AIRMOUR

5th October 2022

Public and stakeholder acceptance of Urban Air Mobility and its application for Emergency Medical Services

“We need to have open and regular forums together with stakeholders from local government, academia, industry, and the public to shape future UAM policies.

Without involvement of these stakeholders, we won’t have a complete picture of what will be publicly accepted, what is operationally possible and how those operations could fit into the regulatory landscape.”

Introduction

AiRMOUR has undertaken the most extensive public and stakeholder engagement on the topic of Urban Air Mobility (UAM) and drones in Europe since EASA’s study published in May 2021. The engagement undertaken by AiRMOUR builds on these findings and delves further to increase our understanding of public acceptability and perceptions on drone use cases. Additional studies will take place in the upcoming year.

The engagement activities included a European citizen survey circulated in six countries (Norway, Sweden, Finland, Netherlands, Luxembourg and Germany). Interviews were carried out as well as a technical stakeholder survey and a technical stakeholder workshop. The demographics of participants were broad to gather a good representation of societal views. Focused discussions with stakeholders were carried out on the topics of public acceptance, safety and risk, privacy, socio-economic impacts and environmental considerations.

This brochure highlights the key findings drawn up by LuxMobility from the public and stakeholder engagement activities undertaken in 2022 and presents suggestions from technical stakeholders on increasing public acceptance of drones in our future cities. The full report is available to read via the AiRMOUR website fvh.io/airmouracceptanceinterim

Consultation activities – ‘The Figures’

1,100+
citizen survey responses

50
technical stakeholders involved in workshop

15
expert interviews

25
technical stakeholder survey responses

6
countries represented in citizen survey

7
languages translated for citizen survey

Main findings from our engagement

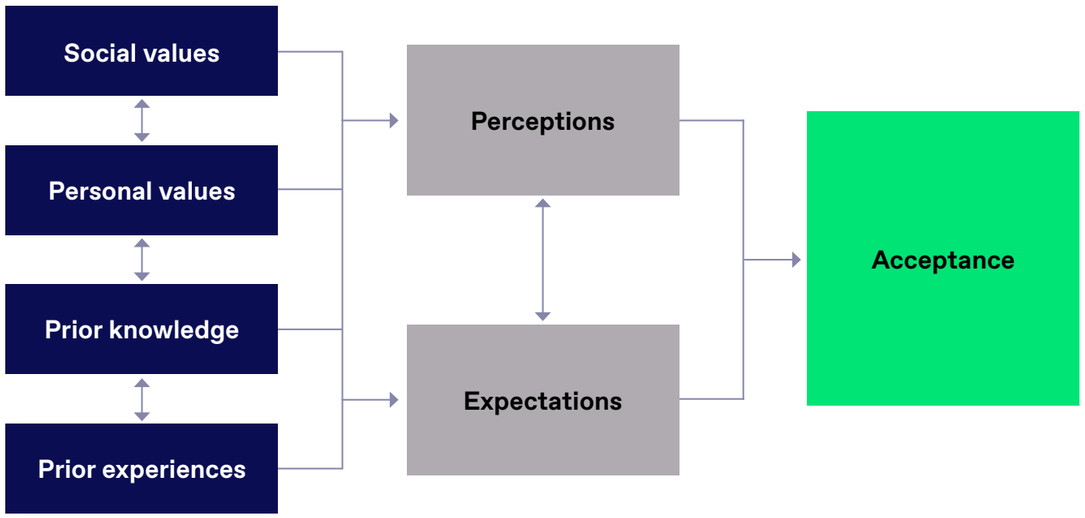
Citizens are either ‘not knowledgeable at all’ on the topic of UAM or are ‘slightly knowledgeable’. A high proportion of them are ‘undecided’ about drones which is reflective of their lack of knowledge on the topic. Present and future testing of UAM for Emergency Medical Services and other operations should be accompanied with a dedicated citizen engagement strategy.

Technical stakeholders feel that regulations are currently the most limiting factor in the advancement of UAM. There is a need for an easier process to enable test flights for drones and certification of drone operators should be mandatory.

Acceptable use cases from surveyed citizens are infrastructure maintenance, land or building surveying and environmental monitoring. Non-urgent medical use cases are considered less acceptable than urgent ones. Ad-hoc UAM missions (e.g. transport of a first aid kit to a scene of an incident) seem to be more acceptable than regular missions (e.g. regular delivery service for pharmaceutical products). Social inequality appeared as a high concern for citizens if delivery drones and passenger eVTOLs are introduced in the airspace.

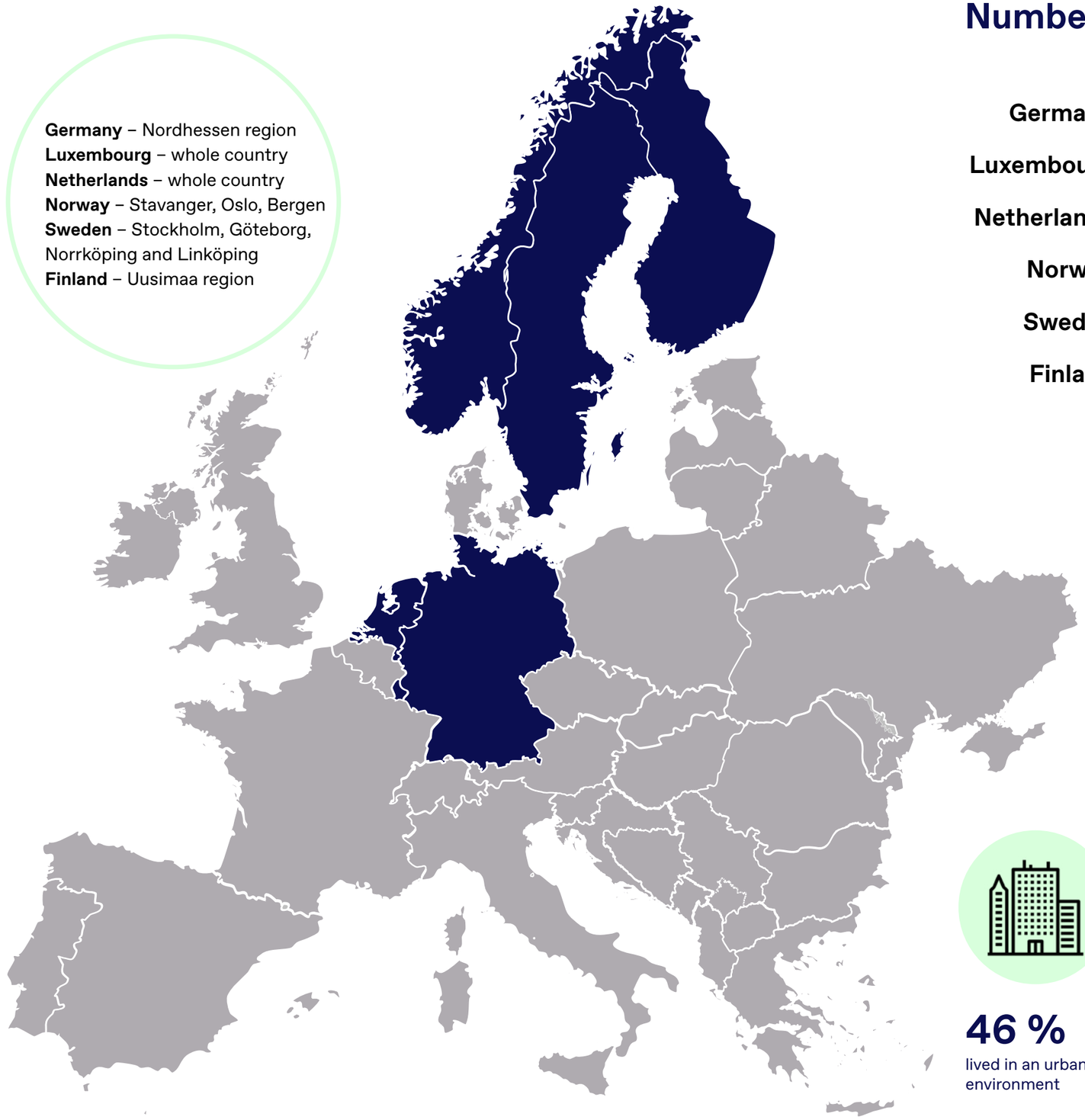
Acceptance theory

Depending on; the personal and social values, level of knowledge, prior experiences, expectations, and delivered UAM service, perceptions are formed and lead to a level of acceptance. This principle can be applied to societal acceptance for any new technology.



Citizen Questionnaire

Germany – Nordhessen region
Luxembourg – whole country
Netherlands – whole country
Norway – Stavanger, Oslo, Bergen
Sweden – Stockholm, Göteborg, Norrköping and Linköping
Finland – Uusimaa region



Number of responses per country

Age group	Percentage
18–30	16,5 %
31–40	16,5 %
41–50	17 %
51–60	17 %
61–70	16,5 %
70+	16,5 %

50 / 50
Female / Male representation

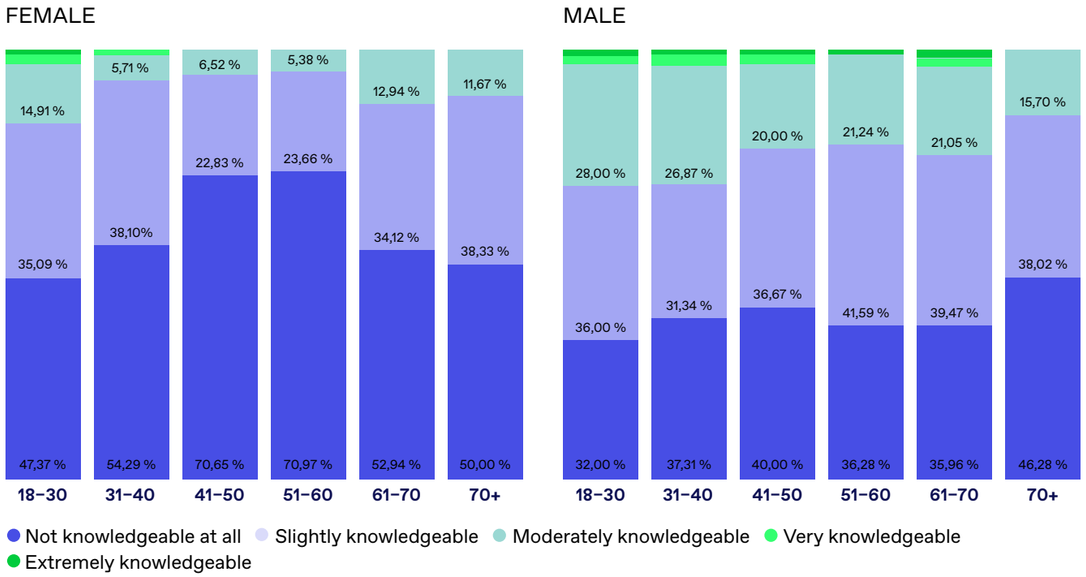
46 %
lived in an urban environment

26 %
lived in a rural environment

28 %
lived in a suburban environment

9 %
worked in healthcare

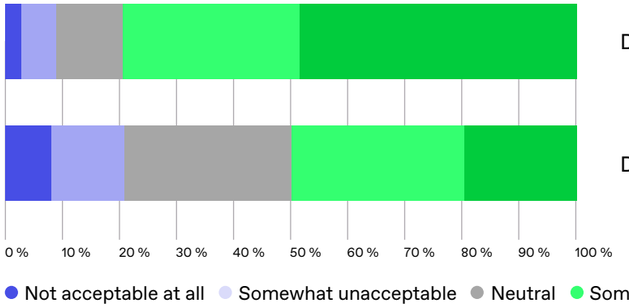
What is your level of knowledge of Urban Air Mobility?



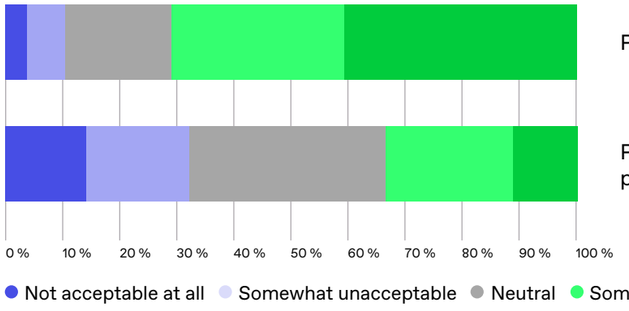
What is your level of exposure to drones?

Acceptability of medical vs. non-medical use

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



Passenger eVTOLs transport a small number of people over short distances and are able to electrically vertically take-off and land. They can be piloted by a human on board, remotely piloted, or completely autonomous with no human pilot.



Perceived benefits of delivery drones and passenger eVTOLs

	Delivery drones	Passenger eVTOLs
Most likely benefit	Reduction of traffic jams due to fewer road vehicles	Reduction of traffic jams due to fewer road vehicles
	Reduction of local emissions and pollution (most drones will have battery electric propulsion)	Reduced journey time
	Improved development of and access to remote areas (e.g. the countryside, regions outside of a metropolitan area)	Reduction of local emissions and pollution (VTOLs are electrically powered)
	Reduced journey time	Improved development of and access to remote areas (e.g. the countryside, regions outside of a metropolitan area)
	Improved safety (reduced likelihood of an accident compared with road transport)	Improved safety (reduced likelihood of an accident compared with road transport)
Least likely benefit	Boost economic growth in my city and create new jobs	Boost economic growth in my city and create new jobs

Concerns about delivery drones and passenger eVTOLs

Most concerning	Safety, such as flying vehicles possibly crashing
	Privacy concerns, such as a drone flying close to my window or over my property
	Noise pollution, such as loud and/or annoying sounds of flying aircraft
	Social inequality e.g. the service being affordable only for rich or privileged people
	Environmental, such as impact on wildlife
	Visual pollution, such as annoying air traffic
Least concerning	Inner-city space occupation due to infrastructure requirements (take-off and landing stations)

Do you think delivery drones and passenger eVTOLs will improve society as a whole?

35 % Yes

34 % I don't know

32 % No

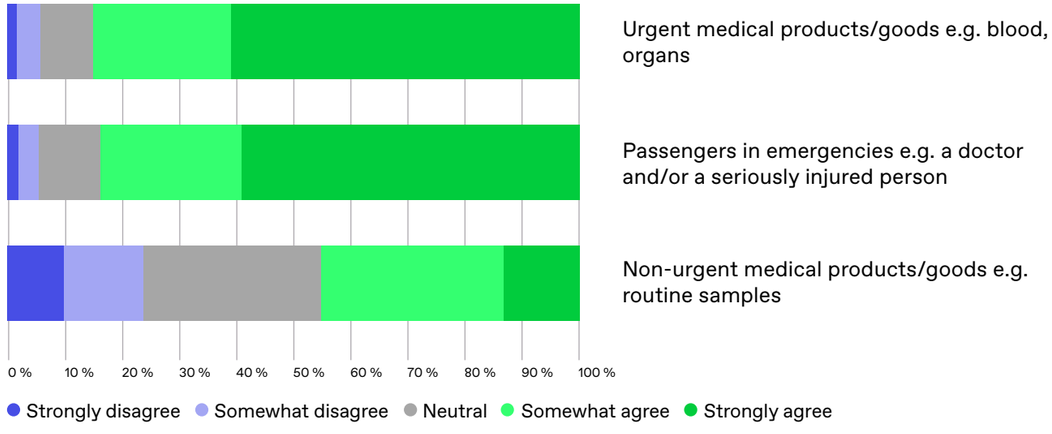
Do you think delivery drones and passenger eVTOLs will improve your life?

24 % Yes

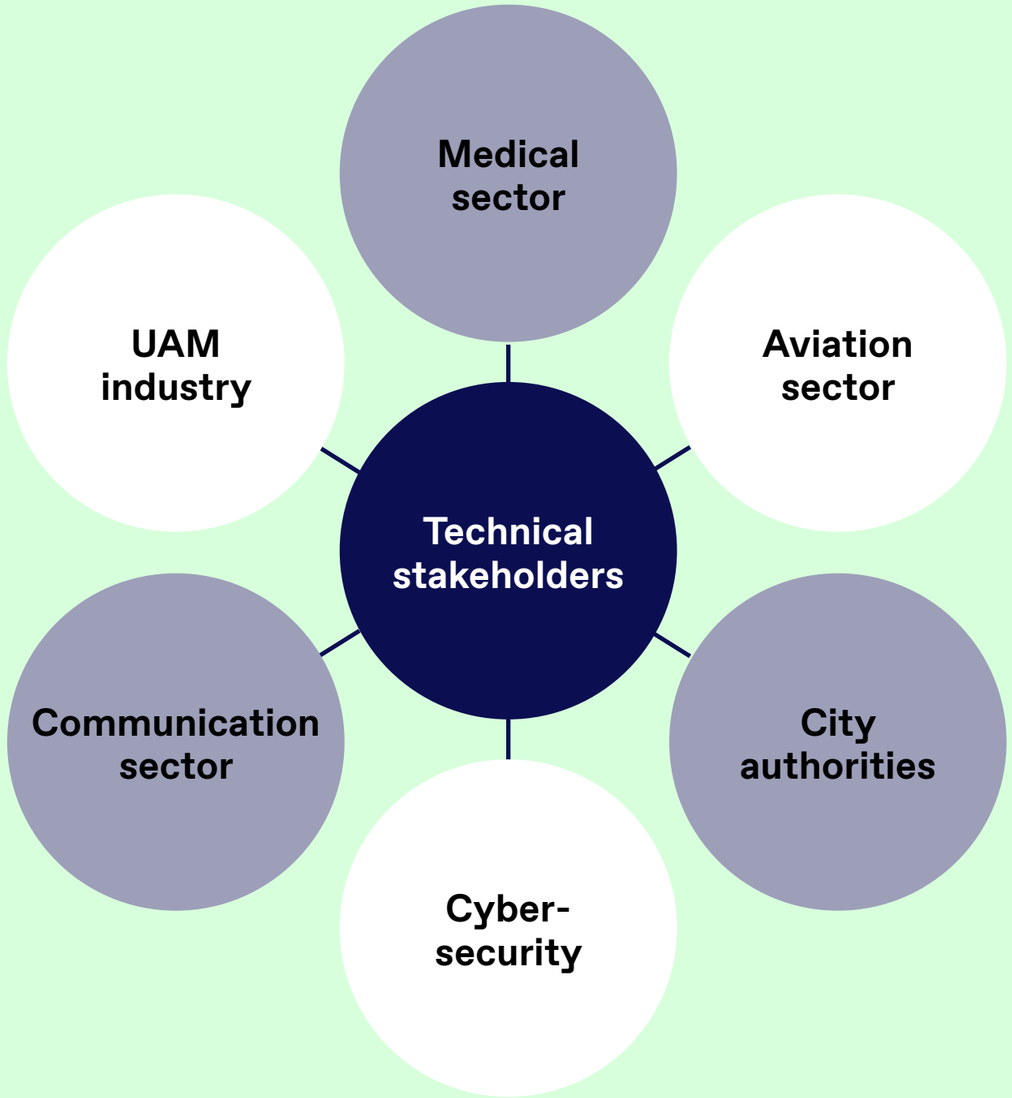
45 % I don't know

31 % No

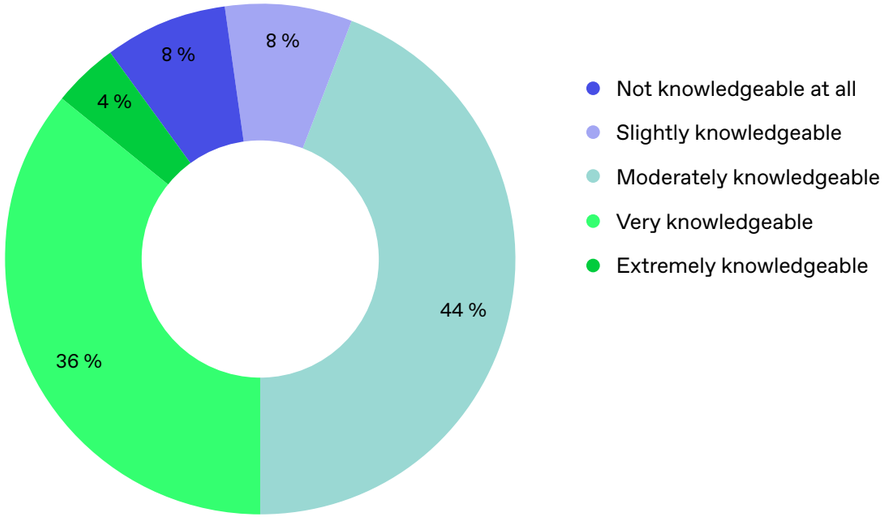
Acceptability of medical use cases



Technical Stakeholder Engagement



What is your level of knowledge of Urban Air Mobility?



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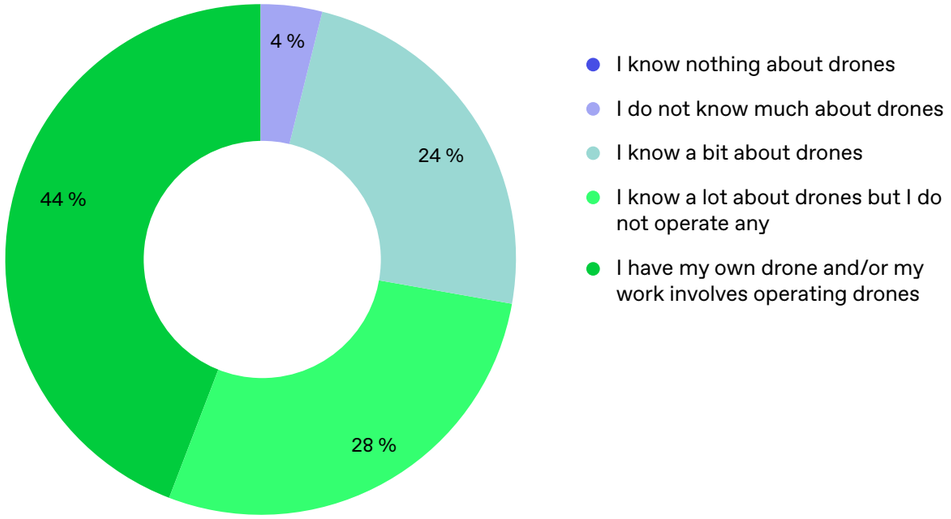
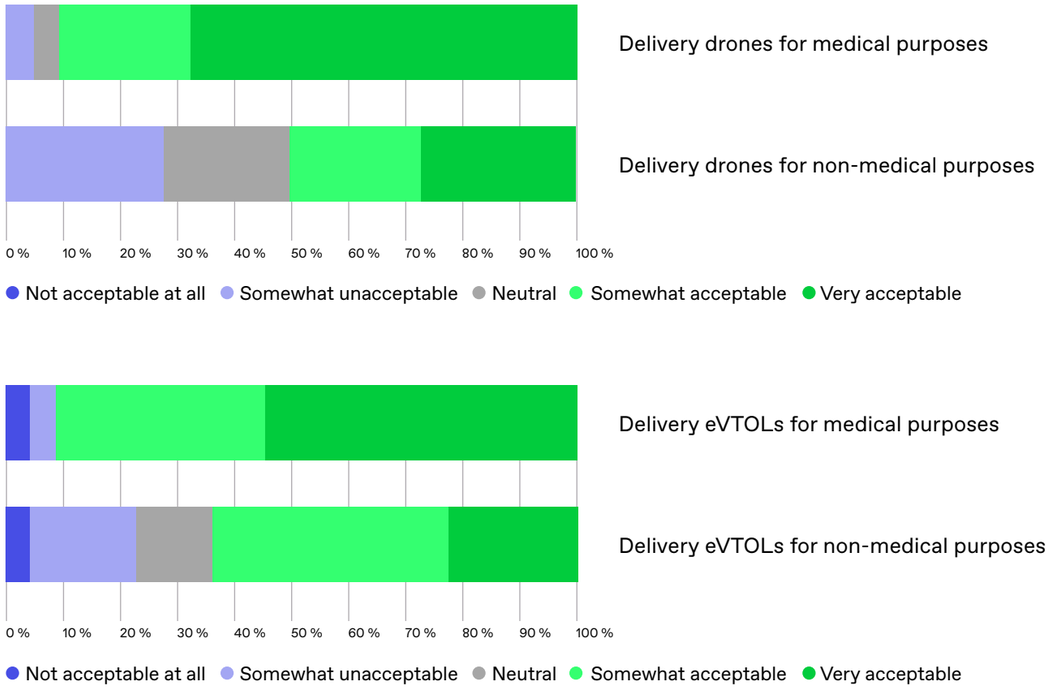
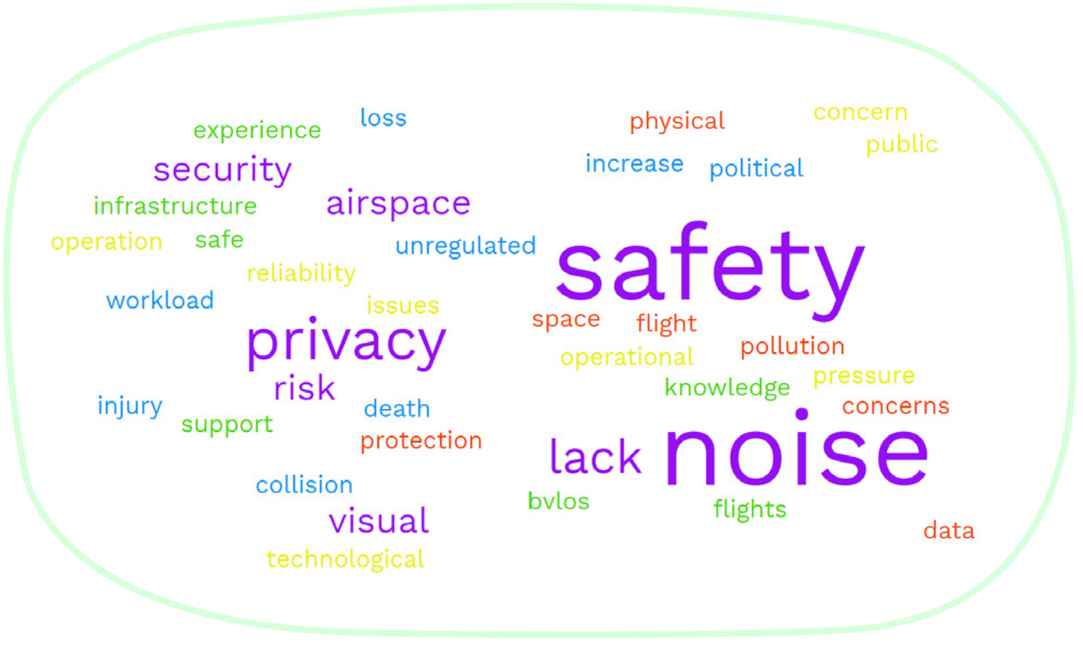


Acceptability of medical vs. non-medical use



Stakeholder perception on public concerns



Compared to citizens the other stakeholders ...

- are more accepting of both delivery drones and passenger eVTOLs for medical and non-medical purposes
- are more decided on whether they accept or do not accept delivery drones and passenger eVTOLs (fewer answered neutral)
- also found use for medical purposes more acceptable than for non-medical purposes

Stakeholders correctly thought safety, privacy and noise would be most concerning for the public related to delivery drones and passenger eVTOLs. However, they did not identify social inequality as a concern for the public which it was found to be.

Suggestions from technical stakeholders for increasing public acceptance of Urban Air Mobility

- Give the public transparent and factual information about the capabilities of UAM, from a technical point of view. People tend to rely on online searches, which does not always lead to the most factual information.
- Increase the number of flight demonstrations, such as those carried out as part of AiRMOUR, and engage the public in them through a dedicated citizen engagement strategy.
- Ensure safe and secure operations and make sure citizens are informed about what those entail.
- Work with magazines to publish articles explaining the latest developments in unmanned aircraft, which will help to inform the public.
- Educate the press as the media plays a huge role in influencing public acceptance levels. The press can sway public acceptability positively or negatively.
- Inform the public about good examples of drone operations.
- Clear signing of medical aircraft to raise public awareness of their presence/use.

"Some will like the new technology and it's more acceptable if it's for the medical sector, others may find it disturbing especially if they don't know the purpose of the drone operation"

Perspective from healthcare worker

"It's important for people to know what type of drone is flying and what it's purpose is and that it's not affecting you as a citizen"

Perspective from healthcare worker

"I don't see barriers from society as long as the operators follow regulations and deliver value to citizens"

Perspective from drone operator

"The ecosystem needs to be built on transparency, inclusivity and diversity"

Perspective from UAM communications expert

"The public feedback has been very good from all generations"

Perspective from drone operator

For more information on the first round of engagement work undertaken as part of the AiRMOUR project read the full report via the QR code or link below.

Click here to be directed to the Public and stakeholder acceptance report fvh.io/airmouracceptanceinterim

AiRMOUR is a research and innovation project supporting sustainable Urban Air Mobility (UAM) via Emergency Medical Services. The project consortium has a total of 13 partners, including research institutes, aviation authorities, UAM operators and Emergency Medical Service organisations in Finland, Sweden, Norway, Germany, Luxembourg and the Netherlands. The leading partner is VTT Technical Research Centre of Finland Ltd. Furthermore, the AiRMOUR project has 12 Replicator Cities, and an External Advisory Board with strong international support from organisations such as NASA, Dubai Future Foundation and EASA. The project will run 2021-2023 and has received funding of approximately €6 million from the European Union's Horizon 2020 research and innovation programme.

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Photos in this brochure: Ehang Scandinavia and Carina Johansen

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