

ÉALÚ-AER: How we started, where we are now and what's next?

Dr. Wassim Derguech, FMCI (Project Coordinator)

Supporting drone strategy 2.0: results from U-space digital sky demonstrators
23-24 October 2025 – Eurocontrol HQ, Brussels, Belgium



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Drone Registration to Commence on 21st December 2015

17 Dec 2015



IAA Drone Registration Media Event (L-R: Chief Supt Fergus Healy, An Garda Síochána; Paschal Donohoe, TD, Minister for Transport, Tourism & Sport; John Wright, Chairman, Unmanned Aircraft Association of Ireland and Ralph James, IAA Director Safety Regulation)

“The Irish Aviation Authority (IAA) today announced a new drone regulation which includes the mandatory registration of all drones weighing 1kg or more from Monday, 21st December 2015.”

<https://www.iaa.ie/media/2015/12/17/drone-registration-to-commence-on-21st-december-2015>



Emergence of Irish drone startups



Early partnerships in mapping, inspection, emergency response



Testing in remote/rural airspaces

R&D investment from SEAI, SFI, Enterprise Ireland





A Growing and Structured Industry 2020-2025



**How did
all this
start?**

Let's build a vertiport, they will come!

ÉALÚ-AER

In **April 2021**, Future Mobility Campus Ireland, Skyports, Avtrain and the Shannon Airport Group signed a memorandum of understanding (MoU) to establish Ireland's first passenger and cargo vertiport.



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*Project Partners at Shannon Airport



FMCI Air Drone Delivery Proof of Concept

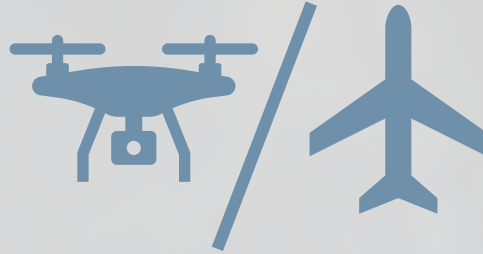
BVLOS Operations in Shannon as a proof of concept – Nov. 2021



**70 BVLOS FLIGHTS CONDUCTED IN
CONTROLLED AIRSPACE AND
UNCONTROLLED AIRSPACE**



**100% SAFETY RECORD ACROSS ALL
70 BVLOS FLIGHTS**



**SUCCESSFUL AIRSPACE
MANAGEMENT & DECONFLICTION
WITH SHANNON ATC**



**BVLOS LIGHT UAS OPERATOR
CERTIFICATE GAINED**



17+ HOURS FLIGHT TIME



PROJECT PARTNERS

Ireland's First Vertiport – Dec. 2021



How about ÉALÚ-AER?

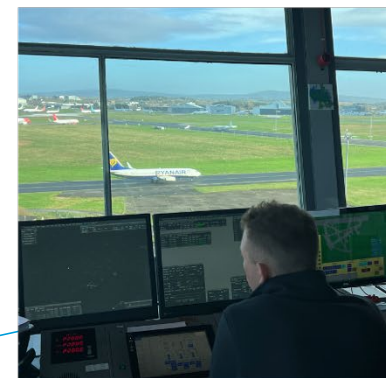
ÉALÚ-AER



Proposal Submitted in January 2022



ÉALÚ-AER Kick-Off – Nov 2022



38 months

Nov 2022

Dec 2025

8 partners



5 countries



Project coordinator

101079674
Grant Agreement

Our Consortium



ÉALÚ-AER Consortium

ÉALÚ-AER



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ÉALÚ-AER Consortium

ÉALÚ-AER

Infrastructure



U-space Services

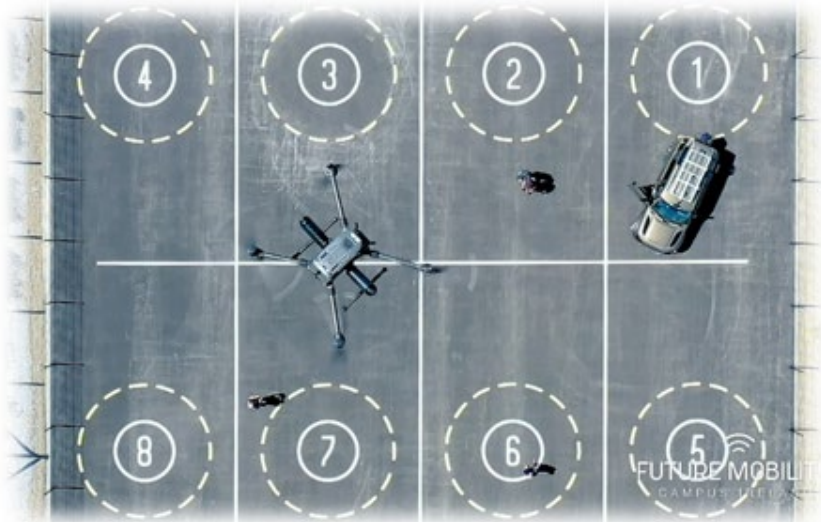
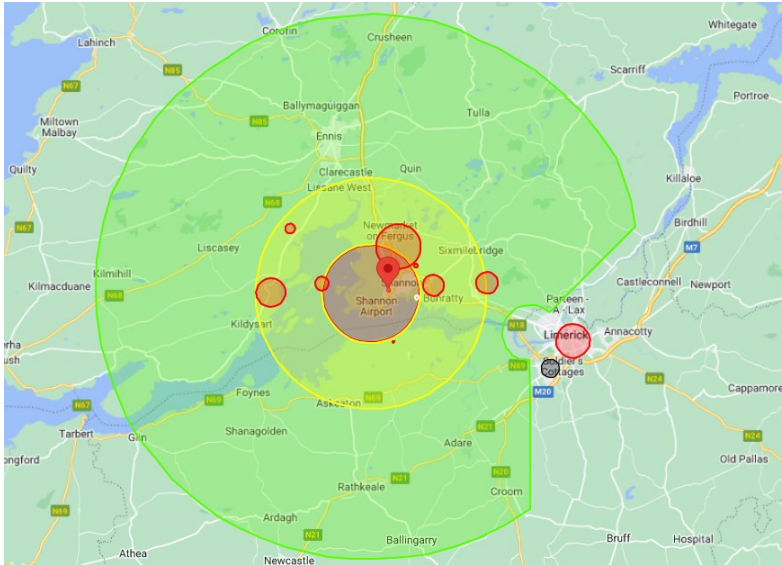


Drone Operator



ÉALÚ-AER location

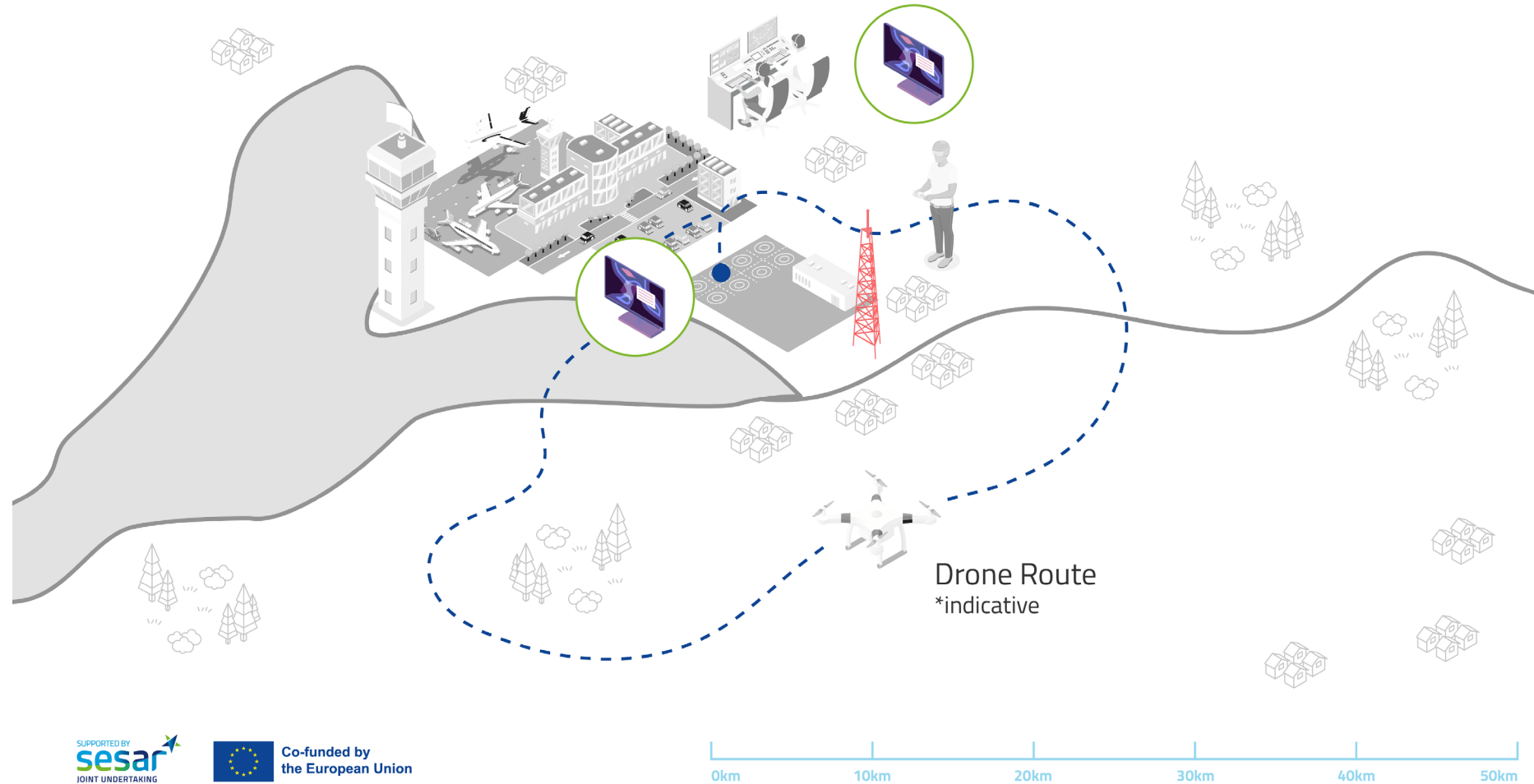
ÉALÚ-AER



Ireland's First Vertiport – Home for ÉALÚ-AER



BVLOS Operations within Class-C airspace with regulatory U-space services



CONCEPTS AND ENABLING TECHNOLOGIES



Shannon Airport



FMCI Vertiport



ATC
Tower



ARINC
Global
Network



DJI MATRICE
300RTK



USSP+CISP
Collins Airspace
Services



FMCI
Control Centre



Remote Pilot
/ Visual Observer
/ Extended
VLOS Spotter

ÉALÚ-AER

AESA X-Band radar as a surveillance enabler



CONCEPTS AND ENABLING TECHNOLOGIES



Shannon Airport



FMCi Vertiport



ATC
Tower



ARINC
Global
Network



DJI MATRICE
300RTK



MANNA



Long distance
eVTOL



USSP+CISP
Collins Airspace Services



FMCi
Control Centre



Remote Pilot
/ Visual Observer
/ Extended
VLOS Spotter

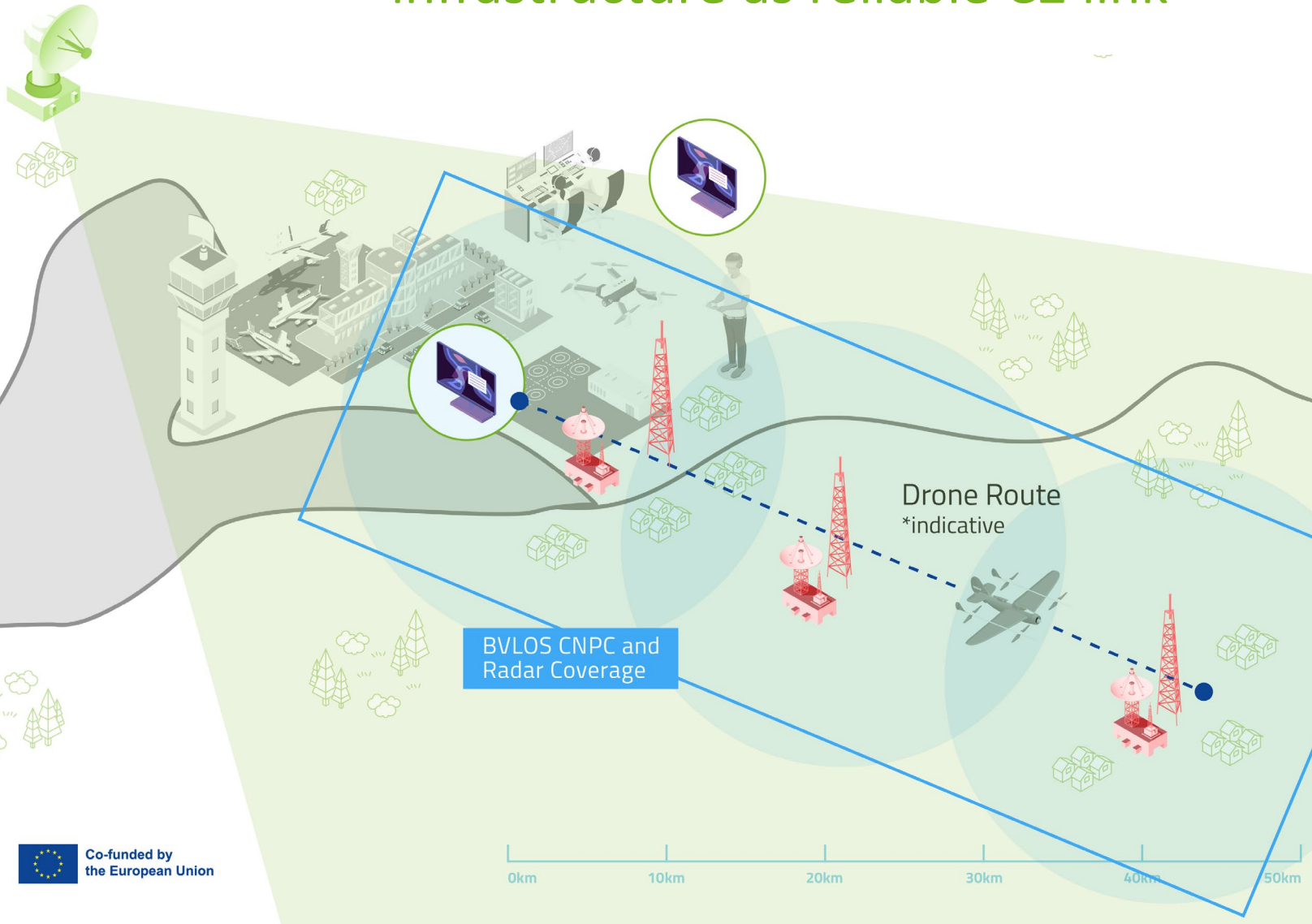


CNPC5000
C2 Data
link radio



Skyler:
Low-power
X-band
Surveillance
AESA Radar

Modular and scalable CNPC radio infrastructure as reliable C2 link



CONCEPTS AND ENABLING TECHNOLOGIES



Shannon Airport



FMCI Vertiport



ATC Tower



ARINC Global Network



DJI MATRIX 300RTK



MANNA



Long distance eVTOL



USSP+CISP
Collins Aerospace Services



FMCI Control Centre



Remote Pilot / Visual Observer / Extended VLOS Spotter



CNPC5000
C2 Data link radio



Skyler:
Low-power X-band Surveillance AESA Radar

**WHAT
NEXT?**

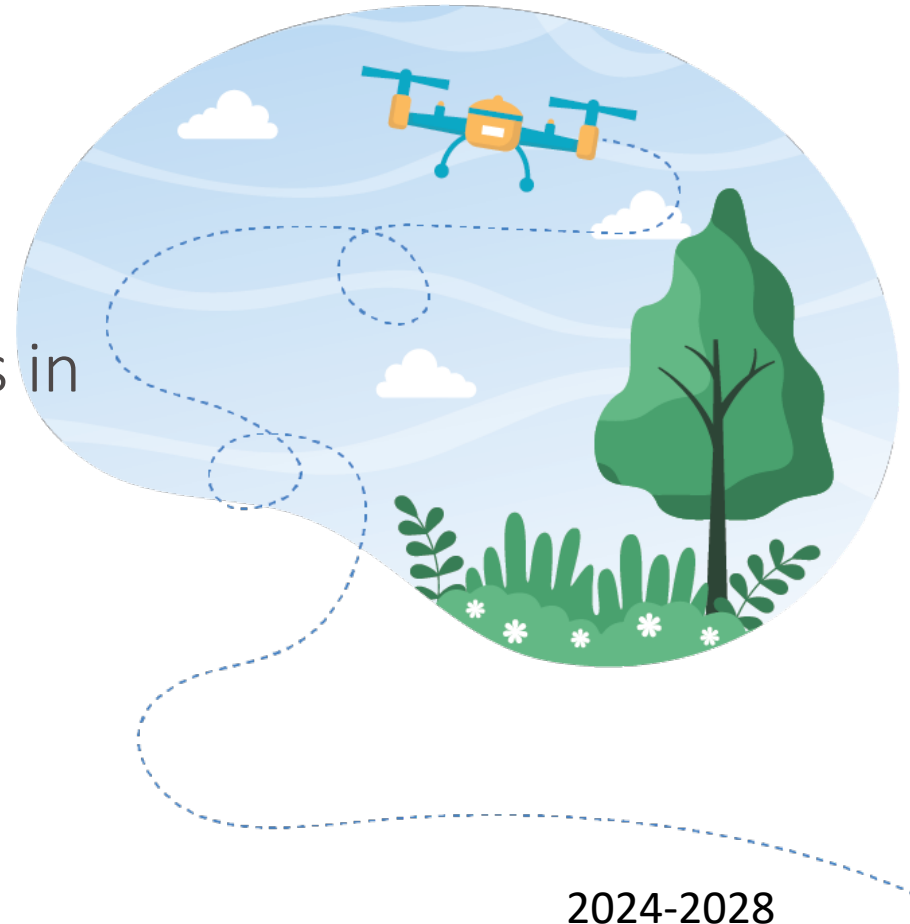


Developing Skills and Capabilities for Innovative Air Mobility

AIRMOb (Developing Skills and Capabilities for Innovative Air Mobility) with five regional clusters in Italy, Spain, Portugal, Ireland, and Türkiye

Coordinator:  **deepblue**

Irish Cluster:



2024-2028



Co-funded by
the European Union

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SKYWARD BOUND

Advanced Aerial
Innovation in Ireland



FUTURE
MOBILITY
CAMPUS
IRELAND

Understanding the ecosystem in Ireland
released at Paris Airshow 2025



Shannon Airport Eyeing Up Advanced Aerial Mobility Research Lab

29 MAY 2025





FMCI IS SET TO OPEN
IRELAND'S FIRST
VERTIPORT IN

2026



BETA Technologies
starts their European
tour in Ireland.
May 2025

Who You can Meet Here?



Wassim Derguech



Javier Camacho



Ray Foley



Stefano Rivero



Cathal MacCristail



Denis Doyle



Anshika Gupta



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Social Acceptance of Innovative Air Mobility in Ireland: Stakeholders' Perspective and Survey Insights

Dr. Wassim Derguech, FMCI (Project Coordinator)
on behalf of Aurora De Bortoli Vizioli, Deep Blue

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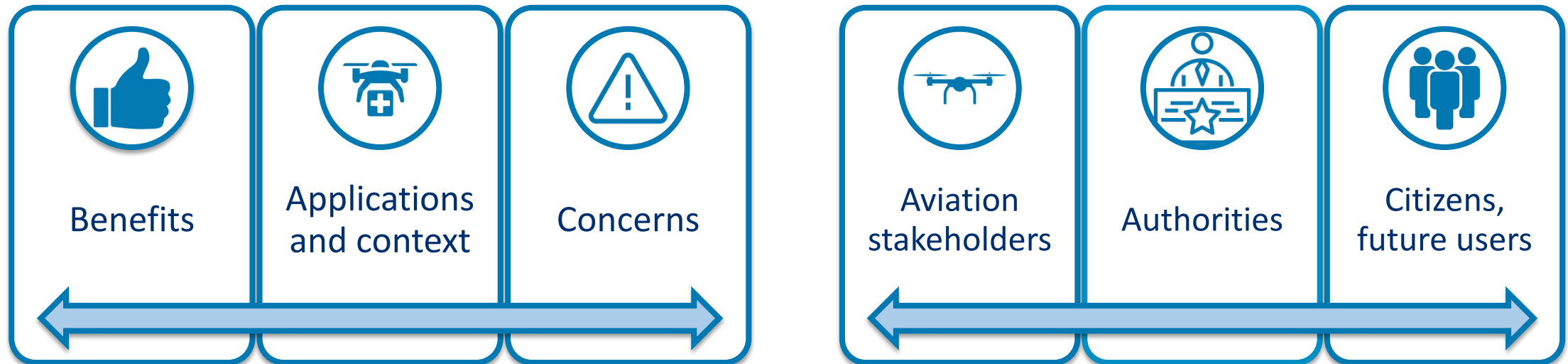
Social acceptance of IAM

- Positive attitude towards a technology or measure, which leads to supporting behaviour / adopt or willing to adopt.
- Social acceptance is a complex construct and the result of a process.
- Critical for success and full deployment.

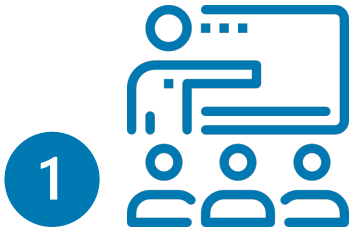


Social acceptance of IAM

Acceptance is a complex construct that results from the combination of many different factors such as knowledge and experience, demographic factors, trust (technology, authorities) & fears, perception of risks & benefits, social norms and community influence.



Methods: Data collection



FMCI Drone-a-palooza, Shannon, Ireland, January 2024

- Questionnaire and discussion of results in real time
- Industry representatives, researchers, policymakers, N=28



Transport Research Arena (TRA), Dublin, Ireland, April 2024

- Semi-structured interviews
- Industry representatives, researchers, policymakers, N=9



Survey to the Irish population, May-August 2025

- 23 Items
- General public, N=126, average age: 39

Methods: Topics addressed

1 2 3

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Demographics



Level of familiarity with IAM and exposure to drones



General attitudes and perceived benefits



Acceptability and pros & cons of services and application cases



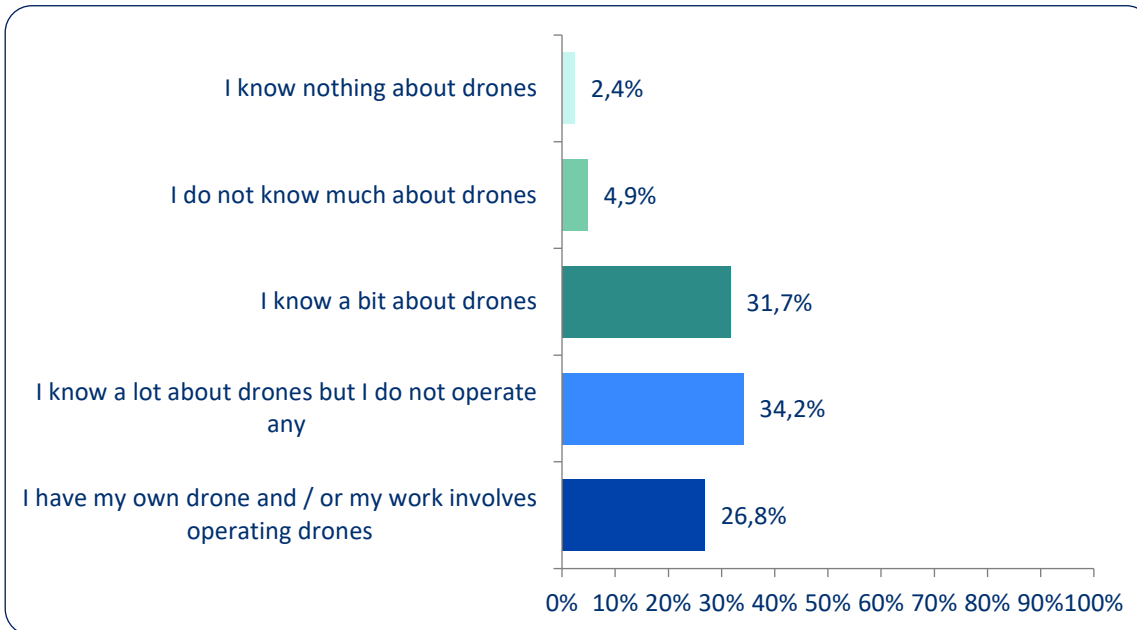
Concerns and barriers related to drone operations in Ireland



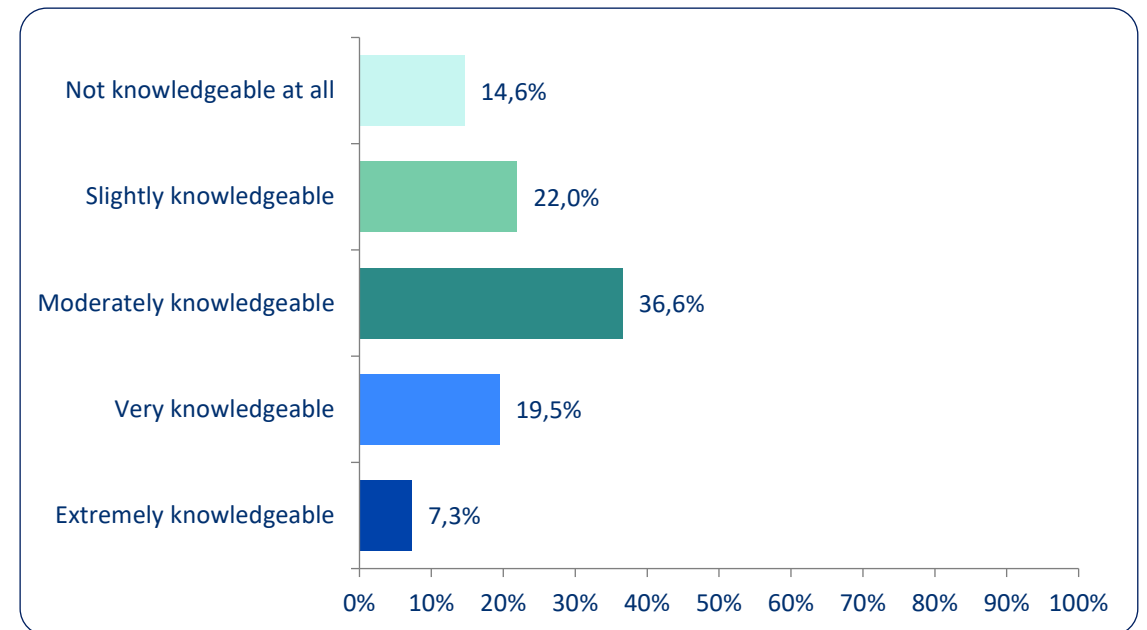
Real life experience, mission transparency and mitigations



Familiarity with drone technology



Familiarity with IAM concept



High familiarity with drone technology

Moderate knowledge of IAM

Results - General feelings

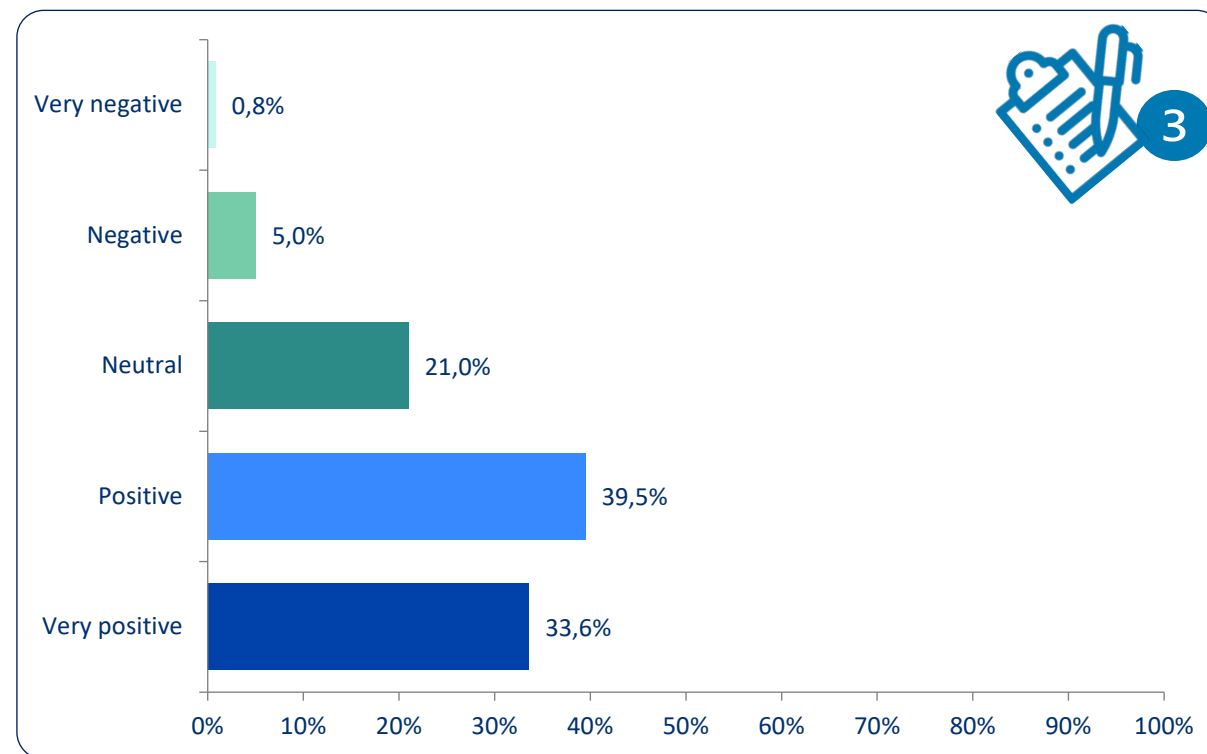
Overall, positive feelings toward drone technology and IAM from **1** **2** **3**

Key concerns from stakeholders:

- Lack of comprehensive regulatory framework
- Unclear potential for specific UAS applications
- Social acceptance (e.g., trust, social equality)

Full deployment timelines:

- Cargo delivery: around 5 years, with medical delivery to be adopted first.
- Passenger transport: more than 10 years, contingent on regulation, public trust, and tech maturity.



Environmental benefits





Goods &
cargo
delivery



Emergencies,
Search &
rescue



Monitoring
&
Inspections



Remote
areas
connection



Media &
Entertainme
nt



Agriculture



Medical
delivery



Law
enforcement



People air
transport

Strong support: Applications for the common good such as Medical delivery, Search & Rescue, Monitoring & Inspections

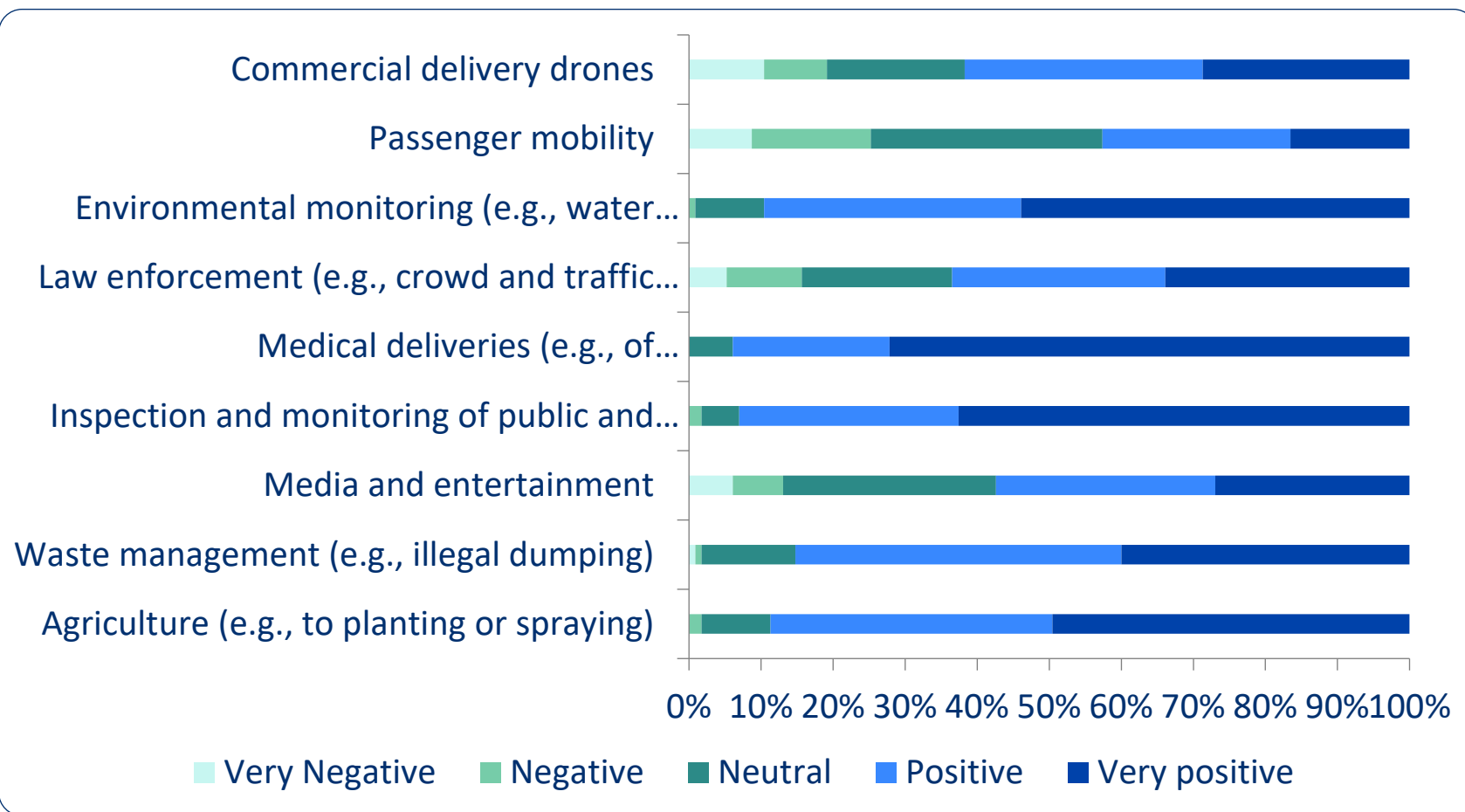
Mixed results: Freight delivery, Agriculture, Media & entertainment

Pros & Cons: Passenger mobility and Law enforcement

Concerns from stakeholders: “Cost-effectiveness of services” “Social inequality” “Big-brother effect”



- **Medical delivery and Inspection & monitoring** (more than 90% positive or very positive)
- **Commercial delivery, Law enforcement** (for both, 60% positive or very positive)
- **Passenger mobility** (40% positive or very positive)



Results - Issues & concerns

1 2

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Safety concerns



Privacy concerns



Noise annoyance



Visual annoyance



Mission purpose



Environmental concerns



Misuse



Illegal Use



Social equality

Safety, security and illegal use

Privacy

Environmental concerns and noise

Social Inequality

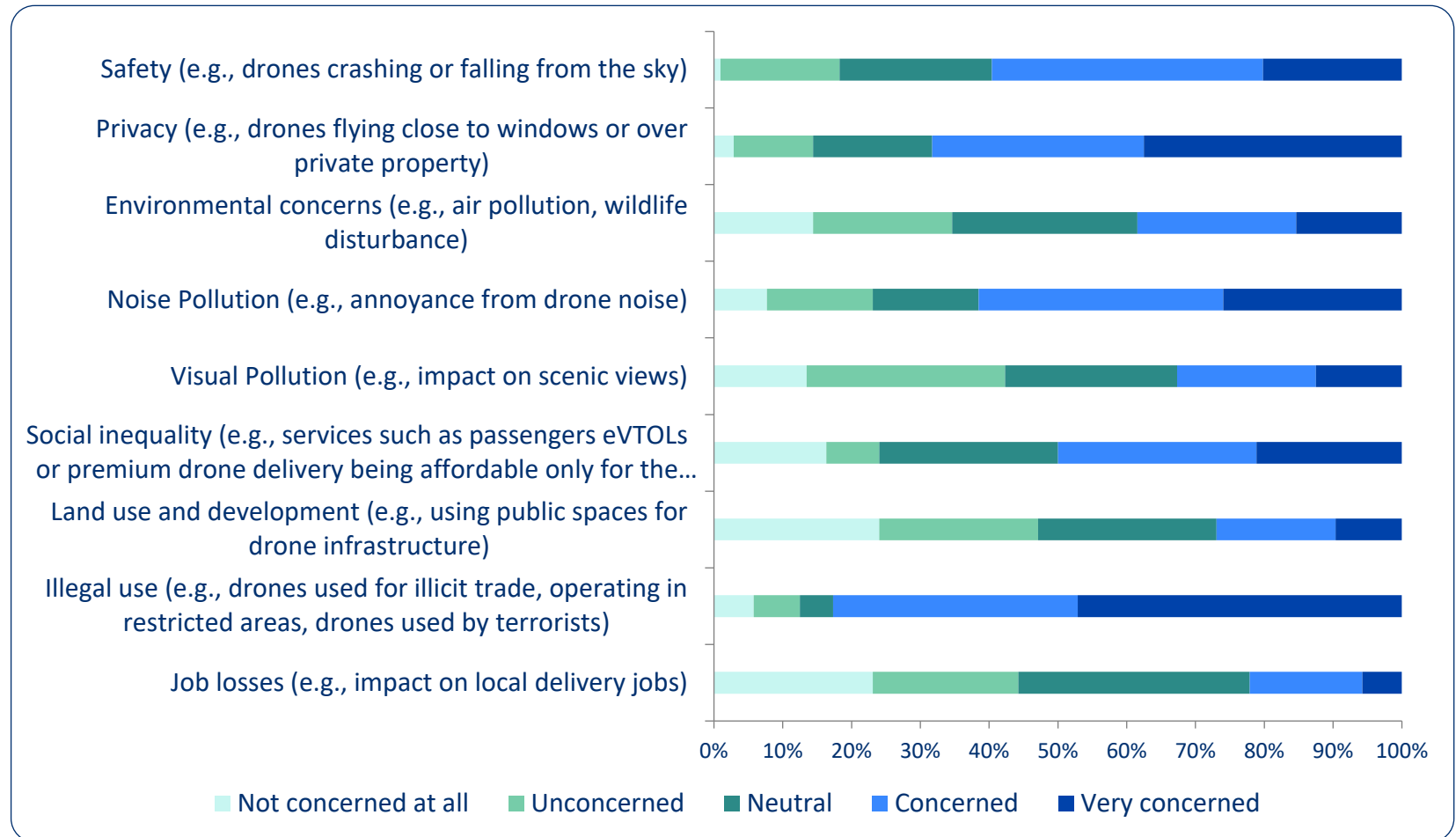
Visual pollution and land use

Barriers & showstoppers from stakeholders: *“Regulatory and certification issues” “Technological maturity and infrastructural readiness” “Acceptance, trust, and accessibility”*



Top 3 concerns:

- **Illegal use** (more than 80% concerned or very concerned)
- **Privacy** (about 70% concerned or very concerned)
- **Noise and Safety** (for both, 60% concerned or very concerned)

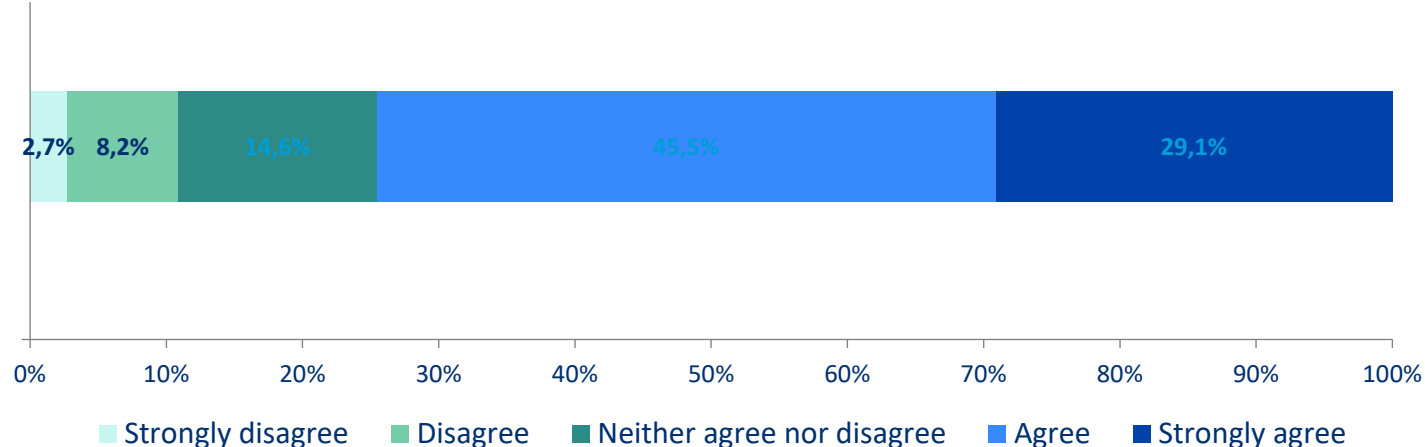


Results - Real life experience, mission transparency and mitigations

1 2 3

“Who is flying it, and what is it doing?” “What is the mission?” “Why is the drone there?” “What is the purpose?” “Who’s operating the drone?”

If drones were to operate in your area, would knowing their purpose and operator in real time (while the drone is flying overhead) make you feel more comfortable?



Results - Real life experience, mission transparency and mitigations

Knowing the mission purpose and responsible entity

- Authorization and data collection
- Safety, pilot experience

Implementing mitigation measures

- Regulation & policy, Tools and technologies, Operational, Engagement

54% of survey participants would find very useful an app that allows to identify the drone, 40% would also appreciate visual cues.



- Overall, similar pattern of answers from 1 2 3
- **Alignment with EU and Non-EU Nations:** Results align broadly but reveal unique Irish characteristics:
 - Technological Hub
 - Increasing familiarity and exposure
 - Collaborative and continuous effort
 - Dublin City Council 2021 - Accelerating the Potential of Drones for Local Government project
 - Irish Department of Transport 2023 Policy Framework for Unmanned Aircraft Systems
 - Dublin City Council Smart City 2024: Drone and Urban Air Mobility Strategy 2024 – 2029
 - FMCI 2025, *Skyward Bound: Advanced Aerial Innovation in Ireland*
 - Erasmus+ AIRMOB project 2025-2029 -> Irish Centre of Vocational Excellence on IAM

Who You can Meet Here?



Wassim Derguech



Javier Camacho



Ray Foley



Stefano Rivero



Cathal MacCriostail



Denis Doyle



Anshika Gupta



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Assessing Current and Future Skills Needs for Innovative Air Mobility

Dr. Wassim Derguech, FMCI (Project Coordinator)
on behalf of Julie Garland, Avtrain

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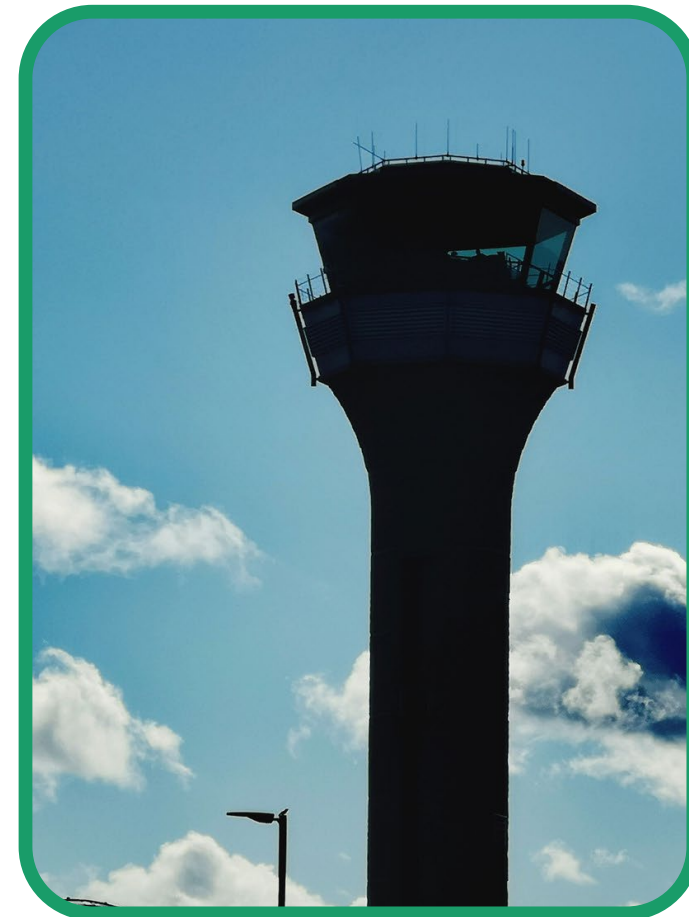
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ABOUT ÉALÚ-AER PROJECT

ÉALÚ-AER aims at demonstrating U-Space architecture operations and the integration with ATM, leveraging world-class drone traffic management technology solutions.

The project established Ireland's first Digital Sky Demonstrator, located at Future Mobility Campus vertiport site, in Shannon, Ireland.

ÉALÚ-AER



- Assess current skills and competency levels in Innovative Air Mobility (IAM)
- Identify future skills requirements for emerging technologies
- Analyse gaps between current capabilities and future industry needs
- Provide recommendations for education and training programs
- Support workforce development in the IAM sector.

PURPOSE

Skills Transformation Map

Recommended training paths, with the aim of “bridging the gap” between the baseline competence/skills profile of the user and the required competencies

Skills Gap Analysis

Analyse how the workforce looks today, and the main project reference scenarios will facilitate an understanding of new roles and the major changes in skills and competencies required by the workforce.

METHODOLOGY

TOP-DOWN APPROACH

Literature review and industry analysis to identify emerging competencies and skills requirements for IAM.

BOTTOM-UP APPROACH

Industry survey to gather insights on current skills, training needs, and technology impact.

VALIDATION

Cross-reference findings with expert consultations and industry standards to ensure accuracy and relevance

OVERVIEW

SECTORIAL

BREAKDOWN

- **Operators (A):** Remote Crew, Safety, Operations, Technology, Maintenance, Ground Operations
- **U-Space Services (B):** Flight Authorisation, Traffic Information, Geo-awareness, Network ID, CIS, Conformance Monitoring
- **ANSP (C):** Air Traffic Management, Navigation Services, Safety Management
- **Human Factors (D):** Training, Research, Communication, Competency Management
- **Infrastructure (E):** Vertiport Operations, Facility Management, IT/Digital Infrastructure
- **Regulators (F):** Competent Authority, Inspectors, Certification Officers
- **UA Manufacturers (G):** Design, Testing, Production, Airworthiness
- **Related Services (H):** Legal, Risk Management, HR, IT, Marketing



**TOTAL OF 249
OCCUPATIONS
IDENTIFIED WITHIN
THE PROJECT**

Competency Framework for the Air Sector

CFAS FRAMEWORK

Behavioural

1.

Interpersonal Skills & Teamwork

Collaboration, consultation, cultural awareness

2.

Communication & Reporting

Technical communication, information dissemination

3.

Personal Resilience & Critical Thinking

Crisis management, adaptability, independent decision-making

4.

Training & Development

Continuous learning, competency assessment

Technical & Functional

5.

Operational Expertise

Design, manufacturing, maintenance, equipment operation, data analysis

6.

Customer Focus

Client management, service excellence, stakeholder relationships

7.

Leadership, Management & Planning

Work organisation, process management, HR coordination

8.

Safety & Responsibility

Screening, monitoring, regulatory compliance, ethical practice

SURVEY DESIGN

ÉALÚ-AER

1

Background and employment. The first section contained general questions about the background and employment of the respondents, including their age, gender, country, and area of the IAM sector in which they currently work, as well as information about what they like most and least about their job.

2

Education and training. The second section included questions related to the educational qualifications of the respondents and the training they have received within their organisation.

3

Key competences. This section collected feedback on the competences required in the sector. It validated the key competences identified within WPI, which were included in the sector's competences framework developed as part of this work.

4

New and emerging occupations. This last section explored respondents' views regarding the changing nature of work in the next years: the occupations that are going to disappear and those that will be created.

Participants were asked to share their experiences and views regarding

(a) the skills and competences required in their current occupations;

(b) the emerging skills and competencies necessary for the future workforce;

SURVEY

ÉALÚ-AER

DEMOGRAPHICS

63 Responses

80%
Age 25-54
years



32
Male
respondent

97%
work in
Ireland

Primary Roles
55% UAS Operator
16% Remote Pilot
16% Training
12% Consultant

40%
currently work in the IAM
Sector

82%
of organisations use UAS

SURVEY

EDUCATION

BACKGROUND

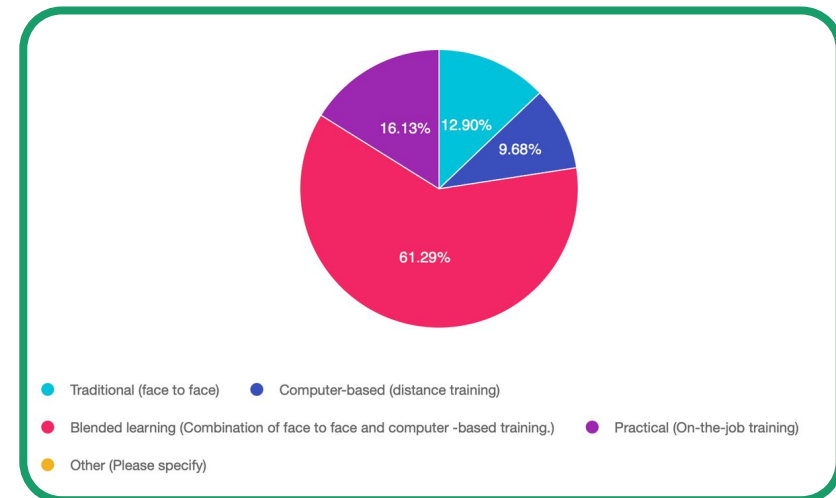
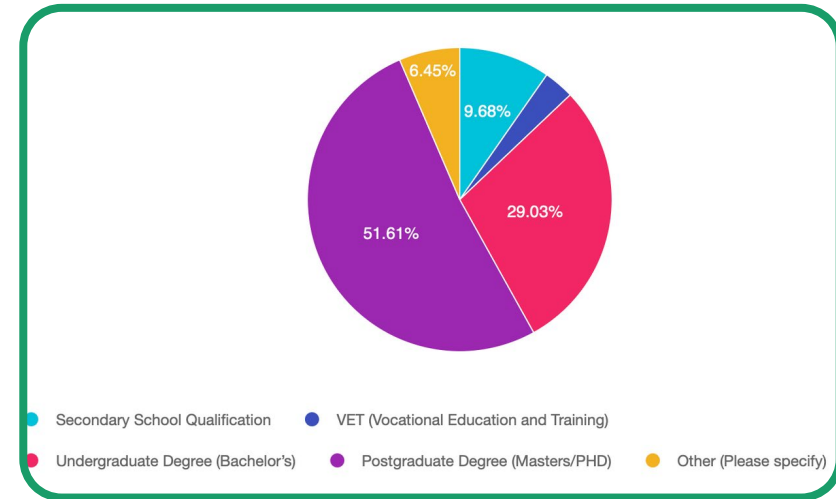
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Around 81% have university-level education (52% postgraduate, 29% undergraduate)

Around 36% studied Engineering

Only 25% rated institutions as Very/Extremely Effective for IAM preparation, while 41% found on the job training Very/Extremely helpful.

62% prefer blended learning approaches

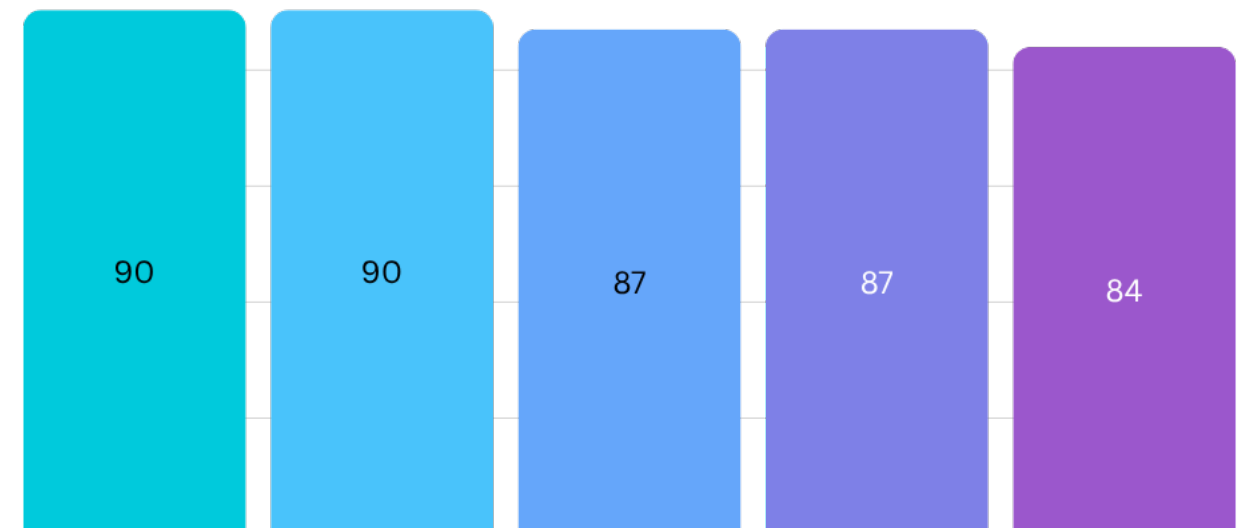


SURVEY

MOST IMPORTANT COMPETENCES

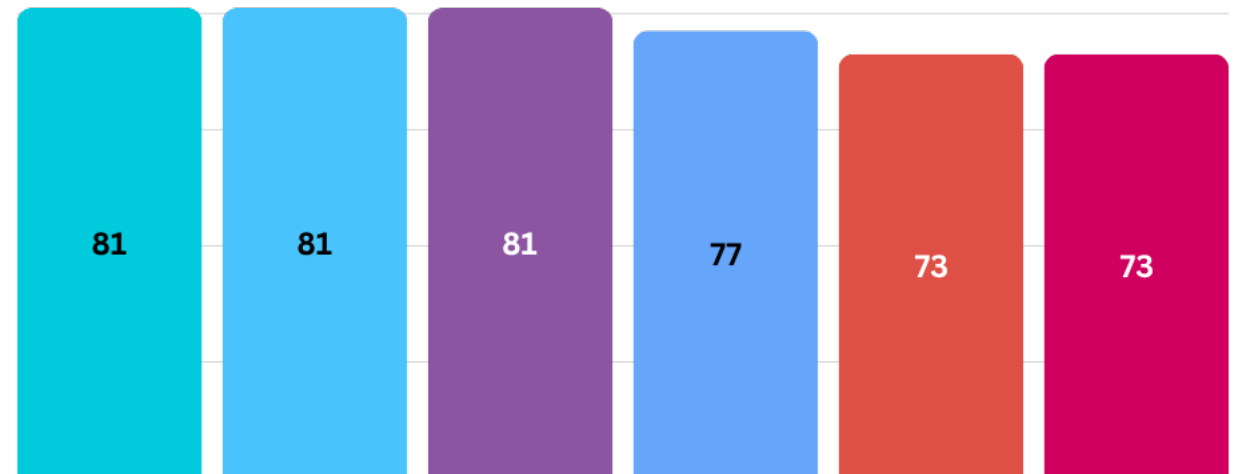
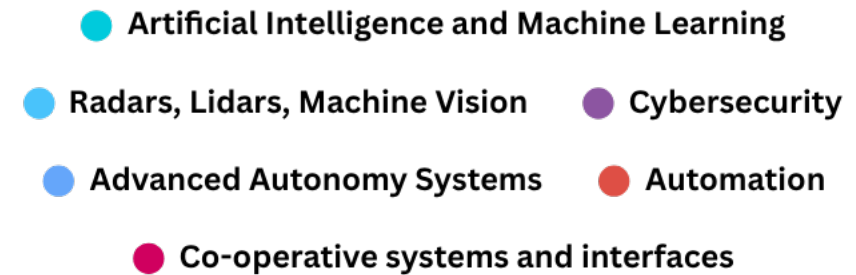
- **Safety-First Mindset.** Decision-making and safety responsibility are top priorities.
- **Human-Centric Approach.** Interpersonal skills are equally important as technical skills
- **Analytical Thinking.** Critical thinking is essential for complex operations
- **Regulatory Awareness.** Compliance remains crucial in a regulated environment
- **Collaborative Operations.** Teamwork is necessary for integrated air mobility

- Dealing With Complexity & Adaptability
- Decision-Making, Safety and Responsibility
- Communication & Reporting
- Compliance With Regulations
- Teamwork & Collaboration; Leadership, Management & Planning

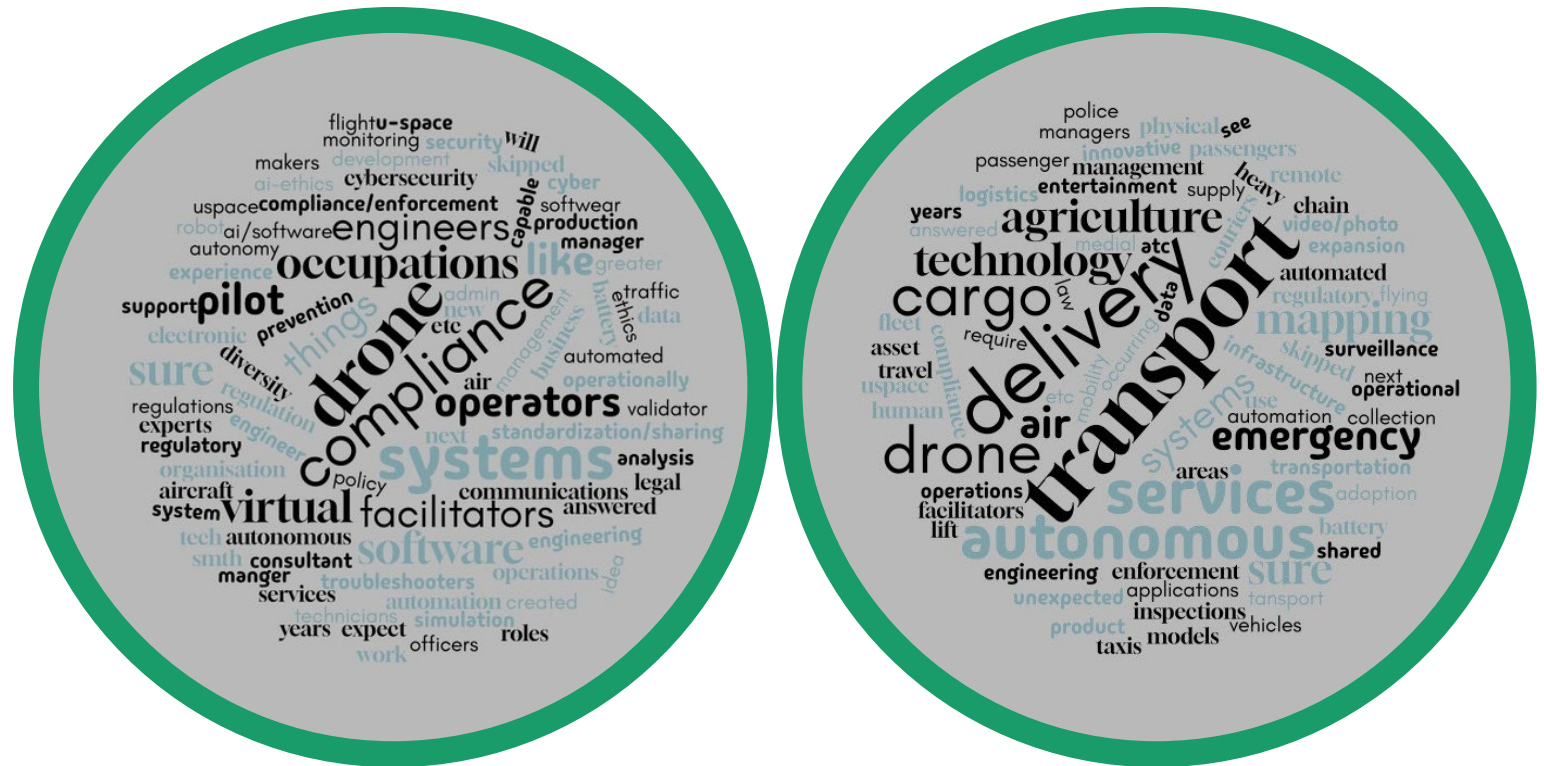


SURVEY TECHNOLOGIES IMPACTING IAM

- **Sensing Technologies.** Radars, Lidars, and machine vision critical
- **Security Focus.** Cybersecurity essential for safe operations
- **AI/ML Leadership.** 81% expect significant impact from artificial intelligence
- **Automation Evolution.** Advanced autonomy systems transforming roles
- **Skills Implications.** Workforce must adapt to technology-driven environment.

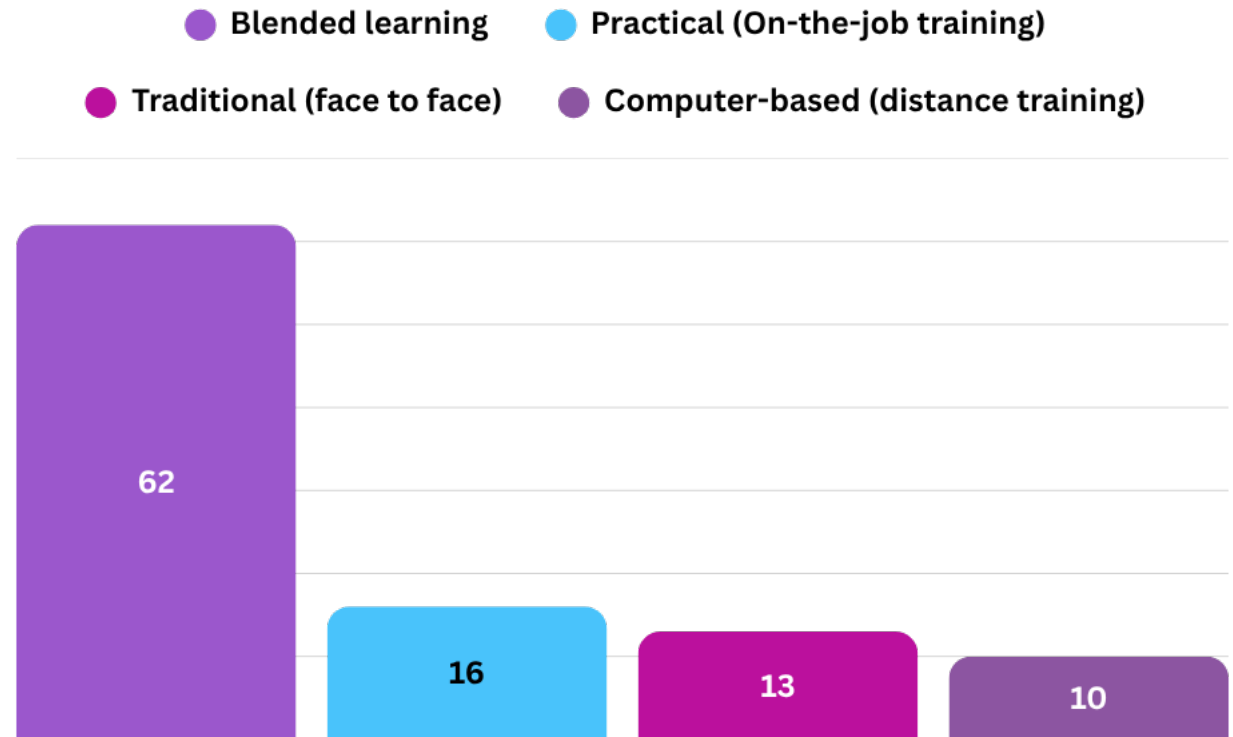


In what areas do you see expansion occurring, in Innovative Air Mobility over the next 10 years?



SURVEY TRAINING PREFERENCES

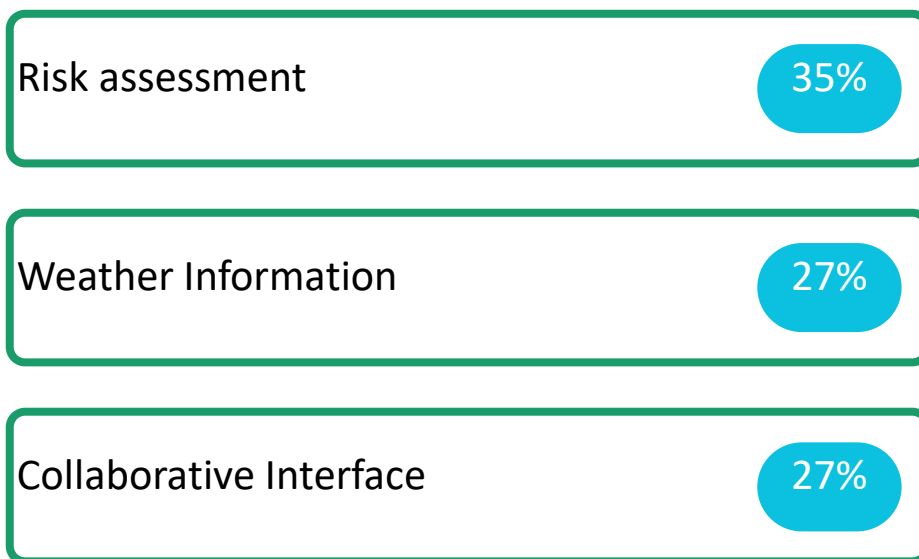
- **Blended Learning Dominance.** 62% prefer combination of face-to-face and digital
- **Practical Focus.** 16% emphasize on-the-job training importance
- **Balanced Approach.** Equal preference for traditional and computer-based methods
- **Flexibility Required.** Multiple delivery methods needed to meet diverse needs
- **Industry Integration.** Training should combine theoretical and practical elements



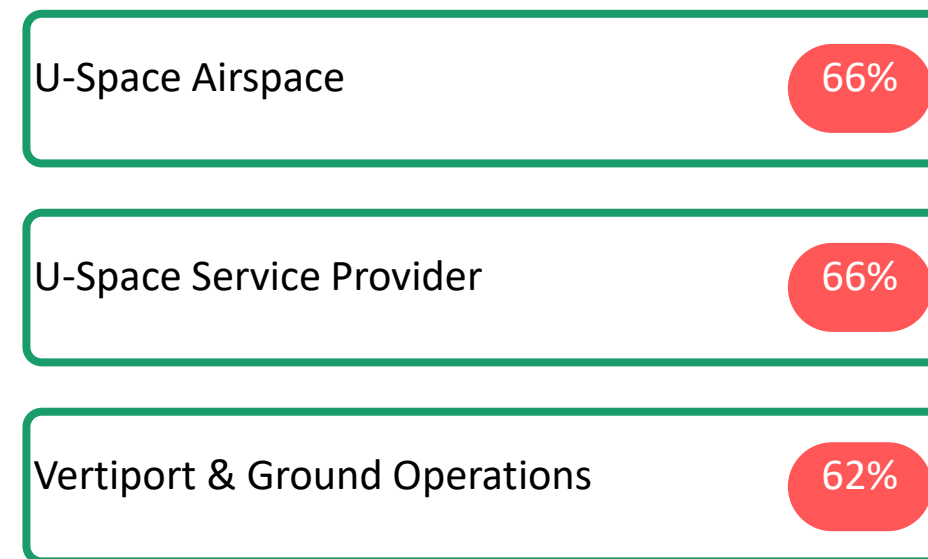
SURVEY

KNOWLEDGE LEVELS

Highest Expertise Areas



Knowledge Gaps (Basic or None)



“Key Finding: Strong foundation in traditional aviation areas, but significant gaps in emerging U-Space and vertiport technologies”

SURVEY

SKILLS GAP IDENTIFIED

Technological Proficiency Gap

Limited knowledge of U-Space airspace.

Cybersecurity expertise shortage.

Advanced systems integration skills.

Enhanced training needed in AI and automation.

Formal Education vs Industry Needs Gap

Inadequate preparation by educational institutions.

Inconsistent initial and ongoing training.

Need for practical and blended learning.

Curriculum not aligned with industry requirements.

Knowledge Distribution Gap

Uneven expertise across IAM services.

Strong in traditional aviation areas.

Weak in emerging technologies.

Limited U-Space and vertiport knowledge.

SURVEY

EMERGING OCCUPATIONS

Changing roles

Remote Pilots

Evolving towards automation and autonomy supervision

Air Traffic Controllers

Adapting to integrated U-space management

Maintenance Roles

Shifting from manual to technology-enhanced operations

New Roles

U-Space Facilitators

NEW

Vertiport Managers

NEW

Cybersecurity Specialists for IAM

NEW

AI Systems Engineers

NEW

Autonomous Systems Specialists

NEW

WORKFORCE TRANSFORMATION

Adapted Roles (Upskilling Existing Positions)

Adapted Roles (Upskilling Existing Positions):

- **Operators:** Safety Managers (A2.x), Operations Managers (A3.x), Technology/IT roles (A4.x) — enhanced with SORA, PDRA, ERP, data protection competencies
- **ANSP:** ATM Controllers (C1.x), Safety & Quality (C9.x) — integrating mixed traffic procedures and U-Space interfaces
- **Infrastructure:** Vertiport/Facility Management (E1–E6) — expanding into connectivity, cybersecurity, performance monitoring

New Roles (U-Space Service Requirements)

- **Flight Authoriser (B3.x), Tactical Deconfliction Specialist (B3.3)**
- **Conformance Monitoring Officer (B13)**
- **Network Identification roles (B8.x)**
- **Common Information Services Management & Information Security (B9.2–B9.4)**
- **U-Space Coordinator (B7.1)**
- **U-Space Performance Monitoring Officer (B10.3)**

TRAINING ROADMAP

PHASED IMPLEMENTATION

PHASE 1 (0-12MO): FOUNDATIONS

- CFAS-aligned micro-credentials in SORA essentials, operational procedures, ERP
- Data protection and GDPR training
- U-Space service fundamentals
- Cyber hygiene modules
- Role-based academies for Remote Pilot, Flight Authoriser, Safety Manager

PHASE 2 (12-24MO): FOUNDATIONS

- Streaming data engineering and deconfliction analytics
- Privacy-by-design implementation
- Joint simulation exercises (ANSP–USSP–CIS)
- Vertiport operations laboratories & training centres
- AI/ML applications for traffic management and maintenance

PHASE 3 (24-36MO): FOUNDATIONS

- Organisational training accreditation under recognised frameworks
- Digital twin integration for performance testing
- Apprenticeship pathways for Systems Architecture, Integration, Cybersecurity
- Cross-industry secondments to ANSP/CIS for inter-organisational fluency
- Continuous improvement via competency observatory

SURVEY

RECOMMENDATIONS

Development Strategy

- Deploy CFAS-aligned curricula with role-based academies
- Institute recurrent blended learning with scenario-based drills
- Establish competency governance with role-competency matrices and learning records
- Create U-Space observatory for multi-stakeholder alignment

Training Architecture

- Micro-credentials mapped to CFAS categories
- Blended delivery integrating AMC theoretical topics and practical scenario tests
- Assessment artefacts linked to operational readiness and oversight evidence
- Create practical on-the-job training programs

Governance & Quality Assurance

- The competency registry maintains role-competency matrices and learning records
- Provider assurance vetting external providers for AMC alignment
- Stakeholder forum establishing periodic KPI reviews and societal acceptance monitoring

Risks & Mitigations

- Capacity constraints: Federate delivery across HE/VET and industry using shared syllabi
- Cyber threats: Embed red-team exercises and privacy-by-design gates
- Change saturation: Phase rollouts and sequence learning with technology deployments

Who You can Meet Here?



Wassim Derguech Javier Camacho Font Ray Foley Stefano Rivero Cathal MacCristail Denis Doyle Anshika Gupta



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