

Har vi disharmoni mellan regelverk och risk när det gäller UAS
reglering?

Reflektioner över var vi står idag i förhållande till framtida scenarier i
urbana miljöer

LFV FORSKNING OCH INNOVATION

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AiRMOUR



[FILM: AIRMOUR]

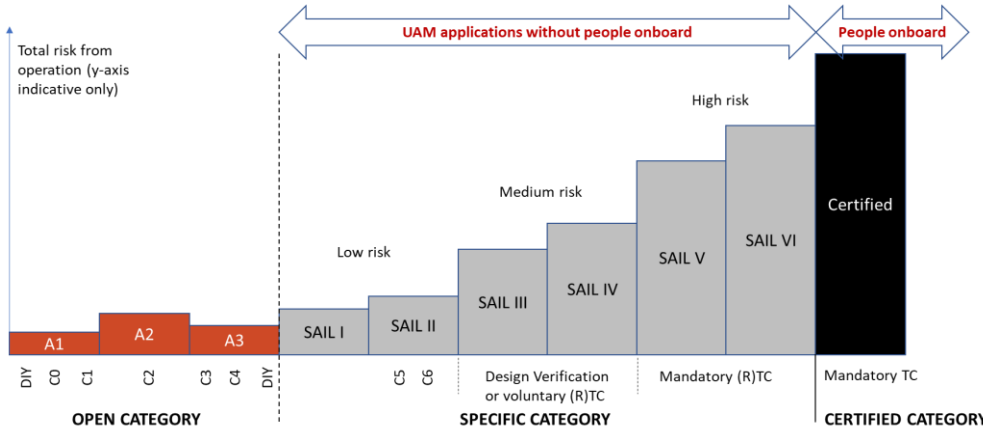
AIRMOUR – ENABLING SUSTAINABLE AIR
MOBILITY IN URBAN CONTEXTS VIA
EMERGENCY AND MEDICAL SERVICES -
YOUTUBE

Regelverks mognad och nationella skillnader

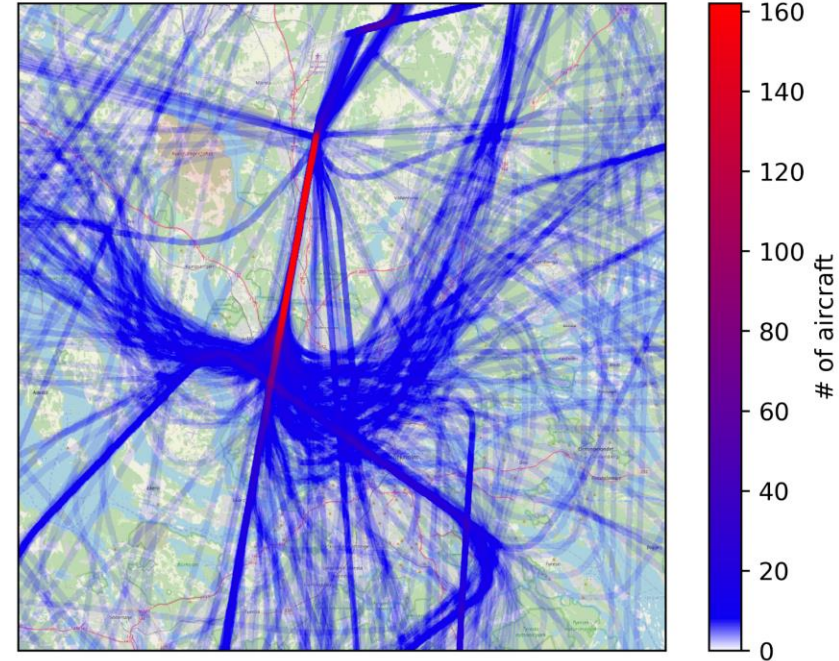
Category	Domain	EU	Finland	Germany	Luxembourg	Norway
UAS	Operator Approval	(EU) 2019/947 – EASA Acceptable Means of Compliance (AMC and Guidance Material (GM) to Commission Implementing Regulation	Follows EASA regulations			
	Pilot Qualifications	Pilot must pass theoretical exam, hold STS-01 skill training and UAS-SPEC 050 (d) and UAS SPEC.060 (b) of EU Regulation 2019/947	Follows EASA regulations			
	Airworthiness/Design Verification	Comission delegated Regulation (EU) 2019/945 a UAS subject to certification shall comply with the applicable requirements set out in Commission Regulations (EU) 2012/748, (EU) 2015/640 and (EU) 2014/1321	Follows EASA regulations			
	Propulsion	EASA Special Condition SC E- 19 – Electric / Hybrid Propulsion system	Follows EASA regulations			
	Avionics	None	None	None	None	None
	C2	E.Y013-01 EASA Special Condition Light Unmanned Aircraft Systems SC Light UAS 01	None	None	None	None
	Flight Control Software	None	None	None	None	None
	Noiseworthiness	None	None	None	None	None
	Lifecycle analysis	None	None	None	None	None
	Flight Permit	EASA AMC/GM SORA	Follows EASA Regulation			

Category	Domain	EU	Finland	Germany	Luxembourg	Norway
Passenger eVOL	Operator Approval	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
	Pilot Qualifications	Ongoing	None	None	None	None
	Airworthiness	Special Condition Vertical TakeOff and Landing (VTOL) Aircraft	Follows EASA Regulations			
	Propulsion	EASA Special Condition SC E-19 – Electric/Hybrid Propulsion system	Follows EASA Regulations			
	Avionics	None	None	None	None	None
	C2	None	None	None	None	None
	Radio Frequency Equipment	None	None	None	None	None
	Flight Control Software	None	None	None	None	None
	Noiseworthiness	None	None	None	None	None
	Lifecycle Analysis	None	None	None	None	None
	Passenger safety	None	None	None	None	None
	Human Factors	None	None	None	None	None
	Handling Qualities	None	None	None	None	None
	Flight Permit	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Airspace	ATM	Ongoing	None	None	None	None
	U-Space Airspace / UTM	NPA 2021-14	Ongoing	Ongoing	Ongoing	Ongoing
Privacy & Security	Privacy and Data Protection	GDPR	GDPR			
	Medical Payload Security	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
	Cybersecurity	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Ground Infrastructure	Vertiport	Prototype Technical Design Specifications for Vertiports	None	None	None	None
	Droneport	None	None	None	None	None
	Charging infrastructure	None	None	None	None	None
	Communications	None	None	None	None	None
Urban Planning	Aviation Infrastructure in Urban Planning	None	None	None	None	None
	Land Use	None	None	None	None	None

SORA/HFRM



Occupancy over 16 hours



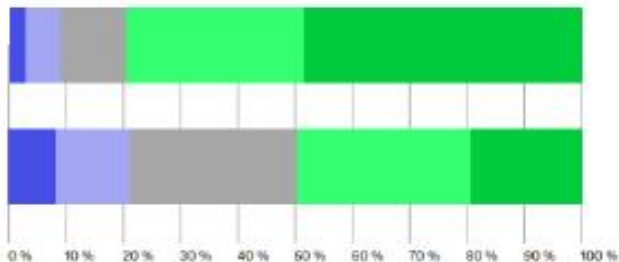
Markrisk



Acceptans för olika användningsområden



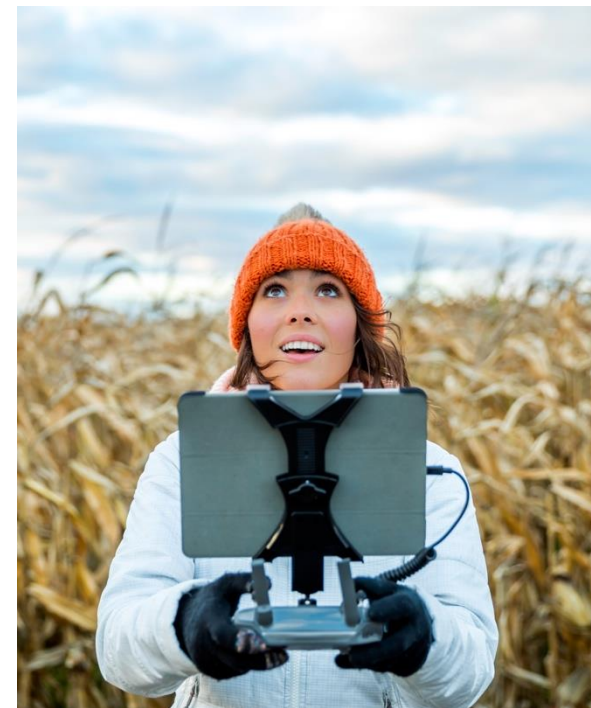
Delivery drones transport small items over short distances with no people on board and are operated autonomously or piloted remotely.



Delivery drones for medical purposes

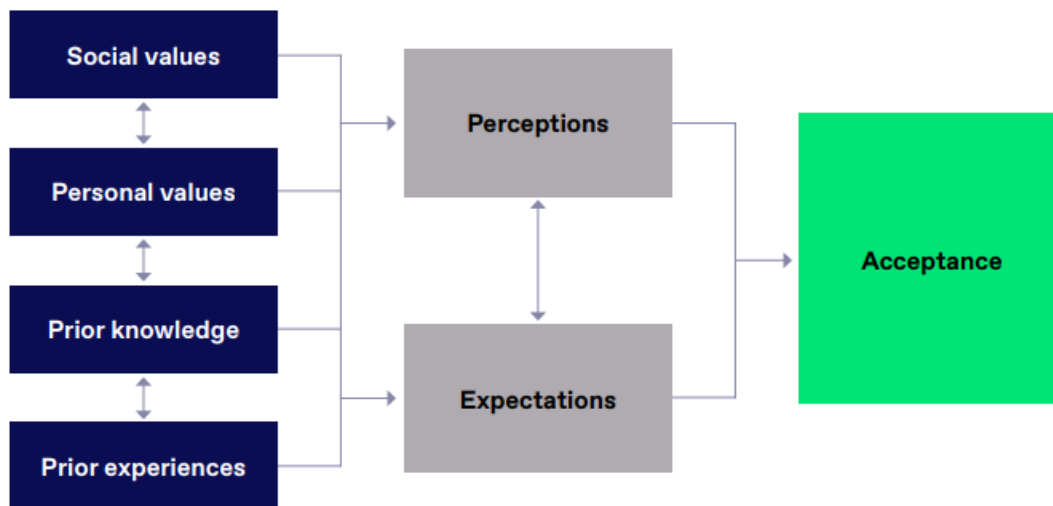
Delivery drones for non-medical purposes

● Not acceptable at all ● Somewhat unacceptable ● Neutral ● Somewhat acceptable ● Very acceptable



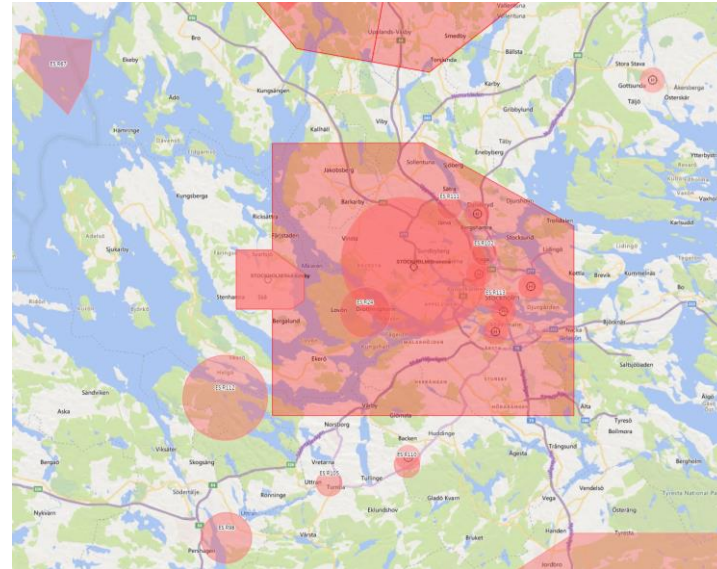
Acceptans och förståelse

- Låg kunskap, låg exponering
- Genererar liten förståelse samt en försiktig hållning till konceptet
- Diskrepans mellan upplevd och faktisk risk

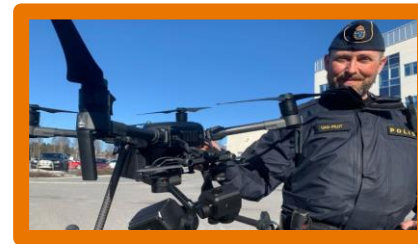


Tidsaspekten - nutid

- 33000 registrerade operatörer
- 29000 dörnarlicenser utfärdade
- 400 000 –600 000 UAS i Sverige



Inköpspris:
cirka 60-90 milj. kr
Kostnad/flygtimme
(inkl. pilot):
15.000– 20.000 kr



Inköpspris: cirka 30.000 kr
Kostnad/flygtimme (inkl. operatör): cirka en tiondel, d v s 1500-2000 SEK

Vad har vi att vänta bortom U1 och U2?

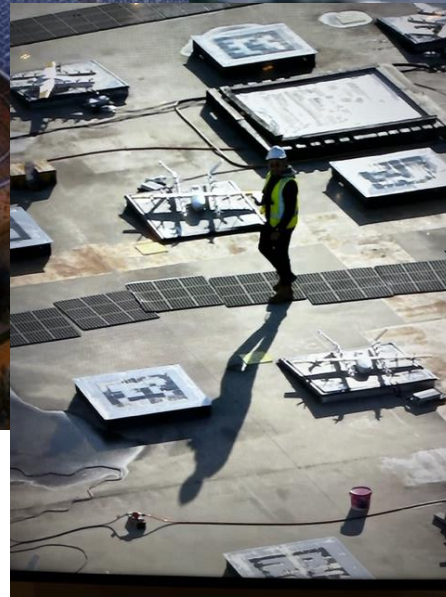
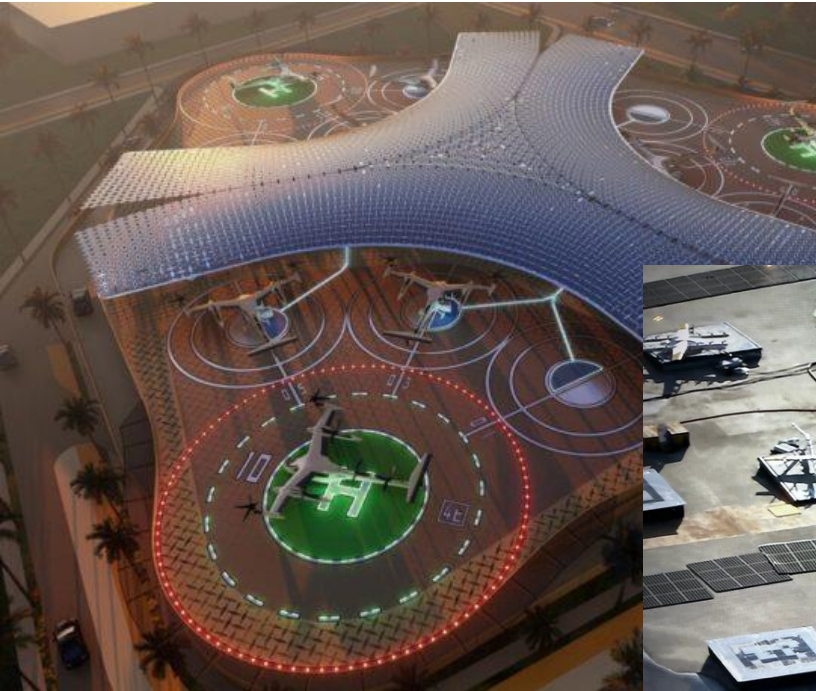


Foto: Vertiportbild / Uber

Tidsaspekten - framtid

DRONE INDUSTRY INSIGHTS

The Drone Market Environment 2022

Hardware

- Drone Platforms:** Agriculture (AGRIUM, JIJIA, HABIT, TRANTOZ, etc.), Delivery & Cargo Systems (DOOSAN, DRONALIA, etc.), Safety & Security (ANDURIL, etc.), Lighter-Than-Air (AEROSTAR, etc.), Passenger drones / eVTOLs (AIRBUS, ASTX, ALAUDA, etc.), eVTOL Vertiports (BAYARD, etc.), Counter-Drone Solutions (911, ARION, etc.), Cameras, Imaging and Vision Systems (SDI, etc.), Components & Systems (ABZRO, etc.), Navigation, Positioning & Guidance Systems (Aerobots, etc.), Propulsion & Power (ACTA, etc.), Launch and Recovery Systems (Dronavio, etc.)
- Drone-in-a-Box:** Aerobotics, Aircraft, etc.
- Helicopters:** ALPHA, etc.
- VTOL Fixed-Wing:** AeroFoundry, etc.
- Recreational:** ALIGN, etc.

Software

- Flight, Fleet & Operation Management:** Aerobios, AirHub, etc.
- Open-Source Infrastructure, SDK:** Auterion, DRONEKIT, etc.
- Navigation, CV and AI:** ANOUR, etc.
- UTM Service / CIS Provider:** AIRMAP, etc.
- Data Analytics, Workflow, CV and AI:** above, etc.

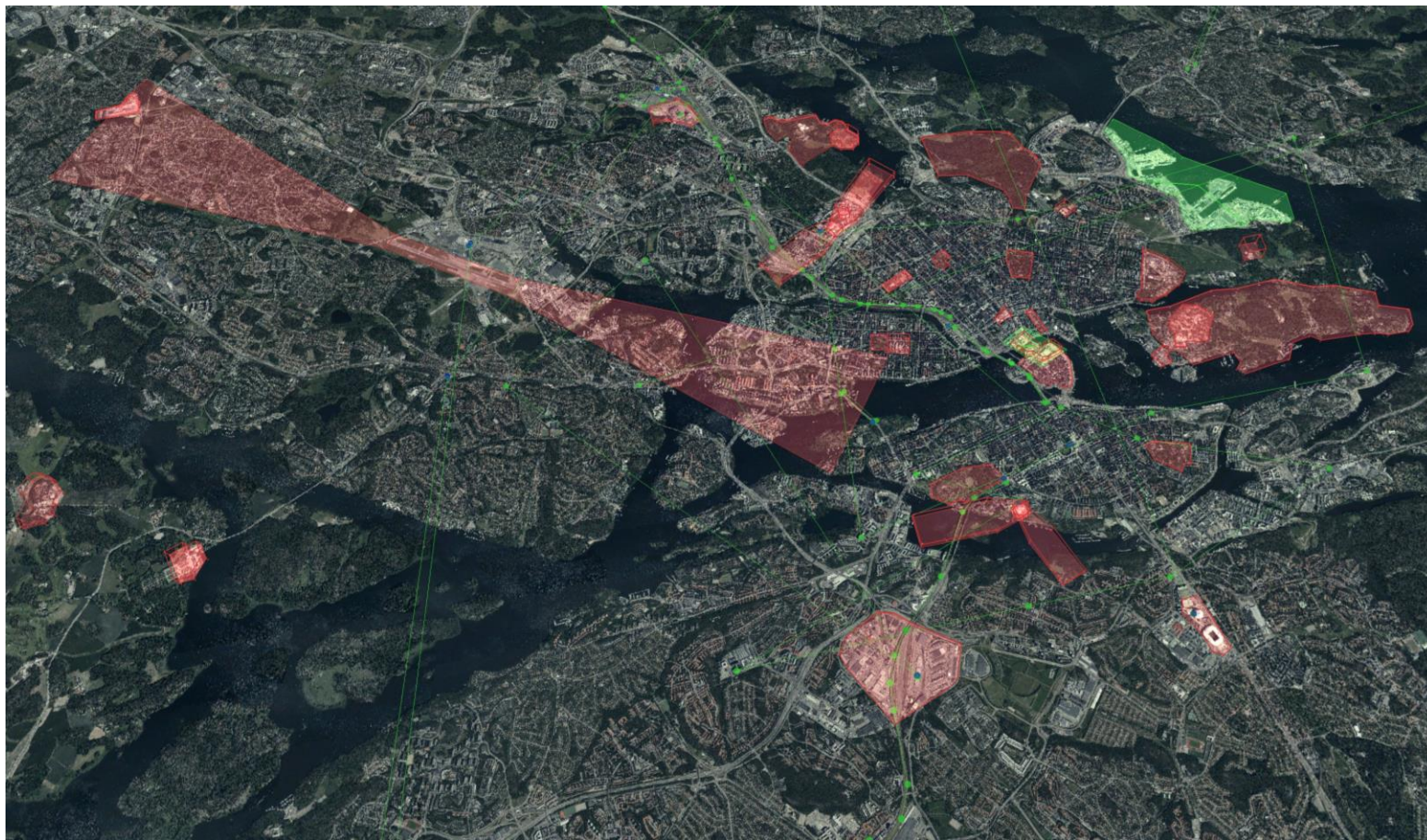
Services

- Drone Service Providers:** Aerial Systems, etc.
- Education, Simulation, Training:** Aerial Academy, etc.
- System Integration, Engineering, Advisory:** Alpha, etc.
- Maintenance:** AEROS, etc.
- Market Research & Consulting:** DRONE ANALYST, etc.
- Media, User Groups, Blogs & Magazines:** droneblog, etc.
- Insurance:** AVION, etc.
- Networks, Coalitions, Organizations & Initiatives:** AIAA, etc.
- Shows, Conferences, Events:** Drone Days, etc.
- Marketplaces:** DroneMarket, etc.

Components & Systems

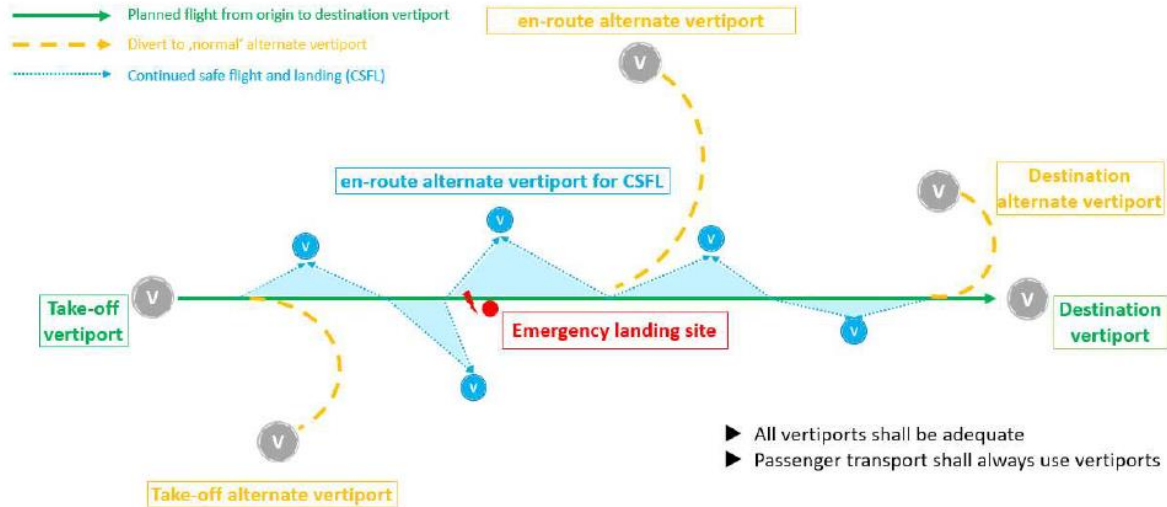
- Navigation, Positioning & Guidance Systems:** Aerobots, etc.
- Propulsion & Power:** ACTA, etc.
- Drone Base Stations & Charging Pads:** AirBase, etc.

Framtid



[FILM: HAIKU]

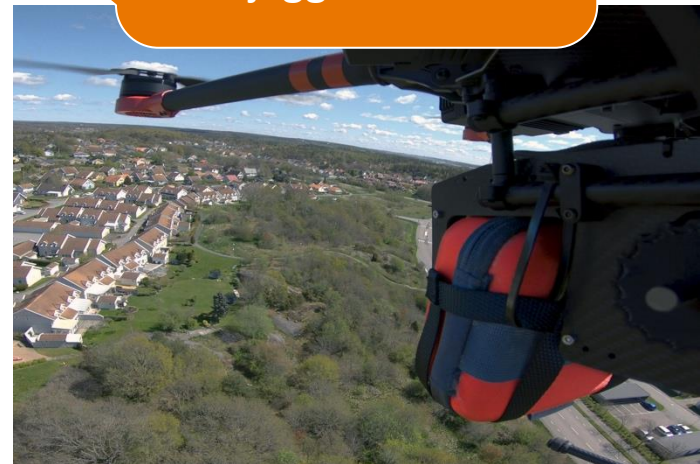
U-SPACE CONOPS AND ARCHITECTURE
(EDITION 4)



Forskning och innovation

- ✓ Fol arbetar med utvecklingen av luftrummet och tillgängligheten för nya brukare i kombination med flygledarnas arbetsbelastning.
- ✓ Arbetet sker i linje med Drone strategy 2.0

Hur kan teknik och automation möjliggöra detta?



FRÅGOR