

# General introduction to UAS technologies

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The aim of this ALPARC event is to provide an overview about the variety of possible uses of the new and rapidly evolving technology for different tasks in the missions of protected areas. Potential dangers of unappropriated use of UAS will also be highlighted.

The use of drones (Unmanned Aircraft Systems/UAS) has considerably increased during the last years, also in the alpine Protected Areas. This new technology has integrated the modern park management and is used for multiple purposes (monitoring, mapping, remote sensing, photography, technical interventions in inaccessible areas...), offering numerous interesting possibilities. On the other hand the use of drones by park managers but particularly also by external persons may cause important disturbances to the protected areas.

During the conference the legal situation in the different alpine countries will be presented and an introduction to general UAS technology given. Protected areas managers and other professional drone users will present very diverse possibilities of use of drones in the day to day tasks of protected areas and discuss further potential challenges for the new technology with the participants. A demonstration of flying performances by experienced drone pilots is foreseen. An overview about potential negative impacts of the flying devices and how to limit them will close the event.

# AGENDA

- › Nature of Innovation
- › IDM Ecosystem
- › Basic structure of RPAS
- › Professional Drone Operations
- › [alpine.expert/drones](http://alpine.expert/drones)

## PROGRAMME

Unmanned Aircraft Systems (Drones) in protected areas: opportunities and threats  
International Conference, **26th – 27th of March 2018**, Toblach/Dobbiaco – Nature  
Parks South Tyrol

### **MODULE 1: Introduction to the world of drones**

- 13.30 – 15.00 - Welcome by the organizers  
- Introduction to the Topic  
- Overview about the legal situation of UAS in the alpine countries  
- General introduction to UAS technologies
- 15:00 – 18:30 Excursion and practical demonstration of drones flying
- 19:00 Buffet at the Grand Hotel Toblach/Dobbiaco

# Südtirol / Alto Adige

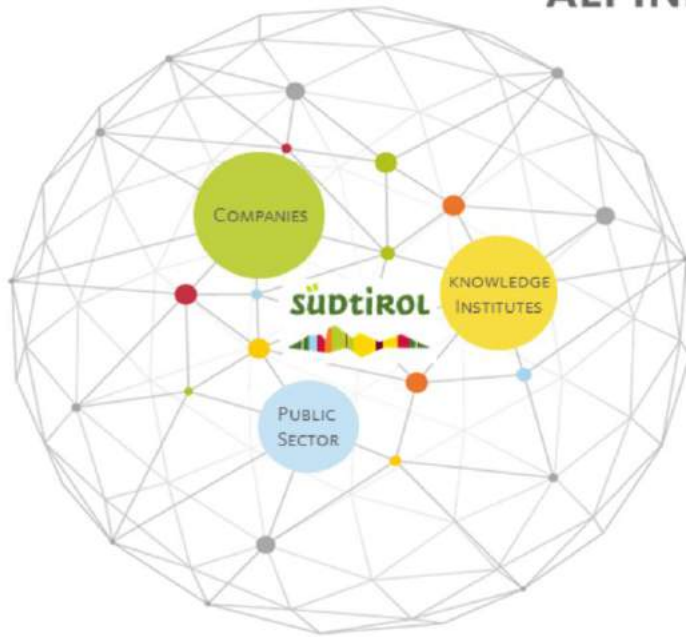
is one of the most coveted

# destinations

in Europa.

IDM is pursuing the aim of raising the level of innovation in South Tyrol, in particular in small and medium enterprises. To this end, IDM sees itself as the centre and driving force for innovation, cooperation and technology transfer for all actors, with special emphasis on businesses, within the South Tyrol innovation system.

IDM offers innovation services and fosters cooperation to bring science and industry together. start-ups are given important assistance to help them on their way in our business incubator AND Knowledge transfer and NETWORKING is made possible in the so-called ECOSYSTEM.



Ecosystem is in the eye of the storm!

We work in the „Spannungsfeld (stress field)“ of companies, uni.bz & EURAC, public administration & politics and the civil society.

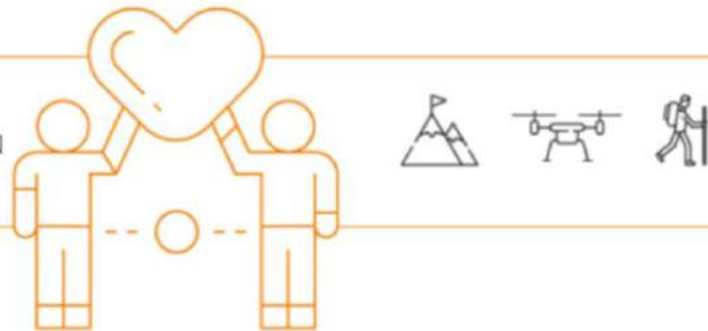
It is a multi-level approach: In our specialisation „Civil Protection“ we collaborate and coordinate action on a different levels

- Strategic agendas i.e. EUSALP.. Macro-regional strategies can be driving forces for change if the right momentum is achieved. Macro-regional strategies are coordination and cooperation frameworks to implement shared priorities through various actions (processes) as well as projects and programmes.
- Operational programmes – focus, applied research
- Tactical measures - services



2 min Film

**between the poles of**  
MOUNTAIN – TECHNOLOGY – MEN



Nowadays it is common to talk about "ecosystems" in the context of innovation. The symbiotic relationship between public and private sectors is intended to thrive in the "civil protection" field.

Interviews on individual firms have shown that the market entry of companies is usually not motivated by the existing profits in the area but depends on technological and social opportunities - which are all the greater if the state invests in the relevant areas. (Mazzuccato, 2013)

The Ecosystem Sports & Alpine Safety acts as a facilitator in the development, testing and INTRODUCTION OF NEW TECHNOLOGY and TECHNIQUES.

We promote COOPERATION of institutions, companies and SCIENCE creates knowledge-based developments in the VALUE CHAIN SPORT and ALPINE SAFETY, also through the participation of the ALPINE.EXPERT community.



Alpine Risk Management



Drones



Infrastructure to innovate



Digitalisation



Outdoor Sport

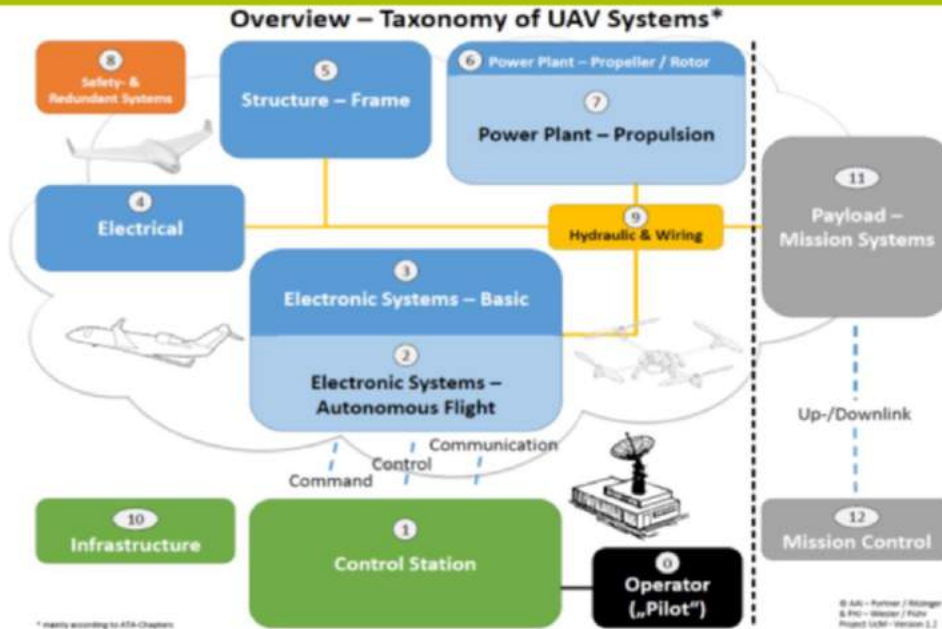
Our goal is the sustainable development for South Tyrol and the companies.

The entrepreneurial ecosystem Sports & Alpine Safety has the focus to establish the conditions for the creation of a strong and competitive manufacturing and services sector able to compete in the Alps and the world.

We offer innovation-oriented services for companies to create more effective and efficient solutions to protect people and properties in the Alps and mountainous regions worldwide.

Thanks to the development and maturing of innovative technologies, the range of non-military drone application for professional purposes of drones is constantly increasing. These new technological developments, which include miniaturization and cover multiple domains (e.g. aircraft navigation systems, autopilots, command and control systems incl. Satellite-based, payloads (imaging & non-imaging), power sources, engines, data storage, mission software and data processing) This evolution is strongly influenced by the large scale production of „leisure“ drones (principally in China) and their wide public acceptance. These leisure drones offer a low cost solution for entry into the professional market.





PUcM-report, Austrian Aerospace Industries/Vienna & FH Joanneum, Graz (3/2015)

The graphic shows the basic component structure of an unmanned aerial vehicle according to the usual ATA chapters in aircraft construction. It should also clarify where improvements in the subsystems will be possible in the future.




**Non-Military RPAS Operations - I**

**Professional RPAS Operations**



**Aerial Work**

- 1 Commercial & Non-Commercial (Including Corporate Operations)**  
 An aircraft operation in which an aircraft is used for specialized (flight) services such as agriculture, construction, photography, surveying, observation & patrol, search & rescue, aerial advertisement, etc.  
*(Chicago Convention, Annex 8 Part 1, Chapter 1.H)*
- 2 Flight Training / Instruction (Private & Commercial)**

  - Duo (student instruction by licensed pilot)
  - Solo (unaided student flight)
  - Check (qualification verification of pilot license holder)
- 3 Other Miscellaneous (Private & Commercial)**

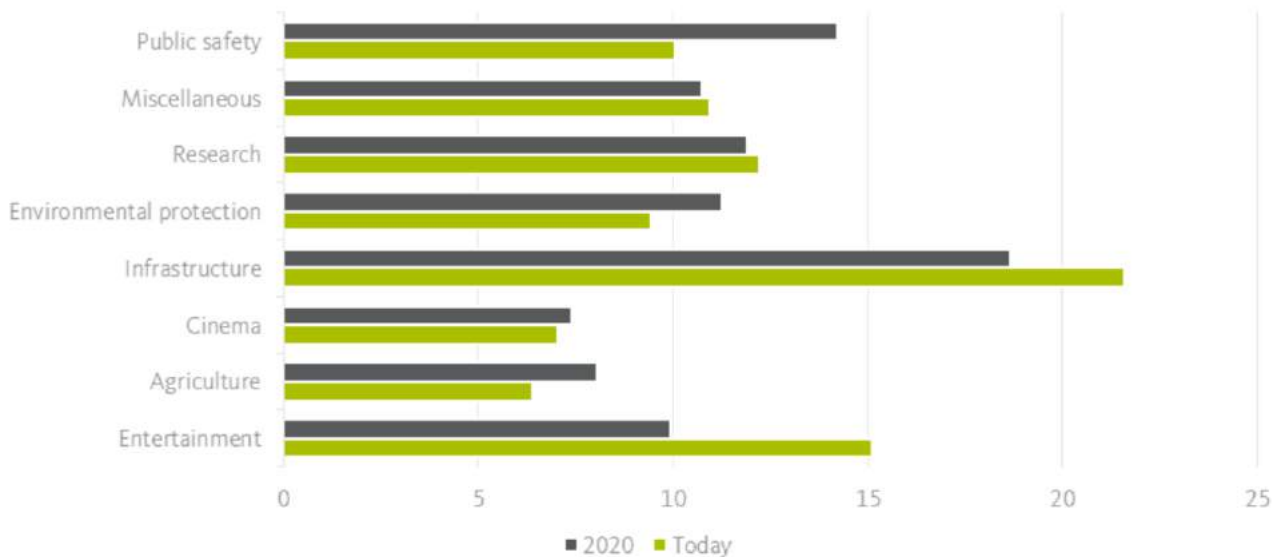
  - Test / Experimental
  - Demonstration
  - Ferry / Positioning
  - Air Show / Race

**Transport (Commercial & Non-Commercial)**

- Small Packages (mass?)
- Medium Packages (mass?)
- Large Packages (mass?)
- Containers / Understung Bulk
- Persons

See [www.rpas-regulations.com](http://www.rpas-regulations.com) for additional information on aerial work

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	Today	2020	
Entertainment	15,1	9,94	Aerial Photography, Entertainment; advertisement
Agriculture	6,41	8,05	Agricultur, forestry, transport
Cinema	7,06	7,39	Cinema, news
Infrastruktur	21,57	18,67	Construction, maintainance, Exploration
Environmental protection	9,45	11,26	Environmental Protection, Wildlife Conservation, Heritage management
Research	12,22	11,89	Research, remote sensing & non sensing
Miscellaneous	10,94	10,76	Flight training, demonstration, Positioning, Racing
Public safety	10,07	14,21	SAR, policy compliance

Agriculture

Emergency

FILM

Transport

Geo-science

R&D Technology



## Challenges

**Poor or inexistent collaboration of RPAS manufacturers and service providers**

**RPAS application is an emerging market that needs a critical mass of potential users. The question is how to maximise its success chances.**

**Regulation is subject to changes and is developing on national and European level**

**Firms in this emerging industry need to invest heavily on development e.g. proving feasibility, developing prototypes and demonstrators, carrying out pilot trials etc.**

**Technology-driven entrepreneurs in the sector face difficulties to business development**

**Business grows on project-based activity, but cash flow is usually insufficient. The firm' growth is fragile as resources are needed both for customers acquisition and projects execution.**

## Opportunities

- Mapping of competences of the RPAS manufacturers in the emerging markets.
- Mapping of RPAS applications of early adopters

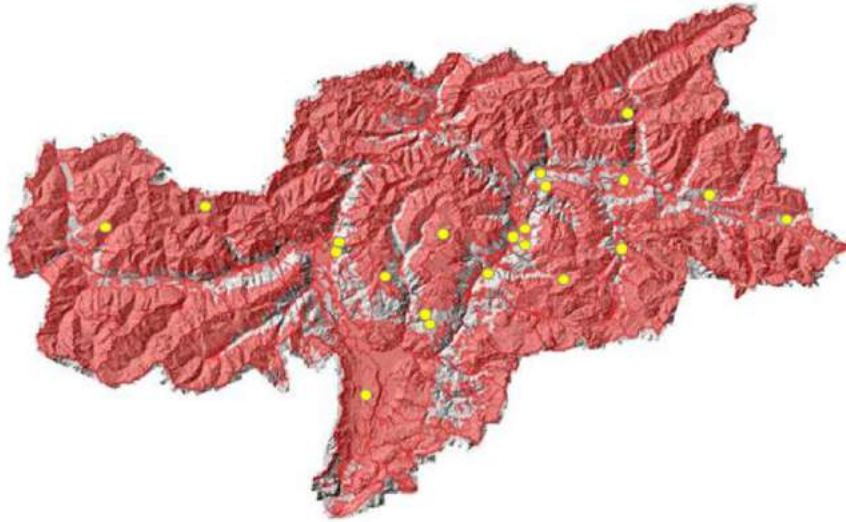
- Mapping of specific services in TN and BZ (laboratories, know-how transfer, networking, business development, ..)
- Specific business innovation, e.g. a new product development or a collaborative innovation project.

- Support public entities (ENAC, Civil Protection, Environment) to develop a regulatory framework efficient for the development of business applications in the alpine environment

- Specific services could facilitate the process and reduce the time to market
- Public funding
- Awareness raising of the general public or specific target groups e.g. helicopter-pilots

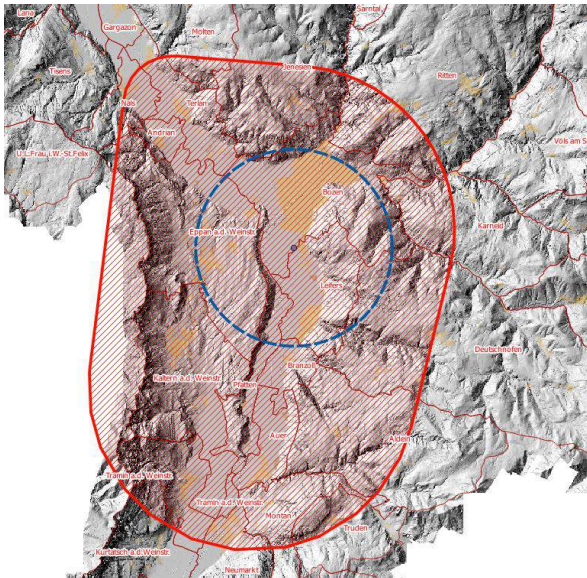
- Attract first customers with convincing results

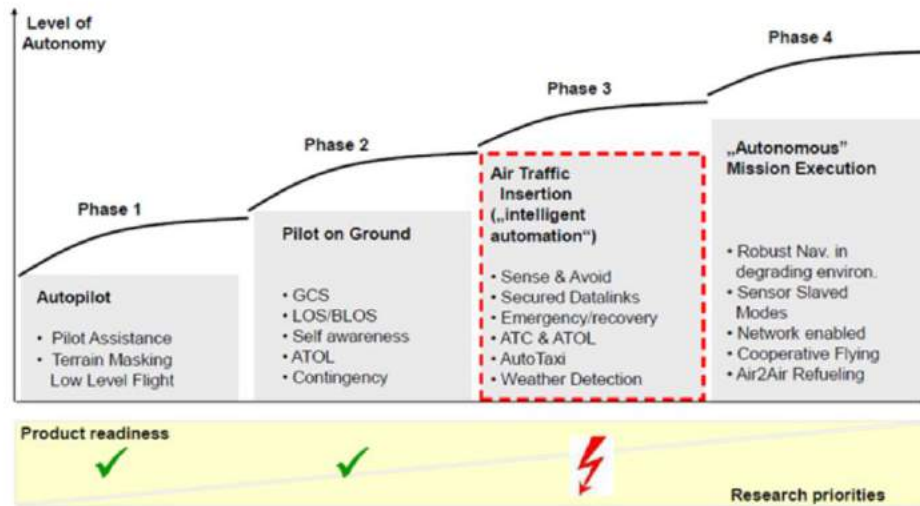
- Transition to industrialization is possible
- Private funding



The fact is that professional pilots can not fly on 512,078 hectares of the total 739,311 hectares of land without violating the LG15 / 1997 or the ATZ of Bolzano - that is 69% of the land area. If we add the populated areas with a buffer of 150 m, then I even get to 547.949 hectares ... that is three quarters of the area above which an operator who is approved for "zone non critiche" is NOT allowed to operate !!

No-fly zones (LG 15/1997): protected areas





A. Bülte/Airbus Defence & Space (UVS Internat. RPAS Conference Brussels, 24. Juni 2014)

The future innovation focus of drones / UAVs lies in the development of new sensors, the miniaturization of components, the application and further development of information and communication technologies, network and automation techniques as well as in aircraft concepts in extremely lightweight construction for long-term missions.





Who we are looking for:

Talents

Innovative startups that want to present and improve their products

Companies

Tech companies, public organizations and research institutes that want to cooperate with talents

Experts

Athletes, industry experts and opinion leaders who want to test & improve innovations