

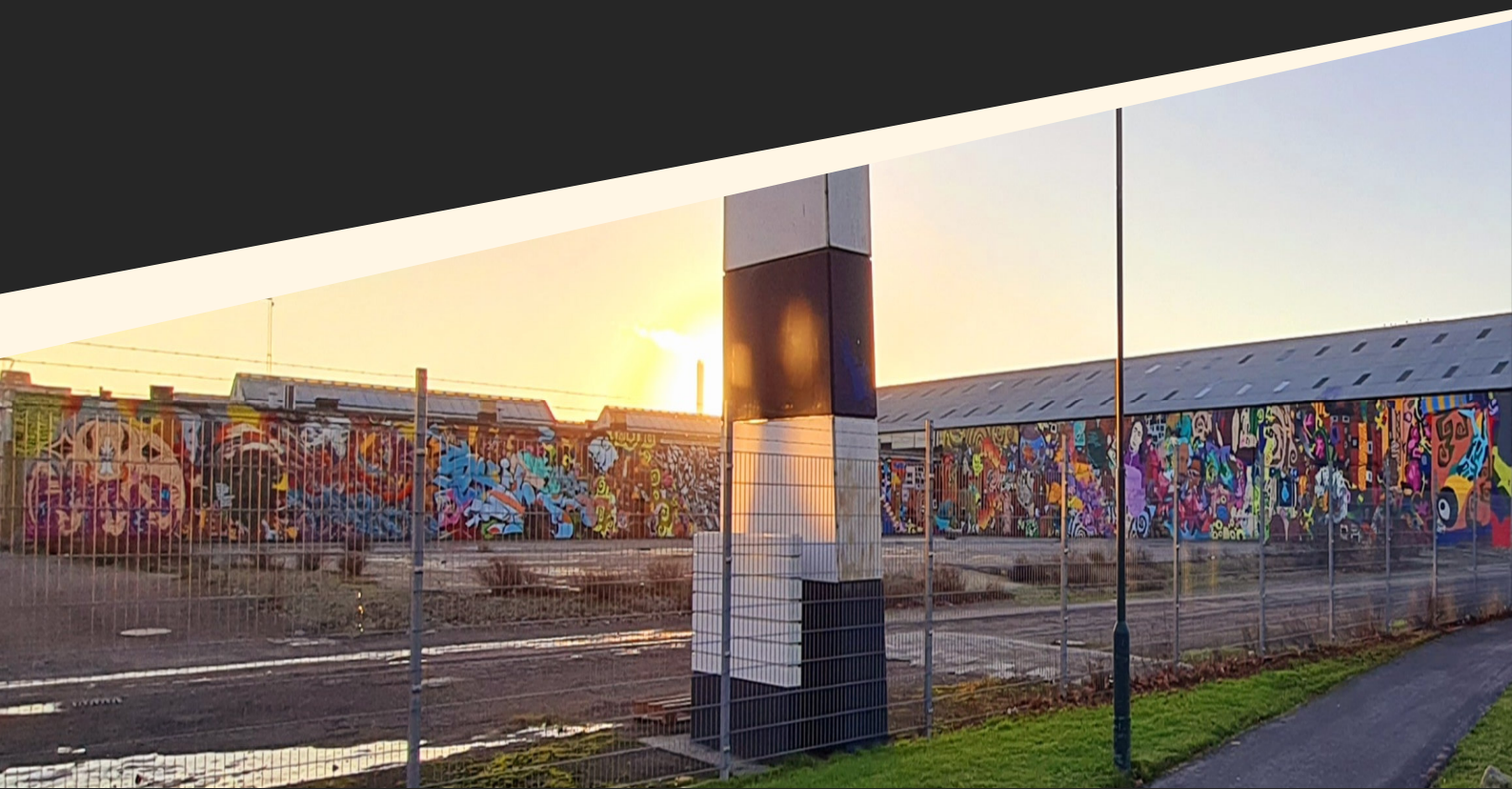


# Kulturljudzon Sofielund, Malmö

## A study on the residents' auditory perception

Amanda Schmidt

Independent project • 30 hp  
Swedish University of Agricultural Sciences, SLU  
Department of People and Society  
Outdoor Environments for Health and Well-being  
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# Kulturljudzon Sofielund, Malmö: A study on the residents' auditory perception

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## Abstract

To become better at planning vibrant mixed-use cities, we need to know more about soundscapes and noise perception in urban environments. The development towards culture being pushed out from the cities lead to the creation of a *kulturljudzon* in Malmö, where culture and industry sounds are allowed to exist almost unrestricted. This thesis aims to examine the perspective of the residents living in vicinity and how their perceived health and well-being is affected. It contributes through assisting professional planners in navigating the work with soundscapes in the planning of vibrant cities and enhancing peoples' health and well-being at the same time. The mixed-method approach is based on a quantitative part in form of a questionnaire that gave an overall image of the residents' attitude towards the *kulturljudzon* and helped identifying follow-up interview partners for the qualitative part, that emphasized diverse narratives with individual experiences for a deeper understanding of their perspectives. The study indicates that traffic noise seems to be the main problem among the residents in the *kulturljudzon*, whereas the mentioning of bird song and other natural sounds as appreciated suggest their positive effects on health and well-being. Sounds that fit their surroundings and have a function seems to alleviate the annoyance and increase the acceptance. Also, the engagement with the environment plays a role. However, the more in-depth interviews revealed some differences in the perception of diverse sounds and individual background stories, which indicate the complexity of noise perception. Creating restorative soundscapes in urban environments must take consideration for the dimensions of urban sound. Thereby both the physical environment and the psychological processes must be considered, which highlights the importance of cooperation between landscape architecture and environmental psychology.

*Keywords:* noise perception, soundscape, kulturljudzon, mixed-use city, urban environment, landscape architecture, environmental psychology

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# 1. Introduction

Perception is a fundamental component of people-environment interactions. The human sensory modalities build the essential ground of our perception and experience of our environment (Mather, 2016). One of the human sensory modalities is the audition. Whilst vision tends to be dominant (Mather, 2016), audition is often not thought about to the same extent. This has made me curious. As a landscape architect I work a lot with the visual, but sound fascinates me, not least because I am a musician, too.

Sounds can trigger emotions, influence our behaviour, and help us to explore, experience and understand our environment (Blessner & Salter, 2007). Furthermore, they have an impact on our health and well-being. Sounds can be positive for our health and are of recreational value (Alvarsson, 2010, Cerwén et al, 2016), but they can be negative too in terms of noise and cause stress and diseases and mental health issues (WHO, 2018; Kang & Schulte-Fortkamp, 2016; Beutel, 2016). Therefore, sounds are important for the planning of outdoor environments, which can be especially challenging in complex urban environment soundscapes.

Today, noise pollution and people feeling disturbed by noise are common in cities, where housings coexist with establishments like bars and clubs. The latter often sound a lot. More and more residential buildings are built and the amount of complaining neighbours is increasing. This has the effect that culture is being pushed out of the cities. There is no space anymore for all these sounds that are not accepted near residential buildings and therefore these establishments are forced to give way. But a vibrant mixed-use city cannot only be made of housings, it needs culture (Pereira Norrman et al., 2021).

I came across a project that intends to give culture a place to be and live. In the Swedish city Malmö, the '*kulturljudzon*', a culture-sound-zone, has been established, which will give space for culture and industry sounds almost undisturbed. I will explain the concept in the following section. However, as the representatives for culture and industry are lucky, it seems like the residents living in the vicinity did not get the chance to take part in the debate around this zone, it rather has a potential for conflict (Afzelius, 2021).

To become better at planning vibrant mixed-use cities, we need to know more about soundscapes and noise perception in urban environments. In this study I am therefore going to evaluate the culture-sound-zone in Malmö, Sweden, with the aim to examine the residents' relation to the *kulturljudzon* and how its soundscape affects their perceived health and well-being. As noise is one of the most important causes of stress (WHO, 2018), it is important to learn about the residents' experience.

In the following I will start with the description of the project site and then elaborate on the background that is needed to understand the context.

## 1.1. Kulturljudzon Sofielund – Project description

To counteract the development of culture being pushed out from the cities Malmö city decided to create space for culture through establishing a '*kulturljudzon*' (see section 1.2.) in the industrial area of Sofielund around Norra Grängesbergsgatan (NGBG) in Malmö, Sweden. In September 2021 the decision was made – the *kulturljudzon* will be put into action in 2022 onwards. This concept – as Sweden's first one of this kind – will allow culture and industry to make noise undisturbed, but within the legal framework up to 85 decibels (Malmö stad, 2021). Housings are not to be built in the area or the near surroundings. This is an opportunity for those acting and developing in the area.

### *2040 planprogram*

Malmö stad has developed a program that is about the development of Sofielund verksamhetsområde as “Malmö's most meaningful and dynamic cultural, leisure and business centre” (Malmö stad, 2021) until 2040 combining business and leisure, letting industry and culture interact in a symbiosis. It is a very comprehensive plan that includes several concerns, which I will not all discuss in this study, but the *kulturljudzon* is one part of that program, as the development proposal implies that these activities need to be allowed to make noise.

An already existing cultural life is allowed to continue. However, it is still a process, and one needs to follow the development to be able to make further conclusions. So far, it seems like most that is planned and done concentrates on noise abatement. The question then is – What is *noise* and who gets to define it? This is a question of democracy, that would go beyond the scope of this thesis.



Figure 1. Map of surroundings. The dot shows where the project site is situated. (Source: google maps, Amanda Schmidt)



Figure 2. Map of surroundings. (Source: google maps, Amanda Schmidt)

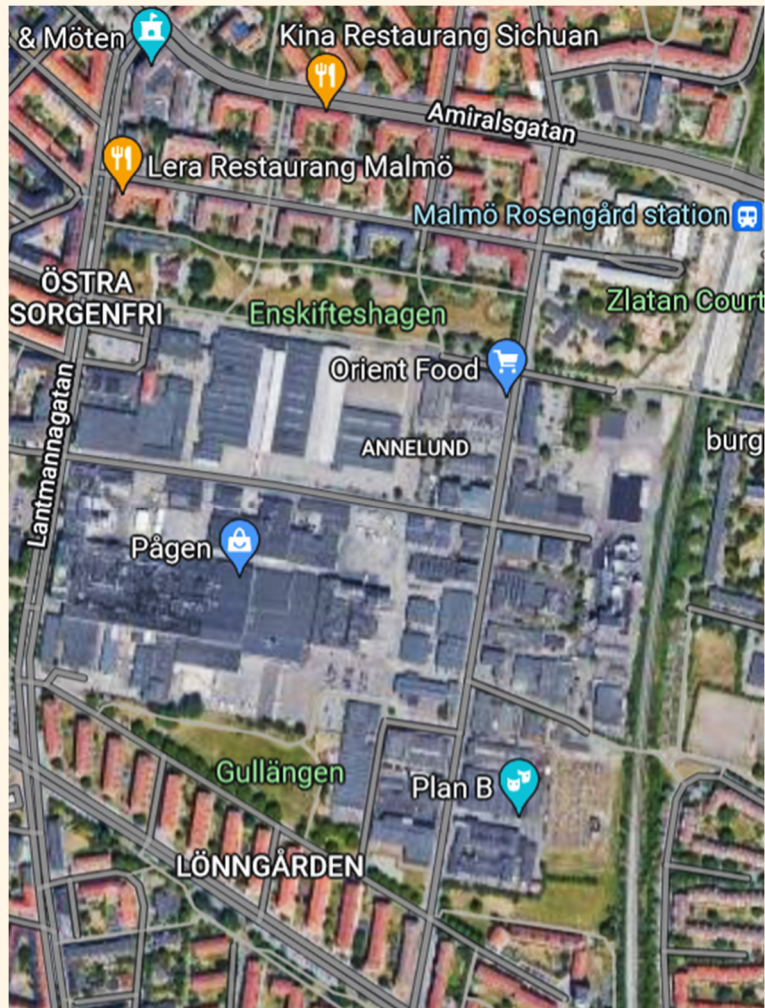


Figure 3. Map of project site. (Source: google maps, Amanda Schmidt)

The area is located southeast of Malmö centre quite near Folkets Park and the hospital area in between the districts Möllevången and Rosengård (see fig. 1 & 2). The main road leading through it is Norra Grängesbergsgatan. The area includes larger and smaller industry facilities and companies, for instance the bakery company Pågen, several car repair shops and bakeries. Further, the known club and concert venue Plan B is situated in the southeast (see fig. 3) and Kampen – a facility and area within Sofielunds industry area, that inhabits most of the cultural and leisure activities, for instance a climbing centre, fighting sports and rehearsal studios and more, lies amid the zone (see fig. 4). The area is surrounded by two smaller parks in the north (Enskifteshagen) and the south (Gullängen), that constitute a buffer zone to the adjacent residential buildings, especially Enskifteshagen (see fig. 3 & 4). Furthermore, it borders on a larger road (Lantmannagatan) in the west and a railway in the east (see fig. 3 & 4). Some photos in figure 5 serve to give an impression of the site.



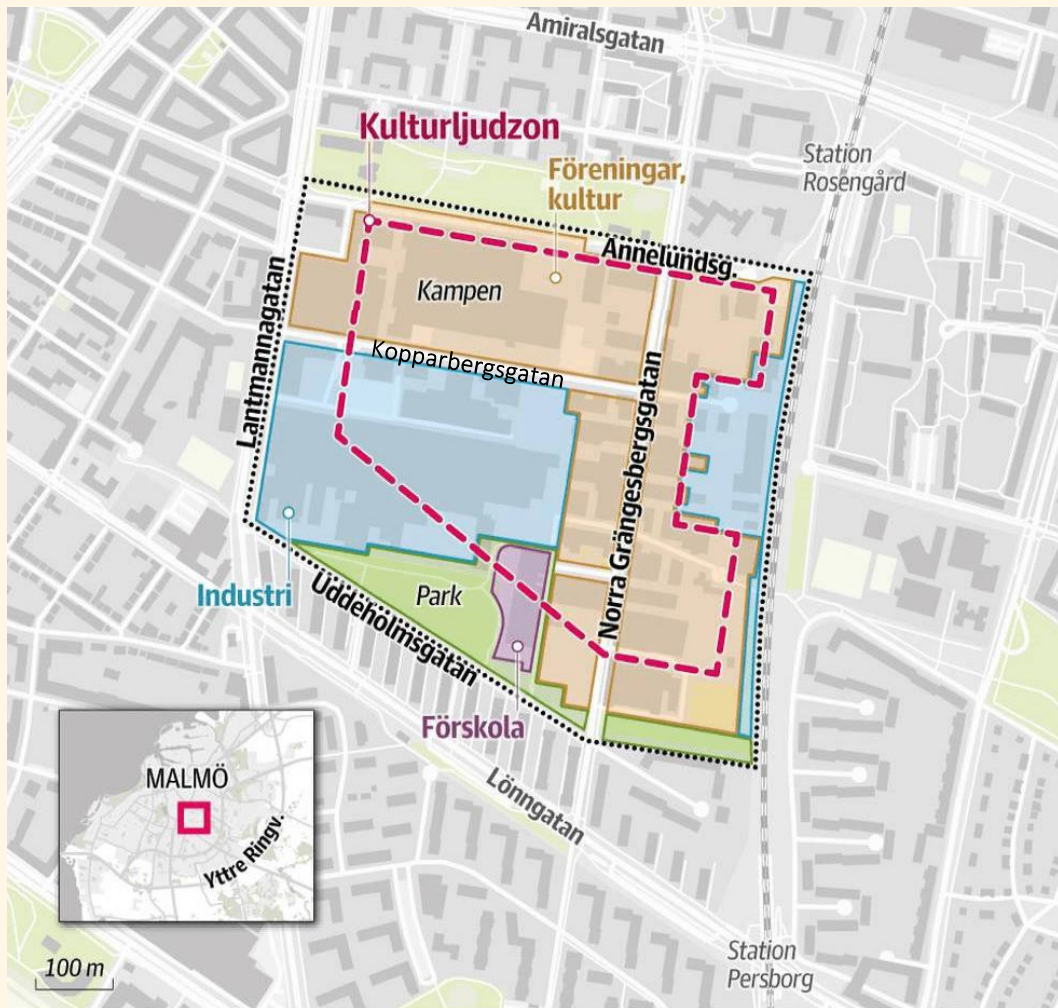
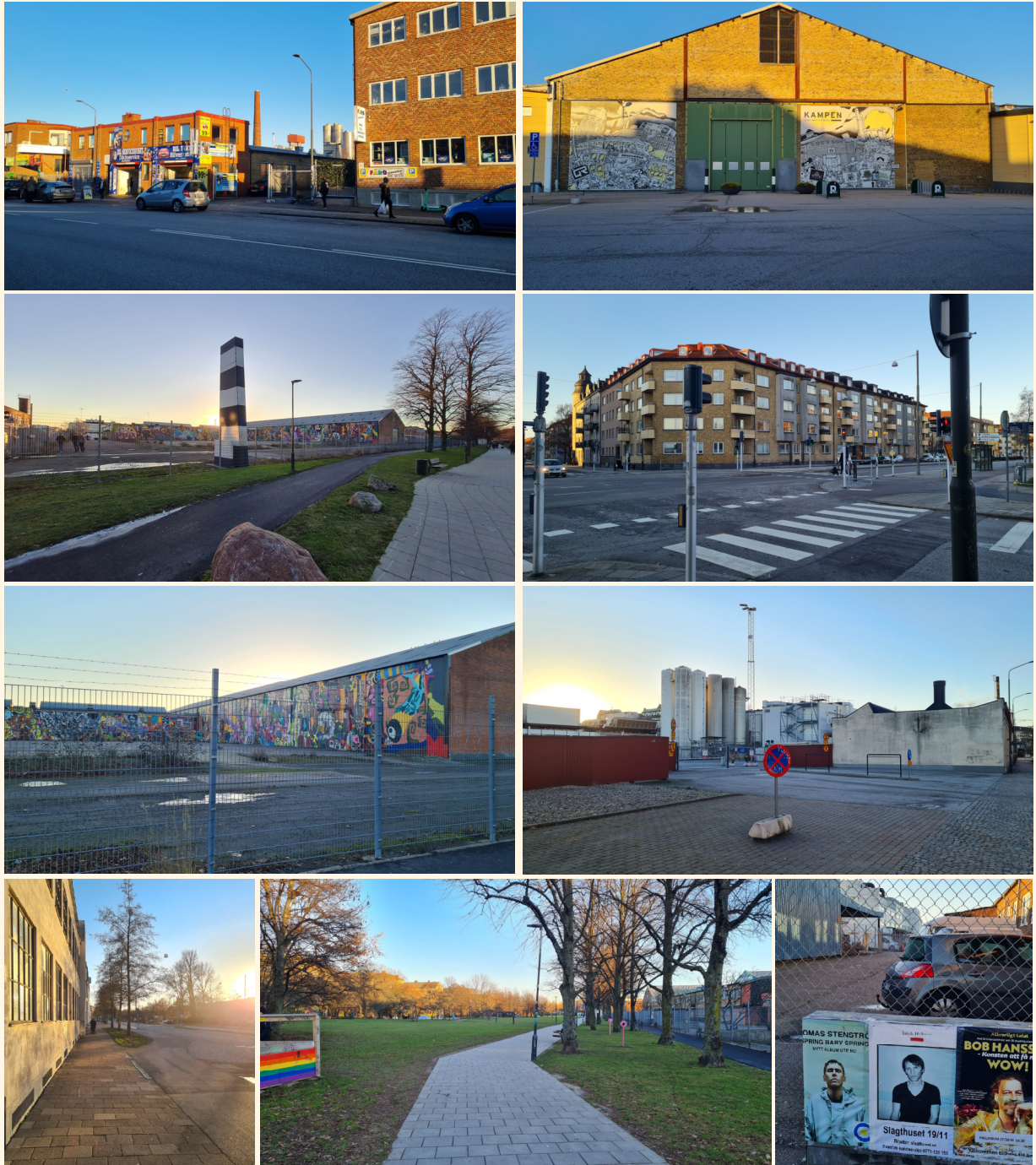


Figure 4. Map of kulturljudzon. (Source: Malmö stad, Open Street Map, Krister Cronqvist)

The soundscape around Norra Grängesbergsgatan during the day is mainly composed of lots of traffic sounds, industry sounds mainly coming from car repairs and music coming from inside some buildings. In the two parks the sounds of people talking, screaming, and laughing and dogs barking are added to the soundscape. Certainly, the soundscapes differ depending on many factors, for instance how many people are visiting the park, how much traffic there is, or what time of the day it is, and many others.



*Figure 5. From left to right: Car repair shops at Norra Grängesbergsgatan, Kampen view from Koppbergsgatan, Kampen view from Enskifteshagen, Residential building at Lantmannagatan, view from Enskifteshagen, Pågen factory site, Lantmannagatan, Enskifteshagen, concert posters in front of industrial site at Norra Grängesbergsgatan. (Source: Amanda Schmidt)*



## 1.2. Kulturljud

The Swedish word *kulturljud* (from kultur = culture and ljud = sound) stands for sounds from cultural events such as concerts. A *kulturljudzon* then is an area where these sounds are allowed and independent of complaints from people who live in the neighbourhood. The cultural life still needs to observe the noise level required by law. This thesis is based on an artistically oriented concept of culture, where culture is defined as music, art, theatre, dance, literature, film, and others.

Since a soundscape is hard to demarcate in outdoor environments, creating a *kulturljudzon* will only allow certain sounds in an area, but other sounds will still exist. Hence, I would consider a *kulturljudzon* not to be a type of soundscape, but a part of a soundscape influencing its character.

## 1.3. Perception of sound

The human perception of the environment is based on the human sensory modalities. Sensory systems transmit information from a source in the environment to our brain, the receiver (Mather, 2016). Sensory stimulations are bottom-up processes. For instance, light getting into your eyes and stimulating the brain is a bottom-up process. In general, sensory stimulation evokes neural responses leading to perceptual experiences (Mather, 2016). Through the sensory modalities we receive information from the surrounding environment. The perception of this environment happens in the brain. Perception is a process of giving meaning to the environment in order to respond with a behaviour (top-down process). The environment has an impact on us, but we also create an individual reality and give meaning to it. We use our knowledge, understanding, exploration, memory and emotion. What we see, hear or feel depends on our earlier experiences. It has an impact on what we perceive. (Mather, 2016; Gifford, 2014)

A sonic event is always composed of a source, a path and a receiver (Mather, 2016). The source of a sound is always a vibration measured by amplitude and frequency and phase (Mather, 2016). From that source, the path of the sound has an impact on its colouration (Mather, 2016). There are many aspects in the physical environment influencing a sound and its propagation, such as the distance between source and receiver, spatiality, or the materiality of the ground and surrounding physical elements where the sound is reflected (Mather, 2016; Nilsson et al, 2013). Also, the medium in which the sound travels plays a role. For instance, sound is faster in water and on water surface and when the temperature is warmer (Mather, 2016).

Then the sound comes to the receiver, the person, rather the ear, where it goes through the peripheral and then the central auditory system in the brainstem and cortex to get encoded and located. How we subsequently perceive the sound is individual (Mather, 2016). A sound can be informative as well as emotional. It shows what happens around us and make us feel emotions (Mather, 2016). Sounds influence us, sometimes so we notice, sometimes not. They trigger emotions, influence our behaviour and help us to explore, experience and understand our environment (Blessner & Salter, 2007). Sound carries important information about the environment that help us to orientate and locate (Mather, 2016). There is a difference between active and focused listening and more passive hearing (Cerwén, 2017). Often sounds are not even noticed consciously and people are not aware of what they hear. These sounds still have an impact on us, our behaviour, emotions and our health and well-being.

## 1.4. Definition of noise

According to the Cambridge dictionary the definition of noise is

a sound or sounds, especially when it is unwanted, unpleasant, or loud

This definition shows how subjective the perception of noise is. How would you define unwanted, unpleasant or loud in a general way? These are factors that are perceived differently by different people and even different by the same person in different situations.

## 1.5. Noise perception and its impact on health and well-being

Sounds and noise are physically indistinguishable (Folkhälsomyndigheten, 2019). The classification as noise depends on an individual's perception. Generally, natural sounds are appreciated, technical sounds annoying and human made sounds somewhere in between (Cerwén, 2017). But the perception varies depending on several factors. For instance, sounds of neighbours can be perceived very differently. According to Pedersen (2021) a home is considered a safe space where one has control. She states that when sounds from neighbours create a "feeling of invasion of privacy" they become noise (Ljudmiljöcentrum Lunds Universitet, 2021). According to Kang & Schulte-Fortkamp (2016) the perception of noise depends on the characteristics of the sound itself like "frequency, intensity, duration



and meaning” as well as the circumstances of the receiver such as “context, attitude, expectations, fear, noise sensitivity and coping strategies”.

Sounds have an impact on our health. According to the WHO (2022) noise effects human health negatively:

“Excessive noise seriously harms human health and interferes with people’s daily activities at school, at work, at home and during leisure time. It can disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour.” (WHO,2022)

“Traffic noise alone is harmful to the health of almost every third person in the WHO European Region. One in five Europeans is regularly exposed to sound levels at night that could significantly damage health.” (WHO, 2022)

Being exposed to noise can lead to i. a. sleep disturbance and noise annoyance and thereby increased stress levels, which can evoke cardiovascular diseases and mental health issues like depression and anxiety (Kang & Schulte-Fortkamp, 2016; Beutel, 2016). Whereas traffic noise, for instance, has negative effects (WHO, 2018), nature sounds can contribute to the improvement of our health. There is not much research about positive health effects, but so far it shows that nature sounds can help recover from stress and thus have a restorative potential (Cerwén, 2017, Cerwén et al, 2016, Alvarsson, 2010). Kaplan & Kaplans (1989) Attention Restoration Theory (ART) describes how a restorative environment can support psychological restoration. According to this theory an environment needs to contain four attributes to be restorative – *fascination, being away, extension and compatibility*. Soft fascination for the environmental aspects, for instance, does not require the demanding mental focus (directed attention), so it helps to restore from attention fatigue and stress (Kaplan & Kaplan, 1989). Cerwén et al (2016) discuss in their study how nature sounds often in connection to other sensory modalities can evoke soft fascination.

However, Hellström (2014) points out that traffic noise and nature sounds coexist in an urban setting, which should be considered in research. Steele et al (2019) showed with their sound installation Musikkiosk that sound levels don’t have to be as low as possible in urban settings, the perception rather depends on the context and how the sounds contribute to the experience of the urban space, which is connected to the increased engagement of the users with their environment.

## 1.6. Soundscape as a sonic event

A soundscape is per definition of the International Organisation for Standardisation (ISO) the “acoustic environment as perceived or experienced and/or understood by a person or people, in context” (ISO, 2014). Several sound sources at the same time in an environment make a soundscape together with a spatial setting and the individual experiences of the receiver. The different sounds have different roles, such as distributing an atmosphere, narrating the situation or serving as a signal (Schafer, 1977). Gunnar Cerwén (2017) places soundscape in landscape architecture through the metaphor of R. Murray Schafer whereby a soundscape can be seen as a musical composition that contains not only noise, but enjoyable sounds. Hence, landscape architects can act as “composers” and influence the acoustics of an area through design and create the setting for soundscapes like a “concert hall”. Further he states that “[s]haping the land thus also involves shaping the passive acoustics or, in other words, the prerequisites for the composition.” (Cerwén, 2017, p. 17-18) However, demarcating soundscapes in outdoor environments is harder than indoors because the borders that demarcate a room outdoors are not as clear as walls that demarcate a room indoors. This entails a look at the discussion of what place is from another angle. The limits or borders of place are not always that clear either, they depend on perspective and interaction with the environment. Ingold (2011) states that “not the occupation of a world already built, but the very process of inhabiting the earth” creates place. Places not only are, they happen, and are thereby characterized by the actors who create them (Casey, 1966, p. 27). Gifford (2014) speaks of place as “the setting for life’s actions [...] where we conduct our day-to-day activities, where we journey to and where we and our ancestors have traversed”. Sounds are part of the happening that creates a place. Hence, soundscapes can contribute to placemaking. Visually, design elements support placemaking and so can even soundscapes make meaning of place. Blesser & Salter (2007) argue that a place per definition must not be delimited by physical boundaries. Their concept of the *acoustic arena* defines it as a “[...] region where listeners are part of a community that shares an ability to hear a sonic event.” (Blesser & Salter, 2007, p. 22).

## 1.7. The role of sound in a mixed-use city

Noise regulations that allow the industry to make noise to a certain extent already exist in industry areas. How to combine different types of areas in city planning is also already known (e. g. industry and residential areas). But combining industry and culture, as in Sofielund, is a new and interesting concept.

The concept of a mixed-use city has no clear definition. According to Bellander (2005) it means a city with access to public space that includes more than just housings and a social and diverse environment with a continuous street life, which is in addition supposed to make it more safe and secure.

Functional division or zoning of cities can even lead to isolation and segregation and even contribute to creating ‘borderlands’, like Yigit Turan (2021) explains about Superkilen, a park in Copenhagen, Denmark, where a ‘them’ and ‘us’ was created, although there were other motives laying behind.

Anyhow, according to Bellander (2005) a city should not be sleeping and only consist of one type of function (e. g. housings) but be vivid. Thereby, not only the image or identity of a city but a well-functioning living environment can be enhanced. Moreover, a mixed-use city entails social, economic and environmental advantages.

A vivid city life with all different types of establishments brings along a vivid soundscape. For instance, sounds from bars and restaurants often annoy people living nearby. Therefore, in many cities there exist noise regulations or even quiet zones. Again, this is a type of zoning that makes the achievement of a mixed-use city difficult. In an architecture magazine the importance of culture for a successful mixed-use city is discussed, but the authors are critical towards the *kulturljudzon* in Malmö (Pereira Norrman et al, 2021). They argue that by not including housings in the area Malmö city is working against building a mixed-use city.

However, solutions for noise reduction exist and are important tools for situations like these. For instance, buildings can function as shields (Nilsson et al, 2013). The HOSANNA project studied innovative ways to create noise barriers. In the following noise reduction will be resumed and discussed.

## 1.8. Forming identity through soundscapes

Landscapes have been used to influence identity and belonging (Sörlin, 1999). Sörlin (1999) states that a "sense of belonging is deeply rooted in emotion, memory and imagery: mental categories". The important role of landscape in building identity is connected to events and memories of events. He argues that identity must not be national, but is about community, which is created through a “shared set of

'givens', historically and geographically". Applying this to soundscapes means that this shared *acoustic arena* brings along a sense of togetherness (Blessner & Salter, 2007). By using sounds as a characteristic design feature, which can give places their own handwriting, people might identify with these places because they enjoy the sounds or soundscape and associate them with particular places and memories. These memories can create a sense of belonging and feeling of connectedness to the place and to a group of other people with similar preferences and memories. This again can bring along place identity and place attachment. Both concepts suggest that people form bonds with places, whereby place attachment is the cognitive-emotional bond between a person and a place and place identity has to do with "one's incorporation of a place into the larger concept of self" (Gifford, 2014, p. 275).

## 2. Aim

Facing the current development towards less culture in the cities and the challenge to create vivid cities with a high value for peoples' health and well-being, this thesis aims to examine the experience of the residents living in vicinity to the *kulturljudzon* in terms of how their perceived health and well-being is affected. It contributes through assisting professional planners in navigating the work with soundscapes in the planning of vibrant cities and enhancing peoples' health and well-being at the same time.

Altogether, through this example of the *kulturljudzon* Sofielund in Malmö, this thesis intends to contribute to an understanding of the aspects playing a part in noise perception in urban environments. These aspects and the resulting difficulties are elaborated in a structured explorative manner, meaning they are discovered with the help of a pre-arranged semi-structured mixed method approach that leads to insightful information. This should help strengthen the role of sound and soundscapes in landscape architecture and the planning of vibrant cities to make a difference for people's health and well-being as well as avoiding conflict and encouraging understanding and communication in the future.

The following questions serve to clarify the aim:

- How is the soundscape in the neighbourhood perceived?
- What is perceived as noise and in what context?
- What is the attitude towards the culture-sound-zone?

## 3. Methodology

This chapter explains the methodological procedure, how the participants were selected, and the data analysed.

### 3.1. Assessment and user experience

In this thesis the opinion and perceived health and well-being of the people living adjacent to the *kulturljudzon* is to be examined and analysed to get an understanding of their perspective and experience.

To gather the data from these residents a mixed method was used including both quantitative and qualitative data (Bryman, 2012). The questionnaire should contribute to getting an overall impression of the atmosphere in the surrounding area and help discover interview partners for the follow-up interviews, which should deepen the understanding and uncover diverse narratives.

#### 3.1.1. The quantitative inquiry

The quantitative part is dedicated to the overall impression of the average person living in proximity to the *kulturljudzon*. It consists of a questionnaire addressing the residents living closest to the area to investigate in a broader sense with a few questions their attitude towards the *kulturljudzon* as well as how they perceive the sounds of its soundscape.

The distribution of the questionnaire took place in March and April 2022. The link or QR code to the online questionnaire was distributed as printed paper notices in the whole area and on social media in the local Facebook group Sofielund. The possibility was offered to answer the questionnaire in Swedish or in English (see appendix 1+2). For the selection of the participants the location was relevant. About 100 notices were put up in the streets and on houses in the area and in direct neighbourhood to the zone in one round. The distribution of the link on social media enabled the extension of the outreach to more residents still within the area of Sofielund. With a control question it was determined if the participants really live in the area or somewhere else.

The questionnaire started with a gathering of personal data and letting the participants mark in which district they live to be able to examine if there are any differences between them and if the distance to the *kulturljudzon* has an impact. Therefore, the area was divided into five districts (see fig. 4).

With a numeric scale from 1 (I don't like it) to 5 (I really like it) the preference for the *kulturljudzon* in general was queried. Five steps were chosen to offer the participants the neutral option in the middle and respectively one answer in between the neutral and the extremes.

The two main questions - '*What sounds do you hear in and around your home and to what extent?*' (*not at all, slightly, moderately, very, extremely*) and '*How do you perceive these sounds?*' (*very annoying, slightly annoying, neutral, pleasant, very pleasant*) - were constructed as Likert scales again with five alternatives. Here, the four sound categories *traffic, industry sounds, social sounds* and *music* were queried respectively to get an understanding of the distributions.

Two additional open-ended questions enabled the participants to specify what other sounds they appreciate or find annoying. The intention with these questions was to gather further input and interesting aspects that besides supported the selection process of the participants for the follow-up interviews.

### 3.1.2. Description of the sample

The questionnaire was answered by 80 people, whereby 70 answered the Swedish and 10 the English version, which all were considered valid.

Most participating residents live in Annelund, then Norra Sofielund and Lönngården (see table 1). Six participants stated to live in none of the given areas (see fig. 6). In the further analysis these will be excluded since the aim is to address the residents living adjacent to the *kulturljudzon*. Consequently, the number of participants results in 74.



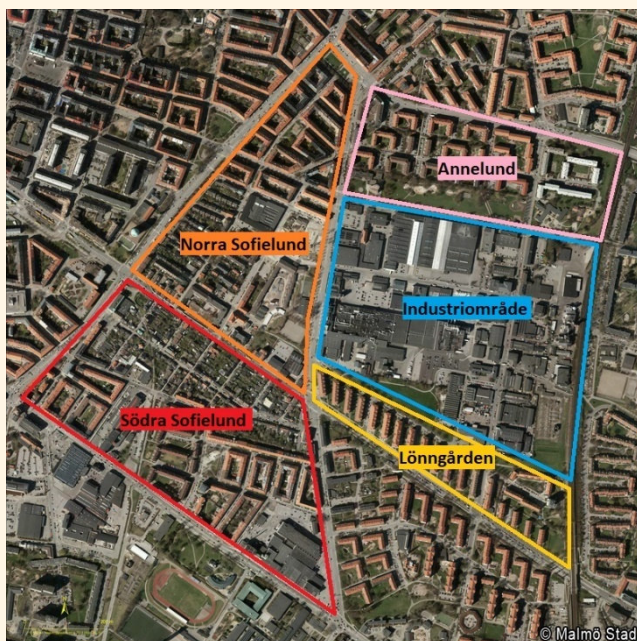


Figure 6. Division into areas.

Table 1. Distribution of residents in areas

Area	Frequency	Percent
Annelund	28	35,0
Lönngården	16	20,0
Norra Sofielund	23	28,7
Södra Sofielund	7	8,8
None of the above	6	7,5
Total	80	100,0

The gender distribution was 56,8% (N=42) female, 33,8% (N=25) male and 6,8% (N=5) non-binary. 2,7% (N=3) preferred not to answer. The majority of the participants (77%; N=57) were between 25 and 44 years old. Almost half were between 25 and 34 (see table 2).

Table 2. Age distribution

Age	Frequency	Percent
18-24	5	6,8
25-34	34	45,9
35-44	23	31,1
45-54	5	6,8
55-64	4	5,4
65+	3	4,1
Total	74	100,0



### 3.1.3. The qualitative inquiry

The qualitative approach includes interviews with three residents to get a deeper understanding of their perspective and perception and being able to start a discussion with the aid of exemplary narratives.

The interviews were semi-structured conversations based on open-ended questions about the participants preference and perception of the kulturljudzon to enable an exploration of when sounds are perceived as noise and in what context. A guideline of ten questions (see appendix 3), that were used in different orders and in different wording, ensured a communication within the framework of the research questions. Every interview started with the opening question '*What do you think about the kulturljudzon?*' to let them answer freely and express their feelings and thoughts about it without any leading question forcing them to start in a certain direction. Further, the questions, partly relating to the questionnaire and adapting to their telling, were aiming for a deeper explanation leaving space for their own narration including personal experiences and a description of the soundscape.

The interviews took place in June 2022. Each interview took about half an hour. There was a relaxed atmosphere at all three of them, sitting down and talking at places around the area which were chosen by the participants, so that they would feel comfortable. Before the actual interview the participants were informed again about the topic and purpose of the study, duration and procedure of the interview, and their rights. With their consent the interviews were audio recorded.

In table 3 below the participants are presented briefly. These names are fictional and were chosen to reflect the appropriate generation. In the results (see section 4.2.) the three are presented in text form with a short summary each, followed by a summarizing analysis. For the results the quotations have been translated into English. The original quotations in Swedish can be found in the appendix (see appendix 4).

*Table 3. Interviewees*

<b>Name</b>	<b>Age</b>	<b>Area</b>	<b>Location Interview</b>	<b>Preference</b>	<b>Traffic</b>
Boel	65+	Norra Sofielund	Home	5	Neutral
Robin	25-34	Annelund	Café	1	Neutral
Sara	35-44	Annelund	Outdoors on a park bench	5	Very annoying

### 3.1.4. Selection of participants

The participants for the quantitative part were determined by the distribution. Whoever walked by the notices could answer, but the aim was to reach the nearby residents. In the questionnaire the participants were asked if they would be open for being contacted for a follow-up interview, which was answered by 24 of them. After considering the results from the questionnaire, the three participants were selected from the 24 volunteers for the qualitative part. For the identification of these three the focus lied on finding people with different preferences and perceptions to be able to examine the various aspects. The intention was to obtain narratives with diverse perspectives on how the *kulturljudzon* can be perceived. Since the perception of noise is subjective, it is desirable to understand the perspectives more in depth. Hence, the question ‘What do you think of the *kulturljudzon*?’ was important for the selection. Further, the attitude towards traffic noise played a role, since the questionnaire gave an image of traffic being perceived as the most annoying sound. This attitude was detected through the answers on the main questions (perception of traffic noise) and the comments in the additional questions (*‘What other sounds do you appreciate?’* & *‘What other sounds annoy you?’*).

## 3.2. Analysis methods

The statistical analysis of the questionnaire was held descriptive because the mission was to find out about possible connections and getting an overview also in order to prepare for the interviews. The interviews were analysed thematically to structure the data and identify common and differing themes, patterns, and experiences (Brown & Clarke, 2006). First, the sound files were listened to several times to get to know the content. The next step was the transcription of the interviews, which was conducted as a verbatim transcription. It includes registering the emotions, repeats, self-corrections, stutters and pauses for reflection, which might be interesting for the interpretation of the perception. Each transcript ended up being about 7 pages. These transcripts were reviewed again several times to get familiar with the content, before coding them with keywords to structure the texts and find patterns. This facilitated the identification of themes, which concluded in the following:

- Importance of culture
- Individual background
- Buffer zones
- Home as safe space
- Sounds part of landscape
- Nature sounds

Finally, the analysis was written down presenting every participant followed by a concluding summary of the themes.

### 3.3. Background material

The introduction is supposed to provide a foundation for the understanding of the field. Information about the project itself was gathered through planprogrammet and Malmö stad as well as on-site visits. Literature was used to explain the concepts of mixed-use cities, identity and soundscapes as well as the investigation of the perception of sounds and noise linked to health and well-being.

### 3.4. Ethical considerations

The participants for the questionnaire as well as the interviewees directly before the interviews were informed about context and purpose of the study and that the participation is voluntarily and can be stopped at any time. They were asked about permission to record the interviews and use the information anonymously for this thesis solely.

## 4. Results

This section is presenting the results from the statistical analysis of the questionnaire. Furthermore, it entails the analysis of the interviews.

### 4.1. People's perception of the *kulturljudzon* – Questionnaire

#### 4.1.1. Preference

The following graph (figure 6) shows the appreciation for the *kulturljudzon*. 60% of those who know about the project really like the *kulturljudzon* and voted for the maximum value 5 (mean value = 4). 25,7% (N=19) did not answer this question. It is to assume that they have never heard of the *kulturljudzon* as the instructions were to skip it if one had not.

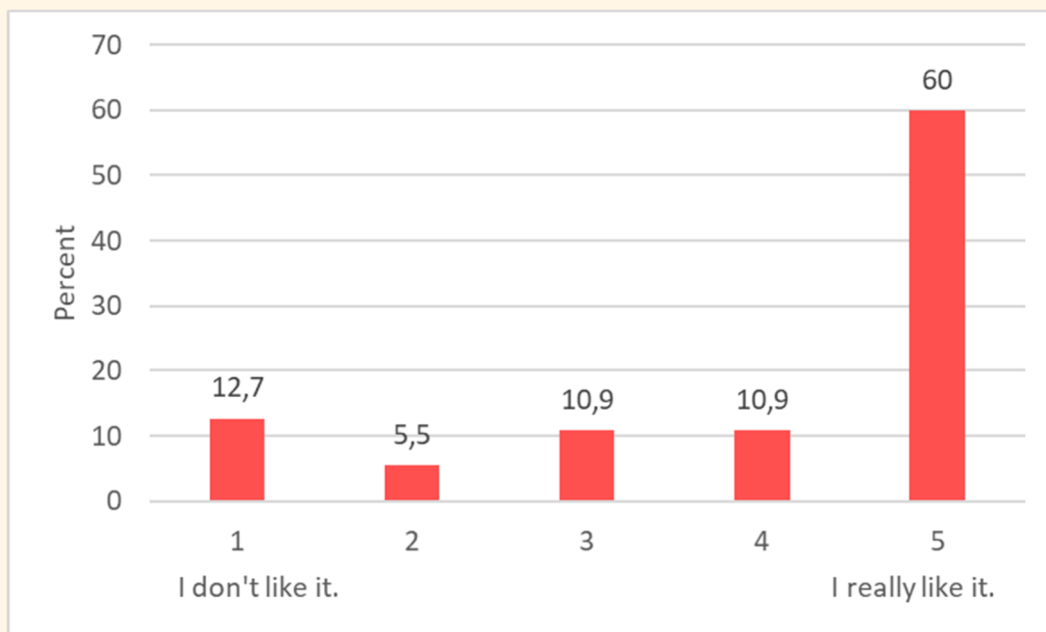


Figure 7. Preference for the *kulturljudzon*

### 4.1.2. Inclusion

Only one person was included in the planning process. More than 80% answered that they had not been part of it and the rest did not care. This confirms that the residents that answered didn't experience to have been included have not been included in the planning process, although most of them care.

### 4.1.3. Sounds

The questionnaire shows that traffic is the sound that is heard the most in the surroundings, followed by social sounds, music and last industry (see fig. 7). Traffic is also the sound that is perceived by 70% as slightly annoying or very annoying, whereas music is perceived as most pleasant by almost 50% (see fig. 8). That implies that for the residents traffic is the most disturbing sound in the area. Most residents are neutral to industry sounds and the perception of social sounds shows a disparity of responses. Of the four sounds music is appreciated the most.

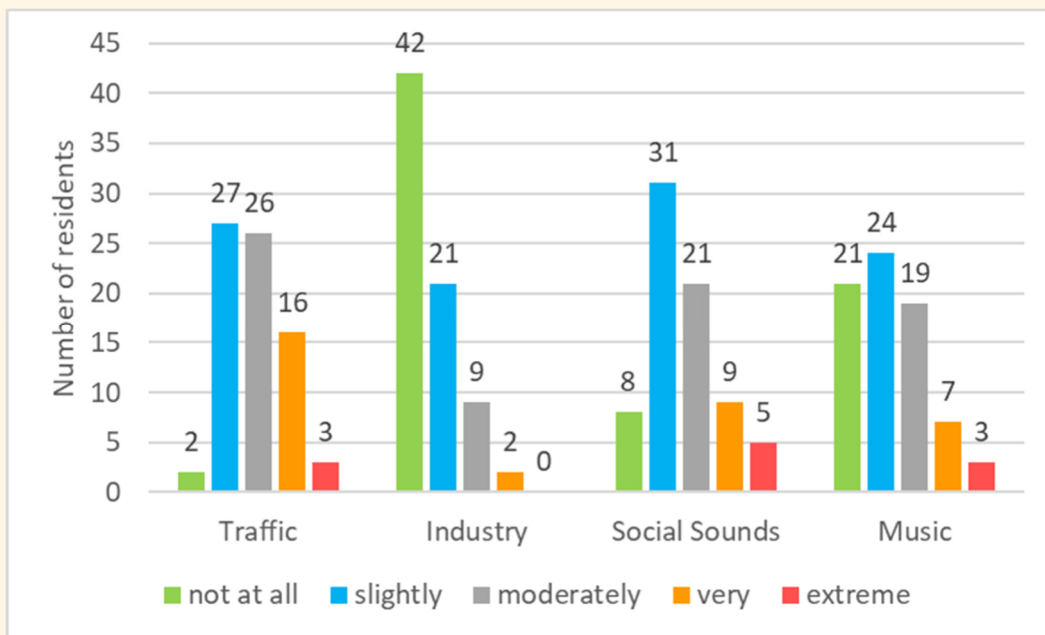


Figure 8. To what extent sounds are heard.

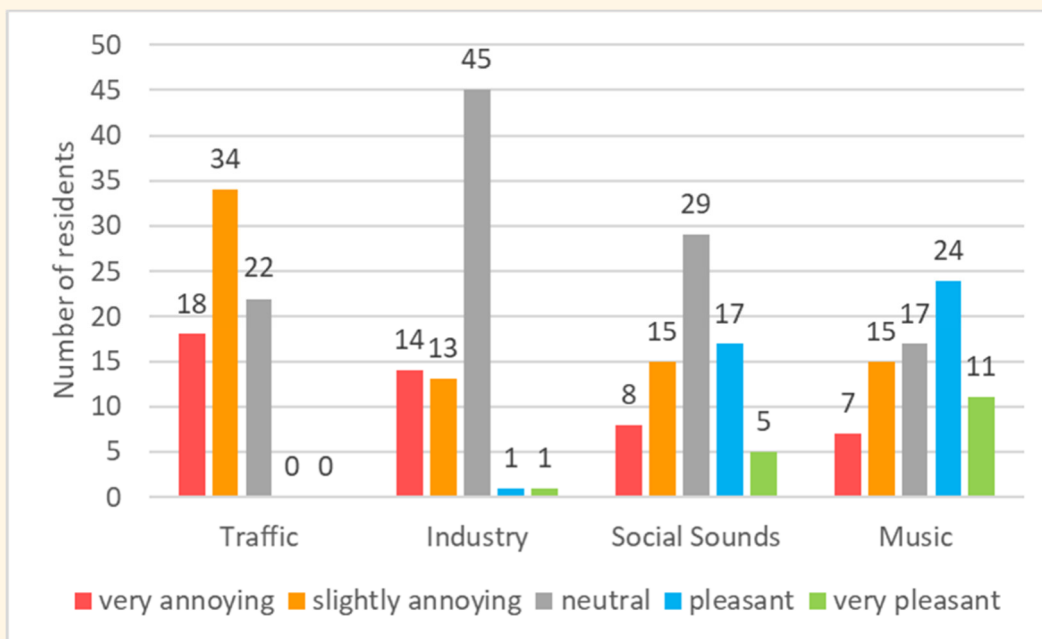


Figure 9. Perception of sounds.

The additional questions, where the participants were asked to add further sounds that they appreciate (*What other sounds do you appreciate?*) or find annoying (*What other sounds annoy you?*), revealed the following.

#### *What other sounds annoy you?*

Of the 41 people who answered this question more than a third (15) mentioned traffic as annoying. In this case traffic includes mostly cars accelerating, idling or honking, but also motorcycles, helicopters, trains, sirens of emergency vehicles or garbage trucks. Besides, the mentioning of seagulls was striking. People seem to find those very disturbing, as some called them “fiskmåsjävel”. A few named dogs barking as well.

Social sounds were described by several participants, such as children screaming or screaming in general, drunk people, people walking from/to the concert venue Plan B or noisy neighbours. Some find music annoying, especially the bass.

Other things mentioned were skateboards on pavement, fans, garden work, construction work, drilling, church bells and even the answers “everything” and “nothing” appeared.

In general, it can be noticed that the time of the day and the duration of the sounds play a large role for many. Furthermore, many answers were very specific (e.g. “two neighbours voices”), which stresses the subjectivity in perceiving sounds.

*What other sounds do you appreciate?*

Represented most clearly by more than 50% of the 40 answers (24)s were bird song or birds, which is interesting in contrast to the amount of people being annoyed by seagulls. However, two people mentioned even these.

Additionally to birds, other animals (e.g. dogs) were appreciated sounds. Also, nature sounds, such as rain, wind or the ocean, were named.

Social sounds like people talking, laughing or moving around and children playing were considered appreciated. So was music in different ways, may it be the neighbour singing opera, live music from concerts or bands playing in rehearsal rooms.

Two people mentioned silence specifically, especially at night. Other sounds mentioned were “soft sounds”, skateboards, demonstrations and trains.

Even here there were some very specific descriptions of appreciated sounds (e.g. “when they honk to remind about the Palestine issue”). Some simply appreciated that things are happening in the surroundings other than traffic or loud people. Further, irregularity and the importance of the right amount, volume and timing of the sounds as well as having the chance to decide on this or choose by oneself were important factors, even when the sounds are appreciated.

#### 4.1.4. Summary

Taken together, the questionnaire shows that the *kulturljudzon* is appreciated by most of the residents. It reveals that traffic is heard the most and states a problem, more than any other sounds. A difference between the areas they live in cannot be acknowledged. Moreover, it can be said that the sounds are subjectively perceived which makes it difficult to make generalized statements. To understand the individual perspectives better the following interviews will be helpful.

## 4.2. People's perception of the *kulturljudzon* – Interviews

### 4.2.1. Interview 1 – Boel

*"I think [the kulturljudzon] is really, really good. I am very happy about it." [1]*

Boel is a 65+ year old woman. She lives in Norra Sofielund and answered with '*I really like it*' (5) on the question '*What do you think about the kulturljudzon?*'. Her overall attitude towards the project is very positive, whereas she is quite neutral to traffic sounds. Usually, she is at home all day. This interview was conducted in Malmö, Sofielund.

#### *Not disturbed by culture sounds*

When asking about how much of the *kulturljudzon* Boel can hear she states that it does not disturb her at all. She can't hear a difference between now and before the decision was made, it's the same activities in the area now than before. However, she thinks it will sound more in the future. Further, she says that cultural sounds to her means concerts. When there are concerts, she can hear the music, but other than that she can't hear the culture sounds nor the industry sounds from where she lives and has thereby difficulties describing the soundscape of the *kulturljudzon*. That she can't hear a lot of these sounds, she says, may probably be because of the distance to the zone and the buildings in between blocking off the sounds. It has also to do with if the events are inside or outside.

#### *Pleasant social sounds*

When walking around in the park that is in the area, Boel hears children playing and people talking or singing and playing the guitar. These sounds she enjoys and perceives as relaxing. She likes hearing people being up and running and having a good time. She stresses that she is not talking about amplified music but acoustic guitar, these natural sounds she thinks are nice.

#### *Sudden vs. constant sounds*

The sounds Boel hears the most are traffic sounds and emergency vehicles and their sirens. She states that she perceives traffic sounds as quite neutral because she got used to it. However, the sirens annoy her. This has also to do with constant and sudden sounds. Since Boel is sensitive to sounds as a result of being burnt out, sudden sounds make her feel stressed. The traffic is more or less constant. Emergency vehicles and their sirens and alarms are suddenly appearing sounds and



thereby more stressful. Other sounds that fall into that category are seagulls and fireworks/firecrackers, shots, or explosions, which Boel mentions as annoying more than once. These she designates as the most stressful and unpleasant.

*"Yes... so [the seagulls] are probably similar to traffic noise, perhaps. So, these alarms that are... the emergency vehicles when they activate their sirens you can hear them of course and it's the same with these seagulls when they get started. But at the same time, because you know it belongs to the surrounding landscape, [it works]." [2]*

#### *Function makes it work*

Further, Boel explains that she finds traffic important, because she has a blind friend who is reliant on the access of the vehicle (taxi) to the buildings she needs to reach. Therefore, she would not want to remove all the traffic. The importance of its function contributes to accepting the sounds it makes. Also, knowing that it is part of the landscape, meaning the city in this case, makes it alright to accept.

#### *Relaxing nature sounds*

Sounds that Boel appreciates and would like to add to the area's soundscape are bird sounds – other than seagulls, preferably blackbirds – and water, which has a really calming effect on her.

#### *Your own choice*

In general, Boel likes culture and considers it important. However, she wants to seek out the culture she wants to enjoy and listen to instead of being forced into hearing it. She thinks the *kulturljudzon* being a specific zone is good, because people can choose whether they want to live there or in a calmer area, so one would know what one must expect.

*"I like culture, I think you should seek out the culture you want. I don't want to have a culture forced upon me air bound so to speak, I want to seek it out and hear it there and preferably not too loudly." [3]*

#### *Appreciation through participation*

Boel emphasizes many times during the conversation how much she loves the *kulturljudzon*, not least because culture is important to her and she appreciates that cultural events are gathered there. She was part of the planning process insofar that she together with her local tenants' association walked through the area, looked at the plans and stated their opinion. Incidentally, she was the only one of the persons to answer the questionnaire who participated in the planning process. To her it

seems that with the participation comes an understanding and appreciation for the project. She thinks that being part affects what one thinks about it, because one takes the time to familiarize oneself with what the proposal entails. She doesn't understand how one should understand what people think about it and why if they are not involved or not interested in being involved.

*“Well, it came as a proposal from the municipality, from the municipality of Malmö, to make this sound zone, and since it is right across, I was interested in what they think about it. And I'm committed, I've made an association for those who live in this neighbourhood. It is such a local tenants' association called 'Trevnaden', which is what the neighbourhood used to be called. So, we as an association went through the plans, we went and looked around in the area, looked at what was planned for it and so on. And then we stated our remarks.” [4]*

### *Summary*

Boel lives a little bit further from the area with buildings in between, that block of many sounds, which contributes to feeling less disturbed by them. Due to a prior burnout, she is sensitive to sudden sounds. Therefore, sounds like loud bangs tend to stress her, but the constant traffic sound, to which beyond she has become accustomed, is perceived as neutral. The fact that it is part of the landscape makes it even more acceptable for her. Moreover, she finds social sounds and nature sounds pleasant. To her the *kulturljudzon* it is a good solution and very appreciated. To her, a contributing factor was the participation in the planning process.

#### 4.2.2. Interview 2 – Robin

*"Well, spontaneously, I think it's a good idea, but I don't want it right here where I live."  
[5]*

Robin is non-binary and in the age group 25-34 years. He uses the gender pronoun 'he/him'. He lives in Annelund and is mostly at home around noon, in the evening and at night. He answered on the preference question with 1 (I don't like it). His perception of traffic sounds is neutral. This interview took place at a café in Malmö near the area.

##### *Good idea but not right there*

Robin thinks the project is a good idea and he understands the concept. He likes the idea of Malmö as a culture city and thinks it is important for them to push it forward, but he does not want it exactly where he lives. In his eyes there are too many residential buildings right nearby. Moreover, it is a problem on a personal level. He does not want it right there because of the psychological stress of his partners sound sensitivity.

Culture is important to Robin. It is a way for people to communicate with each other. He works as an illustrator and thinks culture needs to be free. He would like culture not to be perceived as a disturbance. He wants it to be something that everyone can take part in if they want and choose it. Therefore, culture must be accessible, which creates the struggle, because then it also needs to be as central as possible, where it is most disturbing. This balance between availability or access and that it does not disturb people he finds important but very difficult. He sees the point and agrees that culture should not be pushed out of the cities. It is a struggle for him to feel both ways. He did not think about that before he met his partner, but noise that disturbs a moment is really something that can make one feel mentally ill, he says.

##### *Partner sensitive to sounds*

Robin lives together with his partner, who is very sensitive to sounds. Robin says that he himself is not sensitive to sounds, that he can filter them or fade them out, but the strong reactions of his partner have an impact on him too.

*"I like the sound of the seagulls. Stressful sounds are this basketball court and music. I'm pretty neutral about other sounds. I mentioned that my partner is very sensitive to sound and he reacts much more strongly to various sounds and it is more his reaction that can make me stressed or feel bad, but the sounds themselves are mostly neutral." [6]*

### *Most sounds neutral*

Since Robin lives in Annelund near the park (Enskifteshagen), which is the borderland to the *kulturljudzon*, he hears a lot of it, at least from the parts that are closest to the park. There are rehearsal studios, culture schools and an open art hall where they have sound installations. The rehearsal studios send out mostly bass and drums. To him it is not much noise, rather it is noticeably musically. Still, he perceives the music as stressful. Further, the sounds of the basket court in the park annoys him a lot. These sounds get worse due to the echoing.

He says that he hasn't noticed a difference since the decision was made. It has always been pretty rowdy, and it seems like the culture has just continued as it always has, but with more freedom, he believes. However, it depends a bit on season and time of the day. During the summer there is more activity, so is it mostly from five o'clock onwards.

He reflects that he usually not thinks about sounds actively, but most sounds he perceives as quite neutral. For instance, he doesn't care much about traffic. Though, he thinks the traffic would be more annoying if they would live closer to the road. Now the window is not directly by the road, but next to the park. Because he lives near the park where people like to hang out, he hears many very happy and rowdy people. These social sounds he perceives as quite neutral as well, though it depends. Sometimes it can get annoying in the evening when teens are screaming or adults arguing, and it is getting worse through the echo.

He likes the sound of seagulls. That and nature sounds are the only sounds he labels positively.

Again, it is more his partners reactions to the sounds than the sounds themselves that stress him or make him feel bad.

If he could, he would remove the basket court and the rehearsal studios, because these produce the most annoying sounds. On the contrary he would add bird sounds - additionally to seagulls - and ocean and nature sounds, because he would not want to disturb someone else, and he thinks that nature sounds are nice and a safe choice.

### *Echo*

Robin explains that it echoes extremely between the houses so that it is heard very much as well as it is amplified a lot. For instance, the social sounds from the park in the evening get worse through the echo. There have also been a few times when there has been a club or concert on Norra Grängesbergsgatan when it has felt like it was right in the living room.

### *Home a place for relaxing*

In his home Robin wants to relax, and he wants his partner to be able to relax. He would say that the echo makes it worse in the apartment. When being on the ground outside he would describe the sounds as not as intrusive. He feels like through the echo the home as a safe space for relaxation is being invaded by the sounds.

### *Inclusion in process*

Robin explains that he has not been part of the planning process and didn't know about the project until he read about the decision. He was not amused. His partner then contacted the municipality, they said it should have been the duty of the housing association to forward the information. He wanted to be part of the process and get asked to at least get the chance to say what he thinks about it even if it wouldn't had changed the outcome. It would have felt better, and the message would have been less stressful for his partner.

*"We pretty much received in the mailbox one day 'congratulations, you now live next to a kulturljudzon'. It wasn't that fun." [7]*

### *Summary*

The kulturljudzon is in Robins' eyes a partly good and partly bad idea. On the one hand he wants culture to be accessible for everyone, on the other hand he wants it to not disturb people, especially him and his partner, who is very sensitive to sounds and his reactions have an impact on his stress level. Robin himself is mostly disturbed by music and the echo of some sounds and perceives most other sounds as quite neutral. He wants his home to be a place of recreation and peace.

### 4.2.3. Interview 3 – Sara

*"Well, I probably have a very positive attitude towards culture and music, absolutely. I think it's nice." [8]*

Sara is a woman between 35-44 years. She too lives in Annelund. Her preference for the *kulturljudzon* is 5 (I really like it), whereas she perceives traffic sounds as very annoying. She is mostly at home in the evening, at night and on the weekends. This interview was conducted in Malmö, Värnhem.

#### *Loves music*

Though Sara is unsure about what the *kulturljudzon* really entails, she likes it very much. Like the other interviewees she doesn't think there is a difference in the soundscape since the decision was made. She always hears quite a lot of sounds from the rehearsal studios, mostly drums, which she finds very nice and cosy to listen to. She likes it when something happens in the area, like a concert, or the like. If she could, she would add even more music to the area's soundscape.

#### *Social sounds from the park*

Sara hears quite a lot of social sounds from the park that lies directly in between the zone and where she lives (Enskifteshagen). Children playing, people talking and the events during the summer she perceives as quite nice, except from when there are too many events during the summer, then it can be a little too much for her sometimes.

#### *Traffic most annoying*

Traffic sounds, cars but especially heavy traffic like trucks, are the most annoying sounds to Sara. She hears the road quite a lot – she thinks it is Amiralsgatan – and though it is different from every room she perceives these as most stressful, mostly at night when trying to sleep with the window open, because it is an unusual sound. At the same time, she sees it as something one must live with when living in the city and she finds it nice with traffic insofar that it enables a great connection. Therefore, it is acceptable, despite from heavy traffic at night, but she is happy that she doesn't live closer to the road. If she could, she would remove the trucks at least. Other than that, the only sounds she mentions might annoy her sometimes are dogs barking, mostly guard dogs at a store, seagulls, which she would remove, too, and the fans from a store if she sleeps with her window open at night. She says that all sounds are of course always more annoying when the windows are open. She

talks about not being so sensitive to sounds, only a little sensitive to steady ongoing sounds such as her constantly beeping heater that annoys her.

#### *Passive hearing*

Sara needs to think a while when being asked about what sounds she hears and how she perceives them. She is unsure about what is part of culture sounds and what is not and says she does not think about sounds actively a lot, except from the rehearsal studios. These she really appreciates and even mentions to others, talking about how much she likes them. This underlines her appreciation of music and being in the middle of such happenings.

*"You don't often think about sounds in that way, I guess. They are just there." [9]*

#### *Access to culture*

To Sara culture sounds are concerts and music. She likes both very much and considers them important. Therefore, she considers having access to culture important too, which is why she thinks the *kulturljudzon* is a good idea that even should be implemented at more places in the city. She prefers a vivid city with not only housings, but with something happening. To her that's the point with living in the city. She states that protecting that with the *kulturljudzon* will allow the cultural life to live and the district to be vivid. This is where she wants to live and the reason why she lives in the city.

*"Yeah, definitely because I like culture, but I also think it's good because... well, in some way, I think it's fun to have such a rather vibrant neighbourhood, not solely residential buildings but something going on. So, it feels like that's the point, because if you protect this, it feels like you will allow it to live like... continue to live the cultural life there. So, I think that's why I'm probably very positive because I'd like it to be a lot of things going on there and that it's not just residential buildings being built and such." [10]*

#### *Part of city life*

When being asked what she would add to the soundscape, besides music Sara answered with water. She would love to have rippling water on her balcony because this sound is calming to her. Other nature sounds she likes too, but she does not necessarily need them in the area. She says she has never thought about it, and they would probably not fit the environment. Because it is the city environment the sounds there are acceptable. She wouldn't like to have traffic sounds or concerts when being in a cottage in nature, but she chose to live in the city for a reason and this makes her able to adapt to the situation. If it is part of surroundings or happenings it is okay. That also applies to the difference between being inside and outside. Many sounds are more annoying when she is at home trying to relax, e. g.

watching a movie, but when being outside she does not notice it as much, then it is just part of being outside.

#### *Summary*

Thinking about sounds actively is nothing Sara does regularly. She likes music a lot, she would even add more music if possible. To her having access to culture and building a vivid city is important, which is why she appreciates the *kulturljudzon*. Overall, she is not disturbed by a lot of sounds, except from at night when she tries to sleep. She appreciates living in the city and sees it as her choice to live there with everything that this brings along, so if the sounds fit the environment it works for her, because she knows what to expect. This way, she can accept sounds like traffic better although she finds it unpleasant and stressful. She too would appreciate the sound of water as a relaxing influence.

#### 4.2.4. Summarizing analysis

This summary highlights the similarities and captures the differences in the experiences of sound perception showing its complexity. There cannot be drawn generalising conclusions on three people, but their narratives show how differently sounds can be perceived, what they have in common and what needs to be thought of in future projects. The selection of participants intended from the beginning the receiving of different narratives.

#### *Importance of culture*

The access to culture plays a role in all three interviews. They all consider culture important and think it is crucial for a vivid city and its availability that it is placed in the city and not pushed outside, even though Robin might struggle with the positioning. The appreciation of culture alone is not enough, the balance between having access to culture nearby and not being disturbed by it is crucial. Everyone should be able to decide by themselves if and when they want access to culture, but the possibility should be given.

#### *Individual background*

The burnout from Boel, which makes her sensitive to sudden sounds, and the fact that Robins partner is sensitive to sounds, which has an impact on Robins stress level, are factors that influence their noise perception. It is a challenge to include everyone's factors, but it must be considered that people can be more or less sensitive to sounds due to their individual background.



### *Buffer zones*

The distance to the area and what is in between seems to play a role. Whilst Boel lives a bit further from the zone where larger buildings shield the housings from many sounds, Robin and C, both living in Annelund, only have the park as buffer between them and the *kulturljudzon*. Robin even experiences an echo due to the placing of the buildings. This shows the importance of considering the differences in architecture and sound distribution in the area. This way, it can be spotted where actions need to be taken.

### *Home as safe space*

The participants describe a difference between the perception of sounds inside and outside. Outside when being part of the environment and happenings, the sounds are part of it too. There they might be less annoying. Hence, the own four walls are supposed to be a place of relaxation, where sounds can be perceived as an invasion of privacy, e.g. because the partner gets stressed (Robin) or one is trying to sleep or doing something else where the sounds from outdoors might interfere with, such as watching a movie (Sara). So, which sounds they are disturbed by depends a lot on the respective context.

### *Sounds part of landscape*

There seems to be a coherence between sounds and the environment insofar that if the sounds fit their surroundings, they seem to be more acceptable, as for instance traffic sounds for Boel and Sara. Especially the interview with Sara shows this. She chose and wants to live in a vivid city and appreciates the sounds that come with that. Some sounds, like traffic sounds, she can easier accept because they belong to the soundscape of a city. Hence, Boel can accept traffic because its function is important to her. Further, she is not disturbed by certain sounds anymore because she got used to them. For Robin it is harder to accept because he is affected too much by his partners sound sensitivity.

### *Nature sounds*

A common thread is the mentioning of nature sounds. All three participants were asked which sounds they would like to add to the soundscape. They all answered with water and/or bird song. They give as a reason that especially the sound of water has a calming effect on them.

## 5. Discussion

This section contains a brief recap of the key results and their interpretation. Moreover, a method reflection discusses the limitations of the study and what aspects influenced the results. The aim was to use the *kulturljudzon* as an example to gather aspects that play a role in noise perception to support the work with sounds and soundscapes to enhance people's health and well-being and evolve the planning of vibrant cities. Thereby the focus must not only lie on the source and the path (noise prevention) but on the receiver too (perception, individual background, subjectivity).

### 5.1. Main findings

The outcome of this research shows which problems the perception of noise of the *kulturljudzon* and its surroundings brings along. It has provided insight into the similarities and differences in noise perception and how this perception can vary a lot. However, it reveals also common patterns. In the following, aspects from the overall perception shown in the questionnaire and the individual experiences presented in the interviews are discussed.

#### *Noise subjectivity*

The questionnaire reveals that the sound that annoys most people is traffic, whereas music was the most appreciated. So, the real problem of noise in the area might be traffic more than the sounds from the actual *kulturljudzon*. The interviews give a more nuanced image of the perception of traffic sounds. One participant got used to and can accept it, another one can accept it because she considers it to be part of the city soundscape. However, even if it is acceptable, some residents are still disturbed mostly at night when trying to sleep. As traffic noise has negative health effects (WHO, 2018) this is to consider a problem.

Most of the participants mentioned nature sounds as positive, appreciated, or soothing, both in the questionnaire and in the interviews. The most mentioned were bird song or birds. That acknowledges the research, that says nature sounds can

help recover from stress and thus have a restorative potential (Cerwén, 2017; Cerwén et al, 2016). It too refers to the biophilia hypothesis (Wilson, 1984) that describes the tendency to seek connection with nature. One approach can be to increase the nature sounds in the area and the possibility to experience them for enhanced health and well-being with the help of soft fascination in Kaplan & Kaplans (1989) Attention Restoration Theory as a tool to create restorative soundscapes.

At the same time traffic noise and nature sounds coexist in an urban setting, which needs to be dealt with (Hellström, 2014). Instead of wanting the urban environment to be quiet, a thinking, like some of the interviewees had, that sounds should be seen as part of their surroundings, the fitting soundscape to the fitting landscape, might contribute to acceptance, what might influence the perception. Sounds are providing information about the surroundings and contribute giving meaning to it (Mather, 2016; Gifford, 2014). Considering the function of the things in the environment that make noise as important seems to alleviate the annoyance and increase the acceptance for certain sounds. This could then even lead to decreased stress and anxiety.

The fitting of the sound to the environment or situation reflects in this study even on another level. The participants talked about differences in the experience of certain sounds and it turns out that sounds like a basketball bouncing on the court, people screaming or bands rehearsing seems to be more “fitting” and acceptable when being outside in the middle of these happenings, but more annoying when being inside trying to e.g. watch a movie. As we know from the Musikkiosk experiment the context is crucial for how we perceive the urban soundscape and thereby experience the urban environment (Steele et al, 2019). The engagement of the users with their surroundings contributed to a positive perception, which can be used as tool for an enhanced connectedness with the environment and thereby a revised attitude towards the sounds. In this case, this might apply to music and might not help solving the problem with traffic noise. At the same time, according to Pedersen (2019) sounds from neighbours can create a “feeling of invasion of privacy” and thereby become noise. These sounds are then experienced as intruders of one’s safe space, one’s home. This phenomenon seems not only to apply to sounds from neighbours, but from the whole surrounding area.

However, the results show how subjective the perception of sounds is. For instance, the two open questions in the end of the questionnaire gave several very specific descriptions of sounds and what is perceived as noise. Another clear example for this individual level is one participant’s narration of living together with a partner who suffers from sound sensitivity. Here, even another person’s perception influences the own health and well-being, especially the stress level. This is only one example for many different individual levels of perception. This

clearly shows the importance of considering that the perception of sounds is influenced by both the sound itself and the receiver (Mather, 2016; Gifford, 2014; Kang & Schulte-Fortkamp, 2016). In praxis this means that the collective of planners, municipalities or others need to be aware of that fact and instead of solely focusing on noise prevention work with democratic processes to include the individuals, which for instance can be achieved with an improved communication to create a common ground. The individuals needs must be taken into account, but at the same time of course not all of these single needs can be included.

According to Cassegård (2014) public space functions as an arena of life and platform for representation. If you acknowledge the culture scene as marginalized because it is pushed out from the cities, the *kulturljudzon* makes the marginalized visible – or in this case hearable using the soundscape to reach the excluded. At the same time, one could argue that the residents become the new marginalized group in this area. These dynamics in power relations need to be emphasized in the work. The challenge here is not to separate the parties but create a space where the culture scene and the residents can come together.

#### *Involvement and identity*

From the results no conclusions can be drawn regarding the connection between citizen involvement and appreciation for the *kulturljudzon* because there was only one person included of the ones participating in this study. However, Boel talks about how it seems to her as if along with the participation comes an understanding and appreciation for the project, because it affects the way one thinks about it. Another one explains how he would have appreciated to be included and given the opportunity to make his voice heard. In what way this would influence his perception of sounds remains only to speculate. However, an engagement with the surrounding environment can affect the perception positively (Steele et al, 2019). To strengthen the relation of the residents with the *kulturljudzon* interaction is needed. If a place is defined through what happens there (Casey, 1966), sounds, like the cultural sounds in Sofielund, can define a place and make meaning to it, which again is connected to the creation of identity. If then the residents feel that they are part of this place and this again creates a sense of belonging and togetherness (Burlingame, 2020), their perception of what is noise to them might be impacted positively. Instead, these sounds can be the creators of memories about being connected to the community and thereby positively charged, creating place identity and belonging (Sörlin, 1999). This can be explored in further research.

#### *Importance of culture*

The results, mainly the interviews, show that culture is appreciated among the participants and the accessibility to culture is wanted, but they also reveal that it is

a challenge to balance the assurance of accessibility and the retention of peace and quiet for the residents. At the same time, one could argue that if people live in the city, they need to adapt to the city soundscape, like Sara does.

Just recently this was a topic again in Stockholm. There, the Fylkingen, an artist-run, non-profit association for experimental music and art with an own venue in central Stockholm, is being terminated from its premises after 36 years, because the landlord believes that the business is too loud and disturbs the adjacent offices. (DN 2022) This is a classic example for an incident of this kind, which emphasizes the increasingly occurring problem with culture being pushed out from the cities. This starts the discussion again about adaptation to wherever one settles. Moving to the countryside and complaining about the farmer doing his work or moving next to the seaside and complaining about the wind seems less common than complaining about loud music in the cities. If one adheres to the definition of Bellander (2005) a city should be vivid, not sleeping, and it should consist of more than only one type of function, not solely housings. When moving to the city this vividness is to be expected. Eventually, the pandemic could function as an eye-opener. Jonas Naddebo, municipal commissioner for culture in Stockholm, sees Malmö's 'kulturljudzon' as a good example (da Silva et al., 2021). He says that a lot of people now during the pandemic became aware of the importance of a vibrant city and it is going to be interesting to follow the happenings in Malmö. This development might be followed up in further research, both as case study of this *kulturljudzon* and in its entirety.

Strict functional zoning like creating noise zones and quiet zones can be problematic for a mixed-use city and can even lead to segregation and isolation (Bellander, 2005; Yigit Turan, 2021). The creation of "the others" is indicated in the debate around the *kulturljudzon* through the development towards the "culture supporters vs. residents" conflict. On the other hand, the *kulturljudzon* creates space for culture which is very important to counteract the problematic situation of decreasing access to culture in inner cities. An aspect in the interviews was about one's own choice to consume culture. Having a choice requires there to be access to it.

### *Physical environment*

The differing experiences of the participants are partially due to the shape of what is in between the sound source and the receiving person. As we know, distance and the surfaces where the sounds reflect play a role in sound propagation (Mather, 2016; Nilsson et al, 2013). The *acoustic arena* can be influenced by physical boundaries (Blessner & Salter, 2007). Some objects and formations shield sounds better than others and work as a buffer. The placement of i. a. buildings can either work like a shield or contribute to an emergence of echo, like it does for Boel.

Moreover, soft surfaces like vegetation reduce noise, which is why Nilsson et al (2013) have come to sustainable solutions focusing on vegetation and the materiality of the ground. Further, they stress the importance of combining solutions to reduce noise effectively. It is important to consider the architecture and landscape architecture to prevent disturbance through sound distribution as much as possible for everyone in the whole area equally, so that mixed-use cities can be created. In this case, when the housings already existed before the creation of the zone, one needs to make adjustments where it is needed. The solutions with vegetation are excellent for this and can be managed as an addition to the existing physical environment. Defining the borders of the *kulturljudzon* on the map will not stop the sounds right there. For the adjacent areas the delimitation of the *kulturljudzon* entails at the moment either the formation of buffer zones (parks) or the adjacent residential buildings become the buffer itself. These buffer zones become important not only for the sound distribution but how they are used. For instance, the park (Enskifteshagen) in between the *kulturljudzon* and Annelund is used a lot, which makes it valuable. It thereby creates a lot of social sounds too, what could be considered as a quality or as noise disturbance, but it is important that such buffer zones don't become abandoned places. The function in terms of noise regulation cannot disregard the use, otherwise they can contribute to the creation of "the others" (Yigit Turan, 2021), which has counterproductive effects on a communal understanding and acceptance.

## 5.2. Method reflection

The mixed method of this thesis contained the questionnaire providing an overall impression of the residents' perception and a basis for the interviews that delivered three different narratives deepening the understanding. However, there were a few difficulties in the different parts.

The outreach to the residents in the total area turned out to be a challenge due to i. a. data privacy. The questionnaire was distributed as paper notices with a QR code to an online questionnaire in the whole area in and around the *kulturljudzon* and on social media with the possibility given to answer in Swedish or English to reach as many residents as possible. Using a QR code worked without any further complications. This way, the data was gathered automatically online and the step of compiling the data manually became obsolete. However, a large number of answers could not be ensured, which has an impact on the results. Given that in the whole adjacent neighbourhood – depending on what is considered included – contains about estimated 12.000 residents, the sample of 80 people cannot represent the whole population.

Furthermore, the selection of the interview partners was limited due to the given response. Of the ones willing to participate only a few remained to choose of to find a variety of people with different stories to tell. Still, it was possible to meet the intention of extracting diverse narratives giving perspectives on how the *kulturljudzon* can be perceived. Three participants were chosen considering their preference for the *kulturljudzon* and with focus on the attitude towards traffic. Anyhow, the time limit would not have allowed the number of interviews to be increased too much.

There might be other perspectives hidden in the narratives of the participants that were not selected for the interviews. These can provide insight into further individual factors but also into other similarities. Further, this study focuses on the residents, but there is potential for perspectives from other people interacting with and in this area that could be considered. These people could be for instance workers representing the industry, musicians or other representatives of creative and cultural activity, visitors, and others.

In the questionnaire the place of residence was demanded to examine if it plays a role in noise perception. The area was divided into five areas between which the participants could choose and show where they live. This was mostly helpful for choosing the persons for the follow-up interviews, but it lacked the exact place of residence and the accurate distance to the zone, so that a more precise statement about possible connections could have been made. This would have been achieved with a map where the participants pinned their exact place of residence, which could not be managed in the tool that was used for this online questionnaire. Additionally, movement patterns could have been studied to broaden the examination of the possible connectedness of noise perception and where in the area the residents spend time. Moreover, the time of the day has been considered, but it too turned out to be difficult to connect to the sound perception.

To get an understanding of the distribution of noise perception, the sounds of interest were divided into the four categories: *traffic*, *industry sounds*, *social sounds* and *music*. Due to the subjectivity of perception these four chosen sound categories, and which sounds they respectively include, might be interpreted differently. Eventually, a more detailed explanation would be beneficial, to ensure a common basis for the evaluation. At the same time the questionnaire was supposed to be kept general and further with the interviews more specific sounds got clarified.

The *kulturljudzon* and its surrounding area is quite new and still about to develop. One could ask the residents again about it in a few years and see if there are any differences or more striking developments.



## 6. Conclusion

This thesis is meant to be an inspiration for future studies and an assistance for professional planners in the form of reference points in navigating the work with soundscapes in the planning of vibrant cities. The intention of evaluating the *kulturljudzon* was to present the problems of noise perception that emerge and show what we can learn from them.

The results have revealed that traffic noise is perceived as most annoying, whereas music is appreciated the most and bird song and other nature sounds mentioned of the majority as additional preference. This indicates that not the cultural sounds of the *kulturljudzon* are the main problem, but traffic noise seems to be, which already is linked to negative health effects in research. Further, the mentioning of bird song and other natural sounds as appreciated emphasize its positive effects on health and well-being. However, the more in-depth interviews revealed some differences in the perception of diverse sounds, which indicates the complexity of noise perception. This makes it challenging to include all individuals, which shows the importance of considering democracy and power relations when planning mixed-use cities. Despite different reactions to the cultural sounds, the appreciation for and importance of culture is reflected in the results. Furthermore, the function of the elements in urban environments seems to be important for the noise annoyance and acceptance. Creating restorative soundscapes in urban environments must take consideration for the dimensions of urban sound. Thereby both the physical environment and the psychological processes must be considered, which highlights the importance of cooperation between landscape architecture and environmental psychology.

Future research should follow the development of the *kulturljudzon* in *Sofielund* as well as the general development of culture being pushed out of cities as it requires solutions. Further, it can be explored how sounds can contribute to creating identity and how this influences the noise perception. Lastly, it should be further investigated how the fact that urban soundscapes fit the urban environments interplays with the perception of noise.



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# Appendix 1 – Questionnaire / English

## KULTURLJUDZON SOFIELUND

Estimated time: under 10 minutes

Dear participants,

In 2021 Malmö town has decided to create a ‘kulturljudzon’ in Sofielunds industry area, where industry and culture sounds are allowed.

I am a student at the Swedish University of Agricultural Sciences (SLU). As part of my master thesis I invite you to be part of the research and give your opinion by completing the following survey. The aim is to investigate what you as adjacent residents think about the ‘kulturljudzon’ and how it impacts you.

The participation is completely on a voluntary basis. Your answers will be anonymous. The data collected will remain confidential and used solely for academic purposes.

Thank you for taking your time!

Sincerely,  
Amanda Schmidt

### Personal Data

#### Gender

female       male       non-binary       I prefer not to say.

#### Age

under 18       18-24       25-34       35-44       45-54       55-64

65+       I prefer not to say.

Where do you live? (Please mark on the map.)



When are you mostly at home? (Multiple answers possible.)

- Morning     Noon     Evening     Night

### Questions

1) What do you think of the ‘kulturljudzon’?

I don't like it                      1   2   3   4   5                      I really like it

I've never heard about it.

2) Were you included in the planning process?

Yes.                                       No.                                       I don't care to be included.

3) What sounds do you hear in and around your home and to what extent? (Please select the option you consider the most appropriate.)

	not at all	slightly	moderately	very	extremely
Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social sounds (e.g. crowds of people)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Music	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4) How do you perceive these sounds? (Please select the option you consider the most appropriate.)

	very annoying	(slightly) annoying	neutral	(slightly) pleasant	very pleasant
Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industry sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Music	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What other sounds annoy you?

---

What other sounds do you appreciate?

---

If you want to communicate your perspective further and you could imagine being contacted for a follow-up interview, please fill in your contact information below. I would very much appreciate your contribution.

Name: \_\_\_\_\_

E-Mail or Phone: \_\_\_\_\_

## Appendix 2 – Questionnaire / Swedish

### KULTURLJUDZON SOFIELUND

Beräknad tid: under 10 minuter

Kära deltagare,

2021 kom beslutet av Malmö stad att skapa en kulturljudzon i Sofielunds verksamhetsområde, där industri- och kulturljud tillåts.

Jag är student vid Sveriges Lantbruksuniversitet (SLU). Som en del av mitt examensarbete inbjuder jag dig att vara en del av forskningen och ge din åsikt genom att fylla i följande undersökning. Syftet är att undersöka vad du som granne till området tycker om kulturljudzonen och hur den påverkar dig.

Deltagandet är helt på frivillig basis. Dina svar kommer att vara anonyma. De insamlade uppgifterna kommer att förbli konfidentiella och användas endast för akademiska syften.

Tack för att du tar dig tid!

Vänliga hälsningar,  
Amanda Schmidt

#### Personlig information

Kön

kvinna     man     ickebinär     Vill ej svara.

Ålder

under 18     18-24     25-34     35-44     45-54     55-64

65+     Vill ej svara.



Var bor du? (Markera på kartan.)



När är du mest hemma? (Möjligt att ge flera svar.)

morgon     mitt på dagen     kväll     natt

### Frågor

1) Vad tycker du om kulturljudzonen?

Jag gillar den inte      1   2   3   4   5      Jag gillar den verkligen

Jag har aldrig hört talas om det.

2) Var du inkluderad i planeringsprocessen?

Ja.     Nej.     Jag bryr mig inte om att vara inkluderad.

3) Vilka ljud hör du i och runt ditt hem och i vilken utsträckning? (Välj det alternativ som du anser är lämpligast.)

	inte alls	lite	måttligt	mycket	extremt
Trafikljud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industriljud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sociala ljud (t. ex. folkmassor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Musik	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4) Hur uppfattar du dessa ljud? (Välj det alternativ som du anser är lämpligast.)

	väldigt irriterande	(lite) irriterande	neutral	(lite) trevlig	väldigt trevlig
Trafikljud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industriljud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sociala ljud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Musik	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Vilka andra ljud irriterar dig?

---

Vilka andra ljud uppskattar du?

---

Om du vill förmedla ditt perspektiv vidare och du skulle kunna tänka dig att bli kontaktad för en uppföljande intervju, vänligen fyll i dina kontaktuppgifter nedan. Jag skulle verkligen uppskatta ditt bidrag.

Namn: \_\_\_\_\_

Mejladress eller mobilnummer: \_\_\_\_\_

## Appendix 3 – Questions guideline interviews

1. What do you think about the *kulturljudzon*?
2. What times of the day are you at home? How much from the *kulturljudzon* do you hear from home? (Is there a difference since the decision was made?)
3. How would you describe its soundscape (or the soundscape in the area)?
4. If you could add and remove sounds from it, which sounds would you choose? (Why?)
5. What is *kulturljud* for you?
6. What are you usually doing when you are at home/in the neighbourhood/area?
7. Which sounds do you perceive as relaxing/annoying in these different situations? (Why?)
8. What do you think about the traffic (sounds) in the area?
9. How is your attitude towards music/culture?
10. Are you sensitive to sounds? / Do you suffer from sound sensitivity?

1. Vad tycker du om *kulturljudzonen*?
2. När på dygnet är du hemma? Hur mycket av *kulturljudzonen* hör du hemifrån? (Finns det någon skillnad sedan beslutet togs?)
3. Hur skulle du beskriva *kulturljudzonens* ljudlandskap (eller ljudlandskapet i området)?
4. Om du kunde lägga till och ta bort ljud från den, vilka ljud skulle du välja? (Varför?)
5. Vad är *kulturljud* för dig?
6. Vad brukar du göra när du är hemma/i grannskapet/området?
7. Vilka ljud uppfattar du som avslappnande/störande i dessa olika situationer? (Varför?)
8. Vad tycker du om trafiken (trafikljudet) i området?
9. Hur är din attityd till musik/kultur?
10. Är du känslig för ljud? / Lider du av ljudkänslighet?

## Appendix 4 – Quotes in Swedish

### Interview 1 – Boel

[1] ”Jag tycker [kulturljudzonen] är jätte, jätte bra. Jag är väldigt glad över det.”

[2] ”Ja... alltså [fiskmåsarerna] är nog ungefär som trafikljudet kanske. Alltså de här alarmen som är... de utryckningsfordon när de sätter i gång det hör man ju ändå och det är det samma med de här måsarna då när de får för sig. Men samtidigt eftersom man vet att det hör till landskapet runtom så [fungerar det].”

[3] ”Jag tycker om kultur, jag tycker att man ska söka upp den kulturen som man vill ha. Jag vill inte bli pådyvlat en kultur i luften liksom, jag vill söka upp den och höra den där och helst inte för högt.”

[4] ”Alltså det kom ju som ett förslag ifrån kommunen, från Malmö kommun, att göra den här ljudzonen och i och med att det är precis mittemot så var jag intresserad av vad tänker de nu om det här. Och jag är ju engagerad, har gjort en förening för de som bor i det här kvarteret. Det är en sådan lokal hyresgästförening som heter 'Trevnaden' som kvarteret hette förut. Så vi som förening gick igenom då, vi gick och tittade i området, tittade på vad det var planerat för och så där. Och så har vi då nämnt yttranden.”

### Interview 2 – Robin

[5] ”Ja, rent spontant, jag tycker det är en bra idé, men jag vill inte ha den där jag bor.”

[6] ”Jag tycker om ljudet av fiskmåsarerna. Stressande ljud är ju den här basketplanen och musik. Övriga ljud är jag rätt så neutral till. Jag nämnde att min partner, min sambo är väldigt ljudkänslig och hen reagerar mycket starkare på diversa ljud och det är mer hens reaktion som kan göra mig stressad eller må dåligt, men ljuden i sig är för det mesta neutrala.”

[7] ”Vi fick i stort sett hem i brevlådan en dag att 'grattis, nu bor ni bredvid en kulturljudzon'. Det var inte så kul.”

### Interview 3 – Sara

[8] ”Ja men jag har nog en väldigt positiv attityd till kultur och musik, absolut. Jag tycker det är trevligt.”

[9] ”Man tänker inte så ofta på ljud på det sättet antar jag. De bara finns där.”

[10] ”Ja men absolut för att jag gillar kultur men jag tycker också att det är bra för att... ja men på något sätt så tycker jag att det känns roligt med en så här ganska levande stadsdel liksom, inte bara bostäder utan att det händer något och då känns det ju att det är det som är pricken, för att om man fredar det så känns det som att man kommer tillåta det att det kommer leva liksom... fortsätta leva kulturlivet där. Så jag tänker att därför är jag nog väldigt positiv för att jag vill gärna att det ska vara mycket som händer typ och att det inte bara ska vara bostäder som byggs och så där.”