Interreg Baltic Sea Region

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SMART GREEN MOBILITY
CITYAM

Consolidated Urban Air Mobility Public Acceptance Toolkit

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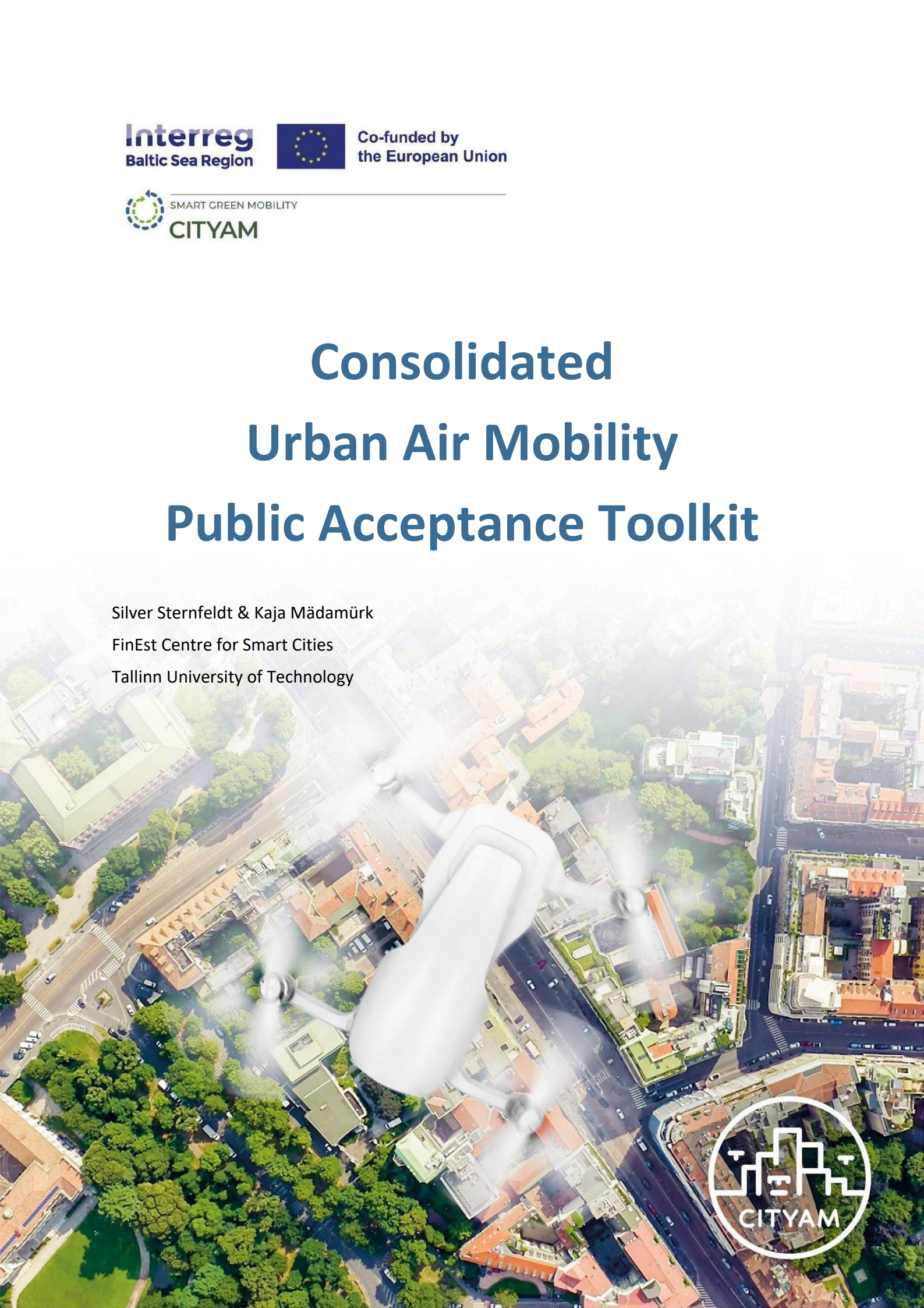

Summary

Urban Air Mobility (UAM) is being deployed globally, and its successful integration requires engaging citizens early on. National and international institutions are working to keep pace with the rules and procedures that need to be established amidst these developments. Public embracement is crucial, considering concerns raised by the public. To help gather data and present it for city planning strategies, this toolkit assessing social acceptance of UAM has been developed.

Social acceptance of UAM gauges the willingness of communities to support the integration of aerial vehicles and accompanying infrastructure into urban transportation systems. Acceptance includes attitudes toward UAM technologies, considering factors like environmental impact, safety, privacy, visual and noise pollution, trust in technology and authorities, and perceived benefits. The questionnaire, adjusted from existing models of social acceptance of new technologies, evaluates general acceptance of UAM and use-case-specific acceptance of drone services in urban environments.

Additional e.g., open-ended questions can be added if necessary. The toolkit is modular and can be adjusted to address various circumstances cities might have when piloting their use cases. Modules in different languages are available here:

https://docs.google.com/spreadsheets/d/14MoBLT2VS2m4FxYF8Tl2gZnDuJnaAYS3/edit?usp=drive_link&ouid=113516906799984323432&rtpof=true&sd=true.

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1. Toolkit introduction

Social acceptance of urban air mobility toolkit is a questionnaire meant to assess the general social acceptance of the UAM (see 2.3) or the use case specific social acceptance of the UAM (see 2.4). One does not exclude the other. The toolkit is meant for the municipalities or other stakeholders to understand the social acceptance of the UAM. The toolkit was developed in english, finnish, swedish, german, polish, latvian and estonian simultaneously. It is meant for municipalities or other UAM stakeholders to be used or if needed, translated into their local language for implementation. Step-by-step guide is provided to foster the process from translating to survey rollout. The questionnaire is meant to be set up in a preferred survey platform. The questionnaire consists of four sections:

3.1. Survey invitation
3.2. Sociodemographics
3.3. General acceptance
3.4. Use case acceptance

Modules in different languages are available here:

https://docs.google.com/spreadsheets/d/14MoBLT2VS2m4FxYF8Tl2gZnDuJnaAYS3/edit?usp=drive_link&ouid=113516906799984323432&rtpof=true&sd=true.

1.1. Survey invitation

Survey invitation is meant to be sent to the citizens to give a short introduction about the aim of the survey together with the link to participate. Survey organizer should distribute their invitation via preferred channels (e.g. social media, newsletters, survey panels etc). General information about the survey is presented, including the location where the survey is carried out (city or district etc), the name of the organiser of the survey (e.g. the municipality) and other responsible stakeholders (e.g. aviation authority), the duration of the survey, the response time and the link to the survey itself.

1.2. Sociodemographics

Some sociodemographic variables like age, gender, highest level of education, main residence and occupational status are proposed. These can help municipalities to reach targeted groups in case of low social acceptance. Also, main residence option allows the municipality to filter respondents according to the district if necessary (e.g. when use case location and answers from only locals is relevant). Some sociodemographic variables are specific to local circumstances. So, the organizer of the survey must phrase the options about the education and the residence according to the official classification of the educational system and the local district division. Sociodemographic variables can be added or removed, if necessary.

1.3. General acceptance

The general acceptance section of the survey is meant for assessing the attitudes, preferences and concerns (i.e., the costs, benefits, and trust) of the citizens about the social acceptance of UAM in general, and their previous knowledge and experience with drones. Respondents are presented with a short introduction to the UAM not related to any certain UAM service.

1.4. Use case acceptance

The use case acceptance section of the survey is designed to evaluate the social acceptance of the drone service that the municipality is currently piloting or planning to pilot. The survey organizer should create a brief description of the drone service, addressing key points outlined in the instructions to structure the introduction. To enhance clarity and understanding, additional materials such as photos, videos, or maps should be included.

The questionnaire consists of modules covering topics about trust, perceived usefulness, privacy, environmental aspects and launch and landing sites. The organiser of the survey can choose, which modules are relevant for their use case and if they want to use all modules at the same time, or present the respondents with multiple, shorter surveys.

1.5. Translating the toolbox

The questionnaire is available in English, Finnish, Swedish, German, Polish, Latvian, and Estonian. If none of these languages are suitable, the first step is to translate the questionnaire from the original English version into your local language. Ensure that all terms, concepts, and phrases are culturally and linguistically appropriate. After the initial translation, conduct a back-translation—a process where a different individual who has not seen the original English version translates the local language version back into English. Compare the two English versions to identify discrepancies, mistranslations, or cultural nuances that may have been overlooked. This step ensures the questionnaire maintains its original meaning and intent.

Adapt the sociodemographic sections to align with local classifications and divisions. For example, update educational level categories to reflect your country's official system and replace placeholders for district or neighborhood names with relevant local areas. When describing specific UAM use cases, provide clear, detailed explanations tailored to local contexts. Ensure adaptations comply with the guidelines provided in the toolkit.

Modules in different languages are available here:

https://docs.google.com/spreadsheets/d/14MoBLT2VS2m4FxYF8Tl2gZnDuJnaAYS3/edit?usp=drive_link&ouid=113516906799984323432&rtpof=true&sd=true.

1.6. Rolling out the survey

Once the translation is complete, the blanks are filled, and the questionnaire is uploaded to a survey platform, the invitation containing the survey link can be distributed to residents. If necessary, the survey organizer may collaborate with dedicated survey companies to ensure sufficient responses and obtain a representative target group.

1.7. Possible analysis methods

The analysis of the Urban Air Mobility (UAM) Public Acceptance Survey can be approached using quantitative (and qualitative, if open ended questions are used) methods, depending on the survey structure and collected data. A survey report template is provided in the end of this document. Here are key types of analyses that could be conducted.

1.7.1. Descriptive Analysis

- Summarize **demographics** (age, gender, residence, occupation etc.).
- Report **response distributions** (e.g., percentage of people who accept or reject UAM).
- Identify **mean, median, and mode** for Likert-scale responses.

1.7.2. Comparative Analysis

- Compare **acceptance levels** between different demographic groups (e.g., younger vs. older respondents, urban vs. suburban residents).
- Analyze how **experience with drones** (e.g., prior knowledge, direct use) influences acceptance.
- Compare acceptance across **different UAM use cases** (e.g., rescue operations vs. infrastructure inspection).

1.7.3. Correlation and Regression Analysis

- Identify relationships between **perceived benefits and acceptance** (e.g., Does trust in authorities predict higher acceptance?).
- Use **regression models** to see what factors (e.g., safety concerns, noise pollution, privacy) most influence public acceptance.

1.7.4. Sentiment and Thematic Analysis (Qualitative Data)

- Categorize open-ended responses into themes such as **safety concerns, privacy issues, perceived benefits, and trust in authorities**.
- Conduct **sentiment analysis** (positive, neutral, negative attitudes toward UAM).

1.7.5. Geospatial Analysis (if location data is collected)

- Map **geographical variations in acceptance levels** (e.g., different districts might have different levels of support or concern).
- Identify **areas with the highest resistance or strongest support** for UAM deployment.

1.7.6. Trend Analysis (if longitudinal data is available)

- Compare responses over time to **identify shifts in public perception**.
- Assess how **public engagement efforts or policy changes** affect acceptance.

2. The UAM Social Acceptance Toolkit

2.1. Survey invitation

Instructions

This is the survey invitation for the **Urban Air Mobility Public Acceptance Survey**. Please translate it (if necessary) and fill in the blanks described in the brackets. This part is sent to the respondents together with the survey link. The invitation is meant for introducing the survey to the potential respondents. Please add or remove any information needed to suit your goals and circumstances.

NB! ***"(Notes: …)"*** throughout the toolbox are for your information only. They are here to help you navigate the questionnaire and build the necessary structure for your survey. Delete them from the questionnaire so that they would not distract the respondents.

(This box is not part of the questionnaire.)

/ Survey invitation starts here /

Dear citizen of the ***(Note: Insert here the name of your city, municipality or district)***! ***(Note: Insert here the names of the organisations who are arranging the survey)*** is inviting you to participate in the Urban Air Mobility Public Acceptance Survey. This survey was developed within the CITYAM project funded by Interreg Baltic Sea Region (2023-2025). The survey has been conducted in various cities in Europe. Urban Air Mobility (UAM) includes various types of drones, as well as launch and landing sites, which have an increasingly large role in urban transportation. The aim of this survey is to engage citizens, raise awareness on UAM, gauge the opinions on this topic and in general put UAM on the local agenda. Your participation is very important for helping the municipality in making strategies and policies on drones in the best possible way and making our cities more human friendly. The data is collected from ***(Note: insert start date here)*** to ***(Note: insert end date here)***. Your answers are anonymous and analysed in a generalized way. The survey takes up to 15 minutes to complete. If you are willing to participate, please click **here**. ***(Note: Add the link for your survey. Use your preferred survey platform.)***

/ Survey invitation ends here /

2.2. Sociodemographics

Instructions

This section of the survey addresses the sociodemographics of the respondents. If necessary, please translate all the questions and options. Use your local circumstances to phrase the options about the education and the residence. Variables can be added or removed to suit your circumstances.

NB! ***"(Notes: …)"*** throughout the toolbox are for your information only. They are here to help you navigate the questionnaire and build the necessary structure for your survey. Delete them from the questionnaire so that they would not distract the respondents.

(This box is not part of the questionnaire.)

/ Questionnaire starts here /

The Urban Air Mobility (UAM) Public Acceptance Survey

Dear respondent! The aim of this survey is to engage citizens, raise awareness on UAM, gauge the opinions on this topic and in general put UAM on the local agenda. Your participation is valuable for making our cities more human friendly.

Please answer the questions about your background.

Age:

(Note: this is an open-ended question)

Gender:

(Note: this is a single choice option.)

- *male*
- *female*
- *non-binary*
- *other*

Highest level of education:

(Note: this is a single choice option)

- *(Note: Please insert the options based on the national classification of the education that you are using in your country.)*

Main residence:

(Note: this is a single choice option. This can be used as a filter question if there is a need to differentiate locals from nonlocals in the 4.4 Use case acceptance.)

- *(Note: Please insert the options based on your local division of the districts in your city where you are carrying out the survey.)*

Occupational status:

(Note: this is a multiple-choice question)

- studying
- working
- not in employment
- on parental leave
- retired
- other

Click next

/ Questionnaire ends here /

2.3. General Acceptance

Instructions

This section of the survey addresses the general acceptance of urban air mobility. Please translate the introduction about urban air mobility with all the questions and options. Note: this section of the survey can be used together with section 2.4. Use Case Acceptance.

NB! ***"(Notes: …)"*** throughout the toolbox are for your information only. They are here to help you navigate the questionnaire and build the necessary structure for your survey. Delete them from the questionnaire so that they would not distract the respondents.

(This box is not part of the questionnaire.)

/ Questionnaire starts here /

Please read the following introduction about drones and then answer the questions.

It is quite new to have drones flying in the city. If there starts to be more of these small flying robots, we call this Urban Air Mobility (UAM). Drones come in different shapes and sizes. Some are only 30 cm wide, and some are 2,5 metres wide. Note that large drones, or air taxis, that can carry people are not considered for this survey.

Drones can have a lot of uses. They can carry sensors, cameras or packages. There are many different things they can do, for example help with deliveries, inspect buildings, bridges or forests, scan fires, assist in searches, deliver medical supplies, aid in disaster response and many more. They have the potential to save time and costs and change the way the city will look like. If cities know what the citizens think about drones, they can better plan where, when or how often they should be allowed to fly.

1. **Have you ever heard of drones before participating in this survey?**
   - yes *(Note: If yes -> Q2)*
   - no *(Note: If no -> Q4)*

2. **Where have you seen or heard about drones? Select any that apply.**
   - Read or saw through media (e.g. social media, books, movies or tv series, news)
   - Personal experience (e.g. drone events, hobbies, family or friends etc.)
   - Professional experience (e.g. school, work, conferences, workshop, trade literature etc)
   - Other, please specify:

3. **Have you operated a personal drone and/or does your work involve operating drones?**
   - yes
   - no

4. **How knowledgeable are you on the subject of urban air mobility?**
   - Not knowledgeable at all
   - Slightly knowledgeable
   - Moderately knowledgeable
   - Very knowledgeable

In your opinion, how acceptable are the following uses of drones?

(Options: Very unacceptable; Somewhat unacceptable; Neutral; Somewhat acceptable; Very acceptable; Do not know)

5. Commercial use (e.g. transporting cargo, groceries, takeaway food, small packages)
6. Passenger transportation (air taxi)
7. Public safety (e.g. crowd control at large events, traffic patrol, border control, illegal immigration, home security systems, tracking criminal activity)
8. Maintenance or inspection of construction works and infrastructure (e.g. roads, buildings, bridges, telecom towers, windturbines, highways, railways, nuclear plants)
9. Emergency or disaster detection and response (e.g. search and rescue services, police, ambulance, first aid, firefighting)
10. Medical deliveries (e.g. laboratory samples, organs, surgical instruments, medicine)
11. Environmental monitoring and management (e.g. ecosystem health, oil spills, wildfires, wildlife protection, air pollution, maintaining agricultural fields, crop health and growth, planting trees, herding livestock, fertiliser spraying)
12. Leisure activities and hobbies (e.g. photography or videography, drone racing)
13. Media coverage (e.g. recording video and sound, taking photos, counting people at events)
14. Scientific research use (e.g. meteorological, archeological, marine, global warming etc.)

How concerned are you with the following drone topics?

(Options: Not concerned at all; Slightly concerned; Moderately concerned; Considerably concerned; Very concerned; Do not know)

15. Personal injuries (people getting injured or dying as a result of a drone accident)

16. Property damages (drones colliding with buildings, infrastructure or other vehicles)
17. Animal welfare (e.g. pets getting stressed or running away, wild animals driven out of their habitat)
18. Criminal activity (e.g. misuse of data, violation of privacy)
19. Noise pollution (how much or how often drones make disturbing noise)
20. Visual pollution (how many drones or how often they are flying)
21. Too many launch and landing sites

In general, what would you consider a suitable launch and landing site area for drones?

(Options: Not suitable at all; Somewhat suitable; Not unsuitable nor suitable; Quite suitable; Very suitable; Do not know)

22. residential area (e.g. where are mostly apartment buildings or private houses)
23. commercial area (e.g. supermarkets, cafes, offices, and factories)
24. industrial area (e.g. where are mostly factories or offices)
25. recreational area (e.g. parks and playgrounds)
26. rooftop of a private building
27. rooftop of a public or commercial building
28. sidewalk/pavement
29. Street infrastructure (e.g. public transport stop, street lighting posts)
30. parking space

How important are the factors that influence your opinion on launch and landing sites for drones?

(Options: Not important at all; Somewhat important; Moderately important; Quite important; Very important; Do not know)

31. aesthetics (how they look)
32. frequency of landings and takeoffs (e.g visual or noise annoyance)
33. size of the launch and landing site
34. purpose of the drone flight
35. proximity to where I spend most of my time
36. safety of the launch and landing site (e.g if it has a fence or alarm lights around it)

Click next

/ Questionnaire ends here /

2.4. Use Case Acceptance

Instructions

This section of the questionnaire addresses the acceptance of your use case. This section can be used together with section 2.3. General Acceptance. You can filter the respondents by district in section 2.2. Sociodemographics, if you want respondents from only the district where you are piloting your drone service.

Composing the description of the use case

Use the following topics to compose a short informative description of your drone service use case for the respondents. You can write it as a press release. Keep it short, but precise enough to enable the respondents to form an opinion and answer the survey. This description will be given to the respondents before they start answering the questions about the use case given below.

- Name of the use case
- Responsible party for piloting this drone service (+ other stakeholders if necessary)
- Reason for piloting this drone service
- Time and location of the pilot of this drone service
- Type of the mission or the service
- Necessary drone specifications
- Necessary launch and landing site specifications
    - If you have multiple launch and landing sites, then describe all the locations
    - Use the launch and landing site module for each site separately.
- Add additional materials and visuals (photos, videos, maps)

Statements

The use case and the statements go hand in hand. Because the statements are modular (e.g. Trust, Launch and landing sites, Privacy) you can choose to leave some modules out, if they do not apply to your use case. However, the use case description should be specific enough for the respondents to form an opinion regarding the use case. Make sure that the statements and the use case description correspond to each other.

- Trust: Q41 - Q43
- Perceived usefulness: Q44 - Q47
- Privacy: Q48
- Environmental aspects: Q49 - Q57
- Launch and landing site: Q58 - Q61

NB! ***"(Notes: …)"*** throughout the toolbox are for your information only. They are here to help you navigate the questionnaire and build the necessary structure for your survey. Delete them from the questionnaire so that they would not distract the respondents.

(This box is not part of the questionnaire.)

/ Questionnaire starts here /

Please read the following introduction about the drone use case and then answer the questions.

(Note: Insert use case description here. Add necessary visuals to illustrate the use case.)

37. **Have you seen the drone flights described above with your own eyes?**
    - yes *(Note: If yes -> Q53)*
    - no *(Note: If no -> Q54)*
38. **Where did you see the drone flights?**
    - *(Note: Add options, where these flights take place e.g. neighbourhoods, districts or flightpaths from A to B etc.)*
39. **Have you seen the launch or landing of the drone described above with your own eyes?**
    - yes (*Note: If yes -> Q53*)
    - no *(Note: If no -> Q54)*
40. **Which launch and landing sites did you see?**
    - *(Note: Add options, where these launch and langing sites are located e.g. neighbourhoods, districts, some other recognizable urban feature etc.)*

To what extent do you trust the local authorities regarding the use of drones?

(Options: do not trust at all; rather do not trust; neither distrust or trust; rather trust; trust completely; do not know)

(Note: Here starts the Trust module)

41. Do you trust the local authorities to use drones for the benefit of the citizens?
42. Do you trust the local authorities to regulate the use of drones adequately considering the needs of the public interest?
43. Do you trust that local authorities will engage the public in decision making when regulating the drone operations?

To what extent do you agree with the following statements regarding the drone service described above?

(Options: strongly disagree; somewhat disagree; neither disagree or agree; somewhat agree; completely agree; do not know)

(Note: Here starts the Perceived usefulness module.)

44. It's easy for me to understand the benefits of this drone service (personal, social, economic etc.).
45. This drone service is beneficial.
46. This drone service creates new job opportunities.
47. This drone service helps to increase citizens' quality of life.

(Note: Here starts the Privacy module.)

48. This drone service decreases my personal privacy.

How likely do you consider the following events and changes in the environment caused by the drone service described above?

(Options: Very unlikely; quite unlikely; not unlikely or likely; quite likely; very likely; do not know)

(Note: Here starts the Environmental aspects module.)

49. This drone service might decrease road congestion.
50. This drone service reduces the cost for me (delivery, service etc.).
51. This drone service might be more environmentally friendly than fossil fuel based solutions.
52. This drone service might increase noise pollution (disturbing noise from the drones).
53. This drone service might increase visual disruptions (number of drones in the air).
54. This drone service might endanger wildlife and nature.
55. This drone service might be misused for criminal activity.
56. This drone service might cause many people to lose their jobs.
57. This drone service might put the safety at risk (property damage, traffic accidents, fatal injuries, etc.)

To what extent do you agree with the following statements regarding the launch and landing sites described above?

(Options: strongly disagree; somewhat disagree; neither disagree or agree; somewhat agree; completely agree; do not know)

(Note: Here starts the Launch and landing sites module.)

58. TheThe site is situated in a location where the space is otherwise underutilized.
59. The launch and landing site restricts my access to public space.
60. The site in this location appears safe for the drone operations.
61. The site considers the landscape values (natural, historical, cultural, aesthetics etc.) of this location.

Submit answers!

Thank you for participating!

Contact person: (Note: Inser here the name and the contacts of the survey coordinator from your municipality who is responsible for the survey.)

This questionnaire was developed as a part of the Interreg Baltic Sea Region project CITYAM.

Read more:

https://interreg-baltic.eu/project/cityam/

https://forumvirium.fi/en/projects/cityam/

https://www.linkedin.com/company/cityam-project/

/ Questionnaire ends here /

3. Survey Report Template

3.1. Introduction

This template provides a suggested structure for reporting the findings of the Urban Air Mobility (UAM) Public Acceptance Survey. It serves as a guide to help present the collected data in a clear and organized manner. Key points and short examples are provided. However, this template is flexible and should be adapted based on the specific needs, goals, and context of the survey conducted. Researchers and stakeholders are encouraged to modify the structure and content as necessary to ensure relevance and clarity.

3.2. Background

- **Title of the Survey**
- **Date:** [Insert Date]
- **Prepared by:** [Your Name/Organization]

- **Purpose of the survey:** e.g., assessing the public acceptance of UAM and its integration into urban environments in the municupality of [Insert the name of your municipality].
- **Objectives and research questions:** e.g., evaluating social acceptance, concerns, perceived benefits, and trust in UAM technologies. What are the primary concerns of different demographic groups regarding UAM?
- **Target audience:** e.g., citizens, municipalities, aviation authorities, regulators and policymakers.
- **Brief overview of methodology described more detail in 4.3. Methodology:** e.g., online questionnaire designed to gather quantitative and qualitative responses regarding UAM.

3.3. Methodology

- **Survey design:** e.g., the questionnaire consists of four sections - Survey Invitation, Sociodemographics, General Acceptance, and Use Case Acceptance. Clarify, which parts did you use, did you modify the questionnaire or add additional open-ended questions etc.?
- **Sampling method and size:** describe the sample of your study in detail e.g., municipality-defined outreach through digital and local channels. Are you going for convenience sampling or representative sample etc.
- **Survey duration and timeline: s**pecify duration, start, and end dates of the survey.
- **Data collection process:** describe how you are going to reach the sample e.g., distribution through social media, newsletters, or local partnerships.
- **Tools used for analysis:** statistical software, qualitative coding for open-ended responses etc.

3.4. Survey Results

3.4.1 Response Rate & Demographics

- Total number of responses.
- Demographic breakdown (age, gender, residence, occupation etc).
- Response rate percentage and representativeness.

3.4.2 Key Findings

- **General Acceptance:** e.g., citizens' attitudes, knowledge, and prior exposure to UAM.
- **Perceived Benefits:** e.g., trust in local authorities, environmental concerns, safety considerations.
- **Concerns:** e.g., noise pollution, visual impact, privacy, infrastructure compatibility.
- **Use Case-Specific Acceptance:** e.g., acceptance levels of UAM services in specific districts or applications (e.g., delivery drones, medical transport).

3.5. Analysis & Interpretation

- Patterns in UAM support and resistance.
- Comparisons with previous survey results or existing literature.
- Key drivers of acceptance and opposition.

3.6. Conclusion & Recommendations

- Summary of major insights.
- Strategies for improving public engagement and transparency.
- Recommendations for municipal planning and regulatory frameworks.
- Steps for further research and continuous monitoring.

3.7. Appendices

- Full questionnaire (including survey invitation, sociodemographics, general acceptance, and use case acceptance questions).
- Additional charts or raw data.

Instructions

This is the end of The Toolkit of The Social Acceptance of Urban Air Mobility. Good job!

(This box is not part of the questionnaire.)