

# Towards Urban Sound Design for Transitional Public Railway Park/Places: Sonic Strategies for Engagement, Critical and Spatial Design

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## Abstract.

The undeveloped open space along the Western ring railway L28 has long been marginalized in Brussels planning processes. Thanks to its natural, historical and ecological richness the urban edge area is an excellent research object, especially in the context of urban sound design. Within the context of public park/place development along the Brussels railway line L28, urban sound is dominantly discussed as a nuisance to suppress. Urban studies increasingly recognize sound as a medium for community building and political action. Recent research in urban sound studies focuses on how collective listening practices help to develop a critical ear for urban space, thus contributing to productive reflection on future spatial plans. The search for alternative strategies for engagement, critical and spatial design is supported and inspired by the work of artists and musicians making new aesthetic experiences and new ways of (physical) mobilization developments possible. Understanding an urban area in transition as a negotiable atmosphere of sonic and vibrational possibilities, encourages a review of the role and position of sound and vibration in the design of transitory processes for public railway park/places. Via (pro-) active involvement in the design and participatory processes for transitional public railway park/places in Brussels, the Ph.D. project questions pre-established thought patterns on urban noise and urban development. Through hyper-contextual urban sound design, the project explores methods and tools for working with sound and vibration in the design of urban transition. As a step towards a global approach, the findings will be situated in relation to a cultural- historical, a morphological, a design and performative perspective on sound and urban transition.

**Keywords:** urban sound design, vibrational nexus, urban transition, public space, infrastructure space

## 1. INTRODUCTION

Urban sound is still poorly addressed in the design of future public space [1]. An important part of this Ph.D. project consists of exploring how urban sound can be tackled as a design challenge in a context of urban transition. Our main objective is to develop a sonic approach to urban sound design, grounded in artistic and community engagement practices, and discussed and tested in urban sound design studios on site. Whereas limited or repressive sonic approaches make many urban designers lean in resignation or neglect, building on tactics and ideas used by sound researchers and artists, we

aim for a constructive approach to urban sound, confronting constraints and deploying most of them as productive forces in the design process. Once sound is understood as a potential constructible aspect of the urban environment, it can be defined as a design challenge in a context of urban development. One that necessitates appropriate urban design concepts.

## 2. CONTEXT

For our research, we chose to focus on public space development along the Brussels railway line L28 with among others PAD West Station, PAD Tour & Taxis, the Canal Plan and the Regional Green Network as priority projects. This part of the Brussels Zennevallei became fully industrialized in the nineteenth century. The construction of the railway L28 and industrial buildings and housing alongside the rail line contributed profoundly to the fragmentation of the original landscape structure. With the emergence of new modes of mobility and the disappearance of industry, the area experienced a period of deprivation that lasted until the beginning of this century. Where frogs once croaked over the ponds of marshland, now freight trains are rumbling, the dull thuds of truck maneuvers, the immersive drone-waves of airplanes, the piercing sounds of trams and underground trains sliding over iron, and the buzzing drone hovering produced by helicopters flying over the area, can be heard. After decades of neglect with wastelands and empty buildings as a result, West Station received recent attention. With the reorganisation of the Brussels metro network, and the opening of the new station in 2009, West station became an important hub for public transport in the metropolitan Brussels area. Today it is one of the strategic areas for Brussels regional development. A research by design in this area, realized by Coloco, Devspace and Gilles Clement in the context of the study Metropolitan Landscapes [2], argued in favor of more research into the quality of the soil and associated use, but also into the identity and experiential value of the sites. This recommendation is in line with the conclusions of a study conducted by the Brussels Agency for Territorial Development, which also acknowledged the temporary physiognomy of the L28 area as an important condition for the future urban development of the area [3]. In its more recent projects for the L28 area, Brussels chose for a dynamic approach to landscape urbanism, hereby challenging the assumptions about the landscape being a mere inert primitive lacuna or pause in the urban of development of its territory. In 2016, the Brussels Region commissioned a large-scale urban renewal project for the L28 area in Molenbeek and Anderlecht, Brussels. The project was assigned to a Brussels based consortium: 1010, Taktyk and Alive Architecture with Mariska Vogel and Caroline Claus (the first author of this paper). One year later followed the assignment for the design of a masterplan for the Weststation area to Taktyk, Alive Architecture & 51n4e, ABO, Tractebel + Idea & Caroline Claus & Les Eclairagistes Associé. Because of the expected duration of the project, the development of a Masterplan for West Station was supposed to be accompanied by the design of transitory processes for the future public railway park/places. Within this planning context, little attention is paid to the quality of the public sound environment. Proposed sonic approaches are limited to nuisance control [4][5]. From the perspective of the project developers and authorities, the health and peace of the future public space should be guaranteed. Conflicts over social noise nuisance are dealt with preventively and repressively in the short term, at street level. An exploration from the perspectives of young people and professionals involved, opened up to more constructible sonic approaches.

### **3. CONCEPT**

Urban studies increasingly recognize sound as a medium for community building and political action [6][7]. Recent research in urban sound studies focuses on how collective listening practices help to develop a critical ear for urban space, thus contributing to productive reflection on future spatial plans [8][9]. Accounts of the sonic in terms of conscious hearing or listening are troubled by Goodman [10] in favor of an unconscious, affective account of sound as material impact, hereby opening up to the inaudible frequencies. Much of Goodman's work on sonic warfare is given over to determining a politics of frequency through describing experimental practices that intensify vibration, thereby unfolding the body onto a vibrational discontinuum that differentially traverses the media of the earth, built environment, analog and digital sound technologies, industrial oscillators, and the human body. Goodman[10:p.79) describes the vibrational nexus as each actual occasion of experience that populates the discontinuum, drawing in an array of elements into its collective shiver. The conception of a differential ecology of vibrational effects leads him towards a non- anthropocentric ontology of ubiquitous media, a topology in which every resonant surface is potentially a host for contagious concepts, percepts, and affects. In line with Goodman's ecological theory on sonic warfare through practice development, from an ecological perspective, we want to explore different possible engagements with acoustic force in public space and their possible effects.

### **4. TOWARDS A SONIC APPROACH TO URBAN DESIGN**

Developing a sonic approach to urban design opens up to a more critical approach to urban design as we know it. How does constructive engagement with urban sounds and vibrations support the realization of people's existence (including ourselves) as part of a transforming social material environment ? How can urban sound designers contribute to a more inclusive urban transformation? How can they take responsibility in terms of negotiating, enabling relationships so that people can perform, move through, experience and negotiate the sounds and vibration of an urban environment in transformation? And by doing so, how can they establish a relationship with conflicting individuals, groups and thus the cultural, social and political context? Can they intervene in the urban environment by changing its sonic and or vibrational fundamentals or maybe just some elements? Can urban designers shape or contribute to inclusive urban space? What is the role of sound artists in this process of intervening? Can we connect disparate vibrational topographies with subjects, creating space for new understanding and experiences?

As a step towards a sonic approach to urban design this paper deals with the questions above by setting up a design perspective in line with Goodman's [10] ecological theory on sonic warfare, grounded in artistic and community engagement practices. Accordingly, different urban projects are used to show how sonic approaches may have an impact on public space design in a context of urban transition. These practices contribute substantially to our research project by highlighting new phenomena and methods for converting sound into a constructible quality. Resulting sonic approaches, methods and techniques will be taught and tested with respect to specific challenges in forthcoming urban design studios and workshops.

## **Sound Art and Artistic Research**

Constructively dealing with sonic and vibrational material is not a new phenomenon. Our search for alternative, constructive, sonic strategies is supported and inspired by the work of artists and musicians making new aesthetic experiences and new ways (physical) mobilization developments possible. Avant- garde artists [11][12][13] explore in their work the possibilities of vibration and sound in urban space. Their work is situated at the crossroads of acoustics (landscape) architecture, urban planning, and actions for conceptual and experiential integration. Much of their work consists of research into the way vibrational and sonic events affect buildings, urban space and the bodies they occupy. Sculptural aspects of sound and vibration are investigated on how resonant materials, structures can define and thus manifest urban public space. The Sonic Rupture approach of Jordan Lacey [14], a practitioner-led approach to urban soundscape design, foregrounds the importance of creative encounters in global cities. Lacey considers urban noise as creative material and cultural expression that can be reshaped with citywide networks of sonic installations. The sonic and vibrational explorations of artists and researchers mentioned above show that sound and vibration can be approached in a positive way. Though it may difficult to apply them on an urban time/space scale, they offer valuable conceptual viewpoints, methods and tools for the design of sonic and vibrational interactivity.

## **Setting up an Urban Sound Design Perspective**

In our attempt to set up a framework for a sonic approach to the design of the L28 railway area in transition, in what follows we sketch out five sonic approaches to public space design for sonic and vibrational improvement on different urban time/space scales. Interdisciplinary in nature, these sonic approaches comprise mental tools in the form of concepts, models and techniques for observing and defining sonic and vibrational interactivity in transforming urban environments.

In the *Articulation approach*, we develop a framework for urban design on the basis of identified sonic and vibrational qualities and physical constraints in a project area. Articulation is about playing the city via its design through the generation, modulation, and dampening of vibrational carrier waves of sonic affect. Contrasting earlier sonic models, such as R. Murray Schafer 'soundscape' or Pierre Schaeffer's 'objets sonores', which dealt respectively with large sound environments and very small sonic utterances, and the set of experiential features or 'sonic effects' as described by Augoyard & Torgue [15], within this approach, based on Goodman's ecological conception of the 'vibrational nexus', the body is understood as a multi fx- unit, as a transducer of vibration, becoming merely another actual entity in a vibrational event, assuming not necessarily any more significance than the resonances between other entities within this nexus.

By examining the experience of listening and being heard among those traditionally left out of urban research of community planning processes, sound artists and community based researchers define new ways of possible engagement with the complexities of urban environments in transformations. Recent work by Brandon Labelle [16] and MIT CoLab [7], for example, points to the importance of sound for political transformation.

*Sonic Activism* we understand as reaching out to, and activating the political potential of urban sound and vibration. It consists of an outreach based observation of protests, and other pertinent sonic and vibrational materials of urban social struggle, followed by a participatory translation of these observations into interventions offering shared imaginations for urban transformation.

*Infrastructuring*: Particularly in the last two decades a new understanding of infrastructures has emerged [17][18]. This school of thought rethinks infrastructures beyond their material and technical limits and critically reframes them as a part of the “urban social” and collective culture and space [19]. Building upon Neumann and Star’s [20] and Star and Bowker’s [21] work on making infrastructures, Karasti and Syrjänen [22] coined the term “infrastructuring”. Infrastructuring is a process which involves infrastructure design for participation “*along with mediation, interpretation, articulation, actual design-in-use such as adaptation, appropriation, tailoring, redesign and maintenance.*” [23:p.57]. Recent research introduced the idea of design as an infrastructuring activity [24][25]. In this context, this approach reframes urban sound design as infrastructuring, rethinking the agency of ongoing spatial and sonic interventions to empower the communities to take part in the making and remaking of a particular vibrational nexus.

*Sonic Augmentation* we understand as the creation of a direct or indirect live experience of a physical, real-world environment whose elements are “augmented” by computer generated sonic vibrations. De Jong en Schuilenburg [26] explain how a lack of sensory input can be complemented by a mental apparatus or mental assumptions, executing computations following musical rules. Techniques like sound collage and sampling provide a basis for subtly designed semi- acoustic environments or soundscapes with particular spatial effects. For De Jong and Schuilenburg, sonic spatiality is not abstract nor neutral. The two authors define it as space for social relations in which specific stories, symbols and knowledge are shared, a spatiality which is different than the spatialities which appear to people in the physical city. “Surrounded by a 360 degree sound sphere, the listener always stands in the middle of a sonic spatiality. This center is not a static but a dynamic place. Everything moves and resonates through the simultaneity of different sounds. Pulses, tones, tapping noise, melodies and beats form a periphery which keeps the listener in its grip. Sound opens doors and passes through walls to make people move. The acoustic space of a sonic spatiality therefore has no rigid but soft boundaries. It is an ongoing becoming, or intensity where only extremes seem to be playing” [26:p.111].

In the following parts of our paper we introduce a few examples employing five sonic approaches to public space design introduced above.

### **Articulated Waves: The Zadar Sea Organ by Nikola Bašić (2005)**

The Sea organ is an architectural sound art object and an experimental musical instrument, which plays music by way of sea waves and tubes located underneath a set of large marble steps. It was part of a larger redevelopment project for the north-western seafront of the peninsula in Zadar, Croatia [27]. The organ extends along a seventy meter front at the confluence of a newly created platform and marine parade connecting the seafront with the city. The organ’s architecture consists of resolving the meeting with the water gradually, by means of a flight of broad white marble steps that go down beneath the waves. Understood as a rectilinear platform elevated above the water level, the stairs

support the dissolution of the border between land and water, hereby functioning as a kind of transit space. Not just a proper adaptation to the topography of the parade, the variations in the dimensions of the flights of steps also follow the musical line of the object, interpret as musical instrument. A series of polyethylene tubes of different diameters run along the inside surface of each flight of steps, connecting the submerged part with a gallery that runs along beneath the parade. The air pressure produced by incoming waves and pushed to orifices that connect the gallery with the surface of the parade, generates sound vibrations which, given the variations in the diameter and length of the tubes, cover a broad range of musical tones that can be listened to by people sitting on the steps outside the organ.

### **LA Listens, a collaborative project that explores sounds of urban vibrancy in Los Angeles by Wendy Hsu, Steve Kemper and Jessica Blickley (2017)**

LA Listens is a neighborhood-engaged sound project using a multimodal methodology comprised of: community-based listening, soundwalk, sonic data analysis, and creative re-composition [28]. The project allows community-driven computational analysis of the permeable layers of LA's public acoustic territory [29] via the extraction of patterns from field recordings of cities, followed by creative re-compositions of city sounds from LA Listens team members and artists in the community. By closely listening to the field recordings, the researchers question the meanings of "vibrancy" and reflect on the role of motorized vehicles, pedestrians, conversations, street vendors in the multivalent soundscape of LA's neighborhoods. Additionally, using computational methods including Music Information Retrieval (MIR) techniques and sonographic data analysis, they search for underlying patterns in terms of sound events and periodicity in recordings. Integrating the data-driven and qualitative findings, LA Listens further wants to explore broad inquiries such as: What are the sonic characteristics of a dangerous intersection? What is the sonic identity of street-side vibrancy as defined various stakeholders including residents, urban planners, and city's officials? What is the sonic relationship between sanctioned and unsanctioned social activities? How do sounds (re)mediate neighborhood cultural identities? This research can be understood as a form of activism for two reasons: through community-driven analysis and sharing of sensory data, LA Listen wants to influence LA's urban development. Secondly, by sharing their data with artists, they want to activate a creative dialogue grounded in a co-production of reflexive interpretations of LA city's sounds.

### **Infrastructuring through Design: PASIONARIA by Emilio Lopez-Mencherro (2006)**

Since infrastructuring is an ongoing process by definition, while reframing it as a design activity, it is necessary to make a distinction between two different modes [30]: infrastructuring *in* design and infrastructuring *through* design. Infrastructuring in the design involves practices that allow various actors to contribute to the overlapping phases of the design and decision-making. A simpler formulation of this mode is the design of infrastructures which enables the facilitation of participation in design. Examples of these can be all kinds of communication tools and media that empowers the participants to contribute to the design process as an active participant such as platforms for crowdsourcing sono-spatial perceptions. Expanding this mode, sound can be interpreted as a metaphorical infrastructure for facilitating debates on and participation in design, making the act of

designing sonic environments an action of infrastructuring.

The second and the most interesting mode we introduce here is infrastructuring through the design product. This kind of empowerment takes place when various sono-spatial qualities of a design product enables the participants to continuously shape and reshape their own living environments. In this context, through design, it is possible to create infrastructures combining sound and space, facilitate different types of appropriations, and when possible enable adaptation and redesign referenced by Bannon and Ehn [23]. Essential qualities of this practice are the creation of products which are performative, reflexive and open to different sono-spatial appropriations.

The permanent intervention PASIONARIA by Emilio Lopez-Menchero, located at the beginning of Stalingrad Avenue, in the center of Brussels. Inaugurated on the occasion of 40 years of Moroccan immigration, this project is dedicated to all migrants. In parallel it refers to the speeches of encouragement delivered by the Spanish Republican soldiers in the trenches, on the battlefield [31]. This spatial intervention provides an open and reflexive metaphorical infrastructure for the voices of ordinary citizens to be amplified and encouraging them to participate in the debate. It can alternatively be used as a listening; interestingly, this function is hardly made use of.

In time, the Pasionara installation has been appropriated in different ways, and the surrounding space became a place of meeting and protest, extending the affordances of the intervention from being an metaphorical infrastructure to an actual facilitator of political representation. In this sense, the design approach of Pasionaria can be interpreted as an attempt at infrastructuring through design.

#### **4DSOUND by Paul Oomen, Poul Holleman, Luc van Weelden and Salvador Breed (2007)**

4DSOUND is a sound system conceived as a spatial instrument that can be played through integration with a range of interfaces and controllers allowing for evolving changes in three-dimensional positioning of sound [32]. One of the goals of this omni directional sound system is to enable visitors to experience spatial sound and immersive sonic environment. Another objective of 4DSOUND is to enable a social listening space in which listeners can move freely to explore a physical environment of sound, individually or collectively. As in the Philips Pavilion at the 1958 Brussels World's Fair [33], one of the earliest multi-channel installations, the experience of augmented sonic space in 4DSOUND is bound to the small space of the installation.

## **5. CONCLUSION**

At the time of this writing the development of Brussels West Station comes in a next phase with the finalization of the masterplan. In this planning context, there is little concern for the quality of urban sounds. Suggested sonic approaches are limited to nuisance control. While noise and vibration regulations are necessary measures to limit exposure to nuisance, we consider them as inadequate for public space design. Nor do we find ourselves in the use of sonic arguments for a repressive policy against the presence of young people in the transforming public space of their changing neighborhood. Based on Steve Goodman's conception of vibrational nexus, the approaches and concepts presented in this paper reflect a way of thinking that embraces sonic and vibrational interactivity as a quality for urban design rather than a hindrance. They provide conceptual viewpoints, methods and tools for

more engagement, critical and spatial design, allowing us to explore the potential of sound and vibration for the design of transitional railway park/space in the Brussels L28-railway area.

We introduced five sonic approaches to public space design: Articulation, Activism, Infrastructuring, and Augmentation. We consider these as instrumental sonic approaches that can be used individually or combined. Instead of approaching sound and vibration as a threat to its surroundings, these design approaches make it plausible to see the potential of sound and vibration for the design of transitory processes for future public space. They suggest us to use what is dominantly considered as non-negotiable urban material, for public space design at multiple scales of time and/or space and to test scenarios for the evaluation of sonic and vibrational possible experiences in a changing spatial-temporal place. Most of the cases we present in the former section are situated at the scale of urban installations but contain strategies with a potential for urban design.

*Articulation* is about playing the city via its design through the generation, modulation, and dampening of vibrational carrier waves of sonic affect. It reframes the body as a multi-fx unit, as a transducer of vibration. The Zadar Sea Organ by Nikola Bašić is a clear case of articulation. This organ generates sound vibrations which create a broad range of musical tones that can be listened to by people sitting on the steps outside the organ. The case illustrates how by articulating the interaction between waves, air, cliff and people the design of an urban edge area can contribute to a larger urban project.

*Sonic Activism* was defined as reaching out, and activating the political potential of urban sound and vibration for new possible engagements with urban transformation. LA Listen we considered as a form of activism on the basis of its community-driven analysis and sharing of sensory data and ambition to influence LA's urban development.

Reframing urban sound design as *infrastructuring* requires a rethinking of the agency of ongoing spatial and sonic interventions to empower the communities to take part in the making and remaking of a particular vibrational nexus. Critical qualities for this practice are the creation of infrastructures which are performative, reflexive and open to different sono-spatial appropriations. The Pasionara case reviewed in the paper, indicates that these infrastructures can be metaphorical as well as physical with practical uses and they can be appropriated in the ways that are not intended by the designers.

*Sonic Augmentation* extends our understanding of spatial design towards the creation of a direct or indirect live experience of a physical, real-world environment whose elements are "augmented" by computer generated sonic vibrations. In this context we introduced 4SOUND, a spatial instrument that makes it possible to experience spatial sound and immersive sonic environment, individually or collectively.

In light of the above illustrations, a preliminary conclusion emerge regarding the scale of the sonic approaches presented. Particularly the last two examples are situated on the scale of an installation. They offer little perspective for large-scale urban design interventions in a larger complex city context.



In the near future (next year) the affordances of these approaches will be systematically explored further in the framework of a transdisciplinary studio and an elective course with the students at the KU Leuven Faculty of Architecture.

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