Sono Rezé

sonoreze.fr

Methodological guide

Citizen-led approaches & sound environments

Lessons from the Sonorezé research project
for territorial stakeholders

Research
Noise
Citizen
Calm
Aircraft
Soundscape
Perception
Road traffic
Collaborative
Annoyance

A project carried out by ...

Rezé
umr ae
Université Gustave Eiffel
ESO UMR 6590
L'INSTITUT agro Rennes Angers
AUXILIA | GROUPE SOS |
Cerema CLIMAT & TERRITOIRES DE DEMAIN

... and funded by

anr agence nationale de la recherche
FRANCE RELANCE

Table of contents

This English version of the guide is based on the original French version:
Can, A., Audubert, P., Aumond, P., Bataille, N., Diquelou, G., Escar-Otin, N., Geisler, E., Guiu, C., Petit, G. (2026). Guide méthodologique – Démarches citoyennes & environnement sonore. Enseignements du projet SonoRezé.

The translation hase been made using a machine translation tool and has since been proofread.

The SonoRezé project was made possible thanks to the following two successive funding rounds:
• 2021-22 : **I-Site Future**, as part of a « citizen researchers » call for proposals
• 2023-25 : the **French National Research Agency** (ANR), as part of the « *Science with and for Society* » call for projects – Participatory Research (SAPS-RA-RP1)

About this guide

Coordination and editing

- **General coordination of the guide** : Unité Mixte de Recherche en Acoustique Environnementale (UMRAE)
- **Scientific facilitation** : Arnaud Can (UMRAE)
- **Writing** : Arnaud Can (UMRAE), Nicolas Bataille (Auxilia Conseil), Gwendall Petit (UMRAE)
- **Review & validation** : Philippe Audubert (Ville de Rezé), Pierre Aumond (UMRAE), Gwladys Diquelou (Ville de Rezé), Natalia Escar-Otín (Institut Agro Rennes-Angers), Élise Geisler (Institut Agro Rennes-Angers), Claire Guiu (Ville de Rezé)
- **Methodological & technical contributions**: UMRAE, Ville de Rezé, Institut Agro Rennes-Angers, Auxilia Conseil

Illustrations and graphic design

- Illustrations (drawings & watercolours) : ToniTorfer (all rights reserved)
- Participatory map : Séverine Coquelin, la Vilaine est Jolie
- Graphic design and layout : Gwendall Petit (UMRAE)

Website

Official project website : https://sonoreze.fr/

Contacts

For any questions or partnership inquiries : arnaud.can@univ-eiffel.fr

License and usage rights

Reference

ISBN 978-2-37135-006-9

Recommanded citation

Can, A., Audubert, P., Aumond, P., Bataille, N., Diquelou, G., Escar-Otin, N., Geisler, E., Guiu, C., Petit, G. (2026). Methodological guide – Citizen-led approaches and sound environments. Lessons from SonoRezé project. Available at : https://sonoreze.fr/

Preface

A word from the researchers

We are pleased to present this methodological guide, which concludes two years of a highly stimulating collaborative action-research project. Through participatory workshops involving residents, technical services, and elected officials from the City of Rezé, as well as a third-party observer, we aimed to demonstrate that citizen expertise and scientific expertise are complementary and can help objectify decisions made by public authorities. The uptake of the results produced within the aircraft noise initiative by elected officials, and the debates they helped generate within decision-making bodies, tend to confirm this. We warmly thank the residents and elected officials for the time they devoted to the project and for the richness of their engagement. Through this guide, we have sought to document the approach and highlight elements that can be replicated across a range of territories and themes related to urban sound environments. Now it is yours to take up and use!

A word from the elected officials

The sound quality of a city is fundamental. It reflects the coexistence of activities and uses, and the relationships between humans and non-humans. It contributes to well-being for all, health, biodiversity protection, and conviviality. A city that “sounds” good is a city where people feel good. Yet the sound environment is still too often overlooked in public policy, or reduced to strictly regulatory considerations. Indeed, understanding “noise” or “quietness” in the city remains complex, as it involves multiple fields of action, a range of public and private stakeholders, and different areas of expertise.

In light of this observation, the City of Rezé chose to address the issue of the sound environment by bringing together residents and researchers in an innovative action-research project, enabling both a shared sound diagnosis, the production of scientific data, and an action plan focused in particular on aircraft noise. The project’s results helped us better objectify residents’ perceived annoyance related to noise and bring the legitimacy of citizen voices to airport governance bodies (DGAC, State, local authorities), highlighting the need to revise regulatory frameworks on noise and the importance of establishing citizen observatories on environmental issues.

We hope this guide will equip other local authorities to implement participatory and scientific initiatives on sound environments. Noise is not merely a technical issue; it is a profoundly political one, requiring the combined engagement of public authorities, scientific knowledge, and citizen expertise.

A word from the residents

Researchers invited residents in Rezé to take part in an unprecedented experiment. What a great idea! We were invited to a very interesting initial meeting about noise, sound, how it can be measured, and the app to download, calibrate, and get to grips with.

We then set off to explore different neighbourhoods of the city to capture its soundscape, using the app to record the environments in which we walked and measured decibels. The measurements were sometimes carried out collectively, and each outing led to the same observation: even when we thought we had identified a pleasant sound environment, a looming “sword of Damocles” hovered above us—an aircraft taking off or landing, pushing the decibel levels into the red and disrupting, for long seconds, our fragile sense of acoustic comfort, shattered by this intruder.

This is why we chose to focus primarily on aircraft noise, a widely shared concern. Our measurements revealed an area far broader than the official maps suggest. Aircraft noise extends, in both decibel levels and time of occurrence, beyond the institutional framework. We became concerned about potential health impacts, even though we were only studying noise pollution (and not air or light pollution).

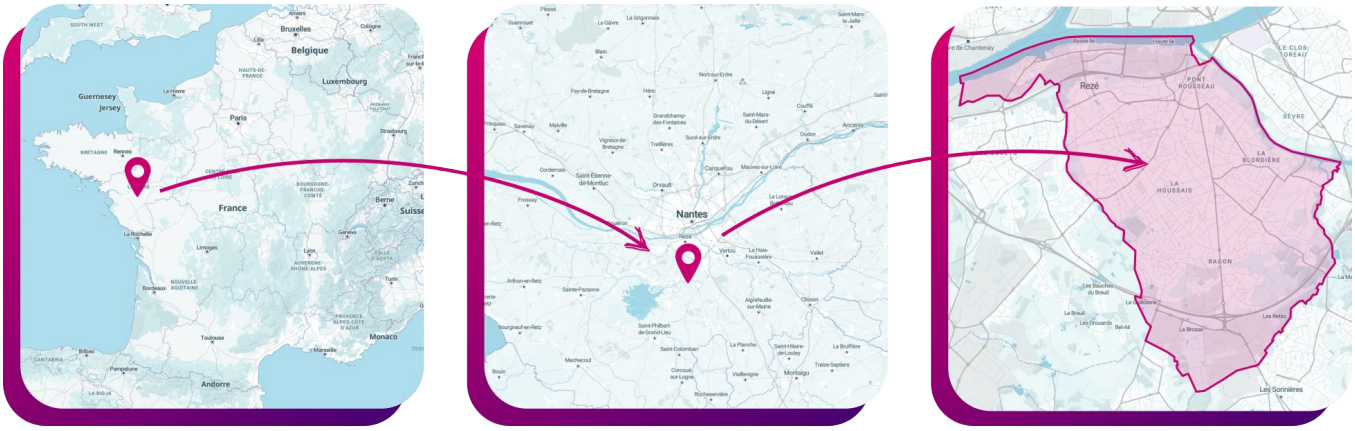
This participation in the project was highly enriching, fostering connections, healthy emulation, and exchanges of impressions and knowledge, always in a spirit of attentive listening (no pun intended) and kindness. We would strongly encourage other residents to take part in similar initiatives in their own cities.

Introduction and how to use this guide

The context of the Sonorezé project

The regulation of sound environments has become a major issue in urban development, in a context of increasing density, growing mobility, and strong expectations for a more peaceful living environment. While the health impacts of noise are well documented — more than 1.5 million healthy life years lost each year in Europe — public policies still largely rely on normative approaches (European Directive 2002/49/EC) based on **standardised acoustic indicators,** which are **often disconnected from residents' perceptions**.

Over the past decade, **participatory approaches have sought to bridge this gap by involving citizens in the measurement and characterisation of noise**. However, these initiatives face several obstacles: the technical nature of the subject, the asymmetry between lay and expert knowledge, and the difficulty of translating citizen observations into levers for public action. Participatory action research offers a response to these limitations by promoting the **co-construction of knowledge and the creation of a shared language between residents, researchers, and decision-makers**. It is within this perspective that the SonoRezé experiment was conducted in Rezé (Nantes metropolitan area), a city exposed to aircraft and road noise yet rich in environmental amenities, and seeking to involve residents in decision-making processes.



Why a methodological guide?

The SonoRezé project has demonstrated that a participatory approach, involving residents, researchers, and decision-makers, makes it possible to better understand sound-related issues and to co-develop impactful actions for the territory. From the outset, it was **designed as an experimental initiative aimed at testing elements that could later be replicated**, with the ambition of serving as a model for other territories. The interest expressed by local authorities and stakeholders during the dissemination seminar confirmed the need to formalise this approach. This methodological guide therefore responds to a concrete need: to s**hare an experience in order to inspire and equip those wishing to implement participatory approaches** to their sound environment, whether related to aircraft, road or industrial noise, or other forms of environmental nuisance (or even other types of pollution involving citizen perception and measurement), as well as to enhance the value of high-quality soundscapes. It provides a clear methodology, tested tools, and lessons learned to facilitate the implementation of similar projects. By capitalising on the lessons drawn from the project, it helps avoid common pitfalls, saves time, and maximises the impact of implemented actions.

"*The metal birds in my garden*"

Who is this guide for?

This guide is intended for **all stakeholders wishing to implement a participatory approach to sound environments and their improvement**, or to launch citizen-based measurement initiatives within their territory:

- **Local authorities** (municipalities, metropolitan areas, inter-municipal bodies, departments, etc.) seeking to integrate a participatory dimension into their public policies.
- **Associations and citizen groups** aiming to engage in action for a more peaceful living environment.
- **Researchers and consultancy firms** looking for innovative methods to combine technical expertise and collective intelligence.
- **Institutions and infrastructure operators** (airports, road networks, etc.) wishing to open dialogue with local residents.

It provides a practical resource for all those who wish to design, implement, or evaluate collaborative and multi-stakeholder approaches to sound and environmental issues.

How did we develop this guide ?

This guide was developed from feedback and an analysis of the process implemented within the SonoRezé project between 2022 and 2025:

- An analysis of the content produced and the various stages of the process;
- An internal collective debriefing workshop within the project team;
- An open workshop involving partners and stakeholders, bringing together 31 participants (listed below) to provide external perspectives on the experiment and its potential for replication.

The guide offers a cross-cutting analysis of this material, which was then translated into an operational guide.

List of participants in the external workshop

SonoRezé Team : Ville de Rezé : Claire Guiu (Adjointe Pôle Aménagement – Paysages et écologie), Philippe Audubert (Adjoint à la santé et aux personnes âgées) et Gwladys Diquelou (chargée de mission environnement) ; Université Gustave Eiffel (UMRAE) : Arnaud Can, Pierre Aumond et Gwendall Petit ; L'Institut Agro Rennes-Angers (ESO) : Élise Geisler, Natalia Escar-Ortin ; Auxilia-Conseil : Nicolas Bataille.

23 external participants : Alicia Mauberet (Métropole Aix-Marseille), Aurélien Bil (Acoucité), Aurélie Prévost (Ville de Bouguenais), Benoit Philibert (Métropole de Lyon), Christophe Rosin (SNCF Réseau), David Tromeur (LASA, Bordeaux), Emma Desvallois (Campus Urbain), Etienne Guyonnet (Ville de Paris), Fanny Berland (Campus Urbain), Hélène Dourneau (Métropole Bordeaux), Jean-Philippe Reigaraz (SNCF Reseau), Manuel Hellot (BruitParif), Marie Pieron (Ville Ivry s/ Seine), Mathieu Sineau (BruitParif), Nolwenn Bizeul (Nantes Métropole), Olivier Pichard (Cerema), Olivier Savy (Ville de Lille), Renaud Balaguer (Cerema), Robin Maffeis (Univ. Eiffel), Sylvie Turck (Nantes Metropole), Tanguy Petit (Cerema), Valérie Janillon (Acoucité), Vincent Tourre (Ecole Centrale de Nantes).

We would like to warmly thank all the participants.

The Sonorezé project in brief

SonoRezé I : a participatory diagnosis

Between 2021 and 2022, the City of Rezé and Gustave Eiffel University conducted a citizen-based assessment of sound environments within the framework of the Researchers / Citizens programme of the I-Site Future initiative. Thanks to the involvement of 130 residents, more than 90 hours of acoustic measurements were carried out using the NoiseCapture application, enabling the production of a **participatory mapping** of noise levels and source typologies. These maps proved to be closer to residents' perceptions than conventional noise maps. Focus groups further explored these observations by examining perceived soundscape quality, and a final seminar — combining debates and artistic performances — helped identify directions for the next stages of the project.

SonoRezé II : co-constructing action

Conducted between 2023 and 2025 by Gustave Eiffel University, Institut Agro Rennes-Angers, and the City of Rezé, with the support of the third-party facilitator Auxilia, **SonoRezé II** aimed to renew forms of consultation and public action on noise. In addition to awareness-raising activities, such as the dissemination of educational materials and interventions in schools, and the continuation of the participatory assessment, the consortium chose to focus its work on an emblematic theme selected collectively: aircraft noise.

The « aircraft noise » action

The approach was based on a three-way partnership between residents, the City (elected officials and technical services), and researchers, and relied on eight participatory workshops. The aim was to identify residents' concerns regarding aircraft noise and to produce analyses capable of informing potential courses of action. The work also included reflection on how the results should be disseminated. Three main concerns emerged from this process, each of which gave rise to a specific line of work:

- **Aircraft flights paths have shifted**: analysis of trajectory data collected on the NTE-Skyview platform, managed and made available by a resident of Rezé actively involved in the project, highlighted slight deviations of flight paths towards Rezé, although no acoustic impact could be confirmed.
- **Residents' sleep is disturbed**: data from official noise monitoring stations, shared by the DDTM, confirmed that the 6–7 a.m. time slot is the noisiest. Awareness-raising indicators were produced, showing for example that a plane taking off at 6 a.m. wakes up an average of 200 residents of Rezé, and that the curfew is not respected approximately once per day.
- **Disturbance is underestimated**: regulatory calculations estimate 150 people as highly annoyed during the day (and 0 at night), compared to around 5,000 (and 3,000 at night) when lower exposure levels below 55 dB(A) are taken into account, in line with WHO recommendations. A complementary annoyance survey conducted in Rezé, which collected nearly 900 responses, confirmed that the number of highly annoyed residents in the municipality is underestimated.U

A **sensitive map** of perceptions of aircraft noise, developed from interviews and collective workshops with residents in collaboration with a graphic designer, complemented these analyses and was widely disseminated across the territory. A dissemination seminar subsequently brought together nearly one hundred residents as well as numerous institutional stakeholders (DDTM, DGAC, AGO, ORS, elected officials, and local technical staff).

Impacts and follow-up

The project had **tangible effets** for residents: :

- The creation of a **residents' panel** associated with the health study conducted by the Regional Health Observatory (ORS);
- The organisation, by the DDTM, of a meeting between AGO (the airport concessionaire), the DGAC, and the SonoRezé collective;
- The **formation of a citizen collective**, the SonoRezéens, which has taken part in public consultations (Noise Prevention Plan in the Environment, draft legislation on airport-related noise pollution) and continues to conduct assessments of other noise sources;
- The inclusion of residents and researchers from the project in the monitoring committees of the ORS and OTANA (Airport Observatory);
- The opening of discussions on the **deployment of a citizen-based noise sensor platform**.

In addition, the researchers were invited to present this innovative approach in various institutional settings, including the airport management committee in the presence of the ministerial delegate, as well as to the Member of Parliament for the 4th constituency of Loire-Atlantique, in the context of drafting a bill.

Lessons learned and perspectives

SonoRezé made it possible to establish an **unprecedented dialogue** between residents, researchers, and institutions around a highly technical issue. Citizens appropriated scientific concepts and reoriented analyses towards their lived sound experiences; researchers adapted their analyses to address residents' concerns and worked on how to communicate them more effectively; the City of Rezé relied on these results in its exchanges with State services.
The project produced open resources — maps, datasets, educational materials — available on sonoreze.fr, contributing to a collective upskilling process.
More broadly, this approach shows that **lay expertise complements scientific expertise**: it helps guide measurement and interpretation towards lived concerns.

The methodological framework developed in Rezé thus constitutes a **transferable model** for other territories exposed to complex noise issues (aircraft, road, industrial, or festive activities, etc.), as well as for the enhancement of restorative sound environments. It is based on the articulation between digital tools, educational support, and political commitment, offering a concrete pathway to bring **measurement**, **perception, and decision-making** closer together, and to place noise at the heart of everyday coexistence.

What SonoRezé produced

Tangible

- **Data and their processing:** the NoiseCapture database, analysed interviews, perception maps, graphs on variability in air traffic patterns, curfew violations, and trajectory changes, as well as an annoyance survey.
- **Communication and framing materials**: awareness-raising indicators and “impact figures”, a critique of the limitations of regulatory data, popularised communication materials, and contributions to an opinion piece for the French National Digital Council.
- **Website**
- **Creation of a community**
- **Scientific publications**
- **Residents’ participation in meetings with institutional stakeholders**

Intangible

- **Awareness-raising** and training of participants, children, and school teachers
- **Public dissemination** of the issue (press articles, radio, and television coverage)
- **Local stakeholder engagement**: neighbouring municipalities, Nantes Métropole, DDTM, DGAC, the airport authority, and a Member of Parliament involved in drafting legislation
- **National and international engagement**: participation in citizen science networks
- **Production of factual inputs** used in **local debates and controversies** between stakeholders (city, State services, etc.)
- **Empowerment:** increased participants’ skills in acoustics and their ability to act collectively and individually on their living environment

Want to get started?

Our methodological recommendations

In this section, we present methodological points of attention and general recommendations drawn from the experiment, to be considered before embarking on such an approach, in order to guide its design and facilitation.

The Sonorezé recipe

These four elements form the distinctive identity of the participatory approach implemented within the SonoRezé project:

1	2	3	4
Field surveys carried out by local residents	The "researchers / local authorities / residents" triptych	Workshops on teaching methods, data analysis and utilisation, objectification of perception	A reflection on the resulting actions

The four key methodological takeaways

We draw four key lessons from participatory approaches to urban environments and their perception:

1. Mediation through measurement: a lever to make perceptions tangible and open them to discussion

One of the foundations of the SonoRezé project lies in the **direct involvement of residents in measuring sound environments**. Using the NoiseCapture smartphone application, participants were able to carry out acoustic measurements at locations and times that directly concerned them. This approach played a key role in **making perceptions tangible** and in relating them to quantifiable data.

Participatory approaches addressing highly technical issues such as noise face a major challenge: how to involve non-specialists in discussions that rely on expert methods and scientific concepts. How can participants be encouraged to engage with the technical dimensions that are essential for producing objective evidence? How can these concepts be explained quickly and accessibly? In Rezé, citizen-based measurement helped overcome this difficulty. **Residents quickly grasped the key issues through concrete data**, while researchers were able to explain the implications of the measurements (sound levels, logarithmic scales, uncertainties, what can and cannot be measured, etc.). Confronted with the measurement results, residents were able to draw on their own experiences, better articulate their perceptions, and express their annoyance based on a strengthened understanding of sound-related phenomena.

An iterative process was then established: additional measurements were carried out to improve knowledge of perceptions that had not yet been captured, to further characterise these perceptions, and to refine the analyses. This interaction between expert knowledge and experiential knowledge not only enriched the discussions but also strengthened the prioritisation of issues to be investigated.

2. The power of representation in giving voice to citizens and their perceptions

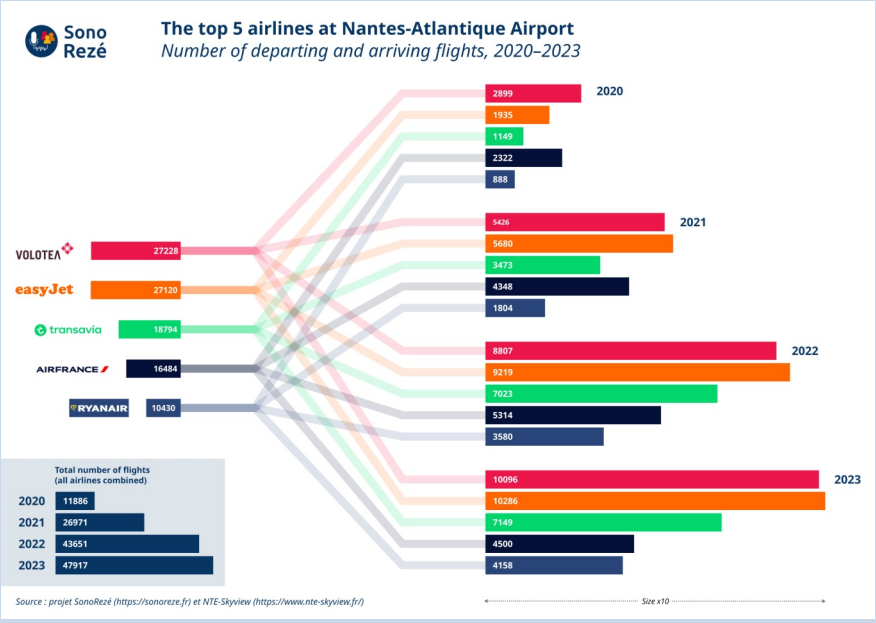
Over the course of the eight workshops, the characterisation of sound perceptions and the prioritisation of issues did not rely solely on verbal exchanges or abstract scientific concepts. They were supported by a **wide range of visual and representational tools**: interactive maps, comparative tables, flight-path visualisations, and quantitative summaries integrating physical, health-related, and perceptual dimensions. These tools, developed by researchers or by residents who had acquired individual expertise, played a central role in the participatory process and gave it particular strength.

This work of representation produced several decisive effects:

- It **provided a platform for residents' experiences by giving voice to their perception**s, placing them in direct dialogue with official data, which are often limited because they rely on normative approaches (such as simulations based on traffic models) or difficult to use because they are inaccessible and poorly documented (through formats that are unreadable, static, or otherwise unsuitable, such as spreadsheets converted into images). This confrontation revealed significant discrepancies between lived realities and technical assessments, thereby enriching public debate.
- It **structured the dialogue** between researchers and residents, thereby concretely fostering empowerment. It enabled the **emergence of individual and collective positions** supported by arguments and evidence. Participants' appropriation of the issues, skill development, and growing awareness of sound-related phenomena were built through these representations, which served both as a basis for discussion and as a catalyst for shared learning. By making data and perceptions visible and open to discussion, this methodology transformed residents into informed actors in the decision-making process.

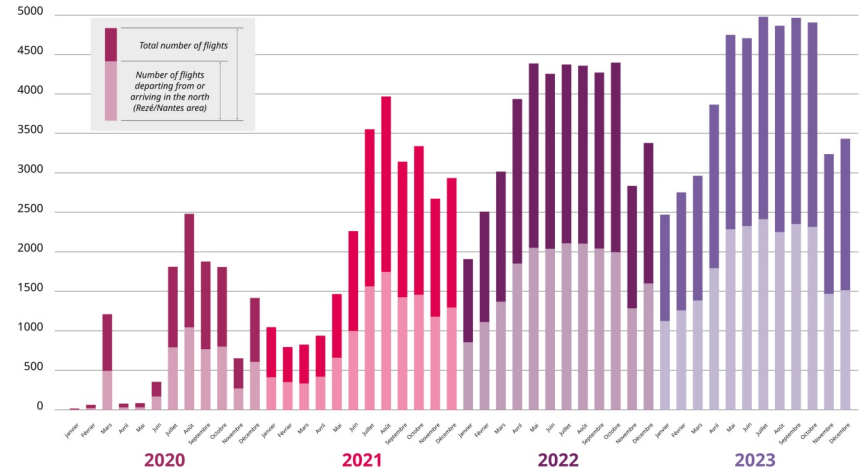
By transforming subjective experiences into structured representations, this methodology gave **new legitimacy to residents' perceptions**. Visual tools did not merely illustrate discussions; they actively shaped them, enabling participants to move from observation to action, and from debate to the co-construction of solutions.

Examples of materials developed to inform and support discussions



Number of flights departing from or arriving at Nantes-Atlantique Airport

Monthly accounting, from 2020 to 2023

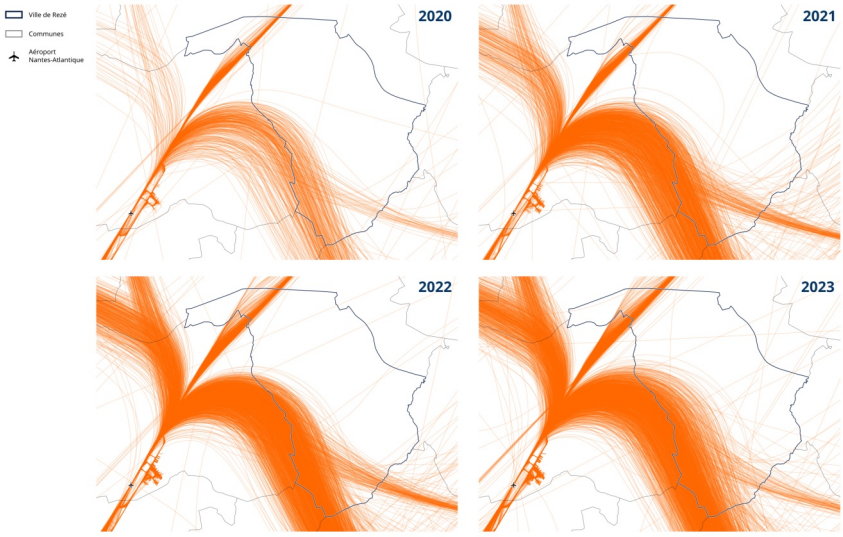


Total number of flights (all airlines combined)	2020	2021	2022	2023
	11886	26971	43651	47917

Source : projet SonoRezé (https://sonoreze.fr) et NTE-Skyview (https://www.nte-skyview.fr/)

Changes to EasyJet flight routes
Departing from or arriving at Nantes Atlantique Airport

easyJet



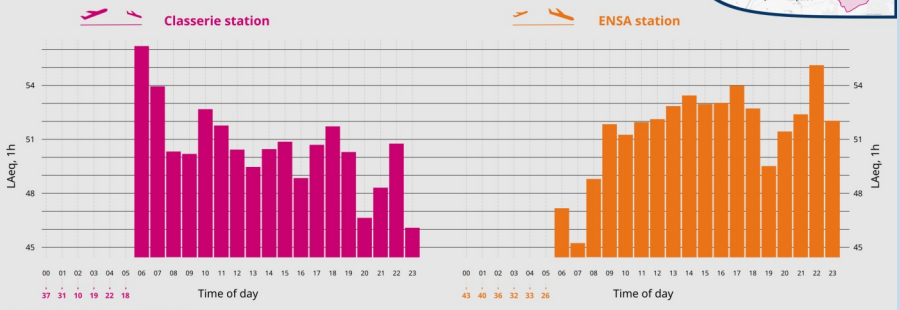
Source : projet SonoRezé (https://sonoreze.fr) et NTE-Skyview (https://www.nte-skyview.fr/)

Please note: this map shows provisional and confidential results

Hourly noise levels, by time of day

Comparison between the Classerie and ENSA monitoring stations – Year 2023

- The **LAeq** is the indicator representing the equivalent sound level (expressed in decibels, dB) over the duration of the measurement. Put simply, it is equivalent to the 'acoustic average' of the measurement.
- **LAeq** represents the equivalent sound level (Leq), adjusted for human hearing and applied to environmental noise. As such, it is expressed in dB(A). LAeq 1h is therefore the A-weighted equivalent sound level measured over a period of one hour.



Source : projet SonoRezé (https://sonoreze.fr)

3. The importance of facilitation in structuring the process

The feedback from the SonoRezé project highlights a key point: **facilitation is a crucial driver, requiring dedicated time, specific skills, and energy**. Without rigorous and attentive support, even the most innovative approaches can lose effectiveness. Facilitation is not limited to enabling exchanges; it structures the progression of workshops, maintains participant engagement, and ensures that discussions lead to concrete and shared outcomes.

Facilitation fulfilled several functions:

- **Framing discussions** to prevent them from becoming scattered or stagnant, while still allowing room for spontaneity and a diversity of viewpoints.
- **Encouraging participation** by adapting facilitation methods to the profiles of participants (residents, experts, elected officials), in order to ensure balanced and constructive involvement. In particular, this involves ensuring that everyone is given the opportunity to speak, in line with the project's intended horizontal governance approach.
- **Ensuring clear progression** between the different stages, regularly refocusing discussions on the defined objectives and formalising progress to maintain collective momentum.

Without this investment in time and expertise, the risk is twofold: a loss of participant motivation, as they no longer perceive the value of their engagement, or discussions that drag on without concrete outcomes or satisfaction for those involved. In Rezé, facilitation was primarily carried out by the research team, who were highly committed to the project, and benefited from the expertise and support of the third-party facilitator in structuring methods and facilitation protocols.

More concretely, facilitation involves several tasks (some of which are supported by tools presented in the toolkit section of this guide):

- Defining recruitment strategies for participants and related actions;
- Managing a WhatsApp group, an email distribution list, and communication actions with different target audiences;
- Defining the different stages of the project;
- Designing facilitation protocols for each workshop;
- Appointing a facilitator for each workshop responsible for setting instructions, moderating discussions, distributing speaking time, and coordinating subgroup work, as well as a timekeeper and note-takers;
- Preparing and disseminating meeting minutes.

CHOIX ET REPARTITION DES ACTIONS

Selection and allocation of actions

4. The political stakes of such approaches beyond technical debates

SonoRezé has shown that projects focused on sound environments are **not limited to technical issues, but also address broader political questions**. Bringing these issues into discussion leads to an examination of decision-making processes and associated power relations, territorial priorities, and the place given to citizens in the making of public policy. Acoustic data, often presented under the apparent neutrality of numbers, are in fact also based on **implicit political choices**: which indicators should be prioritised? Which thresholds should be used? Which noise sources should be studied as a priority? The project helped to open this "black box" of data, showing how measurement methods, standards, and simulation models embed — or obscure — trade-offs that shape diagnoses and proposed solutions. It explored blind spots and highlighted the complexity of reality.
In this respect, participatory approaches may introduce several dimensions identified as political, insofar as they relate to decision-making or institutional governance:

- The **legitimacy of residents' knowledge**: the approach established that citizens' perceptions are not merely a complement to data, but a necessary counterpoint for characterising actual nuisances and blind spots. This made it possible to communicate to institutions issues that are sometimes overlooked by existing regulatory frameworks.
- **Moving beyond top-down expertise**: by confronting technical data with lived experience, SonoRezé helped **deconstruct methodological choices** (particularly in the production of indicators), showing that alternative approaches are possible (such as proposing alternative indicators like the number of awakenings). For example, regulatory maps based on averages or simulations can obscure localised disturbances that are nonetheless significant for residents. The project thus **broadened the scope of what can be measured**, by integrating perceptual or health-related criteria often absent from traditional approaches.
- **Institutional engagement as a condition for change**: the impact of the project depended on the ability of public actors (city, metropolitan authority, State services) to **use the results** to question priorities, engage infrastructure operators (airport, roads), or reflect on the evolution of planning and diagnostic tools (Noise Prevention Plans in the Environment, urban planning documents). Without this willingness, participatory diagnostics remain ineffective. More broadly, the approach benefited from the attentiveness of elected officials, who in turn used the results of SonoRezé to support their positions within local governance decision-making bodies.

- **Conflicts as revealing** dynamics and drivers of change: tensions between residents, users, and decision-makers were brought to light during the workshops. Rather than being smoothed over, these tensions were mobilised and unpacked in order to clarify the issues at stake and identify potential avenues for solutions. Rather than being avoided — at the risk of reinforcing mistrust — these conflicts were channelled to inform more balanced solutions in favour of health, social cohesion, and institutional trust.

The prerequisite checklist

Essential prerequisites

Within the project, several prerequisites emerged as fundamental for a participatory approach of this kind, regardless of its specific form:

- **Technical expertise in acoustics**: necessary to interpret results, assess uncertainty, and produce analyses between sessions that serve as the basis for discussions.
- **Expertise in qualitative social science methods**: required to collect residents' perceptions (individually and collectively) and interpret the results (participant observation, semi-structured interviews, focus groups, and methodological triangulation).
- **Facilitation skills**: to structure discussions, stimulate debate, and ensure the smooth progression of the process.
- **Political involvement of elected officials**: their leadership and participation in workshops make it possible to directly consider how the approach may inform public action, drawing on their knowledge of decision-making processes and current policy agendas. Their presence also helps to strengthen the legitimacy of the process and of residents' voices.
- **Strong and sustained resident participation**: the participatory approach relies on the direct expression of residents, rather than mediated voices or assumptions about their perceptions. Its value depends on regular participation and a minimum group size (the resident group fluctuated but was based on a core of around fifteen highly committed participants).
- **A website and communication tools supporting the approach**: as both an entry point and showcase for the project, communication tools helped sustain engagement (for example by enabling the involvement of more occasional participants) and increased the visibility and impact of the approach by ensuring its dissemination.

Prerequisites depending on the chosen implementation

Other characteristics of the project appear to be essential only depending on the objectives assigned to the approach, and more optional in other contexts.

- **An independent actor**: the fact that SonoRezé emerged from a research project rather than a commission from the City made it possible to place all stakeholders on an equal footing, with no contracting authority or commissioning body.
- **Acceptance of process uncertainty**: since this is a research project rather than a commissioned study, the approach is inherently exploratory. Expectations are shaped along the way, rather than being based on a clearly defined initial need. This aspect may be important when seeking to replicate such an approach, but more optional if the objectives are clearly defined or if a less horizontal governance structure is preferred (for example, to respond to a specific request from a particular stakeholder).
- **Scientific legitimacy**: the presence of researchers and their academic status provided strong legitimacy to the process and a form of scientific validation that helped legitimise residents' voices. In doing so, it helped avoid the dismissal of perceptions that are often devalued as too "subjective" compared to more "objective" technical simulations. Depending on the implementation, this form of scientific validation could also be provided by other recognised forms of expertise (consultancy firms, expert institutions, noise observatories, etc.).

- **A municipal rather than a broader scale**: in participatory approaches, it is generally easier to start from a scale that corresponds to residents' everyday lives. In this case, the municipal scale proved to be an important prerequisite: participants are often neighbours, share common concerns, and know and use the same spaces. At a larger scale, the dynamics and outcomes of such an approach would necessarily be different.
- **Shared leadership** as a prerequisite: the project's shared governance appears as a key prerequisite, as it underpins co-construction and enables mutual understanding of issues. On the one hand, residents gain insight into the complexity of public action and the difficulty of rapidly addressing identified problems; on the other hand, researchers, elected officials, and technical staff gain a better understanding of residents' perceptions and lived experiences. Co-leadership maximises impact by providing mutual legitimation: elected officials are legitimised in institutional arenas dealing with noise through the participatory process, while residents' voices are legitimised through political endorsement.

Barriers to anticipate and overcome

The feedback from the SonoRezé project highlighted certain barriers that could be bypassed or mitigated, and conversely some that could not be avoided.

Common barriers

- **Engaging stakeholders within the local authority**: such a participatory approach calls for cross-cutting action on quality of life, mobility, or even culture. For actions to be developed and implemented, it requires the involvement of other municipal departments and elected officials; otherwise, a noise-focused initiative risks remaining siloed and producing limited effects. In addition, the contribution of support services is essential to the smooth running of the participatory process itself, particularly the communication department, which helps relay events and workshops. However, it can be difficult to engage stakeholders, given the already heavy agendas of elected officials and departments and the multiplicity of priorities. Environmental noise is sometimes perceived as a low-priority issue and therefore needs to be actively highlighted.
- **Temporalities**: the difficulty of managing differing timeframes between stakeholders is a well-known barrier in projects combining research and action. It must therefore be clearly understood and addressed from the outset by all parties. Researchers operate on a long-term horizon, and producing scientific results requires the time needed for rigour and peer evaluation. Municipal actors are more oriented towards operational action but remain bound by decision-making processes and the inertia of governance structures. Residents, meanwhile, experience daily exposure to nuisances that can significantly affect their quality of life and expect concrete and rapid responses to their concerns. Aligning these expectations and operating logics is a considerable challenge that requires mutual understanding and trust-based collaboration, which proved possible within the SonoRezé project.

Specific barriers depending on the implementation

- **Interdisciplinarity**: the research objectives of the SonoRezé project combined issues from environmental acoustics and the social sciences. Although environmental topics inherently involve interdisciplinary perspectives, research projects in this field do not necessarily include researchers from these different disciplines. When they do, interdisciplinary situations can become a barrier: within the research team itself, languages and methods differ and require a process of mutual learning and alignment. This can occur at the beginning of the project, through prior collaborations, or progressively throughout the project by regularly revisiting research objectives and their progress.
- **Access to data for analysis**: the success of SonoRezé relied on the availability of data (provided by the DDTM, with the agreement of the airport operator, as well as data collected via a tool developed by a project participant, NTE-Skyview) which enabled analyses of flight trajectories and aircraft-related noise levels. Without these data, discussions on the theme chosen by residents would have been limited or would have taken a different form, due to the inability to examine indicators or structure analyses. In other contexts or on other topics, access to data may be more complex and may hinder discussions.

Points of attention

The feedback from the project highlights several points of attention to consider when conducting a participatory approach of this kind.

- **Identifying the right coordinator**: overall coordination is a key pillar of the project, requiring legitimacy among all stakeholders and sufficient time availability, given the number of actors that need to be brought together.
- **Explaining how local authorities function to researchers and residents**: such projects inevitably generate expectations towards the municipalities or public institutions involved. When environmental nuisances are highlighted, these institutions are expected to act. However, public action is complex and must go through decision-making processes that can be long and sometimes intricate, which are essential for democratic and equitable governance. Multi-stakeholder projects should therefore include an element of pedagogy about public action, so that expectations from researchers and residents are aligned with institutional constraints and procedures.
- **Clarifying the objectives of the participatory approach to residents**: why is participation being implemented in this case? What is the expected degree of involvement of residents, and what are the respective roles of each actor? This helps clarify responsibilities and avoid potential frustration.
- **Raising awareness among other elected officials and staff, and organising an internal seminar involving researchers, elected officials, and municipal staff**: two elected officials and one staff member were particularly involved in the SonoRezé project, but it was sometimes more difficult to engage other members of the administration and municipal team. The feedback highlighted that broader internal awareness-raising would have been useful (not only externally) regarding the importance of the topic and the functioning of the project. An internal seminar bringing together researchers, elected officials, and staff can be particularly valuable in this respect.

- **Involving the local authority's communication department**: given the coordination challenges and the need to "recruit" and retain participants over a long period (SonoRezé involved eight workshops over one year), communication is essential. The local authority's communication department should therefore be involved as early as possible in order to diversify channels, increase visibility, and reinforce the legitimacy of the approach through the City's endorsement. However, the initial choice was to involve the communication department mainly as a relay. For project communication itself, the team chose to manage it directly in order to streamline validation processes, preserve freedom of expression, and signal the project's independence through its communication activities.
- **Anticipating needs, deadlines, and the overall timeline**: the collaborative nature of the project, combined with the fact that such an approach is often carried out "on top of" participants' existing responsibilities, makes it difficult to align schedules. In addition, the logistical organisation of events and workshops, as well as upstream communication requirements, demand ongoing anticipation and continuous adjustment of the timeline—particularly when the presence of key stakeholders (mayor, elected officials, etc.) is required. This planning work emerged in SonoRezé as an important point of attention.
- **Allocating time for data processing between workshops**: participatory approaches follow a specific rhythm: workshops are used to collect residents' input and to formalise avenues for reflection and action. Between these milestones, researchers (or experts) must structure the data and produce the analyses that underpin discussion and co-construction. The time required for this "back-office" work between workshops should not be underestimated.
- **Allocating time to prepare workshop protocols**: these protocols are developed iteratively, with constant uncertainty regarding the number of participants (it is often necessary to plan both a primary and a fallback scenario).
- **Link between measurements and perception maps**: the interdisciplinary approach relied on combining sound level measurement and mapping (by acousticians) with participatory mapping of perceptions (by social science researchers). These two approaches were sometimes conducted in a relatively compartmentalised way, and it would likely have been more beneficial to better integrate them. A finer articulation between these approaches remains to be developed.

Actionnable levers

The SonoRezé project made it possible to experiment with several levers to address the barriers identified in participatory approaches to urban environments.

Common levers

- **The NoiseCapture application**: its free access, user-friendly design, and simplicity make it possible to quickly and easily organise citizen-based measurement campaigns. Its playful dimension also constitutes an important source of motivation for participants.
- **City–research co-design ("co-construction")**: the highly complementary partnership between the municipality and the academic sphere made it possible to benefit both from political access to decision-making arenas and from information on policy developments, while the presence of researchers ensured a high level of expertise and scientific credibility. This joint arrangement helped connect expertise and action in the service of residents.
- **The municipal scale**: this scale appears particularly well suited to participatory democracy, as it corresponds to the immediate environment and daily lives of residents.
- **Project independence**: the partnership-based structure (with a horizontal governance model and no designated leader), together with the involvement of a third-party facilitator, ensured the project's independence. As an experiment not subordinated to any single stakeholder, this independence enhanced the legitimacy of the approach, supported stakeholder engagement, and helped ensure that participants did not feel instrumentalised.
- **Presence of researchers:** this proved beneficial by ensuring a high level of legitimacy through scientific credibility and the guarantee of independence they provide. In addition, the robustness of scientific methodologies contributes to a form of neutrality that further strengthens legitimacy. Finally, researchers' ability to adapt, work under uncertainty, and experiment fosters innovation and agility within the process.
- **Third-party facilitator:** the role of the third-party facilitator is a key lever in such participatory approaches. It strengthens facilitation (and its framework), which is crucial in such processes; it helps ensure balance between stakeholders by safeguarding both individual and collective objectives; and it provides opportunities for regular reflective assessment throughout the project.
- **Website:** such an initiative has little impact if it does not circulate in the public and social sphere. It therefore relies on effective dissemination and communication channels. In this respect, the development of a clear, accessible, and well-structured website served as an important showcase for the project, both externally and internally among participants.
- **Processual / adaptive approach ("learning-by-doing")**: as an experimental initiative, the project required continuous adaptation based on the results of each workshop and the analyses produced. Such a participatory and experimental approach would not have been feasible within a rigid, fully pre-planned framework, given the unpredictability of dynamics, analyses, and decisions. A learning-by-doing approach is essential to strike a balance that suits stakeholders while addressing residents' experienced nuisances.
- **Workshop and facilitation protocols**: adaptation through learning-by-doing does not mean the absence of structure. On the contrary, developing and adjusting workshop facilitation protocols is essential to avoid losing direction despite uncertainty and to produce concrete, usable outcomes for all partners. These protocols are necessary to ensure inclusive participation and to guarantee that results are produced despite time constraints.

What is a “third-party facilitator”?

In participatory research, where different logics intersect — those of residents, researchers, institutions, and professionals — the third-party facilitator plays a key role in building connections and ensuring the quality of exchanges. Positioned between a facilitator, a mediator, and a methodological guarantor, they act as the “oil in the machine” of the collective process, enabling everyone to contribute effectively while maintaining a balance between the different perspectives.

A mediator fostering synergy

The third-party facilitator’s role is to:

- **Foster the co-construction of knowledge**: they ensure that expert knowledge (scientific, technical) and experiential knowledge (residents’ and associations’ lived experience) mutually enrich one another, without allowing one to dominate the other.
- **Provide an external and reflective perspective**: by observing group dynamics from a distance, they help the collective step back, question its own functioning, and avoid biases (such as becoming locked into habitual ways of operating or excluding certain voices).
- **Identify and defuse tensions:** whether misunderstandings, conflicting interests, or breakdowns in communication between stakeholders, they detect blocking points and propose ways to address them, drawing on appropriate tools (mediation, rephrasing, dialogue workshops).
- **Provide methodological and human resources**: beyond supporting relational dynamics, the third-party facilitator also equips the collective (methods and facilitation techniques, analytical frameworks, reporting tools) to structure discussions, make processes more inclusive, and secure speaking spaces by enabling the expression of viewpoints and their constructive confrontation.

Why is this role important?

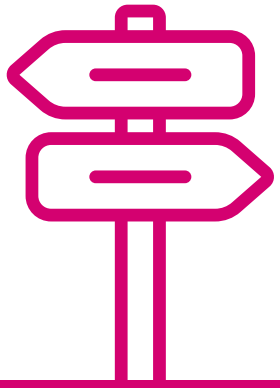
In projects such as SonoRezé, where technical issues (acoustic measurements), social dimensions (perceptions of noise), and political considerations (public decision-making) intersect, the third-party facilitator helps to avoid two main pitfalls: on the one hand, the process being captured by a dominant group (e.g., experts or institutions), and on the other hand, discussions becoming too fragmented, potentially leading to unusable outcomes or participant frustration. In this sense, the third-party facilitator acts as a **guardian of fairness and relevance** within the project, helping to turn the diversity of perspectives into a collective strength.

Specific levers depending on the implementation

- **Interdisciplinary work between social sciences and acoustics**: the experiential dimension of the sound environment emerges most clearly when it is brought into dialogue with acoustic analyses grounded in the tools of this scientific field; this is a key strength of such an approach. However, when it comes to understanding the systemic dimension of these perceptions (relationship to territory, collective dynamics, psychological and social aspects of perception), tools from the social sciences are essential to avoid overlooking important dimensions.
- **Leadership by researchers:** despite the horizontal governance of SonoRezé, the project remains a research initiative and is therefore formally led by researchers. This characteristic highlights the advantages of their involvement, including scientific credibility, perceived neutrality, and the experimental nature of the approach.

SonoRezé-specific levers that are difficult to replicate

- **Good rapport and proximity between stakeholders:** the SonoRezé project benefited from strong rapport and close relationships among the researchers themselves, as well as prior familiarity with actors within the city. These interpersonal connections, built through previous projects or collaborations, fostered goodwill and smooth relationships throughout the project, thereby avoiding friction or conflict.
- **Thematic expertise of elected officials:** the elected officials involved in the project had already worked on noise-related issues beforehand, which facilitated their engagement in the process, their motivation, and their understanding of both the technical and political dimensions of sound environments.
- **Strong mobilisation of a full research team:** the research team was highly committed to the project and invested time beyond what had initially been planned. This substantial involvement was a key success factor, although it is not easily replicable given typical availability constraints and the cost of such resources.



Variants: four approaches to replicate on your territory

From our work on replicability, we identified four archetypal approaches derived from SonoRezé that could be reproduced and adapted in other territories.

1. Full thematic transposition of SonoRezé

In brief

Replicate the SonoRezé approach identically in another territory or on another environmental issue (noise, air quality, light pollution, etc.), while preserving its core tripartite structure: researchers, residents, and the local authority. The aim is to bring citizen perceptions, technical indicators, and the regulatory framework into dialogue in order to co-produce diagnoses and context-specific solutions.

Objectives

- **Qualify** residents' perceptions of their environment (sound, air quality, visual environment, etc.). Then confront these perceptions with existing data (regulatory maps, official sensors, technical studies) in order to identify discrepancies and reveal overlooked issues.
- **Strengthen** the legitimacy of residents in public debate by supporting their contributions with tangible elements (measurements, perceptual maps, surveys).
- **Co-develop** action pathways with local stakeholders, integrating technical realities, social expectations, and political constraints.
- **Inform** public policies (local urban plans, noise action plans, climate-air-energy plans, etc.) with data enriched by experiential knowledge.

Stakeholders involved and their roles

Stakeholder	Role
Researchers	• Provide scientific and methodological expertise (measurement protocols, survey design, data analysis, theoretical frameworks). • Ensure the rigour of diagnoses and interpretations. • Train residents in tools as well as key scientific concepts and issues. • Facilitate and animate the process.
Local authority	• Provide political support for the project and facilitate access to institutional data (e.g., noise maps, pollution measurements). • Mobilise technical departments (urban planning, environment, health, communication) according to needs and planned actions. • Help translate results into actions or decisions (urban planning interventions, regulations, awareness-raising initiatives). • Safeguard the public interest.
Residents	• Express their perceptions and priorities through workshops, surveys, or citizen-based measurement campaigns. • Co-analyse data with researchers. • Propose solutions adapted to their daily lives and take part in their implementation.
Third-party facilitator	• Facilitate coordination between stakeholders and ensure a balance of voices. • Mediate tensions and ensure process transparency. • Provide methodological resources on participatory approaches.

Ressources mobilised

- **Technical tools**: mobile applications, citizen sensors.
- **Human resources:** dedicated time from researchers and local authority staff, recruitment of a third-party facilitator.
- **Budget**: funding for a contract staff member for facilitation and part of the analysis work, a third-party facilitator, and logistical support (venues, printing) if not covered by the local authority.

Duration

1 to 3 years

Specific prerequisites

- Clear political commitment from the local authority, with involvement of elected officials and staff.
- Presence of researchers and dedicated research funding.
- Availability of participatory measurement tools (applications, sensors).

Typical timeline and key stages

- **Phase 1: scoping and mobilisation:** communication to recruit participants (public meetings, social media, posters), setting up tripartite governance, and designing the overall timeline of the process.
- **Phase 2: measurement and co-analysis:** training residents in measurement tools, holding an internal seminar within the local authority, data collection campaigns (measurements, surveys, workshops), cross-analysis of results between researchers, the local authority, and residents, and workshops to prioritise issues.
- **Phase 3: dissemination and action:** co-design workshops to develop action pathways, a public seminar to share results, and integration of proposals into local policies or implementation of actions.
- **Phase 4: sustainability:** creation of a citizen collective to continue monitoring, evaluate the project, and capitalise on methods, as well as producing professional and scientific publications.

Methodological points of attention: barriers and associated solutions

Barriers	Solutions
Difficulty in engaging the local authority in the appropriation of results.	• Involve elected officials from the outset to ensure political ownership. • Organise a researcher–local authority seminar at an early stage.
Technical difficulties (uncertainty in sensor data, data processing, and analysis).	• Allocate sufficient time for researchers' analysis and support work.
Appropriation of the process by one stakeholder or dominance of one actor over the others.	• Regularly revisit the overall objectives of the approach and facilitate discussion around them. • Involve a third-party facilitator.
Limited tangible outcomes, with discussions and debates that are unproductive and drag on over time.	• Plan facilitation, framing, and a detailed timeline from the outset.
Access to existing data (regulatory maps, previous studies).	• Adaptation of the project and its objectives. • Search for alternative data sources.

Expected outcomes

- Shared diagnosis (maps, data, reports, etc.).
- Concrete action pathways.
- Empowerment of residents and awareness-raising among local stakeholders.
- In the medium and long term, better adaptation of local policies and changes in planning and development practices.

Examples and sub-variants

Variant	Territory	Approach	Expected outcomes
“Road traffic noise” approach	Dense urban area or neighbourhood crossed by a major transport corridor (e.g., urban ring roads)	• Measurement campaign using NoiseCapture, complemented by residents’ narratives. • Analysis of peak periods (e.g., night-time deliveries, motorised two-wheelers).	• Action plan to mitigate nuisances (road surface changes, 30 km/h zones, delivery time restrictions).
Air quality approach	Municipality exposed to industrial pollution or fine particulate matter (e.g., proximity to a major road corridor or a port area).	• Participatory air quality measurements using citizen sensors. • Workshops to cross-reference data with perceptions and health impacts. • Comparison with official data (ATMO, monitoring networks) to identify “blind spots”.	• Mapping of perceived versus measured priority areas. • Proposal of local measures (greening, traffic restrictions, awareness-raising).
Quiet places approach	Metropolitan area seeking to preserve quiet spaces (parks, riverbanks)	• Participatory identification of “sound and visual oases”, and surveys on how these places are used. • Co-design of awareness-raising, communication, preservation, and enhancement measures for these areas.	• Action plan to enhance these spaces. • Communication and promotion of routes around these areas.
Light pollution approach	City or natural park affected by light pollution.	• Measurements of light levels and surveys on perceptions and disturbances. • Workshops on ecological and health impacts.	• Public lighting reduction plan (partial switch-off, adjusted schedules). • Behavioural adaptations and measures to support perceived safety and public tranquillity.

SonoRezé methodological resources available for use

All resources in the "Methodological toolkit"

2. Participatory measurement and resident engagement

In brief

In a more limited version of SonoRezé, the aim is to mobilise residents to carry out large-scale measurements using crowdsourcing tools (or citizen-based measurement tools, e.g. NoiseCapture, low-cost sensors), or through individual or collective protocols for collecting residents' perceptions. This makes it possible to produce a collective mapping while also raising awareness of environmental issues (noise, sound biodiversity, sound heritage).

Objectives

- Engage a broad public in participatory measurement or in narrating their relationship to the sound environment.
- Raise participants' awareness of key issues (noise, sound biodiversity, sound heritage) through an active process (training, analysis, discussions).
- Produce a collaborative mapping (e.g., soundscape atlas, inventory of quiet or noisy areas).
- Use and promote data to raise awareness, engage decision-makers, or inform planning projects (e.g., green and blue infrastructure, noise prevention plans).

Stakeholders involved and their roles

Stakeholder	Role
Consultancy firms, experts, scientific mediators, associations and/or local thematic institutions	• Design the measurement protocol, facilitate the process, and train participants. • Analyse data and produce diagnostics and maps.
Local authority	• Lead and coordinate the process. • Communicate about the initiative and recruit participants. • Provide spaces and logistical support (venues, events). • Potentially integrate results into its policies (e.g., local urban plans, municipal atlas).
Residents	• Carry out measurements in their area (via smartphones or sensors). • Participate in analysis and feedback workshops. • Propose ideas to showcase the results (e.g., soundwalks, exhibitions).

Possible partnerships with local institutions related to the topic (e.g., Approved Air Quality Monitoring Associations – AASQAs, urban planning agencies, etc.), and/or with local scientific mediation structures (Scientific, Technical and Industrial Culture Centres – CCSTIs, museums) or environmental awareness organisations (environment centres, etc.). Such an approach could also be of interest to infrastructure network operators (e.g., SNCF Réseaux).

Ressources mobilised

- **Technical tools:** mobile applications (e.g., NoiseCapture, BirdNET for sound biodiversity, etc.), connected sensors.
- **Human resources:** staff time for communication, logistics, and supervision of the service provider (consultancy firm).
- **Budget:** funding for a service provider and communication activities.

Duration

6 months to 1 year

Specific prerequisites

- Funding of the service provision.
- Project management by a commissioning body (local authority or thematic local institution).

Typical timeline and key stages

- **Phase 1: selection of a service provider for facilitation and analysis** (or partnership): funding and scoping of the assignment, and possible launch of a call for tenders or establishment of a partnership with another public or non-profit organisation capable of facilitating the process.
- **Phase 2: mobilisation:** recruitment campaign (public meetings, social media, partnerships with local stakeholders). Training of participants in measurement tools.
- **Phase 3: data collection:** participatory measurement campaign and meetings to discuss initial observations.
- **Phase 4: analysis, awareness-raising and dissemination:** workshops to analyse collected data and understand related issues and concepts, and production of dissemination materials (maps, infographics, exhibitions).
- **Phase 5: valorisation:** organisation of public events (e.g., soundwalks, artistic interventions, exhibitions). Possible integration of results into local authority documents (e.g., sound heritage atlas).

Methodological points of attention: barriers and associated solutions

Barriers	Solutions
Difficulty in engaging the local authority in the appropriation of results.	• Involve elected officials from the outset to ensure political ownership. • Organise an early seminar between researchers and the local authority.
Technical difficulties (uncertainty in sensor data, data processing, and analysis).	• Allocate sufficient time for researchers' analysis and support work.
Appropriation of the process by one stakeholder or dominance of one actor over the others.	• Regularly revisit the overall objectives of the approach and facilitate discussion around them. • Involve a third-party facilitator.
Limited concrete outcomes, with discussions and debates that are unproductive and tend to drag on over time.	• Plan facilitation, framing, and a detailed timeline from the outset.

Expected outcomes

- Raise awareness among participants and, more broadly, residents about the issues related to the topic addressed (noise, environment, etc.).
- Collaborative mapping (e.g., soundscape maps, biodiversity inventories, etc.).
- Potential diagnostic data usable by the local authority or its partners.

Examples and sub-variants

Variant	Territory	Approach	Expected outcomes
Mapping and awareness-raising on (dis)comfort during summer conditions	Municipality or inter-municipal authority	• Public space temperature measurement campaign. • Mapping and awareness-raising on urban heat islands and cool areas, and best practices during heatwaves.	• Raising residents' awareness of the impacts of climate change and best practices during heatwaves. • Mapping of urban heat islands and cool areas.
Sound biodiversity inventory	Municipality, inter-municipal authority, or nature park	• Measurement campaign using apps such as BirdNET or autonomous recorders. • Workshops to identify species and threats (e.g., noise pollution).	• Raising awareness of biodiversity loss and conservation practices. • Mapping of sound biodiversity hotspots. Conservation plan for sensitive areas (e.g., access restrictions, greening measures).
Soundscape	Municipality, inter-municipal authority, or around an infrastructure (if a network operator is involved)	• Participatory noise level measurements using NoiseCapture. Workshops to compare and cross-reference with residents' perceptions.	• Capacity building for residents on the sound environment. • Soundscape and environmental atmosphere maps, adapted to territories and objectives, or structured according to the dominant types of sound sources (human, mechanical, non-human living, geophony, etc.). • Possible valorisation of local sound heritage.

SonoRezé methodological resources available for use

All resources in the "Methodological toolkit"

3. Reconciling uses

In brief

Organise structured dialogue between stakeholders with potentially conflicting uses (residents, businesses, event organisers, road users, etc.) to address a specific nuisance (noise, sound environments, etc.). The approach is based on in situ measurements, a shared analysis of perceptions, and co-design workshops to reach mutually acceptable compromises. The aim is to move beyond oppositions by relying on objective data and exchanges within a safe and structured framework.

Objectives

- Provide a space for expressing experienced nuisances and objectify perceptions through measurements.
- Create a dialogue space between stakeholders to foster mutual understanding, identify sources of tension, and define levers for action.
- Co-design solutions (rules of use, planning interventions, charters) to reconcile sometimes conflicting activities (e.g., events, motorcycle traffic, construction sites).

Stakeholders involved and their roles

Stakeholder	Role
Professional facilitator or mediator (service provider)	• Facilitate exchanges, enable everyone to express themselves, and help de-escalate tensions. • Propose facilitation methods for discussion and, where necessary, conflict resolution approaches.
Technical expert (or consultancy firm)	• Analyse data and produce materials to support discussion. • Develop educational resources.
Local authority	• Lead and coordinate the process. • Recruit/invite relevant participants. • Champion the initiative and mobilise relevant departments (municipal police, urban planning, environment). • Select and fund a service provider for the process. • Provide regulatory and technical data where needed. • Validate and implement the agreed solutions.
Residents, users, and their representatives	• Express their needs and constraints (e.g., residents, event organisers, motorcyclists, businesses). • Participate in measurement activities and co-design workshops. • Test and evaluate proposed solutions.

Ressources mobilised

- **Technical tools:** NoiseCapture measurement applications; where legally robust measurements are required, sound level meters and recording devices.
- **Human resources:** staff time for communication, logistics, and supervision of service providers (facilitator and consultancy firm).
- **Budget:** funding for a service provider and communication activities.

Duration

3 to 12 months

Specific prerequisites

- Willingness of stakeholders to engage in dialogue (prior agreement from key actors).
- Clear framework defined from the outset, setting out the scope for action, dialogue rules, and objectives, for example through a charter.
- Political backing: involvement of elected officials to legitimise the process.

Typical timeline and key stages

- **Phase 1:** selection of a service provider for facilitation and analysis / mobilisation / scoping: funding and definition of the assignment, possible launch of a call for tenders, identification and recruitment of relevant stakeholders, and kick-off meetings.
- **Phase 2**: data collection: participatory measurement campaign and training on noise-related issues and perceptions.
- **Phase 3:** dialogue and co-design workshops: sessions to analyse collected data, objectify phenomena, enable individual expression, mutual understanding, and exchange, and identify potential solutions.
- **Phase 4:** formalisation: drafting of a charter validated by all parties.

Methodological points of attention: barriers and associated solutions

Barriers	Solutions
Resistance from certain stakeholders	• Organise informal meetings to build trust. • Highlight examples of successful compromise. • Involve elected officials in the process.
Data contestation	• Involve stakeholders in data collection. • Have the measurement protocols validated by the technical expert.

Expected outcomes

- Shared diagnosis of nuisances (maps, reports, cross-analyses).
- Mutual understanding among stakeholders, reduced tensions, and strengthened social cohesion.
- Proposed solutions to address nuisances and improve compatibility between different uses.

Examples and sub-variants

Variant	Territory	Approach	Expected outcomes
Management of nuisances related to public events	Neighbourhood with bars, concert venues, or festivals	• Measurement of sound levels during events. • Workshops with residents, organisers, and businesses to define rules (timings, sound levels). • Testing of solutions (e.g., earlier closing times, protective measures, etc.).	• Reduction in complaints and improved coexistence.
Motorised two-wheeler nuisances	City or road frequented by motorcyclists	• Measurement campaign and surveys on problematic routes and time periods. • Workshops to propose alternatives (e.g., designated riding zones, awareness-raising).	• Proposed solutions • Targeted reinforcement of enforcement measures where appropriate. • Awareness-raising.
Soundscape prior to an urban development project	Area affected by the project	• Diagnosis of existing and planned uses (markets, terraces, traffic) and associated nuisances, including in situ measurement campaigns or studies of similar projects. • Workshops to integrate expectations into the project (e.g., sound-absorbing materials, buffer zones, spatial and temporal reorganisation of uses).	• Elements to be integrated into the project.

SonoRezé methodological resources available for use

All resources in the "Methodological toolkit"

4. Integration of citizen dialogue into other structures or processes

In brief

Enrich an existing process, document, or planning framework (e.g., noise action plan, local urban plan, landscape charter, regional nature park charter, landscape plan, etc.) by integrating SonoRezé best practices: listening to residents, participatory measurements, and co-construction between experts, local authorities, and citizens. The aim is to enhance these processes by incorporating user perceptions and experiential knowledge, while respecting regulatory frameworks and institutional timelines.

Objectives

- Integrate residents' perceptions of their environment into more technical processes to anchor them in lived realities.
- Cross-reference official data (maps, studies) with citizens' perceptions and priorities to identify overlooked or underestimated issues.
- Co-design more appropriate and acceptable strategies based on a residents–local authority–experts framework.
- Sustain citizen participation beyond the project (e.g., creation of a monitoring committee).

Stakeholders involved and their roles

Stakeholder	Role
Local authority	• Lead the process and align participatory phases with regulatory milestones. • Select and fund a service provider for the process.
Residents	• Express their perceptions and priorities through workshops, participatory measurements, or surveys. • Participate in cross-analysis of the data.
Facilitator and/or technical expert (depending on profile or consortium)	• Provide a methodological framework for facilitating these specific workshops. • Train residents in the relevant issues and tools. • Facilitate the workshops. • Produce analyses based on measurements carried out by residents.

Ressources mobilised

- **Technical tools**: NoiseCapture measurement application (or other tools depending on the topic).
- **Human resources:** staff time for communication, logistics, and supervision of service providers (facilitator and consultancy firm), as well as staff time dedicated to managing the coordination of the process.
- **Budget**: funding for a service provider and communication activities.

Duration

6 months to 2 years (depending on the document or process concerned and its timelines).

Specific prerequisites

Political willingness to open the process to a different participatory format and to allow room for manoeuvre on sound environments (or other environmental issues depending on the nuisance studied).

Typical timeline and key stages

- To be integrated (or “embedded”) into existing processes, particularly within existing consultation frameworks.
- Organise measurement campaigns and discussion workshops around these measurements, especially during the diagnostic phase.
- Help establish a citizen panel to follow the process over the medium to long term.
- Set up dedicated workshops bringing together staff, experts, and residents to address the question: “How can elements be integrated into the process?”

Methodological points of attention: barriers and associated solutions

Barriers	Solutions
Difficulty in translating residents' needs	• Engagement of researchers or an organisation (e.g., an eco-citizen institute), which can also act as a neutral third party.
Process perceived as an additional constraint by the local authority	• Highlight the benefits (e.g., improved project acceptability). • Integrate participatory phases into existing processes, particularly into existing consultation frameworks.
Risk of "cosmetic" participation (contributions not taken into account) or resulting frustration	• Be clear about the rules of engagement (including awareness-raising objectives). • Organise dedicated workshops on how results are integrated into the document. • Make contributions visible in the final document (e.g., annotated maps, workshop reports).

Expected outcomes

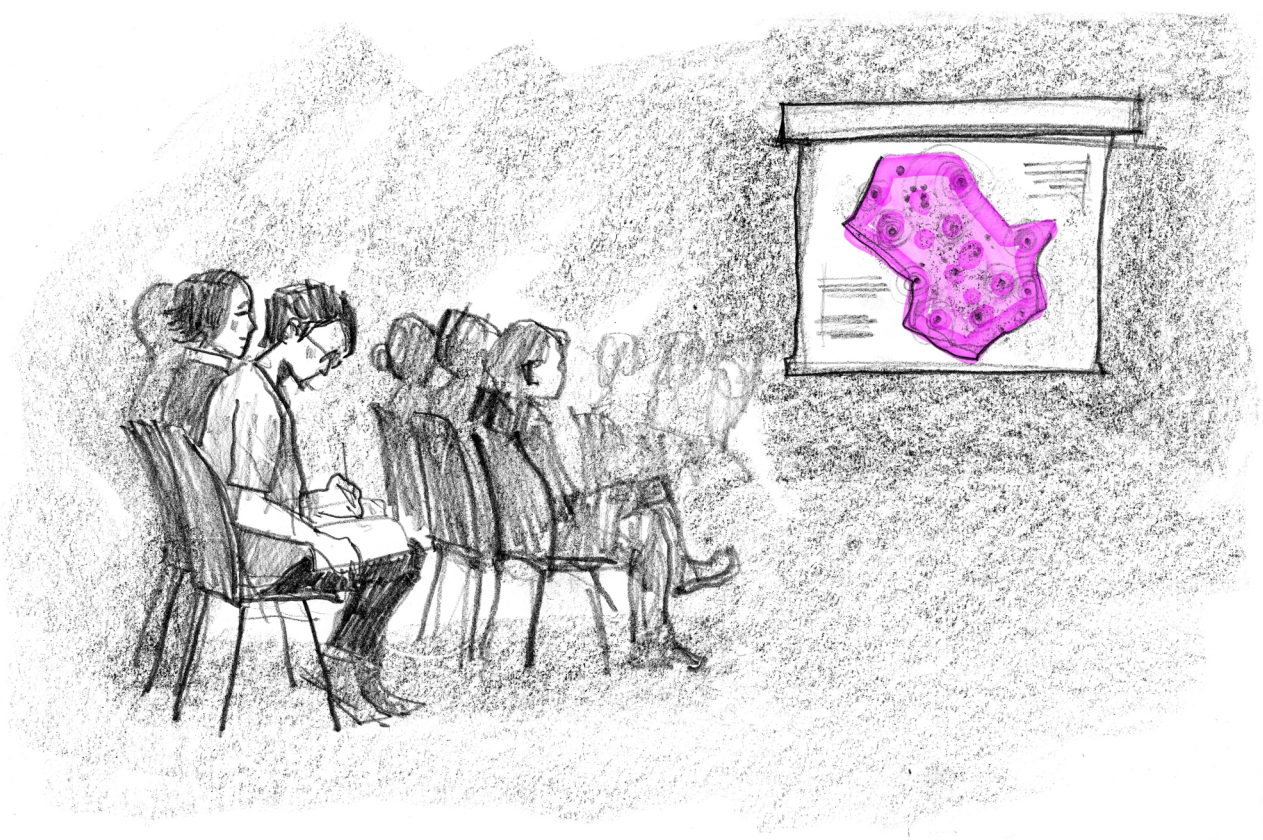
- Shared diagnosis of nuisances (maps, reports, cross-analyses).
- Enriched document (local urban plan, noise action plan, charter) incorporating residents' perceptions and priorities.
- Improved ownership of the document and its guidelines by residents (acceptability, representativeness).

Examples and sub-variants

Variant	Territory	Approach	Expected outcomes
Integration into the noise action plan (PPBE)	Municipality or inter-municipal authority revising its Noise Action Plan (PPBE)	• Workshops to compare regulatory maps with residents' perceptions (e.g., "Where do you experience nuisances that are not mapped?"). • Participatory measurements to complement the data. • Co-drafting of PPBE action sheets.	• Noise Action Plan (PPBE) incorporating resident-identified priority areas and a tailored action plan
Enhancement of a local urban plan (PLU(i))	City revising its local urban plan (PLU(i))	• Surveys and participatory mapping of environments (noisy, quiet, landscape-based), including measurement sessions. • Workshops to translate these issues into planning guidelines (e.g., "Which areas should be preserved?"). • Integration into the Sustainable Development and Planning Project (PADD) or the Development and Programming Guidelines (OAP).	• Local urban plan (PLU) incorporating a shared diagnosis and guidelines based on the participatory process.
Landscape charter	Municipality or inter-municipal authority, for example in a rural or peri-urban context	• Assessment of key issues (noise, light, heritage, biodiversity, hedgerows, etc.) through inventories or participatory in situ measurements, for example in the form of walks. • Workshops to collectively define guidelines and, where appropriate, management	• Landscape charter incorporating recommendations from residents. • Increased engagement and buy-in from local stakeholders.

SonoRezé methodological resources available for use

All resources in the "Methodological toolkit"



Methodological toolkit

This section presents a set of methodological fact sheets for use in your own processes:

Internal and external communication

- **Showcase website:** deploy an essential communication tool.
- **Social media:** facilitate exchange and coordination among participants.

Participatory research workshops

- **Basic concepts training:** introduce participants to acoustic concepts.
- **Workshops in schools:** involve and raise awareness among younger audiences.
- **NoiseCapture Party:** organise events to encourage and target citizen measurements.
- **Key issues workshop:** identify key themes and areas of concern.
- **Prioritisation workshop:** collectively decide on actions to be developed.
- **Action sheet workshop:** operationalise collective ideas and move towards concrete implementation.
- **Participatory perceptionmapping:** represent residents' perceptions and lived experiences to enrich the discussion.

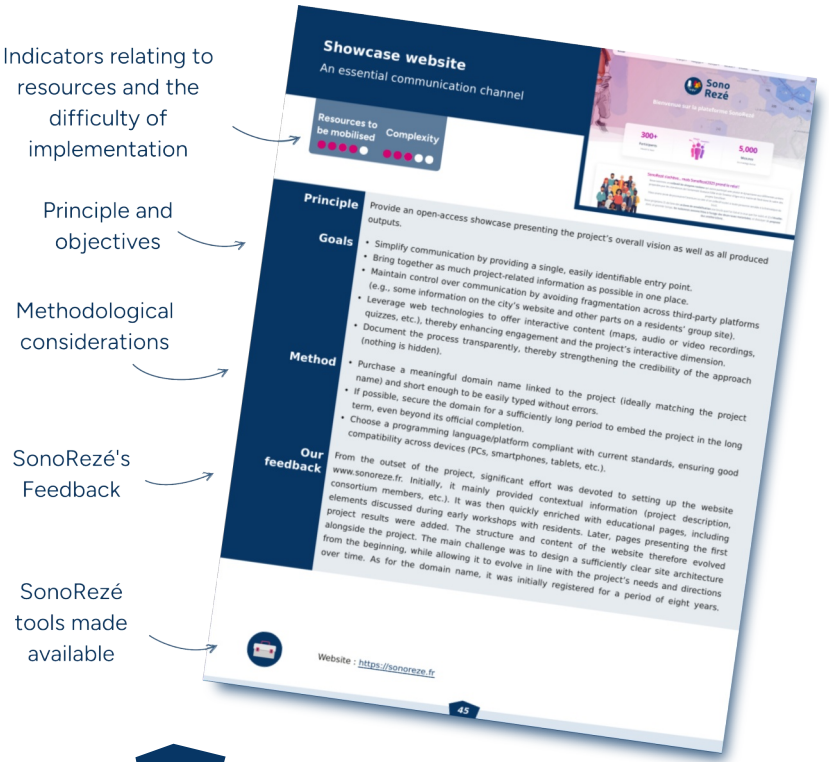
Productions

- **Awareness indicators:** produce alternative indicators to enrich the debate.
- **Impactful visuals:** highlight and communicate results through mediation and outreach materials.
- **Sustainability and dissemination:** promote scaling-up, reuse, and long-term ownership of the project.

Presentation formats

- **Public dissemination seminar:** present the analyses and open discussion with territorial stakeholders.
- **Artistic dissemination session:** showcase results through art and visual mediation.

How to read a fact sheet?



Showcase website

An essential communication channel

Resources to be mobilised	Complexity
●●●●○	●●●○○

Principle

Provide an open-access showcase presenting the project's overall vision as well as all produced outputs.

Goals

- Simplify communication by providing a single, easily identifiable entry point.
- Bring together as much project-related information as possible in one place.
- Maintain control over communication by avoiding fragmentation across third-party platforms (e.g., some information on the city's website and other parts on a residents' group site).
- Leverage web technologies to offer interactive content (maps, audio or video recordings, quizzes, etc.), thereby enhancing engagement and the project's interactive dimension.
- Document the process transparently, thereby strengthening the credibility of the approach (nothing is hidden).

Method

- Purchase a meaningful domain name linked to the project (ideally matching the project name) and short enough to be easily typed without errors.
- If possible, secure the domain for a sufficiently long period to embed the project in the long term, even beyond its official completion.
- Choose a programming language/platform compliant with current standards, ensuring good compatibility across devices (PCs, smartphones, tablets, etc.).

Our feedback

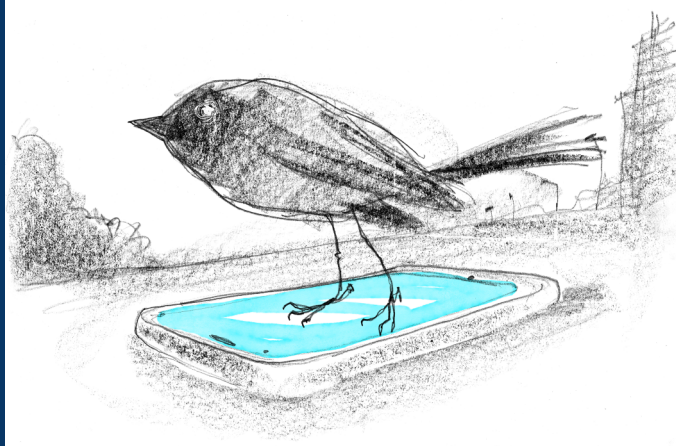
From the outset of the project, significant effort was devoted to setting up the website www.sonoreze.fr. Initially, it mainly provided contextual information (project description, consortium members, etc.). It was then quickly enriched with educational pages, including elements discussed during early workshops with residents. Later, pages presenting the first project results were added. The structure and content of the website therefore evolved alongside the project. The main challenge was to design a sufficiently clear site architecture from the beginning, while allowing it to evolve in line with the project's needs and directions over time. As for the domain name, it was initially registered for a period of eight years.

Website : https://sonoreze.fr

Social media

Facilitate exchange and coordination among participants.

Resources to be mobilised	Complexity
●●○○○	●○○○○



Principle

Set up a social media group bringing together residents and organisers to facilitate fast and continuous communication. This channel enables the sharing of practical project-related information, interim results, and relevant updates. It helps maintain participant engagement by sustaining connections between the different stages and meetings of the project.

Goals

- Facilitate the logistical coordination of activities (meetings, reminders).
- Share interim results or observations quickly with all participants.
- Maintain participant engagement between sessions.
- Encourage exchange on perceptions and interpretation of results.

Method

- Create the group by clearly explaining its purpose and operating rules (respect, confidentiality, message frequency).
- Encourage participants to share their reflections or questions in a structured way.
- Use the group to remind participants of upcoming steps and maintain engagement

Our feedback

The social media group proved to be a key tool for maintaining participant engagement between workshops. It enabled rapid resolution of logistical issues (such as coordinating group measurement sessions) and enriched collective reflection. However, while easy to set up, it requires regular monitoring of exchanges, even in the absence of formal moderation.

Basic concepts training

Introduce participants to acoustic concepts

Resources to be mobilised	Complexity
●●●○○	●●●○○

Principle

Provide participants with training adapted to their level to familiarise them with the basic concepts related to sound and noise (decibels, key indicators, impacts on health and quality of life, regulatory framework, etc.). The aim is to foster mutual understanding and enable informed exchanges between all stakeholders.

Goals

- Introduce participants to the basic concepts of acoustics.
- Explain the links between noise, health, and regulation.
- Promote understanding and appropriation of indicators and technical tools.
- Encourage the expression of perceptions and their comparison with data.
- Strengthen participants' autonomy for future exchanges with experts.

Method

- Design content adapted to the audience, illustrated with numerous examples.
- Organise short, interactive sessions to encourage attention and exchange.
- Illustrate concepts with local examples (noisy areas, types of sources).
- Focus on contextualised elements rather than general and abstract notions.
- Include a Q&A session to clarify complex concepts and gather participants' expectations.
- Anticipate that the training requires significant pedagogical effort and should not be underestimated.

Our feedback

Training sessions were essential in creating a shared language between residents, researchers, and elected officials. Appropriation of key concepts led to richer discussions during workshops and a better interpretation of results. In particular, residents' understanding of decibel-related concepts proved crucial: this technicality can easily be used to their disadvantage in discussions with experts, and mastering it strengthens their position and confidence in the dialogue.

Educational pages developed during the project:

- https://sonoreze.fr/pedagogie/notions.html
- https://sonoreze.fr/pedagogie/indicateurs.html
- https://sonoreze.fr/pedagogie/acoustiquiz.html
- https://sonoreze.fr/resultats/sonoreze_II/avion_pedagogie.html

Workshops in schools

Engage and raise awareness among young audiences

Resources to be mobilised	Complexity
●●●○○	●●●○○

Principle

Organise workshops in schools to raise awareness among young audiences about the project's theme and collect their experiences. Use this collective time to produce outputs that can be shared with parents, residents, or other stakeholders.

Goals

- Raise awareness among children about the issue being studied.
- To some extent, turn children into ambassadors to their parents, reaching audiences that might otherwise not have engaged with the topic.
- Give a voice to a group often overlooked in public consultation processes.
- Offer a new perspective on the topic, as young people's viewpoints often differ from those of adults.

Method

- Depending on the project theme, select a target audience (primary to high school).
- Identify schools and/or teaching staff who may be interested in the approach and could integrate the initiative into their educational project (this should be anticipated, as planning is often set well before the summer holidays for the following school year).
- Organise workshops for each of the objectives below:
  - present the project and its theme (using simplified materials), as well as the objective of the activity (e.g. creating a map representing their sound environment).
  - collect perceptions and inputs that will feed into the defined objective.
  - present early drafts of the final output and gather feedback, suggestions, or critiques.
  - present the final result to the children and their teachers.

Our feedback

Two actions were carried out with schools: the production of perception maps of the environments surrounding children from two primary schools in the municipality, and the publication of an interactive map entitled "Château sonore", which allows users to listen to sound recordings made by children in the vicinity of a third school. These outcomes were made possible thanks to strong participation from the children and, above all, effective collaboration with the teaching staff involved. However, one point of attention is that these workshops must fit within a school timetable that is often dense and constrained. It was therefore necessary to adapt to the children's pace, something that had not been fully anticipated in the project planning.

Work carried out with children : "Cartes écoliers" and "Chateau sonore"

NoiseCapture Party

Events to encourage and target citizen measurements

Resources to be mobilised	Complexity
●●○○○	●●○○○

Principle

Bring residents together at a specific time and place, relying on a convivial atmosphere to encourage participation in measurements and engagement. In particular, this makes it possible to gather in areas that are not well covered by spontaneous citizen measurements. These sessions also give participants the opportunity to calibrate their phones for more accurate sound recordings.

Goals

- Encourage measurements in under-sampled areas.
- Strengthen group cohesion and foster participation through a convivial setting.
- Calibrate smartphones to improve measurement accuracy.
- Initiate initial discussions on perceptions and the interpretation of measured data.

Method

- Pre-event communication to participants: produce an attractive flyer to encourage attendance, with reminders via communication channels.
- Gather at a designated location, calibrate phones, then allocate a short period (e.g. 30 minutes) to explore the area individually (or in pairs) before regrouping for debriefing and a social moment.
- Plan a convivial closing moment (juice, snacks, etc.).
- Use this time to exchange perceptions, announce upcoming workshops, and begin introducing sound-related concepts.

Our feedback

At the beginning of the project, NoiseCapture Parties were crucial moments for strengthening group cohesion and enabling a comprehensive mapping of the areas of interest. Moreover, interactions with researchers helped raise awareness of measurement uncertainties, the possible interpretations of the data, and supported participants in getting to grips with the application. Finally, such sessions, during which researchers join residents in the field, help demonstrate their concrete engagement, showing that they are not confined to their laboratories. By going into the field alongside residents, they confront real-world conditions, thereby fostering cohesion and strengthening the credibility of the process.

NoiseCapture app : https://noise-planet.org/noisecapture.html

Key issues workshop

Identify key themes and areas of concern.

Resources to be mobilised	Complexity
●●○○○	●●●○○

Principle

This initial exchange workshop aims to encourage the expression of perceptions in order to identify issues to be addressed in the next stages of the process. To support this expression and collective deliberation, the workshop relies on maps presenting the results of measurements carried out, a mind-mapping exercise, and group discussions in sub-groups.

Goals

- Identify themes and areas of concern from the residents' perspective.
- Form working groups based on key themes and/or prominent locations, which will later lead to dedicated workshops to define actions.
- Enable exchange between project stakeholders and foster convergence towards shared concerns.
- Facilitation challenge: encourage and unlock residents' expression, open up possibilities, collectively explore issues through participant interaction, and collect input for research analysis.

Method

- Plenary session to introduce the framework and present the overall perspective of the process.
- Small-group work (and individual brainstorming) to encourage participation and exchange (facilitators needed at each table).
- Work based on existing materials: maps produced beforehand from measurements or mind maps created at the beginning of the workshop.
- Plenary synthesis session to build a shared collective understanding.
- Reporting is essential to ensure traceability and provide quick feedback to participants, thereby maintaining momentum.

Our feedback

A preparatory phase was carried out to define each participant's role in the workshop, ensure interdisciplinarity, and make sure that each stakeholder could derive meaningful insights aligned with their own interests. This step was crucial for calibrating facilitation and anticipating roles. In particular, efforts were made to avoid the "complaints desk" pitfall and instead turn the session into a genuine workshop benefiting both the research objectives and the issues identified by residents. Internal discussions helped participants appropriate the protocol, ensuring that everyone felt comfortable facilitating the session and understood its scope and implications. This workshop proved decisive in collectively defining the project's central theme, namely aircraft noise. However, time management proved challenging, and some parts had to be shortened to allow for more collective discussion.

Workshop facilitation materials : see here

Prioritisation workshop

Collectively decide on the actions to be developed.

Resources to be mobilised	Complexity
●●○○○	●●●○○

Principle

After prioritising the actions, it was necessary to define their scope in order to move towards implementation: how can an idea be turned into concrete deployment? To address this, a workshop was organised around action sheets designed to describe each action in detail, thereby moving from an idea to an achievable, manageable, and realistic project.

Goals

Move from the idea of an action to a credible operational implementation plan for the project stakeholders, and define the resources required to achieve it.

Method

Rather than starting from a standard, generic action sheet that was of limited relevance to the specific nature of the project (generation of data on aircraft noise), we innovated in format by defining precise questions for each of the three priority actions:

- What do we want to highlight as a priority?
- For which audiences?
- Through which dissemination channels?
- How should these results be presented?
- What are the key points of attention?

In sub-groups (one per action), and based on the data already produced, we collectively completed response templates addressing these questions.

Our feedback

The aim of this phase is to formulate questions that correspond to the need for operationalisation. A substantial clarification effort (in consultation with researchers, the city, and the third-party facilitator) of each stakeholder's expectations made it possible to define the right questions, ensuring that the collective moved in the same direction. In another project, the questions would likely have been different.

This collective prioritisation enabled a shared decision among all stakeholders regarding the project's direction.

Workshop facilitation materials : see here

Action sheet workshop

Operationalise the collective ideas and move towards concrete implementation.

Resources to be mobilised	Complexity
●●○○○	●●●○○

Principle

This prioritisation workshop is the third stage, following the initial workshop aimed at identifying the issues to be addressed, and the second workshop focused on ideation around actions to be carried out in relation to the selected issue (aircraft noise). This third stage consists of prioritising the actions to be implemented within the project, by building a consensus on which actions should be addressed first.

Goals

Reach a collective agreement on the prioritisation of actions to be carried out on the selected theme.

Method

- Quick roundtable and reminder of the workshop's objectives.
- Presentation of 15 actions (grouped into 7 objectives), resulting from a synthesis of the second workshop.
- Selection of priority actions based on a resident consultation using stickers on a dedicated board.
- Discussion on how to implement the selected actions.

Our feedback

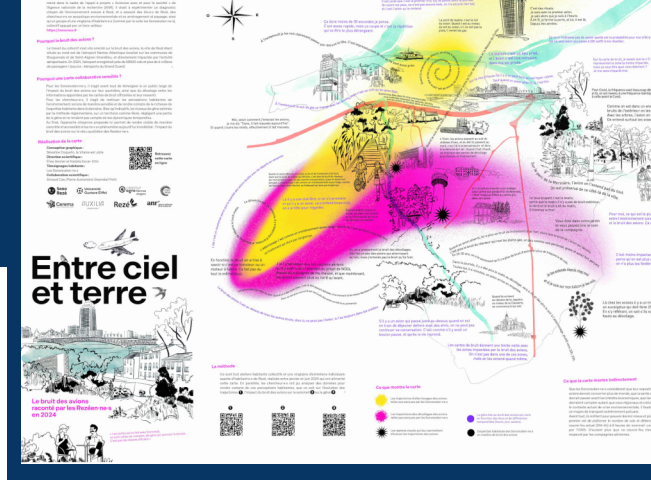
The key success factor of this workshop was the preparatory work—often underestimated—of structuring and reformulating the 15 actions, which were then organised into 7 objectives to clarify possible directions for the project based on the outcomes of previous workshops. Printing a large-format voting board using stickers facilitated discussion within the group and provided an overall view of the actions to be undertaken. This collective prioritisation enabled a shared decision among all stakeholders regarding the project's direction.

Workshop facilitation materials: see here

Participatory perception mapping

Represent residents' perceptions and lived experiences to enrich the discussion.

Resources to be mobilised	Complexity
●●●●○	●●●●○



Principle

Produce a map illustrating residents' perceptions and lived experiences of a given phenomenon (e.g. noise, air quality, use of public spaces). This map is not limited to technical measurements but translates local feelings and experiences in order to make visible perceived impacts, tensions, or priorities on the ground.

Goals

- Make residents' perceptions and experiences of their environment tangible.
- Complement technical and regulatory data with qualitative information.
- Facilitate dialogue between residents and decision-makers by giving form to experiences that are often difficult to express verbally.
- Create a clear and engaging communication tool.
- Highlight issues that are invisible or underestimated in conventional representations.

Method

- Collect residents' perceptions through interviews, questionnaires, participatory workshops, or observations.
- Collectively identify relevant themes or indicators to be represented on the map.
- Define a shared brief to guide the graphic designer's work.
- Choose an appropriate visual format (illustrated map, pictograms, colour codes) to make information immediately understandable.
- Work closely with the graphic designer to ensure readability and visual impact.
- Test the map with a small group to check understanding before wider dissemination.

Our feedback

Participatory mapping proved to be a key communication tool for making visible the diversity of residents' experiences and perceptions of aircraft noise. The project benefited from the expertise of participatory mapping specialists within the consortium, which ensured a high level of methodological quality. Collaboration with a graphic designer further improved the readability and overall impact of the final output. However, particular attention must be paid to the design phase to ensure that the map accurately reflects the collected perceptions and remains understandable to a wide audience. Finally, sufficient time must be allocated to developing the project brief, as well as a dedicated budget, particularly for printing.

The methodology, as well as the final map produced, are available on the project's dedicated page : https://sonoreze.fr/resultats/sonoreze_II/carte_entre_ciel_et_terre.html

Awareness indicators

Produce alternative indicators to objectify the debate.

Resources to be mobilised	Complexity
●●●●●	●●●●○

Principle

The production of indicators that are understandable and usable by all (residents, decision-makers, local authorities), in addition to regulatory data that are sometimes insufficient to reflect perceptions and impacts on the population, helps to objectify the debate.

Goals

- Develop awareness indicators that reflect lived realities not captured by regulatory data.
- Complement conventional representations (e.g. regulatory noise maps) with explicit estimates of the number of people affected, such as the number of awakenings caused by an aircraft take-off.
- Highlight both perceived impacts and the responsibilities of the stakeholders involved.
- Provide indicators that are understandable and usable by all (residents, decision-makers, local authorities) to steer discussions towards concrete solutions.
- Facilitate dialogue between perceptions and quantitative data to support informed debate and strengthen communication with the public and institutions.

Method

- Start with an analysis of available regulatory data to identify existing information and its limitations.
- Define, together with project participants, the awareness indicators to be produced, based on objectives and local perceptions.
- Produce the indicators: carry out the analyses and calculations, clearly documenting methodological limitations and assumptions.
- Discuss with participants the communication channels and presentation formats for the awareness figures, ensuring they are understandable and usable by all.

Our feedback

The production of awareness indicators was a key lever for making visible effects not captured by standard metrics and for highlighting the responsibilities of different stakeholders. Defined jointly with researchers, residents, and elected officials, these indicators required substantial work combining methodological robustness with their potential to inform the debate.
They helped make usually invisible effects tangible and supported more informed discussions between residents, decision-makers, and local authorities. A remaining challenge concerns how these figures are used once released, particularly their uptake by the media and interpretation by the public, which can escape the control of their designers. This highlights the need to accompany their dissemination and mediation.

The methodology and examples of awareness indicators produced in SonoRezé are available here: https://sonoreze.fr/resultats/sonoreze_II/avion_resultats.html

Impactful visuals

Promote and communicate the results through outreach materials.

Resources to be mobilised	Complexity
●●●○○	●●●○○

Principle

Produce visual representations (maps, charts, infographics, highlighted key figures) that make project data and results immediately understandable and appealing to a broad audience. These materials act as mediation tools, helping residents, elected officials, and other stakeholders appropriate the project's results.

Goals

- Make project results accessible and understandable to all.
- Facilitate communication and discussion around the identified issues.
- Highlight key information and salient indicators to draw attention.
- Serve as support for workshops, seminars, and other dissemination events.
- Strengthen the project's impact and visibility among local and institutional stakeholders.

Method

- Identify the most relevant results or data to highlight.
- Select the most appropriate visual representation: maps, infographics, charts, or highlighted key figures.
- Work with a graphic designer or visualisation specialist to ensure clear and impactful outputs.
- Ensure graphic consistency and readability for non-expert audiences.
- Plan an explanatory or mediation phase during dissemination to contextualise information and address questions.
- Test the materials with a small group to ensure they are understandable and effective before wider dissemination.

Our feedback

The production of impactful visual representations made it possible to highlight trends and key figures, enrich discussions during workshops, and facilitate their dissemination. The project benefited from in-house expertise to produce these materials, but it is important to ensure that someone within the project team has this skill or that a dedicated budget is allocated to it.

Examples of the maps and highlighted key figures produced are available on the project results page, as well as on the panels created for the final seminar exhibition:

- https://sonoreze.fr/resultats/sonoreze_II/avion_resultats.html
- https://sonoreze.fr/resultats/sonoreze_II/avion_bilan.html

Sustainability and dissemination

Promote scaling up, reuse, and long-term ownership of the project.

Resources to be mobilised	Complexity
●●●●○	●●●○○

Principle

Ensure the continuity of the approach beyond the initial project by producing and disseminating resources that enable its appropriation by other territories, institutions, or collectives. This involves capitalising on the experience gained, facilitating the reuse of methods, and maintaining the project's visibility over time, while strengthening its local impact by feeding the results into decision-making processes.

Goals

- Document the methods developed to enable their reuse by other stakeholders.
- Disseminate results to a broad audience: institutions, local authorities, researchers, associations, and residents.
- Promote the approach to encourage its replication in other territories or thematic contexts.
- Maintain long-term relationships with participants and partners to recognise their contribution and foster new initiatives.
- Increase the project's visibility through accessible formats (website, technical fact sheets, public presentations).
- Engage with decision-making bodies to showcase project results and influence practices.

Method

- Documenting methods: producing technical data sheets, guides, annotated datasets and educational or methodological materials.
- Maintaining a dedicated website presenting results, tools and resources available under an open-access licence.
- Organising presentations at conferences and within professional networks to embed the approach within broader initiatives.
- Create a replication kit: checklist, prerequisites, contacts and examples of materials.
- Set aside dedicated time at the end of the project to organise all these resources.
- Engage the relevant decision-makers to highlight the value of the initiative and encourage changes in practice.
- Plan and support publicity in the press and local or specialist media to increase the project's visibility and help it spread.

Our feedback

The production of accessible resources (website, fact sheets, etc.) enabled wide dissemination of the results, but required a significant and often underestimated amount of time for formatting.The joint leadership by researchers and elected officials, along with the focus on aircraft noise, helped increase media visibility and facilitate exchanges with decision-makers. These interactions remain key to ensuring a lasting impact on practices.

Public dissemination seminar

Present the analyses and open the discussion with territorial stakeholders.

Resources to be mobilised	Complexity
●●●●○	●●●●○

Principle

Organise a public dissemination event bringing together all project stakeholders, where each presents part of the results or their experience of the project. This plurality of voices helps reflect the diversity of contributions and anchors the findings in participants' lived experience. The event thus becomes a key moment for showcasing the work, fostering ownership, and enabling collective discussion. The presence of a broader audience, including territorial stakeholders concerned by the issue, supports the dissemination and appropriation of the results by all and helps advance the debate.

Goals

- Present the project results clearly and accessibly to a wider audience.
- Give voice to different stakeholders to reflect the diversity of perspectives.
- Highlight residents' participation and recognise their experiential expertise.
- Promote ownership of the results by all stakeholders involved.
- Encourage discussion and debate around the issues raised by the project.
- Aim for a tangible impact on the territory by helping practices evolve.

Method

- Prepare a detailed agenda for the session, including each speaker's contribution.
- Support volunteer residents in preparing their speeches.
- Use a shared visual support (slides, posters, audio excerpts, videos).
- Ensure a balanced distribution of speaking time between institutional, technical, and citizen stakeholders.
- Include an open Q&A session to encourage exchange.
- Communicate widely in advance to ensure representative participation.
- If appropriate, include an artistic contribution related to the topic (illustrator, musical performance, etc.) to enrich the event and engage the audience.

Set up an accompanying exhibition presenting the project results, along with a convivial moment (networking reception) to encourage informal exchanges.

Our feedback

The public seminar was a key moment in the project, requiring a significant amount of preparation. Residents' speeches strengthened their legitimacy. The presence of local elected officials and stakeholders directly concerned by the project themes highlighted its potential impact on local policy. The contribution of artists (an illustrator and a live performance) enhanced both the quality and the reach of the event.

The summary of the seminar, as well as the exhibition panels, are available at the following address: https://sonoreze.fr/resultats/sonoreze_II/avion_bilan.html

Artistic dissemination sessions

Enhance the results through art and visual mediation.

Resources to be mobilised	Complexity
●●●○○	●●○○○

Principle

Organise a public seminar featuring artistic interventions (illustration, music, visual or sound performance, etc.) related to the project's theme. The aim is to create a sensory and aesthetic experience that showcases the project's results, captures attention, and enriches collective reflection.

Goals

- Showcase and make the project results appealing to a wide audience.
- Encourage engagement and participation from residents and local stakeholders.
- Offer an artistic and creative interpretation of the collected data and perceptions.
- Foster discussion and exchange around the project's issues through an original perspective.

Method

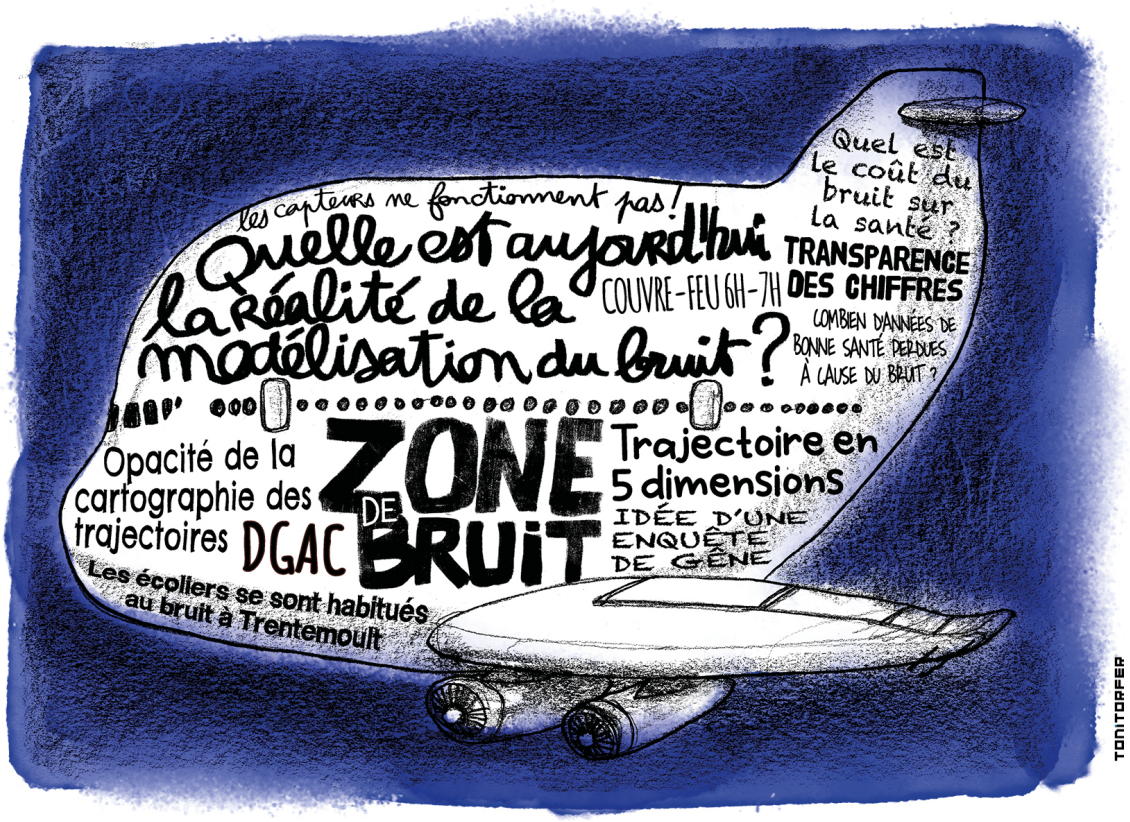
- Identify artists whose work can engage with the project's theme.
- Integrate the artistic intervention into the seminar programme, complementing the scientific and citizen-based presentations.
- Include a mediation or explanation segment to help the audience understand the link between the artwork and the project results, potentially led by the artists themselves.
- Adapt the duration and format of the performance to the available space and audience.
- If possible, organise a convivial moment after the performance to extend exchanges.

Our feedback

The inclusion of an artistic intervention enriched the seminar experience, making the results more accessible and memorable. It also helped sustain audience attention and engagement by providing a stimulating visual or auditory layer. However, its preparation requires close coordination with the artists and careful integration into the overall seminar design.

In SonoRezé 1, the artistic output consisted of a soundscape composed from recordings of the city, over which three artists performed: a saxophonist improvising, a percussionist, and a circus duo. In SonoRezé 2, the artistic output took the form of live illustrations. In this case, the artist's work demonstrated that graphic expression can be a powerful tool for raising awareness and convincing diverse audiences.

The example of the soundscape featuring an artistic performance is available here : https://sonoreze.fr/resultats/publications.html or directly at https://soundcloud.com/umrae-lab/scene-sonore-de-la-ville-de-reze



Recommended citation

Can, A., Audubert, P., Aumond, P., Bataille, N., Diquelou, G., Escar-Otin, N., Geisler, E., Guiu, C., Petit, G. (2026). Methodological guide – Citizen-led approaches and sound environments. Lessons from SonoRezé project. Available at : https://sonoreze.fr/

A project made by

ISBN 978-2-37135-006-9