Listening to Urban Transformations

Environmental well-being through arts-based and sound-conscious approaches

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Figure 1: View on De Binckhorst. *Photo by Renate Zentschnig*

Figure 2: Kiruna's new city center. *Photo by Klara Enbom Burreau*

Key Recommendation

Enhance well-being in urban transformations through sound-conscious strategies by involving architects, urban planners, policymakers, sound artists, residents, and other stakeholders to design and create sonic atmospheres together.

Summary

Sound is a critical yet often overlooked dimension of city planning. This White Paper draws on findings from the Sounding Urban Places research project, funded by the European ERA-NET Cofund program ENUTC (Urban Transformation Capacities). The project explored how artistic approaches to sound design in urban environments can contribute to well-being, sustainability, and community engagement.

Introduction

Cities are transforming rapidly and these changes profoundly affect their soundscapes. As argued by Tarlao et al., “urban planning policies and practices often fail to acknowledge the complexity of sound environments and generally consider sound only as noise” (Tarlao et al. 2024: 931). However, more recent developments in soundscapes standards increasingly point to the importance of taking into account (inter)subjective experiences of sonic atmospheres (International Organization for Standardization 2025). Urban planners, developers, and policy makers still often implement rules and regulations dealing with noise reduction without addressing the social, political, cultural, and affective dimensions of sound. Furthermore, they often fail to consider the sound’s positive capacity for creating vibrant, inspiring, and livable spaces. These gaps limit opportunities for crafting a sonic environment that enhances well-being and social cohesion, while also attending to inclusivity and biodiversity. We argue that artistic and art-based methods can contribute to bridging these gaps by stimulating awareness, imagination, and artistic (co-)creation.

> *Cities [...] need to bring sound expertise to the table and to consider the role of sound art in supporting the intended design goals. This also calls for integrating sound considerations into design and planning practices and policies.* (Guastavino et al. 2022: 21)

Current Challenges

- Sound is often treated in isolation, as a discrete element separable from other important factors such as social, political, economic, cultural, ecological, and technological concerns (Tarlao et al. 2024).

- Procedures to reduce the impact of sound pollution are typically based on models rather than real-world experiences (Vegt et al. 2025).

- Policies express limited awareness of the complex role that sound plays in quality of life, experience of belonging, and ecological sustainability (Steele et al. 2023).

- Architects, urban planners, and policy makers often lack awareness of the potential for sound studies, sound design, and sound art to contribute to a liveable environment (Cobussen 2023).

> *With sound levels primarily being calculated using a virtual model rather than measurements in real-world settings, there is a perceived disconnect between citizens’ own local experiences and the methods employed in addressing the issues they face.* (Vegt et al. 2025: 1069)

Insights from Sounding Urban Places (2024-2025)

The research examined how participatory sound design and artistic interventions can raise awareness of the social, cultural, and affective dimensions of sonic experiences, thereby creating the conditions to support healthier and more inclusive urban environments. The project was set in two locations that are undergoing contrasting yet comparable transitions – the Binckhorst area in The Hague (NL) and the town of Kiruna (SWE). While in Kiruna, the entire city center is being relocated due to ground deformation caused by the expansion of the iron ore mine below, De Binckhorst is in the process of transitioning from an industrial area into a mixed-use urban district expanding housing while preserving some of its industrial characteristics.

Methodological Pluralism

Sounding Urban Places brought researchers from architecture, sound studies, industrial history, and audio engineering together with

practitioners from a wide range of sonic and musical practices. A variety of methods were used – including field recording, audio-based interviews, soundwalks, and participatory mapping – to investigate and understand how citizens experience urban sound. To establish further dialogue with citizens in the two areas, the research teams created sound installations and compositions, an online sound map, podcasts, and geolocated audio walks, while also organizing workshops and guided listening walks. This combination of artistic, academic, and educational approaches proved effective in engaging diverse communities. It also offered valuable insights into their experiences of place and identity through sound as well as into the potential for citizen participation in future-oriented thinking about possibilities to create liveable and sustainable sonic atmospheres.

Figure 3: Stimulated recall interview in the City Hall in Kiruna. *Photo by Curt Persson.*

Findings

An important motivation for the project was the question of how artists can contribute to urban transformations that eventually lead to greater liveability, well-being, and sustainability. However, before these future developments could be addressed, the research teams were first confronted with the unfolding impact of the ongoing transformations in Kiruna and De Binckhorst, as the research was undertaken while these transformations were underway. In De Binckhorst, area development will remain a constant factor for many years to come, shifting from place to place; as more residential blocks are completed, it is expected that more and more people will be exposed to construction noise. Similarly, in Kiruna, demolition and construction noise overlap, creating a constant acoustic backdrop; while interviews reveal strong solidarity with the mining industry and acceptance of its influence on daily life, prolonged noise exposure is often mentioned as a reason for considering relocation.

Despite the above, we have observed how creative initiatives by artists and citizens can mitigate some of the negative effects of noise pollution and of living in an area under construction, for instance, by transforming temporarily vacant land or abandoned buildings into meeting places. For example, in De Binckhorst, the construction of a temporary park created a place for conversation, concerts, and gardening. The acoustic qualities of the place—enhanced by a low embankment—were crucial to its appeal.

Figure 4: The Carweide, a temporary pocket park with a low embankment, was realised by citizens on an unoccupied terrain in De Binckhorst. *Photo: Michiel Huijsman*

Interviewees in De Binckhorst expressed doubts regarding the municipality's plans for creating a mixed environment (with industry and housing), as this may raise the risk of sonic conflicts between different functions in urban environments. Interviewees in both De Binckhorst and Kiruna expressed the need for larger, connected green areas such as parks, which can function as acoustically heterogeneous buffer zones between areas with different functions.

Nature sounds (such as bird calls and water sounds) were almost unanimously perceived and mentioned as pleasant. Repeated recording sessions and the use of birdsong recognition software in De Binckhorst demonstrated how even small patches of nature in (temporarily) unoccupied spaces already contribute significantly to increasing sonic diversity, including geophonic, biophonic, and anthropophonic sounds.

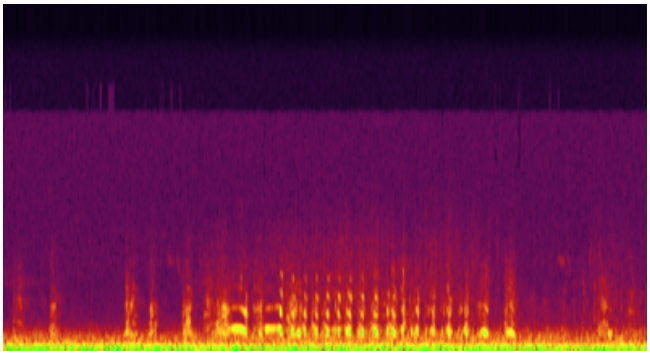

Figure 5: The image above shows a detail of a spectrogram from a recording session in an empty lot along a canal in De Binckhorst. The yellow band at the bottom shows a persistent low rumble, which comes from traffic. The cut-off visible at higher frequencies is a by-product of the streaming codec. The yellow-red peaks are birdsong in the early morning.

> *When I was young, we spent a lot of time in the railway park. There was actually a little stream running through it. There were so many more experiences of nature back then. And of course, a lot more birds and other small animals running around. You'd hear birdsong. And there were other animals too – sometimes even moose in the yard. Later, up here, where we lived before we moved, that was old Kiruna, so the houses weren't so close together. There were plenty of green spaces between them. So there were birds and hares, lots of squirrels, and things like that.* (Interviewee Kiruna)

In general, residents expect their neighborhood to also offer restful and quiet places. Nevertheless, our research simultaneously shows the importance of varied and more complex sound experiences that evoke a sense of life and belonging. Participants expressed strong affective connections to everyday sounds, linking them to identity and a sense of place.

This is how a resident of Kiruna imagined how the future sound of Kiruna could contribute to well-being:

> *What would a sustainable city sound like? What would Kiruna sound like? There'd be life and movement in the square, if there were activities for young people. You'd hear bikes and maybe those slow-moving cars the teens drive. That would bring more energy to the place. The city would feel alive. People out and about. People laughing more, finding community, doing things they enjoy. So laughter – I think that's really important. Just that sense of people moving through the city. There was more of that in the old Kiruna. I keep coming back to green spaces. Outdoor cafés too – that's something you'd want to hear more of. People sitting outside eating. That's such an important part of a city's soundscape.* (Interviewee Kiruna)

Whether people miss certain sounds depends not only on the sounds themselves but also on the context in which they can be heard. In De Binckhorst, for example, a former auto service owner fondly recalled the sounds of neighboring businesses because they represented positive relationships between companies. People who feel attached to the neighborhood in which they worked or lived for years often have positive memories of area-specific sounds and their associations with specific activities. Whether interviewees valued sounds positively or negatively strongly relied on personal connections and connotations. As several interviews with residents and entrepreneurs revealed, even loud industrial noises, which are generally perceived negatively, were appreciated as part of the local soundscape if they had a positive connotation.

> *In my day, we could hear the machines running […] Next to the building I owned, a paper factory was making cardboard boxes until 20 years ago. Boom, boom, boom, boom, it was actually a kind of music. I was completely used to it.* (Interviewee De Binckhorst)

There's so much happening in the mountain, all hours of the day. You could practically set your watch by the blast in the mine – at 1:17 a.m. That's really ingrained in you. I'm away from Kiruna a lot during the summer months. And then I come home, go to bed, and they blast in the mine. And I think, oh, that feels good. It's just something I associate with home.
Maybe you should be a little more afraid of it. But there's none of that – it's just … home.
(Interviewee Kiruna)

Figure 6: The old city center of Kiruna. *Photo by Corey Muntz*

In areas of deep urban transformation, questions about what to preserve from the past usually focus on material and visible heritage: historical buildings, antiquated objects, traditional tools, artworks or old trees. Characteristic sounds are rarely included in considerations surrounding heritage preservation. We found that sound artists can play a crucial role in changing this perspective by creatively using acoustic or recorded sounds to evoke memories and feelings of connection and to raise awareness of a shared immaterial cultural heritage.

I would very much like to preserve these types of cranes and the sounds they make […]. Also the sound of the bridge […], the mechanism and the bells and everything around it. It really gives it a bit of a harbour atmosphere, which I think is very essential to De Binckhorst.
(Interviewee De Binckhorst)


Figure 7: Audio tour in De Binckhorst. *Photo by Paul Craenen*

It proved challenging for the residents of De Binckhorst to listen attentively to their environment and imagine potential sonic alternatives. Even finding the right vocabulary to describe the sonic environment was often difficult. When it came to imagining changes, it appeared easier for participants to think about removing sounds rather than adding new ones. Despite these challenges, more artistically oriented soundwalks, invitations to record and upload sounds to the online SoundUP map, and specific listening exercises helped participants change their habitual listening perspectives and fostered new and inspiring awareness of the qualities of their urban soundscape.

In workshops with a secondary school in De Binckhorst, students were invited to listen to their sonic environment as if it were a musical composition, thereby deepening their interaction with that environment and stimulating their imagination. This in turn led to creative proposals for how it could sound differently in the (near) future. In Kiruna, participatory workshops, where residents mapped sounds in their local environments, combined with field recordings and stimulated recall interviews, created a platform for a deeper engagement with urban sounds. Although it was typical for participants to initially state that they did not pay particular attention to sound, the participatory methods often evoked an hour-long engagement. From this process, ideas emerged for permanent sound installations that would enhance the appeal of the new city center.

> *By listening beyond the primarily "unconscious" way of encountering everyday sounds, one could generate a more attentive and sentient perception or sonic awareness. By fostering a practice of listening-out for the unheard or the overheard, one could learn to hear—within the materiality of the sounds—other possibilities of what they could be.* (Cobussen 2022: 61)

Examples from both locations illustrate how artistically inspired engagement with soundscapes can shape social and cultural experiences in urban spaces. In De Binckhorst, several interviewees recalled memorable music theatre performances from the early 2000s that established dialogue with the physical presence and sounds of the machines in local factories. In Kiruna, the iconic bell tower of the City Hall, a central soundmark, was integrated into a concert performance in September 2025 that connected three cities through telematic technologies. As the bell tower sounded alongside three pipe organs in the city square, Kiruna's sonic heritage merged with contemporary music and sound art practices. These cases demonstrate how sound artworks – performances, permanent installations or virtual geolocated works – can enrich a city's identity and foster social interaction, inclusivity, and connectivity.

Figure 8: The City Hall and Bell Tower in the new Kiruna centre. *Photo by Klara Enbom Burreau*

Policy Recommendations

Sounding Urban Places has explored urban transformation in two different but comparable places. The findings are, however, more generally relevant. To create sound-conscious cities, we recommend:

- Including soundscape considerations in zoning laws and development guidelines.

- Developing guidelines for pro-active design of soundscapes: moving beyond noise control to create sonic atmospheres that inspire and connect citizens and enhance well-being.

- Recognizing the sonic impact of construction work in large-scale and long-term urban development plans. Explain their temporary necessity, but make construction works predictable and controllable by giving agency to residents as well.

- Promoting sound-conscious policies and artistic interventions to mitigate the negative effects of prolonged construction work. By giving residents and sound artists opportunities to modify and “play with” the present sound sources, their (negative) perceptions might change.

- Supporting participatory approaches: fund initiatives that involve citizens in engaging with their sonic environment through workshops and soundwalks.

- Encouraging collaboration: establish partnerships between urban planners, artists, and communities to co-create urban transformations.

- Making possible acoustically varied walking or biking routes for users of the environment. Avoid long trajectories that are acoustically monotonous.

- Retaining unoccupied spaces in urban planning to enable renaturing and enrich the urban soundscape with more diverse natural sounds.

- Paying attention to the role of sound in preserving local memories and culture and strengthening historical awareness. Consider making archived sounds accessible for residents and visitors, for instance, through geolocated walking routes or artworks in public spaces.

- Increasing awareness and creativity through education: train planners, architects, and educators in attentive listening and sound-conscious design principles.

Conclusion

Sound-conscious urban design is essential for sustainable, livable cities. By considering sound as an inextricable part of an environment, by embracing sound as a cultural and environmental resource, and by developing new collaborative approaches, policy makers, urban planners, educators, and art practitioners can proactively create sonic spaces that contribute to well-being, inclusivity, and resilience.

Our findings indicate that participatory and artistic approaches can be effective strategies for the creation of sound-conscious cities. We have argued that the initiatives launched by this project should continue to support a positive trajectory in the urban transitions of both Kiruna and De Binckhorst. Besides, other urban areas can of course also benefit and learn from the above recommendations.

The time to act is now. In the various planning phases of the (re)design of public spaces (from first explorations to final implementation, control, and evaluation), sound is mainly assessed in order to determine whether its volume level falls within the legal framework; sound perception is hardly taken into account in the design process. However, how a place sounds is not random and can indeed be designed or influenced. This can improve qualities of both use and stay; potential problems with noise pollution can be identified and resolved as early as the design phase. Careful planning of a sound environment therefore makes it possible for cities to meet sustainability goals while improving quality of life for their citizens.

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