	South Africa	Seeker (Denel Aerospace, S.Africa) deployed by South African Air Force
	Switzerland	Ranger (RUAG Aerospace, Switzerland) deployed by Swiss Air Force for the Ministry of interior
Road traffic surveillance	Switzerland	Ranger (RUAG Aerospace, Switzerland) deployed by Swiss Air Force for the Ministry of interior
	USA	Cyberbug deployed by local sheriff
Delivery of non-lethal disabling means		Interest expressed by authorities - USEP study
Coastal border immigration control		Interest expressed by authorities - USEP study
	Italy	Predator A deployed by Italian Air Force
	Spain	Interest expressed
Ship lane surveillance		Interest expressed by authorities - USEP study
	Singapore	Keen interest expressed
Persistent police surveillance		Interest expressed by authorities - USEP study
Land border immigration control		Interest expressed by authorities - USEP study
Maritime immigration control		Interest expressed by authorities - USEP study
National border patrol		Interest expressed by authorities - USEP study
	Austria	Demonstration with S-100 (Schiebel, Austria)
	USA	Predator A & Predator B (General Atomics, USA) deployed by DHS

National land border immigration control		Aerostar (Aeronautics Defence Systems, Israel) deployed for DHS Hermes 450 (Elbit Systems, Israel) deployed for DHS Interest expressed by authorities - USEP study
Euro Union land border immigration control	Italy	Predator A (General Atomics, USA) operated by Italian Air Force Interest expressed by authorities - USEP study
Piracy surveillance & interdiction	Nigeria	Interest expressed by authorities - USEP study Aerostar (Aeronautics, Israel)
Smuggling surveillance & interdiction	USA	Interest expressed by authorities - USEP study Predator B (General Atomics, USA) operated by DHS
Illegal ship bilge cleaning detection	Belgium	Interest expressed by authorities - USEP study Hunter-B deployed by Belgian Air Force
Critical infrastructure inspection	France	Interest expressed by authorities - USEP study Copter 1B (SurveyCopter, France)
<b>Environmental Missions</b>		
Local area science missions	Sweden	- SmartPlane (SmartPlanes, Sweden) - APID (Scandicraft, Norway)
National & regional pollution monitoring		Interest expressed by authorities - USEP study
Trans-boundary air pollution monitoring	Maldives	SilverFox deployed by Advanced Ceramics Research for NOAA
Wildlife monitoring (inventory, migration, conservation)	USA	
Fishery control (in-shore)	Spain	Fulmar (Aerovision, Spain) - development financed by European Commission
Fishery control (off-shore)	UK	Being considered
Ghost net detection	USA	Being considered/feasibility being investigated
Ozone level measurement	USA	Being considered/feasibility being investigated
Crop health & disease monitoring	USA	Being considered/feasibility being investigated
Poaching patrol & wildlife preservation	USA	Being considered/feasibility being investigated
Oil spill & oil slick detection & monitoring	Belgium	Hunter-B (IAI, Israel) operated by Belgian Air Force
Coastal erosion monitoring		
Sandbank shift measurement		
Glacier & ice cap monitoring	USA	Being considered/feasibility being investigated
Snow pack & avalanche monitoring	USA	Being considered/feasibility being investigated
<b>Meteorological Missions</b>		
Weather assessment & measurements	Australia USA	Aerosonde (Aerosonde, Australia) operated for national authorities Aerosonde (Aerosonde/AAI Corp, USA) operated for NASA & NOAA
Weather research	Australia Japan USA	Aerosonde (Aerosonde, Australia) operated for national authorities Aerosonde (Aerosonde, Australia) operated for national authorities Aerosonde (Aerosonde/AAI Corp, USA) operated for national authorities
Atmospheric measurements	Greenland	SilverFox (Advanced Ceramics Research, USA) operated for NOAA
Cloud seeding	USA	
Hurricane tracking & measurement	USA	Aerosonde (Aerosonde/AAI Corp, USA) operated for national authorities
Typhoon tracking & measurement	Australia Japan	Aerosonde (Aerosonde, Australia) operated for national authorities Aerosonde (Aerosonde, Australia) operated for national authorities
<b>Science &amp; Research Missions</b>		
Climate monitoring	Australia Canada USA	
Marine mammal monitoring	USA	ScanEagle (Insitu, USA) for NOAA, USA SilverFox (Advanced Ceramics Research, USA) for NOAA, USA
Cryospheric research (Arctic/Antarctic)	Germany UK USA	Carollo (Mavionics, Germany) Carollo (Mavionics, Germany) SilverFox (Advanced Ceramics Research, USA)
Glacier & ice cap monitoring		
Iceberg surveillance & tracking		
Atmospheric chemistry (in situ) measurements	Antartica	
Atmospheric radiation (in situ) measurements		
Open ocean research support	Australia USA	
Land/forestry research	Sweden	
Ice pack patrol	USA	
Vigor mapping & frost mitigation	USA	
Salt water infiltration detection & monitoring	Netherlands	HighEye VTOL UAS operated with TNO sensors
Crop monitoring	UK USA	Ongoing UAS development at QinetiQ, UK Helios (AeroVironment, USA) operated over Hawaiï for NASA to investigate selective crop harvesting SilverFox (Advanced Ceramics Research, USA) operated by Agrarius LLC to survey vinyards
Volcano monitoring	Japan USA	RMax (Yamaha, Japan) SilverFox (Advance Ceramics Research, USA)
Aerial pollution monitoring	Maldives	SilverFox (Advance Ceramics Research, USA) operated for NASA
Aerial photogrammetry	Netherlands	Services supplied by E-Products.
Coastal zone studies	Spain USA	Fulmar (AeroVision, Spain) SilverFox (Advanced Ceramics Research, USA)
Coastal mapping	USA	
Vegetation identification	USA	SilverFox (Advanced Ceramics Research & Agrarius, USA)
Invasive species identification & analysis	USA	
Wildlife sensus		
Thermal imaging of buildings (heat wastage)	USA	
<b>United Nations &amp; International Court (IC) Support &amp; Humanitarian Missions</b>		
Conflict monitoring	UN in Bosnia NATO in Kosovo	
Pease keeping/monitoring operations	Balkans D.R. Congo	CAC Systems, France Hunter-B, Belgian Air Force

Genocide investigation	East Timor	Aerosonde, Australian Army
Disaster analysis	Ivory Coast	SurveyCopter 1, French Army
	Solomon Isds	Avatar, Australia Defence Forces
	Ruanda	Being considered by the International Court
	India	Searcher II - Indian Air Force
	Russia	- Irkut-2 (Irkut, Russia)
		- Irkut-20 (Irkut, Russia)
		- Irkut-850 optionally piloted aircraft (Irkut, Russia)
Disaster management	USA	Experimentation
Flood monitoring	USA	Experimentation
Land-mine detection	Germany	Experimentation (Camcopter, Schiebel, Austria)
	USA	
<b>Contractor Supplied Flight Services</b>		
Operational (flight) training	Netherlands	Vigilance, Netherlands
	UK	West Wales UAV Centre, UK
Terrain mapping	Finland	SmartPlane (SmartPlanes, Sweden)
	Germany	SmartPlane (SmartPlanes, Sweden)
	Netherlands	GeoCopter (GeoCopter, Netherlands)
	Sweden	SmartPlane (SmartPlanes, Sweden)
	UK	SmartPlane (SmartPlanes, Sweden)
Agricultural insecticide spraying	Japan	- RMax (Yamaha, Japan)
		- RPH-1 & RPH-2A (Fuji Heavy Industries, Japan)
		- YH-300SL (Yanmar Agricultural Equipment Comp. Japan)
		- KG-135 (Yanmar Heli Service & Kobe Giken, Japan)
Agricultural fertilizer dispensing	South Korea	RMax (Yamaha, Japan)
	Japan	- RMax (Yamaha, Japan)
		- RPH-1 & RPH-2A (Fuji Heavy Industries, Japan)
		- YH-300SL (Yanmar Agricultural Equipment Comp. Japan)
		- KG-135 (Yanmar Heli Service & Kobe Giken, Japan)
Crop monitoring	South Korea	RMax (Yamaha, Japan)
	Canada	Services offered by CropCam, Canada with CropCam UAS (CropCam, Canada - subsidiary of MicroPilot, Canada)
Critical infrastructure inspection	USA	SilverFox (Advanced Ceramics Research, USA)
Historical monument inspection	France	SurveyCopter (SurveyCopter, France)
Ice navigation assistance	France	SurveyCopter (SurveyCopter, France)
(for icebreakers & ice-breaking ships)	Russia	Being considered by ConocoPhillips, USA
Magnetic field survey	Australia	Services offered by Fugro Airborne Services, Australia (+ Brazil, Canada, Ghana, Peru, S.Africa, USA) with GeoRanger UAS (Insitu, USA)
	UK	Services offered by MagSurvey, UK with a Prion UAS (MagSurvey) equipped with a fluxgate/cesium vapour magnetometer)
Network communications relay (small theatre)		
Network communications relay (large theatre)		
Emergency communications network		
Survey of drilling sites for oil & gas industry	USA	ScanEagle (Insitu, USA) operated by ConocoPhillips, USA
Oil & gas pipeline monitoring	Angola	Aerostar (Aeronautics, Israel) for Chevron Texaco
	Argentina	Yagua (Nostromo Defensa, Argentina) for local oil company
	Mexico	Services supplied by ..... to Pemex, Mexico
	USA	being considered by ConocoPhillips
Power line inspection	Australia	being considered
Inspection of oil tanker cargo tanks	USA	being considered by ConocoPhillips
Inspection of LNG carrier cargo tanks	USA	being considered by ConocoPhillips
Railway track monitoring		
Forest fire operations support	USA	Ikhana (General Atomics) operated by USAF for NOAA, USA
Aerial mineral exploration	Australia	See magnetic field survey
Aerial photography & video (producers)	France	- Cyclope (Vision du Ciel, France)
		- Copter-1b & Copter-2 (SurveyCopter, France)
	Israel	Helivision (SteadyCopter, Israel)
	Netherlands	EKH-001 (E-Producties, Netherlands)
	Sweden	SmartPlanes, Sweden
	Switzerland	Scout B2-120 (Aeroscout, Switzerland)
	USA	- Autocopter (Neural Robotics, USA)
		- Bergen RC Helicopters, USA
		- Various L-t-A (Galaxy Blimps, USA)
Aerial photography & video (services)	Chile	Ingekraft Ltda, Chile
	France	- Airshoot, France
		- Clikair, France
		- Mediazapp, France
	Germany	- Flyingboxcar, Germany
		- Gayk-Luftbildtechnik, Germany
		- Photoheli, Germany
	Italy	- Anemony, Italy
		- Xenatrix, Italy
		- Zeppelin Dirigibili, Italy
	Netherlands	- Lynx SkyMedia, Netherlands
		- Pano, Netherlands
	Portugal	Aerovisao, Portugal
	Spain	- Air Camera, Spain
		- Altafoto, Spain
		- Astrid, Spain
		- Flyabove, Spain
		- Foto-Aerea, Spain
		- Galia 2000, Spain

	St Maarten	- T1000 Factory, Spain
	Sweden	- Island Computer Technologies, St Maarten - Aerophoto Nordic, Sweden - Airfoto, Sweden - AirGhost, Sweden - Heliphoto Skane, Sweden - Videobolaget, Sweden
	Switzerland	- Mathys Partners, Switzerland
	UK	- Minizepp, Switzerland - Aerial 51, UK - Aerial Photography For You, UK - Aerial Pics, UK - Allsop Helikites, UK - Aerial-Cam, UK - Above It All Photography, UK - Highland Helicam, UK - Lawrence, UK - Magna Charters, UK - National Grid, UK - Rotorcams, UK - Vivid Helicams, UK
	USA	1551 registered commercial companies supplying such services - Aerosight, USA - RP Flight Systems, USA
Cinematographic aerial shots & special effects	Belgium	FlyCam (FlyCam, Belgium)
	Czech Rep.	HE series (HighEye, Netherlands)
	France	Soulcam L-t-A UAS (Pix-Scene, France)
	Hungary	HE series (HighEye, Netherlands)
	Netherlands	HE series (HighEye, Netherlands)
	USA	- FlyCam (FlyCam, USA) - HE series (HighEye, Netherlands) - Rotomotion, USA
Advertising (light-than-air UAS) (indoor & outdoor)	Switzerland	- Skive L-t-A UAS (Skive Aviation, Switzerland) - Z10000 L-tA UAS (Minizepp, Switerland) - Z13000 L-tA UAS (Minizepp, Switerland)
	USA	Various (Galaxy Blimps, USA)

**Environment Research Studies**

Forest fire monitoring	Croatia	FENIX Project
	Spain	- COMETS Project - Daedalus Project (Aitem, Spain) - Horus Project (Aitem, Spain) - Sky-Eye Project (Technical University of Catalonia, Spain)
Earth observation	European	- Heliplatt Project - High altitude long endurance earth observation platform - IFATS - Unmanned passenger aircraft