CATÓLICA
ESCOLA DAS ARTES
PORTO

SOUNDSCAPE AND ECOLOGY – DATA COLLECTION TO AN URBAN SOUNDWALK

Dissertação apresentada à Universidade Católica Portuguesa
para obtenção do grau de Mestre em Som e Imagem

Mariana Salgueiro Rocha

Porto, setembro de 2022

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Trabalho efetuado sob a orientação de

Professora Doutora Cristina Sá

E coorientação de

Professor Doutor José Alberto Gomes

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Abstract

Sound is an immensely important aspect of our perception and daily life, by which we are constantly surrounded. From the perception of space to the relationships with other elements or human beings, sound is always present.

In this thesis the main focus is the urban soundscape, its relationships with ecology and to the act of listening in a soundwalk. Our starting point was an analysis of what we considered to be the key concepts, such as the concept of soundscape and ecology, the act of listening in an individual and collective sense, and the one of soundwalks as a tool for ecological awareness. These concepts, more specifically soundscape and soundwalk, are of extreme importance since they are key concepts to the understanding of our relationship with sound on our daily life. The first relates to the sounds that surround our daily life, and the latter the exploration of said sounds. These concepts are part of the analysis that is the basis to the development of our research. Then we gathered data from the academic community about their emotional relationship with the city, namely relating to the urban soundscape. This part of the research was integrated in a financed research project - *HAC4CG*. After the collection, the data was analyzed in a compiling and organizing way and then in light of the concepts mentioned above. The analyzed data informed the creation of soundwalks.

As mentioned, part of the present thesis is integrated in the research project *HAC4CG – Heritage, Art, Creation for Climate Change. Living the city: catalysing spaces for learning, creation and action towards climate change*, funded by FCT (Fundação para a Ciência e Tecnologia) and co-funded by FEDER (Fundo Europeu de Desenvolvimento Regional). This Work Line - *Engaging citizens through* art, intends to create new routes for the city of Porto, based on a collection of data related to climate change, the city, and its heritage. Our role in the mentioned project is of research fellow, from January to December of the present year.

Keywords: Soundscape, Soundwalk, Ecology, Listening, Collective Listening

Resumo

O som é um aspecto imensamente importante da nossa percepção e da nossa vida quotidiana, pelo qual estamos constantemente rodeados. O som está sempre presente, desde a percepção do espaço às relações com outros elementos ou seres humanos.

Nesta dissertação, o foco principal é a paisagem sonora urbana, as suas relações com a ecologia e com o ato de ouvir num soundwalk. Primeiro fizemos uma análise do que consideramos serem os conceitos-chave, tais como o conceito de paisagem sonora e ecologia, o ato de ouvir num sentido individual e coletivo, e o dos soundwalk como ferramenta. Estes conceitos, mais especificamente a paisagem sonora e o soundwalk, são de extrema importância, uma vez que são conceitos-chave para a compreensão da nossa relação com o som na nossa vida quotidiana. O primeiro relaciona-se com os sons que envolvem a nossa vida quotidiana, e o segundo com a exploração dos referidos sons. Estes conceitos fazem parte da análise que constitui a base para o desenvolvimento do processo de investigação. Depois recolhemos dados da comunidade académica sobre a sua relação emocional com a cidade, nomeadamente a relação com a paisagem sonora urbana. Esta parte desta dissertação foi integrada num projeto financiado - *HAC4CG*. Após a recolha, os dados foram analisados de uma forma a os compilar e organizar e depois à luz dos conceitos acima mencionados. Os dados analisados moldaram a criação dos soundwalk.

Tal como mencionado, a presente dissertação está integrada no projeto de investigação *HAC4CG – Heritage, Art, Creation for Climate Change. Living the city: catalysing spaces for learning, creation and action towards climate change*, financiado pela FCT (Fundação para a Ciência e Tecnologia) e cofinanciado pelo FEDER (Fundo Europeu de Desenvolvimento Regional). Esta Linha de Trabalho - *Engaging citizens through* art, pretende criar novas rotas para a cidade do Porto, com base numa recolha de dados relacionados com as alterações climáticas, a cidade, e o seu património. O nosso papel no referido projeto é de bolseira de investigador, de Janeiro a Dezembro do presente ano.

Palavras-Chave: Paisagem Sonora, Soundwalk, Ecologia, Escutar, Escutar Coletivo

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List of Abbreviations

CITAR – Centro de Investigação em Ciência e Tecnologia das Artes

CPNA – Council Plan to Noise Abatement (Plano Municipal de Redução de Ruído 2.0)

dB – Decibels

HAC4CG – Heritage, Art, Creation for Climate Change

UCP – Universidade Católica Portuguesa

VCI – Via de Cintura Interna

WSP – World Soundscape Project

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1. Introduction

Sound is an immensely important aspect of our perception and daily life, by which we are constantly surrounded. From the perception of space to the relationships with other elements or human beings, sound is always present. As objects resonate with each other (McLuhan, 2005), we can also have resonating properties towards each other and the world. These resonating properties directly affect the relationships between beings, the world, the societies we create and the socio-political and ecological actions we take, both individual and collectively. As hearing individuals, we perceive sound constantly, without being able to close our ears in the same way as we close our eyes, which makes sound perception one of our primary senses of awareness. Sound and its perception, unlike image and vision, extrapolates from the tactile, from form, being a constant presence in our daily life (Nancy, 2007, p. 2). It is such a presence that our society lives in an overpopulation of sounds, which makes us constantly overstimulated, inside an overwhelming amount of either auditory or visual action. It is extremely difficult, or almost impossible, to isolate oneself from stimuli in a city today, even inside a closed place, such as a house (Voegelin, 2011). The perception we have of the world, based on our hearing, is therefore constant, as there are few isolating barriers.

Here we do not intend to put sound or auditory perception in a higher stance, neither ethically nor aesthetically, but it does take an essential part in the comprehension of the invisible, of the unseen (Voegelin, 2021, p. 3), as a non-material element of our daily life. As the invisible component, sound needs to be perceived and listened as an element by itself, as it is a part of our daily lives that we may not always be aware or even conscious of. Despite of its immateriality, sound has a particular role in our understanding of the world and the construction we make of it, and ultimately, of ourselves. Sound is not of a material order, but it is a physical one, as it is a wave propagating in space, reflecting in objects and bodies. Sound, as a setter of powerful emotions and perceptions, attempts to disturb and transcend domains of the visual by connecting us to the invisible, unrepresented, or unnoticed (LaBelle, 2018, p. 2), as well as allowing us to connect with the world and the space around us in an alternative way to sight.

The main focus of this thesis is the urban soundscape, its interactions with environment, and the act of listening in a soundwalk. First, we conducted research of the essential concepts, such as soundscape and ecology, the act of listening in an individual and collective sense, and soundwalks as a tool for ecological awareness. These notions, especially soundscape and soundwalk, are extremely important since they are critical to understanding our interaction with sound in our daily lives. The first is about the noises that surround us in our daily lives,

and the second is about exploring those sounds. These concepts are part of the analysis that is the basis to the development of the process of the research. Then we gathered data from the academic community about their emotional relationship with the city, namely relating to the urban soundscape. The analyzed data informed the creation of soundwalks.

The immateriality of sound is a point of interest, as it might be one of the most evident characteristics of sound, for thinking it as a connection to create a collective perception and construction. We do not perceive sound visually, even though we, as a society, have tried to translate sound into visual objects, from musical scores to scientific analysis such as spectrograms or wave representation. But even though sound is not of a material order in the usual sense of being able to touch it, we may be able to feel it, as it is a mechanical wave that propagates in material elements, such as our bodies. The unseen qualities of an element such as sound may be mobilizing in understanding how its invisibility can act as a basis to a series of questions such as social, political, or ecological ones. Although sound has this unmaterial and invisible quality, it is an essential tool to understand and experience contemporaneity in a society, for it is its constant appearance and presence that helps us relate to and with space, globally and culturally (LaBelle, 2010, p. xvii).

We propose to understand, based on the data collected during this research, how the sample of people we had access to understands the soundscape of the city and how they relate to it, both individually and collectively, as part of society. We make a brief assessment on the act of listening differentiating it from the auditory perception, or hearing. As sound perception, the act of physiologically decoding sound, is intricately linked with anatomical, survival and alert issues, listening will be the act of attributing a meaning to this decoding (Nancy, 2007, p. 3), where interference of our consciousness and experience will be more present. From this differentiation, as well as the definition of concepts such as soundscape, and other essential to the understanding of this thesis, we will analyze the collective attributes of the data. Besides, we will use the data for the proposal of routes that will reflect the soundscape of the city, or else the way said soundscape is perceived. Therefore, we will analyze the data collected under the light of concepts related to the acoustic ecology field and soundscape.

We engage in the large field of Sound Studies, which is a very discursive one that prompts to define concepts such as sound, its surrounding concepts and subjects, its implications, and actions, but always in a philosophical and sometimes broad way. This field is intrinsically connected to modernity and contemporaneity, as it raises questions only possible due to the evolution of technology and the changes that took place in the world. This field of research has

a variety of authors, themes, and perspectives, and it is one with enormous space for intervention, questioning and contribution. It is a field based between the scientific notions and facts on sound and its philosophical extrapolation, leaving place to question, to expand and research concepts such as the ones approached in this thesis.

The present thesis is integrated in the research project *HAC4CG – Heritage, Art, Creation for Climate Change. Living the city: catalysing spaces for learning, creation and action towards climate change*, funded by FCT (Fundação para a Ciência e Tecnologia) and co-funded by FEDER (Fundo Europeu de Desenvolvimento Regional). This Work Line - *Engaging citizens through art creation* - and more specifically, the Work Package we integrate and with which this work is developed and supported, intends to create new routes for the city of Porto, based on a collection of data related to climate change, the city, and its heritage. The Work Package mentioned is constituted by six researchers – three senior researchers and three research fellows - from the fields of Heritage Conservation, Psychology, Media, and Arts. Our role in the mentioned project is of research fellow, from January to December of the present year.

1.1. Motivation and Problematization

Although the concept, practice and research on soundscapes and acoustic ecology is fairly prolific, we find it to still be a very pertinent field, as it is in constant actualization and change. Besides the academic world, it is also a quite common subject under the spectrum of the arts. From the conceptualization and description of soundscape, that Schafer does during his work, both in *The Soundscape: Our Sonic Environment and the Tuning of the World* (1994) and in the *World Soundscape Project*[1], as an historic mark on this field, we intend to explore such concepts and ideas to look at the data we collected and understand what the perception of the urban soundscape is.

In this thesis, there is always an approach to the collective in the object of study, approaching the soundscape as a collective work of collective perception and listening. The idea of collective is crucial to this thesis, since the soundscape is always a field of different

[1] R. Murray Schafer founded the *World Soundscape Project* at Simon Fraser University in the late 1960s and early 1970s as an educational and research organisation. It evolved from Schafer's first attempt to raise attention to the acoustic environment through a noise pollution course, as well as his personal dislike for the noisier parts of Vancouver's fast shifting soundscape.

https://www.sfu.ca/sonic-studio/worldsoundscaperoject.html (accessed 27 June 2022)

connections, both between its intervenients, its components and its researchers (Schafer, 1994, p. 131). Although we, as users of the city, are the ones who create the soundscape, we are also the ones who have no control over it, as we are always surrounded and subconsciously affected by it. Here, listening will be considered as an act of enabling such connections with the world (Voegelin, 2010, p. 3), as it is the act that provides us the most conscious and unconscious information of the world and of what surrounds us. After the consideration related to the concepts, their definition, and the data collection and analysis, we will create a proposition of how a soundwalk could be created and implemented from this research and data.

As stated before, the motivation for this research rises from the understanding that the study of soundscapes and acoustic ecology is not a closed field, even though it is a prolific one. The relationship and interdependence between these two are imperative, for all ecological matters are in an urgent crisis. Soundscapes and sound pollution are no different, as they are part of the climatic emergency that we live in. Besides that, it is an everchanging concept, a mutable notion of what is a soundscape and what can be considered as part of one, with different approaches from authors that will be exposed in this thesis. Although we are aware of the mutability of the concept, as well as its subjectivity, we will explore its relationship with the data collected as well as consider the methodology and insight we have from the *HAC4CG* project. Even though all the concepts presented and explored in this thesis are extremely subjective and mutable, we will let clear which perspective we have on those concepts and what they will mean and stand for during the reading of this thesis.

The soundscape, specially the urban one, as it is the one we are working with, is in constant change, constant evolution but also constant research attention and frequent target of artistic practice. As it is a field directly connected to ecological issues, it is not only a present and current subject, but also an urgent one, as the study of the urban soundscape, of sound pollution and acoustic ecology, are a crucial part of the environmental crisis and are not to be forgotten. Even though they are subjects of urgent matter, they tend to be left behind in the political process of decision making. Soundscapes are also a way of collective action, of collective work and therefore, of collective perception which allows the research and thinking of soundscapes and acoustic ecology one of collective interest.

Therefore, we believe it is not a closed field, hence the interest and opportunity given by the research project *HAC4CG*, promoted by CITAR-UCP, to develop and support this thesis. Here, we reviewed the bibliography related to the key concepts of this dissertation. Along with the HAC4CG project, we collected the data and made a preliminary analysis. This analysis was

made together with the other two research fellows. The conceptual analysis of the data was made individual in light of the concepts selected and reviewed. Although it is not entirely connected to the research project, this thesis is based in the data and the input we collected from it. During the course of the *HAC4CG* we collected data regarding the perception our community has of climate change in our city more specifically regarding their relationship with the soundscape. The data collection was not a scientifical traditional one, based on focus groups, surveys, and quantitative try-outs, as it was an experimental methodology (Marres et al., 2018, p. 11) that will be developed in its correspondent subchapter.

The present thesis will contribute to the field of the soundscape study as well as to acoustic ecology by: (1) analyzing and studying the relevant literature, projects and theories on soundscapes and acoustic ecology; (2) collecting data from the academic community of Universidade Católica do Porto – carried out in common with the *HAC4CG* project; (3) analyzing the collected data regarding our community's perception of climate change and living the city considering the concepts and theories afore mentioned; (4) developing a methodology for the creation and use of urban soundwalks, based on the data collected. Besides the concepts and theories being mutable and historically recent, the proposed methodology will also be an innovative approach, as it is the result of our input of the methodologies used in the *HAC4CG* project.

1.2. Structure

The aim of this research thesis is, in a first stage, to make a literature review to provide a definition of the essential concepts to the understanding of the research. Here, the concepts of soundscape, soundwalk and ecology, of listening in an individual and collective form, of the socio-political implications of both concepts will be explored. The reason to why they relate to each other and to the construction of our collective and individual perception of the soundscape we live in is also referred with importance. The socio-political and ecological relation between the concepts will be based, besides the literature review, on the data collection accomplished in the research project this thesis is inserted in. Then, the data informs the creation of the routes that will ultimately create the pre-production of a soundwalk, to be interpreted as a guide or basis.

The thesis consists of two parts: the theorical involving enquiries and definitions; and the development of those concepts into the analysis of the data and construction of the routes.

Accordingly, there are four main chapters. In the first chapter there is an introduction to the thesis, the theme, its motivation and problematizations, structure and methodology, where there is a special emphasis in the methods involved in the collection of data. Within the second chapter, the framework, we present and explore the main concepts surrounding the object of study. We present the notions of listening and collective listening, of soundscape, soundwalk and ecology and the social-political implications of such concepts, as well as artworks related to the said concepts. Following this, in the second part of the thesis, is the development of concepts in relation with the data collection. Thus, for the third chapter, the concepts presented in the framework, as well as the problematizations raised in the second chapter will be expanded, both into a data analysis of the collection, and a relation between those and the concepts presented. In the fourth chapter the guide to the creation of soundwalks based on the data and the reflection made, are illustrated by images, schemes and project drawings that are used as project designs, essential for the understanding, creation and execution of such artworks. Besides the four main chapters mentioned, the fifth one will comprise the conclusions of this research, as well as the future work proposed for this field of study.

1.3. Methodology

Herein is an insight on the methodology used throughout this research, from the data collection to its analysis. The methodology used in this research directly influences the data that was collected as it is not a traditional approach neither to the collection nor to the analysis. In this thesis there is a mixed methodology (Creswell, 2014, p. 264) throughout the totality of the research. The *HAC4CG* project is interdisciplinary because it aggregates different fields of study, for instance, in our Work Package it ranged from Psychology to Heritage and Arts. The methodological choices were decided along with the other researchers that integrate the Work Package, which only promoted learning of other methodologies and approaches. The interdisciplinary, instead of a multidisciplinary, approach promoted a learning and experience sharing environment inside the research group. This environment brought up challenges to combine fields of study, however they were overcome and allowed the creation of various forms of data collection, from the activities to the survey. The experimental and innovative character of the data and the data collection allowed this research to base itself on the emotional relationship of the academic community with the city of Porto. Besides, the methodology presented here is only possible because of the interdisciplinarity of the *HAC4CG* project.

The methodology used for this research, and in particular with the data collection, was not a traditional one of collecting data via surveys or focus groups, instead it is an experimental one (Marres et al., 2018, p. 11), as mentioned earlier. However, there are two things to consider: the methodology of *HAC4CG* and the methodology of your project. They coincide on two points: the collection of non-traditional qualitative data and giving back to the community through artistic expression. And other parts do not coincide: the survey, for example. Even though the data considered in this thesis is not the totality of the data collected for the project, it is possible that the input from the rest of the data unconsciously influences the analysis exposed here.

This experimental and interdisciplinary approach provides the opportunity to perform a series of activities with the community. The activities generated data, qualitative data, but it generated the data from our observation of individuals during the activities. Both the activities themselves and our observations were aimed at extracting information about the emotional involvement of the group and individuals. The results of these activities, as well as the behavior of the community will be used as formal and informal data to the analysis and the artistic part of the thesis. This methodology was chosen as a useful tool for a typology of data that was important for the research, the emotional relationship with the city. This experimental methodology (Marres et al., 2018, p. 11) allows different types of data to be collected and considered, as it does not limit itself to the traditional survey or focus group, where there are only direct verbal answers to a question. Here, the data collected is as diverse as: points in a map, choice justifications, unconscious reactions, and informal discussions. All these categories help us gain insight of the relationship between the students and the city. This was the methodological approach that better suited the goal of the project, which was to work from the communities' perspectives and emotions.

The collection of data was carried out in two different activities that will be explained below. These activities were developed to meet the interdisciplinary needs of the project. They had as a primary concern the challenge of not leading answers, meaning to not influence the answers in a way that they were no longer the students' answers. Note that the traditional approach to data collection does not overlook bias, it even has a series of best practices to counteract this bias. And we've also applied several of them (for example: the opposite categories in the map activity counteract the bias). In fact, traditional methods generate data that is easily analyzed and for that reason are so interesting when dealing with large amounts of data, for example. But in our case, we were looking for something more complex, more

human, which opens doors to subjective reading. It was between these ideas that we had to work, between generating data that allows for subjective, off-grid observations and simultaneously generating data that is robust enough to be scientific. We had to work in this balance that only enriched the research and the data collection, by providing insight on the interdisciplinarity of the project. This interdisciplinarity shows during this thesis, as it informed the methodological choices that we took in the individual work of this research.

The option to follow this type of methodology is based on the aim of the *HAC4CG* project to make contact and return to the community by means of routes informed by the data collected, or artistic interventions. And so, it seemed almost an impersonal approach, not to include them in a more active way in the research by just using a traditional qualitative methodology. So, it was decided to have a different approach to the data collection, as we wanted to do such collection by means of community activities. However, the process to arrive to this methodological option was of constant reassurance of the scientific validation of the activities and the resulting data. The overall approach to the research was initially thought as mixed method of qualitative and quantitative research, for it is based on a literature review, on the testing of concepts, as well as the practical and social collection on data amongst a community. However, it became clear that the followed methodology for the data collection could not only be a traditional one, based on inquiries, focus groups or discourse analysis, because of the project objectives.

When it comes to the community, the sample was constituted by young adults – from ages 18 to 22, with some older exceptions, more specifically of the academic community, students in the *Universidade Católica Portuguesa*, in Porto. Inside the university, the sample was built to be the most diverse possible, with various fields and grades of study, in a total sample of fourteen classes, with a total of 134 (on hundred and thirty-four) students. The adhesion to the activities was complete, there were no dropouts or refusals of participation, the students were very cooperative and receptive to the project and the data collection, always providing consent to the activities. However, there were constraints that have been overcome. It was important to the project to collaborate with local resident communities, who had apparently no connection to the University, like cultural and local associations, or even schools. But after trying to contact such associations, it was decided not to follow that line of research, as due to the repercussions and restrictions caused by a global pandemic, it was difficult to establish such contact. Therefore, the adaptation to the sample being inside the academic

community was an obvious and needed one, that was created with the most variety of fields of study that could be representational of the academic community.

Date	Field	Grade	Year	Student N	Activity
21 March	Conservation and Restoration	Bachelor	3	11	*4Cs*
22 March	Sound and Image	Masters	1	16	*Map*
25 March	Conservation and Restoration	Bachelor	2	18	*Map*
28 March	Conservation and Restoration	Bachelor	1	17	*4Cs*
31 March	Nutrition Sciences	Bachelor	3	11	*Map*
11 April	Psychology and Human Resources	Masters	1	8	*4Cs*
12 April	Economy and Business Management	Bachelor	2	4	*Map*
12 April	Economy and Business Management	Bachelor	2	9	*4Cs*
12 April	Psychology	Bachelor	3	5	*Map*
12 April	Psychology	Bachelor	1	35	*Map*
11 May	Nursing	Bachelor	1	9	*Map*
12 May	Nursing	Bachelor	1	9	*Map*

Table 1 - Table of Sample Description

The main difficulty here was to create an activity for data collection that would be useful for the research as well as one that would not lead the answers to not weaken to study and the conclusions. The question of leading is an interesting one, because it may be argued that the methodologies used in social sciences – such as surveys or focus groups – are influencing the social life and response to them (Muniesa et al., 2007; Ruppert et al., 2013, p. 5). We were aware of the fact that there could be leading answers no matter how careful we were. However, the conclusion and consensus were that it was preferable to have a practice-based method of data collection, that incorporates the leading, the feedback and the results as valid, rather than a usual method that can at times restrain the answers to a type of data intended. Besides, this *bottom-up* rather than *top-down* approach, starting from the community that is a common user to the city, in this case, recognizes that the opinions of non-experts are not based on knowledge

or lack of knowledge, but involve heuristic and immediate responses and above all, emotions (Ockwell et al., 2009). And that immediate response was also something we were looking for, an instant reaction from an user point of view, that did not take too much reflecting on.

Within the options that were taken for the activities, there was extreme care in terms of material choice, re-use, and to keep the sustainable and ecological tone of the project. For that, all the material used for the activities of data collection were either recycled or from recycled materials, and the prints that were used and reused as much as possible. As an example, the cardboards used both to support the map and the pins was always recycled and came from boxes that were going to be thrown away. Also, the maps printed were of fewer number and then reused after the activities, as the marks of the pins do not show as much as a marker. In addition, in the *4Cs* activity, we used washable and reusable magnetic post-it notes.

The community's participation was essential for the creation and adaptation of the activities and games because they are the users of the city we wanted to interact with. Along the process of the creation of the data collection activities, it was decided that the greater variety of data we could collect, the better and so we took the opportunity for collect different typologies of data, from text to points in a map, to audio recordings. The selected activities, as referred, intended to collect the greatest variety of data, and so were conducted two activities. These two activities were to be based on the perspective and experience the students had on and with climate change and the city they inhabit. Both were thought and executed as dynamics of group reflection on the themes surrounding Climate Change and the relation between the community and the city.

1.3.1. Activity 1: 4Cs

Firstly, we opted for an adaptation of a game proposed in the book *Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers* (Gray et al., 2010, p. 164), that presents and explains a series of games for problem solving situations, either in a company, or for research proposes. Here we found the *4Cs*, a game that divides the class in four groups, each with a theme or topic – originally the topics were *Components*, *Characteristics*, *Characters* and *Challenges*. This game is a *simple information-splicing games come in handy because, in an intentional way, they disrupt the standard ways we break down topics. The 4Cs game is a quick way to gather and organize information about any subject using four common key concepts* (Gray et al., 2010). At the beginning of the game, there was a brief introduction and then the instructions of the game were also explained. Simultaneously, a grid was drawn on the board and the material packs were distributed. The material packs included a pack of loose paper

sheets with a front cover correspondent to each group's category, some colored markers and colored magnetic post-its, to write the strategy, questions and answers on the paper sheets, and the final conclusions on the post-its. The latter were placed in the board at the time of the final group's presentation.

For this, we had to adapt it to our needs and topics, becoming *Dimensões*, *Intervenientes*, *Tempo* and *Espaço* (Dimensions, Characters, Time and Space) the topics in use. After the topics were presented and explained to the class, the intent is for them to gather the most information possible by questioning the other groups. Time was given for the groups to assemble a strategy of information gathering as well as being available to answer the other groups questions before proceeding in collecting their answers. At the end of this period of the game, the groups were asked to gather, treat, or add information to the one they collected and make a brief presentation of it to the rest of the class, from which we recorded the audio, with consent, to transcribe and collect the data presented in writing, as well as spoken. This game is a quick way to pick apart the topics and gather information in a creative and cooperative way.

The analysis of this activity was made in *NVivo*, a qualitative data analysis software, which creates and associates words in the visual representation of a cloud. This approach, allowed a faster and easier word association, counting and placement that would take a lot more time without the opportunity to use the software. This type of analysis, more related to the social sciences field, reflects the interdisciplinarity of the project and the mixed methos methodology mentioned for this data collection and analysis. This software provides a word association analysis that groups the most mentioned words so that we can have a perception of what are the opinions and understandings of the students toward Climate Change, and more specifically in the city of Porto.

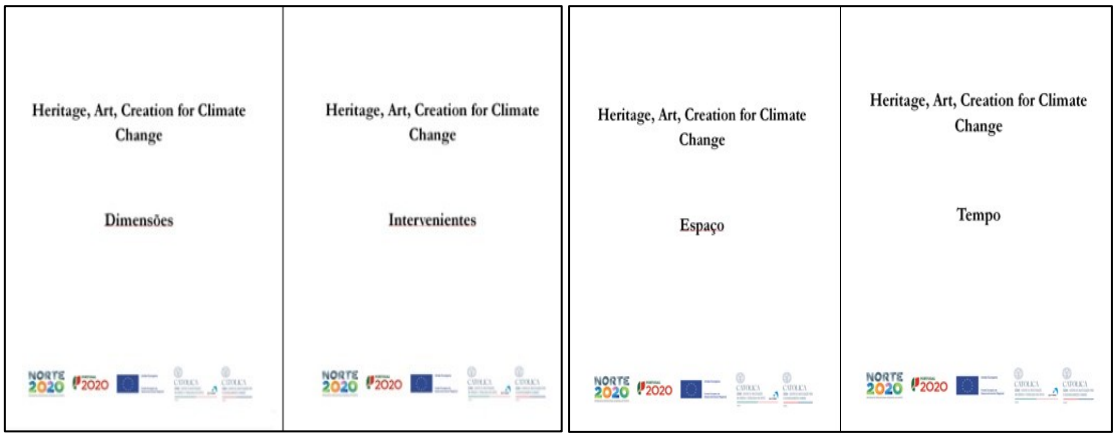

Figure 1 - Front Cover for the 4Cs group notebook

1.3.2. Activity 2: Maps

As for the map activity, we applied a more direct strategy, in the way that it was a type of data collection that would have an obvious reflection in the routes proposed. We used a map of the city of Porto, using as delimitation the Douro River up to Estrada da Circunvalação (EN12), which was printed in a size A0 (841x1189mm). The students that took part in this activity were asked to point and pin in the map the places they associated to three of six categories. These categories were thought to be binomials of urban characteristics – *Clean/Dirty*; *Noisy/Quiet*; *Degraded/Preserved* – and they were associated with colors that corresponded to the ones in the pins. The opposing binominals give the chance for the student to choose without conditioning the perspective towards a positive and negative side. The categories are all connected with the issue of Climate Change and to what it does to the city, being that the cleanliness of the city, or the soundscape or even whether the heritage is on good conditions, or it has been affected by these multitude of variables. Also, the opposing options prevents the leading in answers and in the relation with the exercise, as it keeps to the student's choice whether they perceive the city in a positive or negative way. Associated with all the six categories were colors that match the pins given to the students. These colors do not have a direct relation with the adjective itself, rather they are associated by opposing colors – limited to the available colored pins. They are not complementary colors as not all sit on opposite sides of the color wheel[2], however they were the closest to the original complementary ones – the complementary to blue is orange and not yellow e.g.

Associated to this act of pinning a place in the map, the students were asked to write in a card a small phrase about their choice, either a direct justification or something that the place reminded them of. Here we also aimed to collect different types of data, being the points in the map that after the collection were transcribed to Photoshop to later analyze with the option of joining the totality or part of the points. We also collected the text of the cards that became important also in the analysis. It was important, in both activities to consider the room, the space and the way the students could move in them as they both required a physical action of getting up and either moving towards another group or a map. Here, thinking of the movement of the participants around the room, we created an almost performativity, as part of the *inventive social research* (Guggenheim, 2015, p. 10; Wilkie, 2014) applied in the data collection. It is, although, important to note that the data collected is a lot more than what is being considered for this

[2] A color wheel or color circle is an abstract graphical organisation of color hues around a circle that depicts the connections between primary, secondary, and tertiary colors.

thesis. The data considered here will be the one related to the sonic characteristic described above. Even though the whole data will not be consciously included and considered, it might unconsciously affect the analysis of the remaining data and its perception along with the conceptualization and creation of the soundwalk.

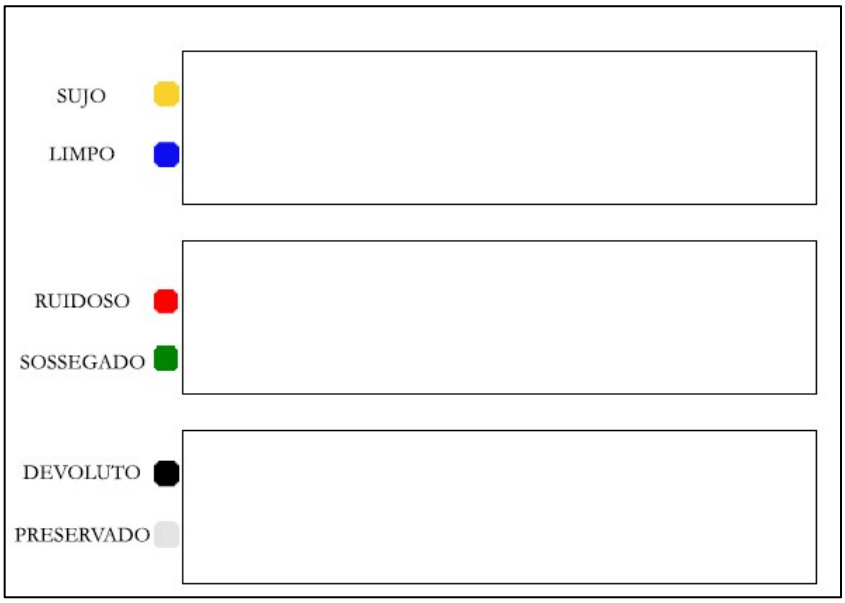

Figure 2 - Card with Categories for the mapping activity

Figure 3 - Porto City Map used for the activity of data collection

2. Framework and State of the Art

In the present chapter the main concepts relating to this thesis will be presented and explored. Here it is intended to make known what the concepts are, what they mean and why they are important for the research. Therefore, it is our goal to give an overall view of the scientific fields and concepts adjacent to fields of Soundscape and Ecology, as well as the concepts of Listening, Collective Listening, Noise and Noise Pollution as to provide a better understanding of the following research, results, and analysis.

The concepts presented are the ones that we understood to be important for the development and conception of this thesis, as they are essential to the comprehension of the soundscape, ecology, and the soundwalk. These concepts are essential here, for they delimit the broad approach to each concept, as well as their importance for the research. Although they are relatively open concepts, that hold a lot of different perspectives in them, the intent of this chapter is to make clear what we understand by each of these concepts and fields important for the research. This chapter is divided in subchapters for an easy separation of concepts and understandings although they are all interconnected, and they relate to and with each other. All the concepts, ideas and authors explored in this research and thesis, are fairly recent. Such concepts are still under construction and are highly mutable and subjective, hence the necessity for this framework chapter, as it helps to delimit the concepts as they should be understood in this thesis.

2.1. Soundscape and Ecology

We have always been surrounded by sounds, from nature sounds to the ones of industrial machinery, and subsequently to the cosmopolitan cities and their aural compositions. The amount and variety of sounds we are exposed to have clearly increased since the Industrial Revolution, but it is still increasing (Schafer, 1994, p. 71), with the constant growth of cities, transportation, and industries, that even though, with the advances in technology are getting cleaner and quieter, still play a huge role in our daily soundscape. The concept of Soundscape is a central and essential concept when it comes to the understanding and theorization of a city and the citizens relationship with it. Both the concept of Soundscape and its relationship with Ecology are of extreme importance to this research and thesis as they the central elements to our own relationship with the world. Besides that, it is important to think of these concepts as

urgent and crucial to the understanding and mitigation of Climate Change, as they are also being impacted, but they can be part of the solution.

The *Soundscape* as a concept and therefore a movement was originally popularized by R. Murray Schafer in the 1970's. *The Soundscape: Our Environment and the Tuning of the World* (Schafer, 1994) plays a crucial role in the creation, dissemination, and analysis of the soundscape, throughout history and its structure. Here, the author proposes a definition that is not one of a dictionary entry, but more of a technical and philosophical one:

SOUNDSCAPE: The sonic environment. Technically, any portion of the sonic environment regarded as a field for study. The term may refer to actual environments, or to abstract constructions such as compositions and tape montages, particularly when considered as an environment. (Schafer, 1994, p. 274)

In *The Soundscape* (1994), Murray Schafer divides soundscapes in two, based on their density, *hi-fi* and *lo-fi* (Schafer, 1994, p. 43). They are, as it will be explained, the very opposite of each other, and they exist without a proper middle term. The first is characterized by the detail that can be perceived. Because of the lack of layers, it is a simple, more organic and unactive soundscape, like one from the countryside or a very small, isolated village. The latter, as mentioned, is the far opposite from it, being the cacophonic, multi-layered, complex soundscape characterized by the *overdense population of sounds* (Schafer, 1994, p. 43). Here the soundscape compares more to a mass of sound and noise than to a collection of sounds that are, above all, identifiable, like those of the *hi-fi* soundscape. In the case of a *lo-fi* soundscape, the perception of space and aural perspective is, in most cases, completely lost, becoming only presence (Schafer, 1994, p. 43). To this day, the urban and denser soundscape have become punctuated with what we can associate to noise pollution, inseparable from what is the climate change crisis we face. This type of pollution is probably the one that affects our daily life in a more direct and constant way, if we happen to live in a city, urban context, or industrial area. And so, the urban soundscape becomes almost an anarchy of sounds, in which there is no hierarchy, no interconnection, no cohesion (Aidoni & Chourmouziadou, 2021). Although there are studies that analyze in a quantitative way what the soundscapes sound like, the perception and evaluation of such environments is always a subjective matter, for it depends on the human perception, background, values and opinions, etc.

The importance of the quality of the soundscape is intimately related to the repercussions it has on our daily life. Besides the duality between the noisy city and the silent countryside, the soundscape provides a different approach to what is our surroundings and the visual

perception of the world (Voegelin, 2021, p. 10). Unlike Ingold's idea that sound is only a medium and not a thing by itself (Ingold, 2007), it seems obvious the need to listen to the landscape, and the soundscape as one, as a reality, as a sonic and different perspective. Sound and by consequence, soundscapes, help us not only physically perceive space, but also helps to build a reality and the world we live in, a collective perspective and understanding. The individual perspective is part of a collective one, in a community that is built on a common understanding of the shared perspective. This common understanding arises from the fact that communities may be built on the fact that people with the same beliefs, socio-political inputs or socioeconomical status, tend to group and form a miscellaneous structure that is part of a larger society (Aidoni & Chourmouziadou, 2021). This miscellaneous structure exists specially if every individual is considered a single listener, interpreter and creator of its own soundscape. But although it is an individual one, it is engaged in a constant exchange of information that can be provided by sound (Truax, 1984).

Therefore, as we live in a sonic world, in a sometimes chaotic soundscape, in a miscellany of sounds and sound sources not always identifiable, the urban scene of sound also provides material to a thinking of noise as an alterity instrument with which we live and cohabit in our soundscapes. Cities and urban spaces become places of encounter, of sounds, noises, people and circumstances and so the way the urban structure is constructed is intrinsically related to that, to the encounters and common characteristics of a community. This community can be seen as an acoustic one, as well as many parts of our lives in society can be associated with sound and our auditory sense. But specially the creation of a community along the acoustic perception, it's one of extreme importance, since it creates at its core a common consideration, interpretation and understanding of a human sense.

Although the way Schafer presents the concepts of soundscape, or the terms associated to it is the basis to a lot of the research done in the field, influencing greatly the notion we have on the concept of soundscape, and acoustic ecology (the middle term between sound, nature and society), there are a few oppositions or, we should say, redefinitions of the concept of soundscape. One may be Ingold's *Against Soundscape* (Ingold, 2007) which is not directly an opposition to Schafer, but to the concept itself, and still, it is not in an artistic, creative or environmental perspective. Here, Ingold refers, from his anthropological standpoint, that the soundscape could only exist if it the audible became aural by means of a technological interference, such as a recording device so that it could be played back and listened to (Ingold, 2007). He argues that we cannot hear soundscapes by listening to what surrounds us, because

sound *is not the object but the medium of our perception* (Ingold, 2007). For this he evokes the same phenomenology as Voegelin, insisting that sound is neither of material, nor mental order, but an immersion for which is a requirement a separation between mind to understand the world and of elements in the world to be understood (Merleau-Ponty, 1964, p. 12).

On the other hand of the concept of soundscape as a middle area between science, art and society (Schafer, 1994, p. 4), there is an undeniable political perspective, that comes from the fact that this notion and concept is at its basis and source, a social one, one that comes from the sense of an individual in a collective. The soundscape we live in, as most matters that have to do with the senses, varies from person to person, or from ear to ear, in this case. It is also intrinsically associated to our socioeconomical or socio-political status, to how we relate with the world and how we let it relate to us. The soundscape we live in and that we are used to, is ultimately a collective work, just like perception of the collective reality and world we experience. With the small and personal soundscapes, we create every day, we contribute to a greater perception of the world by sound, that constantly surrounds us. The acknowledgement and analysis of soundscapes can inform of the socioeconomical, the socio-political and the ecological situation of said scape and its partakers.

Even though the concept and movement of soundscape preconized by Schafer and the *World Soundscape Project* is an extremely pertinent and always present one, being a field of extensive research, it is also a mutable one, for the first perspectives of the concept, the theory, the movement, are as expected, conditioned by the time they were created. Even though there is a present intention of giving emphasis on the auditory sense, on hearing and on listening, we cannot ignore that it comes from a visual term – *landscape* – which may be a way to make the term and those surrounding it, easier to relate to someone who is less comfortable with specific terms of the field. This also draws attention to the fact that visual metaphors have a banality and auditory implication that force us to reimagine language and the words we use to describe auditory or aural elements (Akiyama, 2020).

The concept of landscape and soundscape are obviously connected, not only in a semantic way, having the same suffix, but they complement and influence each other. The way we visually perceive a landscape will impact the way we aurally perceive the soundscape. The way we aurally perceive the soundscape will also impact the way we visually perceive the landscape. The soundscape we perceive and listen may guide us to build new perspectives on reality and the world, because sound, as an invisible medium, can shape the landscape, can make us hear

its depths and create an alternative perspective of what the world is or can be (Voegelin, 2021, p. 22).

The term may be considered a neologism, but it has become enormously popular in a sense, because it is an immediate term when it comes to understanding (Sterne, 2013). It means what it sounds like, but it also provides a set of more complex notions and concepts related to sound. In a simpler definition of the word, soundscape makes a parallel with landscape but instead of a visual object, this is a sonorous one. Not only can alter our perspective on the world, but it also directs our attention to the negative and positive points of the soundscape itself. It makes the issues, the problems audible, affecting our daily life in obvious and less obvious ways, as sleep capacity and relationships, as well as pollution and urban problems.

But the notion of soundscape proposed by Schafer expects a relation with the world and the city of almost escapism from the urban cite. Additionally, it also expects a relation that might be similar to a recording device or composition, as a work, but one that is also its medium of transmission, making it a clear reflection of its time. The perspective of the same author on the soundscape studies is also common in an anti-noise line of thinking, that might relate to sound pollution in a way, but it was not thought as that, but rather in a political and escape of the urban city, glorifying the countryside and the *hi-fi* soundscape (Sterne, 2013). The intent here is not to eliminate or substitute the concept proposed by Schafer and the ones who followed his vast and prolific work on the field, rather trying to expose the concept in itself as a reflection of the time and society status it was created, but also as a way of critically using and thinking the soundscape, adapting it to the present tense, as well as to the context and everchanging field of study.

So, we comprehend that the concept, the notion, and the study of soundscapes is inevitable and undeniably connected with ecology and the emergency surrounding it. Ecology as the study of the interconnections between living creatures, including people, and their physical environment. As for the clear reflection of what our cities have become concerning sound pollution, or for the complete erasing of certain nature sounds that are no longer audible or present because the industrial, populational, or urbanistic development and growth. The way we perceive the city, the urban space, the ecology and the climate emergency is based on a sensory experience that is constantly enhanced by the soundscape. We consider the connection between soundscape and the acoustic perception intrinsically attached to ecology, in the sense that as it was already mentioned, it turns audible the problems we face. Acoustic ecology is the middle term between sound, nature and society. It is, as well, the one field that raises awareness

to the need to have a conscious listening, to strengthen our comprehension of the relationships between each other and with the soundscape (Westerkamp, 2002). This term, or field, is one of extreme importance when it comes to the climate crisis we endure and seem to perpetuate, but it is also a place for reflection on the environment itself, on the social relations we experience and ultimately to our own human subjectivity and ephemerality.

As Guattari proposes (2000), besides considering that the only solution for an ecological and climate crisis need to be on a global level, not that it prevents an individual action, we need to think of an *ecosophy*, that is to say, a way of considering ecology in a philosophical plane, or the founding of these two areas, as well as in the real, physical, material way. This proposal divides itself in three planes of thought that would *link environmental ecology to social ecology and to mental ecology* (Guattari, 2000, p. 28). Therefore, these concepts or divisions between environmental, social and mental ecology could become a helpful and useful tool to the comprehension and action in a more global notion towards ecology.

The way we relate to a place, being urban or rural, private or public, is based on the sensory experience it involves, from sound to sight or touch. And urban space provides numerous soundscapes with properties and qualities that engage passers-by physically, connecting them to the site. It shapes practices, which in return affect it (Thibaud, 2011). The way in which we perceive ecology in the context of our world and community, can be perceived in the same way we perceive the soundscape that surrounds us, meaning we are in a constant creation and collective perception. In the same way as the soundscapes, ecology is a product of a collective work. It is also *an ecology of a lived world* and *of situated perception* (Thibaud, 2011), as soundscapes are a situated perception and object of a shared perception and shared understanding. The acoustic environment of our lived world has in sound a way of creating and making perceptive a sonic world. That is what allows us to understand the source or origin, its meaning or first impression, its contribution to our notion of space and relation with it, making our world, a sonic one (Voegelin, 2021, p. 10). This line of thinking is crucial to the analysis of the data and the creation of the routes and soundwalks.

Although the climate and ecological emergency is clear, visible and audible, the concept of ecology applied to the Sound Studies can be, as the rest of the concepts presented in this thesis, ambiguous, broad and sometimes not well defined. But it might be challenging to define some of these ideas, and in this case ecology, taking the risk of closing it too much, leaving out important notions, perspectives and actions, turning it into a monodisciplinary arena (Westerkamp, 2002). However we understand that, for the reading of this thesis and for the

analysis and comprehension of the concepts and the data, ecology is the awareness and preservation of lives, being human or not, that are related with each other and that this relation needs to be preserved. This is not only a relation of coexistence, but of co-dependency, of practical needs and actions. Sound contributes to this co-dependency in the more visceral way, opening up a channel for communication, interaction and sharing experience, all while already disappeared (LaBelle, 2010, p. xvii). Incorporating these elements into a soundscape has a clear potential for noise disturbance and pollution, as well as strong economic benefits beyond our control, but it also identifies positive aspects of the soundscape ecology (Truax & Barrett, 2011).

Besides being a prolific field of theoretical study, soundscapes are also a base to an immense artistic and research production, from composing through and with the soundscape, to create soundwalks, mapping them or analyzing them. In this vast field of creation. The exploration of the soundscape through the creation of sound maps is very common, especially because it is a very direct way of associating the cartography of the city with its sounds and soundscape. This type of project, even though does not share the same methodology or result than the one from this thesis, shares a common ground of research, the exploration of the soundscape. There are examples of sound maps that commonly create a database where the public can upload their recordings, creating a proximity with the users of the platform, but also of the city or area in question. Even though this thesis does not propose a sound map, the approach to the soundscape as a possibility for data collection towards an awareness of ecology is a common ground between this research and sound maps.

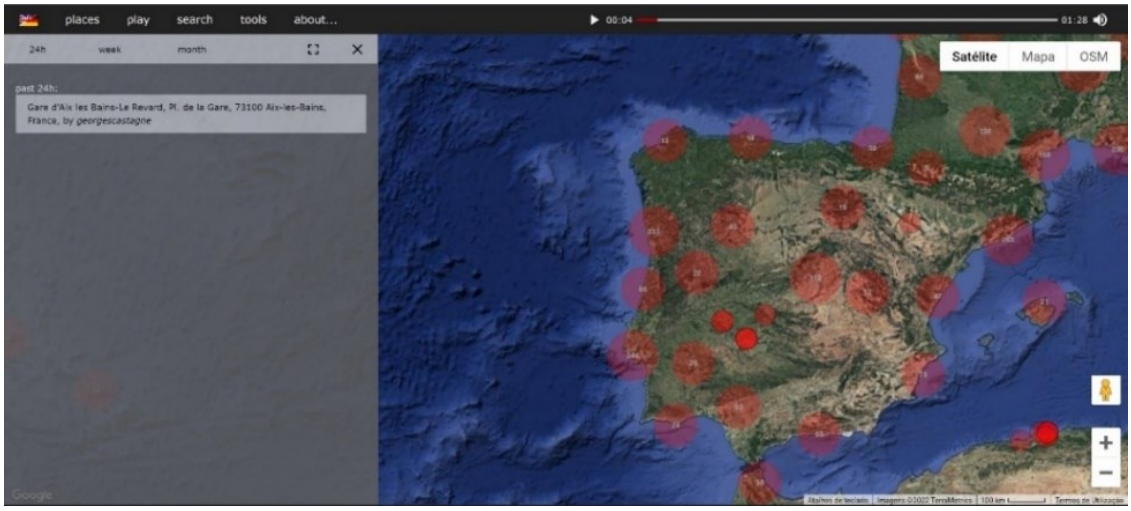

Figure 4 - Radio Aporee Sound Map

In the image above (*Figure 4*), *Radio Aporee ::: Maps*(Radio Aporee, 2000)[3]. This sound map is a public one where anyone can upload their sound files relating to a place. *Radio Aporee* has amassed a vast corpus of sounds from all over the world over the years, in part due to a large community of artists, photographers, and those working with sound and field recording. It has also given various collaborative tools for creative practices and field research. The *Radio Aporee* platform includes elements of gathering, archiving, and sound-mapping as well as experiments that push the boundaries of various media and public space. *Radio Aporee* fits into an idea as both a storytelling and a transitional technology. It makes up a field that is connected, continuous, and exchangeable. Along with this project, there are a few more to highlight for they are of growing number in the past years. For this, the project mentioned above will serve as an example to a category of practice that is too extensive to include here[4].

Another project relating to sound maps that we find indispensable to mention, is *Porto Sonoro*. This project started um 2012 and it aimed to reflect on the *sonic identity of the city*, by collecting, analyzing and providing material for artistic content (Magalhães & Costa, 2013). It is a project of great importance both to the city and its sonic heritage, but also to the approach it takes on creating an archive for public use. However, this project no longer has its website available.

2.2. Soundwalks

In parallel to the concept of soundscape, soundwalks are still a very recent field of theorization. But the concept and action of soundwalking comes inevitably as a sequence for the notion of soundscape as it was also introduced by Schafer and the *World Soundscape Project*. There is a need to highlight those in the *WSP* group who have made this topic their lifelong research and research, such as Hildegard Westerkamp (2002, 2007, 2012), who has extensive practical and theoretical work on the subject. But even inside the group, or former members of it, there is not an agreement on the requirements and definition for a walk to be considered a soundwalk. But broadly, it has a very straightforward concept, where the goal is to walk and listen and it can occur at any time or at any place, it may be performed alone, or it can be organized events as a public walk with a set route and a guide - noting the difference

[3] https://aporee.org/maps/ (accessed 1 September 2022)

[4] For more examples: http://www.phonambient.com/pt/soundmaps (accessed 1 September 2022) https://www.montrealsoundmap.com/ (accessed 1 September 2022) https://citiesandmemory.com/sound-map/ (accessed 1 September 2022) http://www.soundaroundyou.com/ (accessed 1 September 2022)

that Schafer makes with *Listenwalk* (Schafer, 1994, p. 212). A soundwalk is a way to actively participate in the deliberate process of listening to the surrounding sounds of a certain area, and therefore soundscape, being not necessarily one of a countryside.

As a practice and concept associated to both soundscape and acoustic ecology, or just ecology by itself, we consider soundwalks to be of immense importance, not just as a reflection and revealing of the soundscape, but also as a warning, critical or political instrument even. An action of soundwalk, or its route, can be of contact with nature, as an escape of the city and of the cacophony of urban life, or an urban one that incorporates the cacophony as a valid material to be listened to and part of. But the main objective of any soundwalk is to listen to the surroundings, to pay or shift attention to the individual sounds present at the moment and in the place. There is also a possibility for soundwalks to propose a space created by sound. The potential to connect audiences with environmental representation on multiple levels is made possible by the fact that environmental concerns are of greater importance to people worldwide than ever before, and that all such compositions and Soundwalks place an emphasis on listener awareness of the sounds employed. They have the power to both take the listener to imagined realms of strong symbolism and inspire real-world auditory experiences (Truax & Barrett, 2011).

In parallel with the concept of soundscape, the term soundwalk can also be of easy understanding, and it semantically sounds like what it is. But Schafer brings attention to a variation of definition between a *Sound Walk* and a *Listening Walk*. According to the author, a *Listening Walk* would be a regular walk in which the person is paying more attention to listening, while the *Sound Walk* implies an *exploration of the soundscape*, of a certain area (Schafer, 1994, p. 212). It might also imply, what Schafer called and created, exercises of *Ear Cleaning*, as a mechanism for a better understanding and exploration of the soundscape. These exercises intend to help this exploration and analysis because these exercises are ones who are proposed to (re)learn how to listen and to respect silence (Schafer, 1967, p. 1), and there is a suggest including them in the soundwalk,

Soundwalking, as a creation and action, poses questions about how we interact with the outside environment, favoring auditory sensitivities (Denver, 2009). And the questions raised, only exist because there is an exploration of the soundscape with an awareness and consciousness in listening, that does not happen otherwise. The way we interact with the environment should then be one of conscious listening and caring for the environment that we create and that we share as social objects and beings. As such, the connection between

soundwalks and ecology is intrinsic and obvious, as it may be a tool or weapon to better empower communities and urge them to fight to mitigate the effects of an unhealthy soundscape. The importance of this concept is crucial to the discussion of the soundscape and Ecology, as it is to this thesis as it uses soundwalks as a result of an exploration, but also as a means of raising awareness and consciousness to the act of listening. This awareness shapes the listener active role in the soundscape (Carvalhais & Lee, 2019) being that of partaker and contributor, or of listener.

In the creation or execution of a soundwalk, we can look at the map of the area to be listened and explored as a score, making a parallel with music (Schafer, 1994, p. 213). Such score is to be used as a guide to an exploration of the soundscape. The use of the map as a score can be a comparison to what guides a composition, a score, being the map what guides a soundwalk. The use of a map as a score, makes a direct connection to cartography, in this case of sounds or listening sites, and to the difference of methodology between a cartography of urban and the visual, and a cartography of the sonorous and the invisible. Here may be introduced Sound Maps, another approach to the exploration of the soundscapes. In this approach, there is not a necessary walk, even there might be as a pertinent exploration, but rather a collection of cartographic points of interest. This might also include a more digital approach and methodology, such as the creation of websites or *apps*, whether the soundwalk refers more to a physical action, therefore more analogical, which does not prevent a creation of a digital soundwalk, with recordings or compositions relating to the spaces visited or to a narrative constructed for the purpose of the walk.

Following other authors on the matter, this score is not indispensable, as soundwalks can be a mere walk, as the only condition is to prioritize our ears and our auditory sense (Westerkamp, 2007). In this act of prioritizing the auditory sense and using it as a way of exploring the soundscape, it is crucial to have a conscious approach to listening, to be aware of that sense and process. Soundwalking became a useful tool to the study and analysis of soundscapes, as it is a way of reactivating the focus on our listening capacities and awareness of our surroundings. This, because, even though there is a recognition of the problem, we may have neglected our auditory sense in our urban life and we have forgotten our listening capabilities, since we have been surrounded by so much information – visual and sonorous – that we filter or rather ignore a majority of the stimulus. It can also be seen as a balance between what is our production as partakers in a soundscape and our own collective perception and listening, as a raising of awareness towards the soundscape itself.

Even though soundwalks seem to be an instrument of greatest importance to the understanding and analysis of the soundscape and the ecological stance of it, it seems that there is a significant gap in literature when it comes to the use of soundwalks as methodological options (Adams et al., 2008), as a way of exploring the soundscape as it is, guiding oneself through the subject of study to better understand it, appreciate it and consciously listen to it. But this action can be either a methodological instrument, as a way of studying the soundscape itself, the individual perspective or other pertinent parameters, or a result of a study or data collection done *a priori*, which is the case of this research thesis, even though the data collected for this research is not of a quantitative nature, but rather an emotional and perceptive one. This type of data collection makes the route and the soundwalk itself one of great emotional value, as it is based on the perception that the inhabitants and users of the city have on it, and most importantly, how they relate to the city and its soundscape. However, the data collected was not only for the purpose of this thesis, as it was to serve the purpose of the project and the work line, which implies a lot of data that will not be consciously included in this thesis but may have an unconscious influence on the analysis and perception of the data itself as a whole.

The relation between soundscape, ecology and soundwalks are of extreme importance and seem to be inseparable as they revolve around the same central concept, the environment. The environment meaning here the ecological and preservation sense of our living environment, being the sense of world each and every one of us have. They are although, quite recent and concepts under construction, since each author adds a perspective, a definition, a practice. These are ideas and concepts of extreme importance for this research for global thinking and world. For this thesis, for they are an integral and root part of the input and data we collected. For the global thinking, as we live in a climate emergency where every part of our society and urban living is, and should be questioned, as we believe that sound can take a crucial part on this heroic fight on climate change.

As an example of some of the works that relate to this research in a conceptual and practical sense, there are some we want to highlight. These works are important for the understanding of the concept of soundwalk, and to the comprehension of soundwalks as a tool to a conscious and aware relationship with the city and with its soundscape.

Figure 5 - X Marks the Spot (Belfast)

In the figure above (*Figure 5)*, we can see part of a project called *X Marks the Spot* (Meireles, 2013). Here, the artist makes a map of the electrical boxes that produce constant sound in the city of Belfast and then points them out with the frequency produced. This work is part of a research project called *Sonorous Cities: Towards a Sonic Urbanism*[5], that aims to improve the understanding the relationship with cities and urban life by critically analyzing the auditory characteristics of cities and people's perceptions of urban soundscapes. It also focuses on supporting architect, urbanists and other practitioners to improve their sonic understanding. In the same research project, there are other smaller projects that are interesting to mention, such as *Scoring the City*[6], an approach between experimental music and visual scores. On the same note of research projects, *Recomposing the City: Sonic Art and Urban Architectures*[7], is a project started in 2013. In order to investigate the link between sound and urban environment, the aim of the project is to bring together artists, architects, planners. With seminars, events, publications, and creative initiatives, it investigates many questions concerning urban sound. The objective is to expand knowledge of sound in architectural and urban studies and practices while funding innovative design and research initiatives. As a publication of this project there is a published book, intitled *The Sound – Considered City: A Guide for Decisionmakers*, a collection of measures that can help decisionmakers turn the city into space a healthier one, considering sound as an essential tool for that improvement.

[5] https://www.soncities.org/ (accessed 2 September 2022)

[6] http://scoring.city/ (accessed 3 September 2022)

[7] http://www.recomposingthecity.org/ (accessed 1 September 2022)

On the same line of though and a research project as well, *Audire*[8], is a project that intends to propose the creation of different strategies to maintain sound memory by fusing basic research with applied research and social intervention. For this, the project proposes to learn how individuals perceive and appreciate acoustic surroundings, to establish a virtual sound museum that will help promote the imagination of up-and-coming artists while protecting a type of sound heritage. This project also promotes initiatives, one of them being a soundwalk.

When it comes to the subject of soundwalks, there are unavoidable artists and researchers, such as Hildegard Westerkamp, who pioneered a radio program called *Soundwalking* (Oliveira & Martinho, 2021). Besides that, the research and practice of the Soundscape has been a constant, from articles to installations. The correlation between the soundscape and the act of soundwalk is, as mentioned, very close and Westerkamp uses that correlation as a tool for the installations, compositions and as a study object for research and theorization, as it can be accessed in her website[9]. In the same way, with the concern of acoustic ecology and with the awareness of listening, Cláudia Martinho explores the relation between sound and nature, ambient and architecture. Even though her work is more related to installation practice, there are two explorations of soundwalks that we would like to mention. One as a collaborative field work, *Multi-temporal Soundwalk* (Martinho, 2019)[10], that created a soundscape representation of a community in Grenoble, France. The other is the research project mention before, *Audire*, which Martinho is part of.

As another work to have in consideration when reflecting on soundwalks, is the one of Hailey Suviste in *The Manchester Ear* (Suviste & Woods, 2018)[11]. The artist works mainly in field recording and archival sound. It is an ongoing project, that started in 2018, that aims to get local communities more involved and aware of the soundscape. It aims to promote a more present involvement and appreciation for the soundscape, evoking concepts such as acoustic ecology and deep listening [12], and reflecting on the notion of soundwalk as a tool to raise awareness to the soundscape.

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[8] https://www.audire.pt/en/ (accessed 31 August 2022)

[9] https://www.hildegardwesterkamp.ca/ (accessed 3 September 2022)

[10] https://claudiamartinho.net/multi-temporal-soundwalk/ (accessed 1 September 2022)

[11] https://www.hayleysuviste.co.uk/the-manchester-ear (accessed 3 September 2022)

[12] Concept proposed by Pauline Oliveros, that examines the differences between listening, which is voluntary and chosen, and hearing, which is automatic. The exercises involve listening to the sounds of daily life, nature, one's own thoughts, imagination, and dreams as well as engaging in massage, audio meditations, and participatory performances.

2.3. Listening and Collective Listening

The auditory sense, as all sensory activity, is extremely subjective. Not in a physiological or anatomical sense, but in the way we perceive it. While there are senses that can be shut down or limited, like sight, the aural cannot, and that is why it might be more directly associated with a sense of survival and of rapid response. Sight is more directly associated with form and matter, with a sense of physicality and materiality. These characteristics - form and matter - are more directly associated to the visual plane, the realm of what is visually perceived, while the invisible and immaterial, are linked to what is sonorous (Nancy, 2007, p. 3). In this line of thought, Nancy also refers to the sonorous as a matter that *outweighs form*, in other words, an element that in itself goes beyond what we define as form, as a material form.

To have a coherent study on soundscapes, ecology and soundwalks, it is crucial to understand and have as a starting point, the concept of listening and its implications on our daily and community life. Not only in a sense of trying to understand the soundscape and the sounds we listen to, but also and more importantly, to how we listen to them, how we relate to them and to the act of listening, individual or collectively. Reflecting on the act of listening, one needs to understand the difference between listening and hearing. The binomial concept of hearing *versus* listening lands on the distinction between what is our primary perception and what is our understanding of sound and the world (Nancy, 2007, p. 4). We don't intend to make this binominal about an opposition, but instead, a parallel. Hearing and listening are two acts that live and happen in the same body and as a consequence of each other. The distinction between the two seems a matter of semantics but can be comprehended to be more than that. Hearing is linked to perception and to the anatomical act of decodifying sound as a vibration. The hearing act is the one of perceiving and understanding the sense, the immediate sense and the source of the sound in question, not as specific recognition of it, but a general understanding. Therefore, hearing relates more to our primary instinct. On the other hand, listening is a consequence of hearing, a next step on processing sound. Listening is the act of attributing a possible meaning to what has been heard (Nancy, 2007, p. 6). This binominal can be compared to what is seen as a sense and an understanding, being the first as more superficial and primary conception of is being said or seen, and the latter, a more profound interpretation of the subject in question, being visual our sonic, visible or invisible.

It seems to us that one cannot research and present a concept such as listening, without going through what has been proposed as its modes, by Chion, in *Audio-Vision* (Chion, 1994, p. 29), but also, and most importantly, by Pierre Schaeffer, in the *Traité des objets musicaux*

(1966). The latter has a clear historical and conceptual importance, being a pioneer not only in the conceptualization and conception of *musique concrète*, but also giving an important contribute to the thinking of and on the act of listening. Here, Schaffer presents four listening modes, or functions - depending on the translation. The exposition of these modes comes from the intention to redefine the act of listening, to propose a division that is expected to be natural. This almost dissection of the act of listening is intrinsically connected to the creation and conceptualization of the *musique concrète* movement, preconized by Schaeffer. In part, it intended to integrate in the musical composition, elements recorded from the industrial, urban, daily life, breaking with the tradition of musical notation, composition and direction, and relying on the concrete sounds (Schaeffer, 1966, p. 25).

The listening modes proposed in the *Traité des objets musicaux* are primarily based on the goal to define the degrees of perception, comprehension and understanding that auditory perception provides us. They can go from the more primary and immediate mode of auditory perception (*ouir*/hearing) to the information gathering mode where we can attribute a source to the sound (*écouter*/listening), to the mode where you attribute meaning to sound, as in language (*comprendre*/comprehend), to the more profound understanding of the sound we listen (*entendre*/understand). Inspired by these modes of listening, Chion proposes three modes of listening, each of which addresses different objects: *Casual listening*, consists in listening to a sound in order to gather information about its origin; *Semantic listening*, refers to a code or a language to interpret a message; and *Reduced Listening*, requires a fixing of sounds that cannot the compiled in a single hearing, which makes it *hardly natural* (Chion, 1994, p. 25).

Listening, besides all the proposed modes and theories, or because of them, is even a more subjective act than that of initial perception, or hearing. Here, our empirical experience has a main role in conditioning what we understand and what we make of it. Being, in great extension a process and act that facilitates and contributes to communication, listening can be a mechanism of creating new understandings, senses to words or sounds (Carter, 2004). As a subjective act, everyone hears and listens to something different, as everyone as a different experience, background and knowledge, so that the original invisible sound subject forever remains in its anonymity (Chion, 1994, p. 33). But besides being such a subjective act, listening aims to attribute meaning, to be in constant straining toward or approaching oneself (Nancy, 2007, p. 7) and the world.

Consequently, hearing and listening are crucial tools to our knowledge of the world. World as in space, but also as conception of our reality, conditioned by our socio-economic,

political, ecological situation and beliefs. The way we understand and act towards and in the world depends on our values, relationships and status. Our senses and perceptions are not immune to that level of subjectivity, even when it appears obvious what we perceive visual or aurally. Thus, listening cannot be separated from the ephemeral condition of our lives in society. It cannot be separated from the social relationships that we create that are very often created on the basis of what our auditory perception and hearing are. Although being a tool to build our knowledge of the world, listening, following sound, is a tool to question and decipher *the surface of the visual world* (Voegelin, 2021, p. 3). Sound as a medium and as a matter on itself provides, by its vibration and resonance, the contact and deepening of our relations amongst beings and with the world.

But there may be common subjectivities, elements that we, as a community – being a community, a country, a neighborhood, or a simple group of people joined by a circumstance – value and take as important. Important in the sense of being deserving of attention, either positive and in a praising or useful way, or negative, in a frightening, dangerous or just in a harmful way. Therefore, as Chion refers, perception - we add listening - is not only an individual act, since we, as individuals are also partakers in a collective, making it also a collective one, to which to author calls *shared perceptions* (Chion, 1994, p. 29). These *shared perceptions*, as Chion calls them, are only possible through a common understanding of the world, that is built inside a community, a group, social relations or social status. Here we cannot separate this common understanding from our auditory sense and from the act of listening that, by being influenced by this collective motion, which becomes a collective act.

The theorization and philosophical thinking around the act of listening comes from the belief that something exists in sound's unseen movement, something that enhances, extends, and critically assesses how we experience the world and how we structure ourselves to live in it (Voegelin, 2021, p. 2). But also how we perceive space, relationships and other information that might or might not be directly linked to sound. Therefore, the fact that the act of listening is highly influenced by the community we live in, and the *shared perceptions*, opinions, ideas, or rituals, makes it not only variable from individual to individual, but also from group to group. However, the act of listening, besides being highly influenced by our community living, is also highly influential in it. The meanings we attribute to objects or actions, the importance we give to sound and listening, the perception we have on the world and on relationships are examples of how our lives can be impacted by listening. Then, the belief that Voegelin mentions is collectively created to structure a collective, a group, a community, to live, listen and perceive

the world a certain way. Sound and the senses associated to it, only provide these possibilities of perceiving the world, because it is a matter that goes beyond our physical body, that enables an understanding after perception.

The concept of collective listening as a transformative action and medium is accounted for, as a conclusion, in LaBelle's *Sonic Agency*, after a reflection on the agency of sound as a concept of capacity by which sonic gestures are extended. Here the author draws a narrative about a socio-political life, having always sound and sonic properties as a basis and a returning point to reflections and comparisons. In a separate tone and context, Salomé Voegelin also refers to collective listening as a single concept, however, not necessarily as a politically transformative act, but in a generator of a perception of a complex world, such as ours. They are, at their core, not that different, because both these approaches understand the concept of collective listening as essential to the comprehension and transformation of the world.

But all the implications, the repercussions, exist in our lives, because we contribute to the creation of the soundscape that affects us. We create, by contributing with our individual and daily sonorous routines, a collective composition, which we call soundscape. And so, the soundscape, as we know it is then a collective work, a collage of each and every one of our coexisting paths that get together in a community and society. As we create the soundscape that surrounds us, becoming then a collective work, and we share perceptions due to our participation in the world, meaning our socioeconomical statues or political beliefs, the collective act of listening is a result but also a basis to the soundscape as a collective work. And so, collective listening as a possible kind of disruption - an auditioned activism – is a type of listening, that in particular, may challenge established distinctions or structures of control. According to Kate Lacey, *freedom of listening* has the capacity to supplement speech by allowing a *plurality* of voices to be heard. In other words, it creates an immensely dynamic relational space in which voices can echo (Lacey, 2013, p. 177). Therefore, listening, being individual or collective, is also a political act, because it prepares for an individual or collective action, being social, political or ecological.

Listening activism is most powerful when people listen together. The act of collective listening emerges as a social *non-movement* (LaBelle, 2018, p. 160), setting the stage for existing in the present with others - because the sound we listen is already the manufacture of a shared reality, that animates a space between. Listening is therefore a manifestation of an *art of presence*, crafted from the physical and its position in the world, including many new roles of social being (LaBelle, 2018, p. 162). Hence the importance of the act of collective listening

relating ecology, as it becomes an instrument of acknowledging and empowering the communities to act towards a goal of turning a city or the space they live in, into a less affected one and with a smaller impact on climate change. This gives the community tools and influence, not only towards their partakers and to act inside them, but amongst political rulers and decision makers.

The contribution of the concept of collective listening is an integral part of society, transformative, active or passively, as a way of understanding the collective creation of soundscapes, as a way of relating with each other and as a way of relation with the world. The daily listening to a collective creation can make us numb to how cacophonic the urban soundscape has become to this day. Hence the importance of a more focused, intentional and conscious listening, for a more attentive and critical perception of the soundscape and, as a consequence, of the world. However, the non-conscious listening does not prevent that the soundscape influences our own reality and the way we perceive the world. The complexity of the world we live in, as well as the rising complexity of the soundscape we create, leaves room for creating a collective understanding, but also a multiplicity of perspectives and concepts associated to the ones mention to this point. And this awareness and conscious listening, being individual or collective is as important to the creation of soundwalks as it is to ecology and the conservation of the soundscape.

The artworks presented in the last subchapters necessarily imply a listening sense, individual or collective, with a political or ecological agency. The role of listening in the artworks is a role of raising awareness and of agency towards social and ecological implications. The artwork approach to collective listening is as a tool not only for the purpose of the artwork but also as a conscious tool of collective action.

2.4. Noise and Noise Pollution

The difference between a sound that is unpleasant, with an undefined source, or even an unwanted or very loud sound, and what a person understands by noise can be quite significant. The concept of noise and, consequently, noise pollution can be of even more subjectivity than the other presented and exposed to this point as the technical or philosophical definitions and thoughts are not always correspondent to the common use of these concepts. The definitions of noise can vary, according to Schafer, between an *unwanted sound*, an *unmusical sound*, *any loud sound* or a *disturbance in any signaling system* (Schafer, 1994, p. 182). This almost

chronological exposition of various definitions and perspectives on the word and concept, only reinforce the difficulty that it still is to define such a notion. However, Schafer also defines noise as *undesired sound*, as a sound that interferes and destroys what we want to hear (Schafer, 1970, p. 4). In the authors perspective, the concept of noise is always something negative and disruptive, an impediment to a normal quieter living, without the stress of constant background noise that is always present in a contemporary urban soundscape.

As we lose it to various forms of loud sounds and noise, silence becomes increasingly valued. However, we as a society and western culture, enjoy creating sounds so that we can be surrounded by them, as silence is an overpowering force that we are not used to address (Schafer, 1967, p. 7). Nevertheless, this almost dependence on sound and noise became important for the interpersonal relationships and those with the world, as they are also dependent on the act of listening to these sounds and noises (Voegelin, 2021, p. 3) for their creation and development. Besides the potential for creating relationships, interpersonal or not, noise also comes as an extension of our routine, providing a sense of dynamic, being social, political, or ecological. Meaning noise as a dimension of urban interactions, and therefore an arena of social encounters, openly promotes a dynamic of alterity and social acceptance through its disordering potentiality (LaBelle, 2018, p. 72).

Noises, following LaBelle, are manifestations of *disordering principles* and the interactions that occur from them, tensions that cause disruptions into our auditory perception and listening. In this aspect, the impact of what we overhear greatly augments what we listen and perceive (LaBelle, 2018, p. 72). This impact can also be a form of interruption, an almost violent element that affects not only our individual life but also a general social order. However, the disordering properties of sound are sometimes positive in the sense. They also provide a new opportunity to enrich social relations, across demographics, diversifying experiences (Sennett, 2008, p. 108). The presence of an element that disrupts, at the same time brings together parts and fractions of the disrupted collective, to create a new one, that have a common perspective on the disruptive matter. In the same way that soundscapes are created through and by communities and collectives, these same collectives can be created by a disruption in the routine, in society, in the soundscape.

Considering Attali's perspective, noise is situated within a larger social operation in which the potential of cohesiveness is clearly linked to main forces of violence, loud conflict, and distinguishing intensity as a dynamic notion of alterity that may be applied to issues of overhearing and social interaction is offered (Attali, 1985, p. 7). From this, we can think of

noise of a social and political instrument, but with a more violent and threatening connotation, one that disrupts. But this element that disrupts order, being social or sonorous, coming from a strange body, sometimes unidentifiable, has been part of the growth of urban sounds towards a noisy city that we now understand as noise pollution. In parallel and simultaneity with other ecological symptoms, this is as urgent as the pollution that is visible or that can affect us in a more shocking and perceivable way. Noise pollution, in today's city and urban life, is a general problem throughout the world, and it is one, because we have ignored our auditory sense and perception to this point. We would not have such noisy cities and soundscapes if we would have taken care of them to be less noisy, less cacophonic, healthier (Schafer, 1994). But the fact that this problem was ignored while it grew exponentially it only reflects its invisible danger.

Noise, considering what has been exposed, may be considered a negative matter, a marginal force, with an unidentifiable source, that threatens the social order (LaBelle, 2018, p. 68). But this noise, when it is not a violent instrument, when it is a background noise, may be heard as comfort, as the hearing individual is no longer used to silence. So, in this case, noise as background provides a sense of security when the world lacks in meaning (Attali, 1985, p. 7). And here, the background noise may be considered a sort of company while doing a task, or an actual recording of noise such as white or pink noise, which are the totally of audible frequencies together. But these are part of the multiple definitions of noise that are, in large, negative or prejudicial to health, relationships or society as a collective.

Noise pollution, just like noise, like sound, like our soundscape, affects our daily life, the relationships we create with others and with the world, and the perception we have and make of it. But noise in excess has the power of being a force inherently violent that interferes and ruptures the normality of relations. That is the subjective turning point between what is sound and what is noise, when that noise becomes noise pollution. Subjective because with regulation and quantitative measurements of decibels, noise becomes pollution when is constantly bothering the routine and normal living of someone, individual or collective. However, it is almost impossible for the human brain and perception - of a hearing individual - to comprehend and imagine definite silence, as well as total noise. Hence the need to create the awareness to conscious and trained hearing and listening, so that the issue of noise pollution can be addressed in a proper matter.

This type of pollution that is invisible and ignored, can cause even more harm that the ones that we can see and associate with a visible problem. According with the *World Health Organization*, excessive noise is harmful to human health and disrupts people's everyday

activities at school, work, home, and during free times. It can harm the health of individuals causing sleep disruption, cardiovascular and psychophysiological consequences, decreased performance, irritation reactions, and changes in social behavior (World Health Organization, 2010). This is not just an ecological problem, but it is also a public health one. It also has effect on objects, or ones we do not feel in our body, such as interpersonal relationships or the bare notion of space. These health implications are the ones more directly connected with the auditory sense, such as temporarily or permanent hearing loss, concentration difficulties, and various other implications.

For that, it is essential to address the importance of a more attentive and careful urban planning and conservation. It is in the urban environment that this problem is more present but also where the citizens and users of the city are less aware of it, as they might be already numb to the issue. It is also important to state that Noise and Noise Pollution are an integral part of the soundscape, hence it needs to be considered as such. As part of the soundscape, it is inevitably perceived in the data collected for this thesis and will be part of the routes and soundwalk proposal. Noise pollution is a current, and real problem, just like the others related to climate change and there are actions that can be taken to identify, reduce and maintain the levels of urban noise in a healthy level.

According to the World Health Organization, these levels should not surpass 54 *dB* on traffic noise and 70 *dB* on leisure noise (World Health Organization, 2018). But these values are a general suggestion to a broad regulation across the European Union, that may not be enough as it is even harder to apply, regulate and revaluate. The immediate part of the solution has to do with its partakers, the ones that create the soundscape and consequently, noise pollution. There is a need of being more conscious and aware of our surroundings, not just visually, but mostly sonorously, so that we can relearn how to listen and rethink the soundscape of our cities in order to make them healthier, less disruptive, less violent.

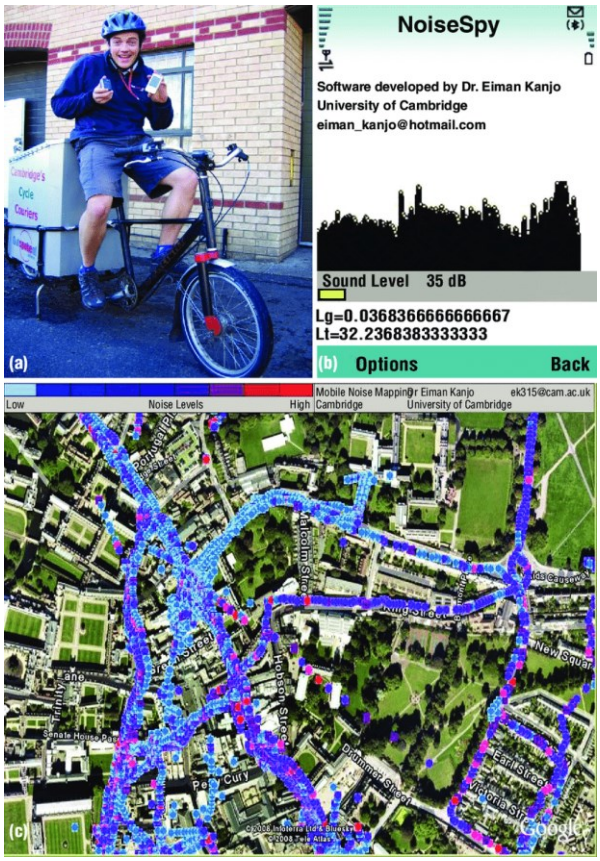

Figure 6 – NoiseSpy

In the image above (*Figure 6)*, a brief image collection of what the project *NoiseSpy* (Kanjo, 2010) is. This project is based on a sound detection technology that converts a smartphone into a cheap data recorder for tracking environmental noise. The users of this device can navigate a city while visualizing the current noise levels at the same time. This could be a tool for the analysis of the noise and noise pollution amount and effect, as well as one to help legislators get an accurate perspective of what the city users experience.

2.4.1. Socio-Political Implications and Actions

In the society we live in and the circumstances we face concerning climate change and the over dense population of the urban space, the awareness of the socio-political impacts, implications, and actions of the components of this emergency, play a crucial role in the resolution of it. But we need to be aware of the issue first, in order to solve it, to rearrange the way we proceed towards a common goal. Here the goal is to understand what space of action is left for us and how we can empower the community, if not more, informing them what is their perception of the city and what can be done.

As our perception of the world is affected both by listening and the soundscape, their interrelations, impact and subjectivities, these elements have become a point of socio-political interest and action towards an urban environment where sound and noise are a concern to be addressed. The size of the area where a sounding item is heard is the total one affected by that object, creating a correspondent *acoustic space* (Schafer, 1994, p. 214). Hence the effects of sound and noise on urban living turn individual sounds into layers of a soundscape so dense that those individual sounds are unidentifiable and almost untraceable to its origin or generator. This can only make more difficult the reduction of noise pollution in urban context. The *acoustic space* or environment turns our living space, that intimately depends on sound and on our sonic perception, into what is making us aware that our world is a *sonic world* (Voegelin, 2021, p. 10).

Therefore, sound becomes an instrument, or agent, for social and political action because it is a social and political element, being an expansion of our physical body as a contained and singular matter (LaBelle, 2018, p. 7). And so, this agency provided by sound contradicts the visibility needed to become politic on a public sphere, being therefore a way of exposing the parts of a society or community that are unheard but need to be heard. But in the same way sound is a socio-political instrument and agent, it can also be orientated or perceived for and with an ecological purpose. As a polluting element, but also as an awareness tool to a collective understanding of what in the urban space is noisy or not. This collective understanding of sound in community is an assessment of the acoustic community that may also involve an examination of how essential information from outside the community enters the ears of the residents and impacts their daily life (Schafer, 1994, p. 215).

The agency referred, based on the concept – and book - of *Sonic Agency*, affects the world around us and how we perceive it, becoming a technique of allowing new public-sphere conceptualizations and discourses of emancipatory behaviors (LaBelle, 2018, p. 3). It is, as can be understood, a profoundly political and transformative concept, that comes from the broad concepts of sound and listening, bringing them forward to as instruments of empowerment. It also makes heard the voices or sounds that are ignored in society, being voices or sounds that were taken away from our imaginary from noise pollution and urban growth. These elements or people that were silenced do not have the capacity or ability to stand up against a dominant order, as example of what Rancière calls *the wrench of equality* (Rancière, 1999, p. 96). This dominant order is also the dominant voice that is heard, overpowering a significant tranche of society, including those whose voice is silenced or not heard. However, this *wrench* can also be

the socio-political option and path taken in decision making process, which moves towards what is thought to be a better living in the city, including decisions on ecology, noise abatement legislation, and other urban questions.

But in the political stance, there are actions that can be taken to minimize the impacts of noise pollution, especially in the urban context, such as noise abatement legislation and plans. Some of the early noise abatement regulation was selective and qualitative, in contrast to present legislation, which has begun to establish quantitative restrictions in decibels for all noises (Schafer, 1994). As these legislations require a quantitative scale and a measurement tool to be executed, they become difficult to implement and regularize, as these measures are not constant and of live transmission to the competent authorities or regulators. Therefore, those plans are quite rarely implemented in practical form. Let us take for example the one written by the Porto city council in 2014, reviewed in 2020 with the goal of being fully implemented in 2023. This document aims to find out what the levels of noise that the population is exposed to, giving as examples or causes road, rail, air traffic, or even commercial, industrial, or residential occupation (Rodrigues, 2020).

These sources of noise pollution or of some sort of discomfort are analyzed through a toponymical contextualization and through acoustic measurements on the locations. The document proceeds to represent these areas in noise maps, with proper measurements. It has also as an objective to establish the technical conditions under which the city plan to noise abatement was developed and integrates a feedback and review of the respective framework of measures published in 2014 - hence the decision to designate this study as version 2.0. The use of this plan for this thesis, comes from the interest of comparing the more affected or noisy areas to those that we encountered in the data collection, as well as the difference between what is quantitative noise, where the measurements are made and conclusions are taken, and the felt noise, where it comes more from a personal and almost emotional perspective of the city users and habitants.

As we can understand so far, listening, as well as its implications in the soundscape and vice versa is always a work in progress, that opens, in a present moment, to what seems obvious but also *what may hover beyond the strictly seen* (LaBelle, 2018, p. 25). Therefore, the socio-political implications of the soundscape are inevitable, as consequence of what we listen to, how we process and perceive it. In this sense, listening to our soundscape, and consequently, soundwalks have a great social importance since they are an exploration of themselves through a guide of others. Following Bickford, we have the ability to listen to something about the world

in a new way by listening to it from another person's point of view; we can be surprised by others and by ourselves (Bickford, 1996, p. 162). The plurality of perspectives is as many as listeners and perceptive beings there is, but also in a collective and communing way of sharing perceptions.

Socially, these *shared perceptions* are of extreme importance because they create the sense of collective identity and understanding, as these communities are built on common groups, social economic status, religion, political preferences and a multiplicity of other more (Aidoni & Chourmouziadou, 2021). However, living in society requires a constant reworking as a relational spatiality where sound is a major paradigm for also conceiving and perceiving the contemporary condition (LaBelle, 2010). This reworking takes time and is not always conscious when it comes to its awareness. Which means that it is an inevitable and unconscious reworking towards a perception and understanding of our urban living, just like the unconscious work of collective perceiving through sound.

The social political implications of soundscapes are also the causes and constructers of it, as the interdependence between the social status of the soundscape creator and the social implications of it, can become a circle of mutuality and stability. This social and spatial awareness through sound and through the collective perception of it, provides social interactions (Martinho, 2017, p. 24). It also provides an obvious orientation to the movement through the volume and space, based on our dependence on the physiological perception of sound; it affects the aesthetic and collective sense of community, improving the individual and collective experience and understanding of all sounds, including music, voice, and consequently, soundscapes as a miscellaneous of urban and individual sounds. Because of the general stability and resignation to the present condition, there is a sense of lack of power in the decision and action towards a healthier soundscape and, in consequence, a healthier city. It is a common feeling that the citizen individually cannot act towards this goal, but actions are made of individual deeds, however, what apparently tends to be seen, heard, and accounted for comes, in large stance, from those with some sort of power in social, political, and economic institutions (Bickford, 1996, p. 162). These power structures are sometimes blamed for not acting on climate change, but this also reflects an excuse of the individual as they do not feel capable or empowered to take the matter into their own hands.

The city councils and local governments should take responsibility for drawing up analysis towards noise maps and the respective zone classification chart to comply with the values of external ambient noise. In this sense, the noise abatement legislations and its practical

application are scarce, both in its thinking, legal creation, and regulation to turn cities and urban living in a less cacophonic soundscape. The mentioned city plan has few changes since its creation in 2014 and it is admitted in the report itself that there is still a lot of work to do. However, the question of what and how this legislations and independent action should be applied and regulated, still stands until it is possible to empower the citizens and listeners to act individual and collectively. This plan will be part of the analysis of the data, as a comparison between the measurements and critical areas considered by the city council, and the ones considered and perceived by the students that constitute the sample used for this research.

3. Data Analysis

The collection of data, as an experimental process and methodology, provided for this research a wide range of answers and perspectives. The two activities – *4Cs* and *Map* – although different, corroborated each other and unveiled a collective perspective and perception of the city that was not totally expected. As mentioned before in this thesis, the data collection was by means of an experimental methodology (Marres et al., 2018, p. 11), and aimed to understand the emotional relationship and perception that the academic community has on the city of Porto. These activities provided for the analysis, not only the formal data collected, but also the informal one such as reactions and feedback from the students that participated in the activities.

Here, it is found the main development of the thesis that comes from a collective work, but it is exposed as an individual approach and analysis from a philosophical, conceptual, and subjective point of view, rather than a quantitative and traditional scientific collection and analysis of data and of the experiment itself. The analysis of this data is divided in three parts: a preliminary one that was made along with the group project and it reflects on the initial data; a conceptual one that analyses the collected data in light of the concepts exposed earlier in the thesis; a parallel with the City Plan to Noise Abatement as a form of grounding the results on actual measurements and to compare those with the emotional perception that the students have on the city.

3.1. Data collection and preliminary analysis

As exposed in the chapter correspondent to the methodology, the collection of the data was not one of traditional scientific approach, being more of an experimental and exploratory one (Marres et al., 2018, p. 11). Here, the collection was made in a total period of two months - with an additional two months of preparation and testing - in which the activities mentioned in the methodology chapter were applied to the different classes of different areas of study. Both the activities of data collection were decided along with the research group and were thought to collect the most variety of data, from text to points in a map, to reactions and comments, so that all could contribute to the understanding of what the perception of the groups were of the city. Throughout the process of data collection there were no major impediments to note, the students were very open and collaborative, being aware of what they were contributing for and that their consent was taken into account, for what they could refuse to participate or leave at any time. The analyzed data informs the proposal of routes and soundwalks that this

thesis presents. Informs directly through the points and areas selected in the maps. Informs in an indirect way through the emotional reactions, conversations and the other activity (*4Cs*).

The *4Cs* activity depended more on group dynamic, where the students really had to discuss and obtain information from the other three groups and not solve the problem on their own. It was our aim here that the students would come up with questions related to their topic and could question other on their perspective. This activity, projected by Matthew Richter in a publication of *Thiagi GameLetter* (Richter, 2004) and reinterpreted in *Gamestorming*, intends to *navigate, combine, interpret and working with ideas to discover something new* (Gray et al., 2010, p. 164). It is also a quick and first thought game to gather information, being on a problem, on a process, to find a solution, or just to promote teamwork and connection.

The results of this game were more directed to text and verbal information, rather than emotional reaction to places and areas of the city. However, we can conclude that between the four topics that were mentioned - *Components*, *Characters*, *Time* and *Space* -, and all the classes in where this activity was applied, only once did the direct mention of noise pollution came up as a problem. Not that they did not note problems surrounding the issue of noise pollution, but they were always associated with the visual clues that were disturbing, namely traffic and tourism.

The data collected here relating the soundscape and noise pollution can be seen as a confirmation of what the perspective of the other participants are, that the main sources of noise and disruption in the urban space is traffic, construction sites and the overpopulation of the city, namely tourists. The *4Cs* activity does not provide such a directly visual result as the *Map* activity, therefore its participation in the analysis may not appear obvious, but it is present as it helps corroborate, interpret and justify the choices and options taken in the *Map* Activity.

Causes	Agents	Behaviors	Impacts
• Car • Tourism • Traffic • Energy • Industry	• Company • Associations • Government • City Councils	• Green Spaces • More Options • Public Transport • Education	• Irreversible • Experiencing Loss • Unpredictable

Table 2 - NVivo Results for the data collected in the 4Cs

The *4Cs* activity was analyzed with NVivo, a qualitative data analysis programme that produces and associates words in the form of a cloud. This method allowed for faster and easier word association, counting, and placement, which would have taken much longer without the aid of software. The form of analysis, which is more connected to the social sciences discipline, represents the project's interdisciplinarity used for data gathering and analysis. This software performs a word association analysis that groups the most stated terms so that we may get a sense of what the students' attitudes and understandings are on Climate Change, especially in the city of Porto. In this case, the word association reflected four new categories, one related to the causes of Climate Change, one to the *Agents*, or *Characters*, one to the *Behaviors* and one to the *Impacts*.

The *Map* activity implied a more physical and close approach to the object of research, meaning the map where they chose areas represented by points pinned by them and then justified. This methodology of data collection was chosen to have a direct connection to emotional cartography, where the importance and choosing of the points are associated to the relation that the person has with the place and not based on historical, political, or economic reasons. The practice and research on emotional cartography was a starting point and is also a very direct term, where the mapping of a certain area is built from the emotions and reactions – physical or emotional – that the person demonstrates towards a place or point in a map. In this research, the line of thought of emotional cartography can be defined as maps that *chart human feelings onto a cartographical landscape* (Perkins, 2009), and it is a useful methodology for understanding the city and urban space through its users. With this, the understanding of the space through emotions and feelings, allows the researcher, the artist, or the viewer to question its own perspective and to rethink its way through the city. However, this approach to cartography – or mapping – opens a space for infinite creativity that can reach distortion of the map and its scale. In this thesis and research, the use of emotional cartography will not visually affect the map of the city.

The map used in this activity of data collection was based on a city contour map that covered the are from the Douro River up to Estrada da Circunvalação (EN12), delimiting the city of Porto, to which was added some street names to help the students locate themselves in the city. The design of the map itself was kept simple in order to not distract the attention off the activity and to avoid other visual stimuli. The grey areas shown in the map are used to distinguish the green areas or gardens/parks in the city. For this activity, the map was printed in a A0 (84,1 x 118,8 cm) so that the approach to the object was of a close relation with the

body and to become easier to navigate in it. It was important that the map could be physically approached and that it would be big enough for people to be able to meet around it as a moment of performativity (Guggenheim, 2015) in the act of pointing in a map the place chosen.

Accompanying the map, each participant got a card with instructions and where was asked to write a justification for the choosing of the place or area. That justification could be anything that linked them to the place, a story, a memory, a daily action. The card was divided in three, between the pairs of categories proposed. Here the colors associated with the categories were presented and it was where they could associate the colors with the respective pin, which were numbered corresponding with the card, in case there was no identification of the place.

Generally, the preliminary reaction of the students to the instructions of the exercise and after being confronted with the map, the card and the pins, was that there was a lack of knowledge of the city. Most of them, between the ages of 18 and 22, with few older exceptions, were either from other cities surrounding Porto and did not live or frequently used the urban space of the city or were directly affected by the pandemic situation that confined them to their houses or residential area, without a chance to explore the city in the way they would normally do in a period without restrictions. Therefore, the answers and marked areas in the map were inside the area that is more commonly used by people of use public transportation to get to Porto, or by people who live in the area surrounding the Universidade Católica Portuguesa Campus. This area is largely confined to the South part of the city, including the historical center, extending to Foz, where the University is located, having an extension North up to Parque da Cidade, a very popular green area of the city. The concentration of data in the South part of the city contradicts in a way what we thought the results were going to be, as we were expecting a variety of places and areas, outside of the common areas and touristic points. But it only raised our awareness to the number of students that are not from the city and are users of the city just for academic purposes and then leave again for their hometowns, without taking advantage of the city and its heritage.

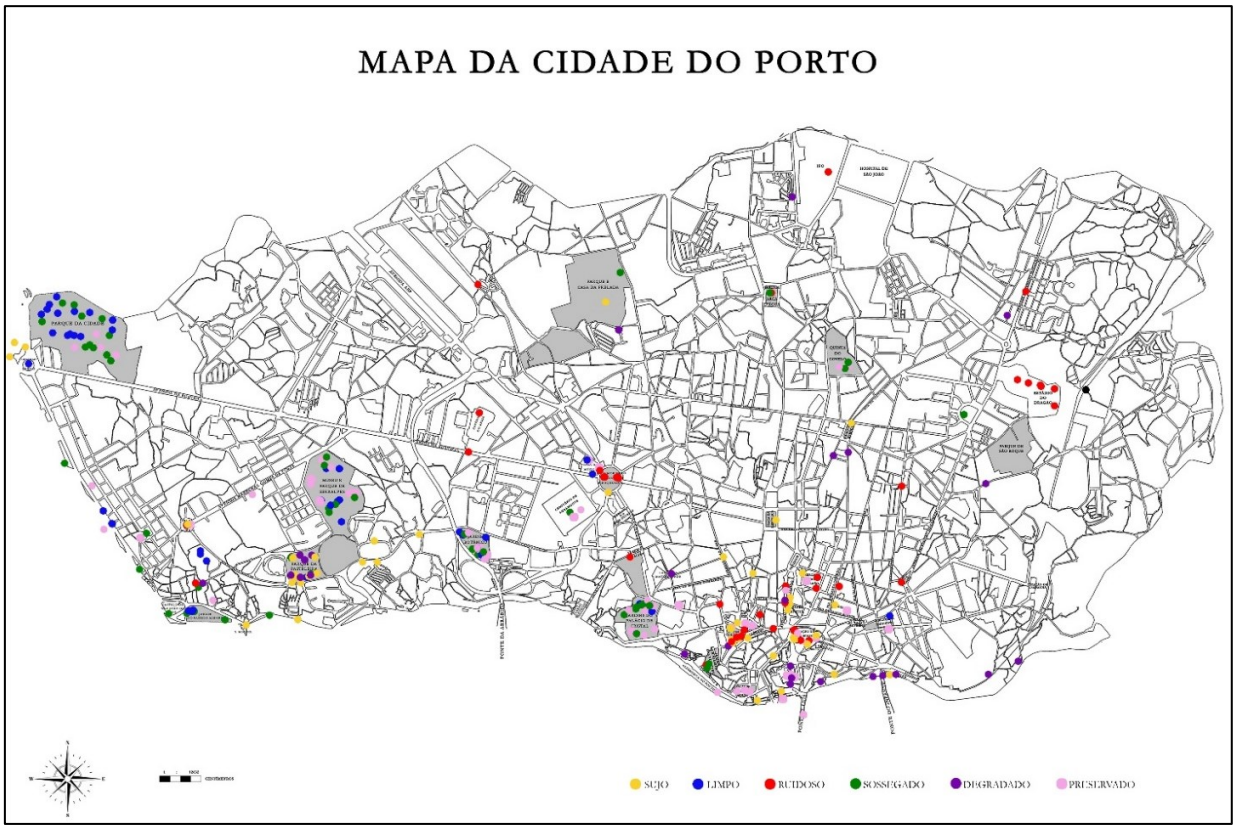

Figure 7 – Total Data Collection of the Map Activity

Another occurrence to take note in the analysis, is that even though this was an expressively individual exercise, the answers were always influenced by the collective. The maps were distributed to small groups within the class, consequently, there were three to six students in which group with a correspondent map. Inside these, a group dynamic was formed and so they influenced each other's answers if not agreeing on pinning the same area, even after several interventions from our part, such as trying to recall that the activity was of individual character. And so, this also contributed for the concentration of points and answers in a specific area of the city, by opting for similar answers or because they could also have a relation with that space or area. Although it was a reaction to the exercise we were not expecting in such present matter. It is positive and productive when it comes to the non-qualitative or quantitative answer, being the dialogues, the discovery and navigation through the map, the sense of collective and collaboration between the students.

Simultaneously with the concentration of data in the referred area, there were areas with a bigger accumulation of points, areas that are common grounds in the city and are tourist attractions but are also a reference for local users of the city. The downtown and historical center of the city was the area of more quantity and variety of data. Variety in the sense of the

categories that could be chosen, as there are antagonisms that can be found, such as an area or place that is conservated but also dirty and noisy. In the same way that there are these differences in the same place there are even more profound ones, such as one person can point out a place as being conserved and the other as degraded and validate its choices by describing the place. However, the pair of categories that are pertinent and to consider for this thesis is the one correspondent to the soundscape of the city, or its characteristics – *Noisy/Quiet* –, but these general considerations are useful for the understanding of the dynamic of the data. In this analysis, we will consider *Noisy* to be of negative impact and *Quiet* of a positive one.

When it comes to the sound related characteristics, the data tends to accompany the binominal dynamic course of the rest of the topics, where the more negative and polluting – *Noisy* – is concentrated on areas of more traffic, being vehicles or people, and the more positive – *Quiet* – is mostly marked in green spaces, parks and viewpoints. However, these more *quiet* and calm places are somehow a superficial notion of quietness, in the sense that are only calm and quiet in comparison to the cacophony of the city. Although green spaces can act as sonic filters for the urban sounds, they do not have the capacity to filter the amount of constant sonic stimuli that involve urban living, from traffic to people, to music and airplanes.

But in comparison to the rest of the soundscape, they are indeed quiet and calm, being also connected to the emotional relation with the concept of green space and garden as a place of escaping from the city. And so, these notions and perceptions of parks and green spaces as quiet spaces can be more of a *shared perception* of these areas to a sense of calmness. These *shared perceptions* (Chion, 1994, p. 29) are established and happen independently of the class, the student, or the scientific area, so it does not integrate the phenomenon of group discussion and answer. It is also of shared perception that the action towards Climate Change should be collective, and rarely individual, reflecting the lack of empowerment of the students and that is a constant in the activities. The reference to government action, being local or national, acts as a release of responsibility as they don't feel capable of acting.

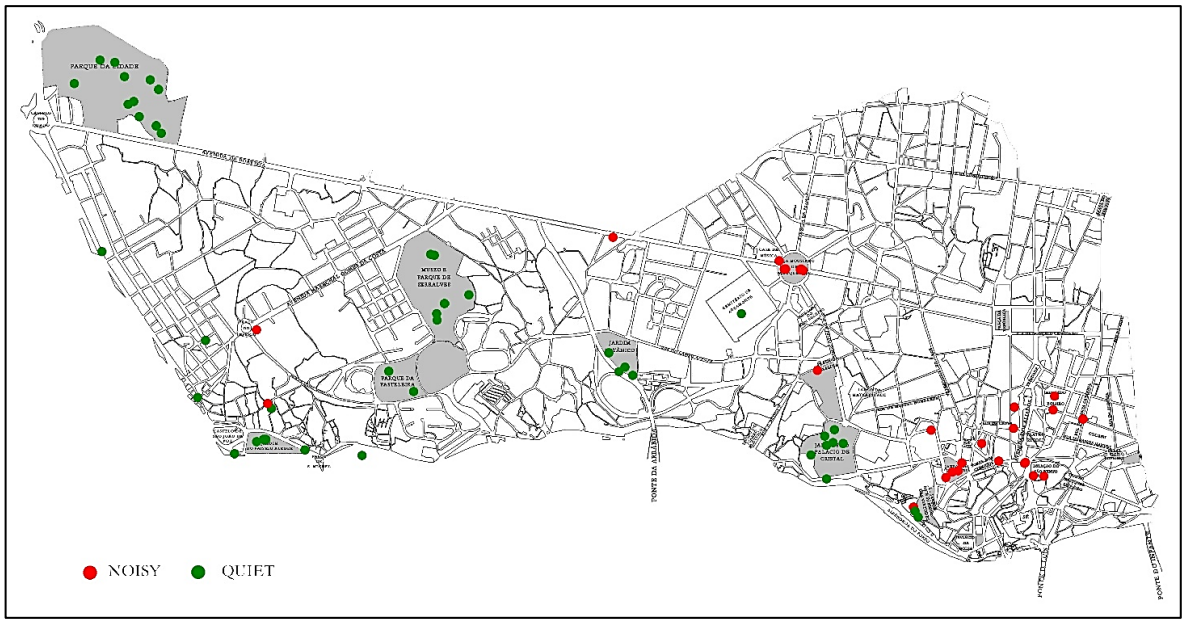

Figure 8 - Quiet/Noisy map of the selected part of the city

On the other hand, the noisier places, besides the ones where the obvious traffic accumulates, are also the ones where the most changes in the city are being made, with construction, in vast majority of the places that most people need to cross. These impediments created by construction work tend to create a bias on people's perception of that space, meaning that if it was a place that is now obstructed or affected by construction, it builds a negative perception, including the raised awareness to the noise produced. But traffic affected places, tend to still be the most exposed as noisy or affected by the issue of noise pollution. From the sample of students that we had the chance to collect data from, most of them did not reside in areas near highways, but that did not diminish the issue of traffic noise pollution as most of them also pointed traffic and congestions provoked by redirection of streets because of construction work as an issue in the historical center of the city. Because of this, it was also mentioned the desire to see less or no traffic in the city center, so that public transportation could be a solution to diminish not only the issue of noise, but also the fuel and gas pollution in the city center. However, the students do not feel like it is in their power to act, to provide a solution or even be part of it, place the responsibility, the decision and acting power in the government and power structures.

From this initial analysis of the data, we were able to obtain a slight perception of the emotional and functional relation between the students and the city. We were also able to understand how the students of the analyzed sample were aware of the noise pollution problem, but in a somehow dissimulated way as it was rarely mentioned as an individual concept, notion

and phenomenon, but its interveners and causes were explicit and known. Furthermore, it became clear that they do not feel as if the action of change is in their power, as they do not feel empowered to act neither individual nor collectively. In the following work developed for this thesis, it is our intent to raise the awareness to the issue of noise pollution, through soundwalks and the reflection on the soundscape, but also to the more positive side of the city that is shown through the perception of those who are the inhabitants and users of a city that is in constant transformation.

3.2. Conceptual analysis

Following a preliminary analysis, it is helpful and needed to understand conceptually what the data means, so that it becomes a sustained and coherent analysis and not only a preliminary one. This conceptual analysis is essential to the development of this thesis and research, as it is the philosophical and conceptual part of the study that gives the required insight for the creation of the soundwalk. Applying the concepts to the data and vice versa creates a perspective of the results that is somehow different and more grounded and pertinent. It also demonstrates the importance of the concepts and of this conceptual analysis to the knowledge of the city, the soundscape and the ecology, being this acoustic, urban and social. It is important to consider that the analysis done in light of the concepts defined in the *Framework* chapter, is one based not on a quantitative collection but on an experimental and exploratory one, that accounted for the emotional cartography as primary source of information.

The soundscape of the city, in the way these students perceive and described it, is not one of quantitative measures in *dB* or with scientific formulas, but rather how they feel about it and how they relate to it, intimately or just as users, but either way, as partakers. These soundscapes as an integral part, are ones that opposes two types of spaces: the ones of quietness associated with how clean the space is and therefore how preserved; the ones of immense noise that derivates from traffic and construction work, both seeming a constant in the city. The types mentioned make a clear parallel to what Schafer defines as *hi-fi* and *lo-fi* soundscapes[13] (Schafer, 1994, p. 43). But here, instead of a countryside *versus* an urban soundscape, there is both perceived in a single city area. A supposedly calmer area that can be found in the green

[13] *The hi-fi soundscape is one in which discrete sounds can be heard clearly because of the low ambient noise level. … In the hi-fi soundscape, sounds overlap less frequently; there is perspective-foreground and background… In a lo-fi" soundscape individual acoustic signals are obscured in an overdense population of sounds. … Perspective is lost. On a downtown street comer of the modem city there is no distance; there is only presence.* (Schafer, 1994)

spaces and parks, and a more cacophonic, loud and noisy are that is, in fact, the rest of the city, making note of some critical points, but distributed along the considered part of the city, giving the sense that the city is, in its vast majority, noisy and loud.

But there is not a truly *hi-fi* soundscape inside the city, as there is no green space or park capable of filtering all the noise and layers of a city soundscape. It may be able to filter some of the traffic noise, but there will still be left with the aircraft noise, the car horns, the construction work and emergency vehicles, the numerous untraceable sound sources that are layers in the soundscape and that cannot be silenced or overheard by being in a green space that evokes the countryside or somewhere calmer. In Schafer description of the soundscape, the difference between a *hi-fi* soundscape and a *lo-fi* soundscape is also a reflection of a critical approach to the urban soundscape at the time, which have gotten worse to this day (Schafer, 1994, p. 43). It is nearly an evocation to escapism of the city and a glorification of the *hi-fi* soundscape as a political stance against the capitalist and industrial city that corrupts the soundscape into noise pollution.

Therefore, the soundscape of the city of Porto, from the data collected, is based, in great part, on traffic noises and construction work, which diminishes at night, but the visual reminiscence of that soundscape is constant. The soundscape, as a layered collective work, becomes cacophonic, confusing, as there is on worry as a society to prevent the collapse to noise pollution. The unconcern and the excuse of responsibility from the partakers in the soundscape – inhabitants or simple users of the city -, makes clear the lack of listening awareness and consciousness. Both this awareness and the listening consciousness create a tool for understanding and being part of a better and healthier soundscape, one that is concerned with the environment and that is part of an ecological solution, one that is concerned about the repercussions, causes and solutions of this matter.

As partakers in the soundscape, and also in the problem of noise pollution, we must understand and reflect on our position as such. The soundscape as a collective work, implies in itself, a social responsibility as we will not be the sole affected by our contribution and creation (Voegelin, 2011). This responsibility comes with the notion of inhabiting and using a space, being that part or not of a city. The circumstantial data that we could perceive shows that, even though the students are aware of the problem and noise pollution and justly point to the causes responsible for it, they excuse themselves from the responsibility of diminishing the problem. It is a common feeling to deposit all the responsibility in the collective political power and almost never in the collective popular power, in what communities can do.

We must understand that we are an integral component of the soundscape, not its focal point, but rather as we simultaneously coexist with it, as we coexist, relate and resonate with others and with the world (Voegelin, 2014). And as social beings we are part of a community, a social one too, one that may be identified as an entity and that can be defined along lines of socio-political status, political beliefs, religion or around acoustic lines or perceptions (Schafer, 1994, p. 215). The idea of *acoustic community* might be more associated with the agency of listening as a collective act, one of articulation and empowerment through emancipatory practices. This collective act was not especially present in the data collected for we believe it is a pertinent approach for to return this idea to the community as a tool for a more conscious approach to listening, as well as a more ecological one.

As the concentration of points that translated to noisy places is not accumulated in one particular area, there are two options that could justify this. It could be because there is no particular area noisier that the rest of the city, or because every area of the city is noisy and populated with an *overdense* quantity of sounds. Hence there might be a collective understanding of the city and its urban area as noisy and always populated by sounds. These areas would be more easily recognizable if there was a strong difference between the foreground and background sounds, as open and reactive spaces have a unique potential for experimenting and staging sonic events (Southworth, 1967). Meaning that the urban web of sonic events is not recognizable as they are just a mass, and do not give chance to individual sounds to be listened to. By foreground and background we mean: by the former, the sounds that stand out from the rest of the soundscape, such as one from an unusual source, that have some type of importance or that is not representative of the soundscape itself; by the latter, the sounds that go normally unnoticed in our day to day routine, the ones we do not give any value to or that are simply normal to hear.

The mention of the collective, as a cause but also as a solution to the issue of noise pollution and the improvement of the soundscape of the city, is a constant in both activities. This condition to which the participants in the data collection subjugate themselves, reflect either the lack of empowerment to think and act by themselves, but also the blaming of the power structures that they feel are responsible for the problem and now for the creation of a solution. This solution, and following the non-quantitative data, needs to be based on a political approach to noise reduction, while the community and the citizen's positions and individual or collective actions are not considered as valid or as a part of an approach to the problem. The reference to power structures reflects the notion of sound and, in this case, noise as power. The

parallel is justified by the intent to appoint these public and private power holders as responsible for the problem, but also, and consequently as capable and with the means necessary to create and implement a solution that, following the data, goes through the creation of noise abatement legislation and verification.

This type of approach to power as a representative structure that should care for the general interest of a city, its inhabitants and users seems to not be corresponded, as it is a common answer to mention what is still to do, and what is not done in the city towards acoustic ecology and the addressing of noise pollution as a problem. However, there is the notion and the consciousness that it is a problem and a very significant and complex one. Noise, overtime, becomes on itself a power structure, as it is a powerful sound that might be used in a diversity of purposes. But overall, it has an impact in our daily lives, from the soundscape to noise pollution, *sound enacts power* (Goodman, 2010, p. 10), sometimes in an intimidating way and it can become overwhelming when it is a constant source of stimulation and ultimately pollution.

The power enacted by sound, and ultimately noise, has an impact in our life and it could have been a measuring instrument for how great and strong an industry, a city could have been (Schafer, 1994, p. 91). However, it is no longer such an important or considering parameter, on the contrary, there is now a transition to more silent industries and a desire of a more silent city. But a transition to a more silent city, we believe it will not be nor a simple nor a consensual one, as it takes more than a change in a political approach, or regulation, it also takes a change in habits, in options to the consumer, user and inhabitant of the city or the urban space in question. As the process towards a *sonic city* would not only improve city life by assisting in overcoming the stress and isolation of the visual city of today, but they would also be a step toward increasing inhabitants and users' sensory awareness and creating a space that is more receptive to human activity and purpose (Sterne, 2013). And by *sonic city*, we mean a city and urban space that values sound and listening – individual or collective – as an advantageous asset to living in community and society. Sound and listening are an advantageous asset because of their role on our relationships, with others and with the world, as space and community, as it determines a big part of the inputs and stimuli we receive in our daily life. Therefore, sound and noise also enact force, as it is a strong one that reaches from the body and into the activating of social structures and their politics, one through which we learn about the entanglements of worldly connection (LaBelle, 2018, p. 69).

The association of noise and noise populated places in the city, is sometimes also associated with the degradation of the city, or some parts of it. This degradation is also connected to how *Dirty* that city area is. But this brought us to question why these locations and characteristics were connected. There could be socioeconomic factors that tend to accumulate these negative characteristics in areas that are inevitably in easier economic reach, such as social housing or areas where there is less security and stability, as noise and noise pollution are such disruptive element in society that have a great impact in the way we perceive the world. But in this case, the data collected does not point directly in that direction, however possible. It rather associates noise and noise pollution, with what Sennet calls a *disorder* that enriches social life (Sennett, 2008) being in fact useful for city and urban organization and for the relations we establish and that are based on the common characteristics, but also on the variety of social beings and status.

Besides Sennet's perspective on noise, Attali puts noise in a position of great social importance, as it is considered an operation where the potential of cohesiveness is directly linked to main forces of violence, loud conflict, and differing intensity (Attali, 1985, p. 9). As the definition of noise is such a subjective and open one, but generally associated with a more negative approach of sound, the importance of it carries the same or even more subjectivity and multiplicity of approaches. The fact that it becomes a social factor, is justified by its constant present, which makes people used to it. It then becomes property of urban interactions, and therefore a place for social meetings, that implicitly promotes a dynamic of multiplicity and social tolerance through its disordering potentiality (LaBelle, 2018, p. 72). In the data collected, this social potentiality of noise is present where the areas selected as noisy become not only the ones affected by traffic and construction work, but also as night-time entertainment, such as areas that are normally crowded around bars and clubs. Noting that those are not the sources of noise pollution, but the crowd reunion and social interactions. Here it is created a different soundscape than the one related to daytime, to traffic, to work hours and stress. Here, the source of noise pollution is the opposite, the escape from that routine, the night life and entertainment, creating a sort of bubble inside the urban soundscape, that intents to escape from the daily one, but replicates the problem of noise pollution.

Furthermore, this *disorder* associated to noise, just like sound, is a powerful force, one that is inherently related with violence and that diminishes social order as it appeals, through the violent sonorous stimulation, to our primary instincts of awareness and defence, becoming a main impulse of social intensity. In this social intensity, is created a space where impressions

and perceptions intersect and blend into what we know has *shared perceptions* (Chion, 1994, p. 29). These are raised from a sense of collective and community, that provide a sense of security and acceptance. The concept of *shared perceptions* is one that was repeatedly observed in the data collection. However, it was an individual task and choice, a lot of the answers got repeated thanks to the collective or *shared perception* and relation that people – in this case students – have with the city, its urban areas and most importantly, how they relate to the soundscape of the city and the consequences of noise pollution.

This collective perception shows a noise populated city, with few exceptions for the green spaces that are not quantitatively and analytically quiet, but they emotionally represent what can be quiet in an urban area that seems to not value silence in the same way other ecological issues are valued or of concern. It is explicitly referred that noise pollution is not as dangerous or notorious as other types of pollution, that affect or attack the visual sense. However, it is also referred that even though, noise pollution is not as prejudicial, there is a big difference between the city area and the countryside. There might be an unconscious adaptation of our ears and listening act to such a cacophonic soundscape, only underlines more the need to listen more consciously and with awareness to what the environment that surround us. This type of approach to soundscape, as almost a background and constant noise, only harms our health, relationships with each other, with our community and with the world.

The mention of the problem of noise pollution in the data collection, is scarce, as it seems to not be associated with a real problem, but instead, with an inconvenience out of their power. And this sense of lack of power to act is as common as the sense of need to act ecologically on pollution. However, it is also of common understanding that each of the students, individually and collectively, are partakers in the soundscape, being affected by it, but simultaneously taking part in its creation, as layer, as a contributor, as a listener and as an inhabitant or user of the city and the urban space. And so, the action is put in the hands of power structures and holders, as it is thought of them to be the only capable of action but on the other hand, the ones to hold accountable for the lack of ecological action towards climate change. In summary, the answers collected are quite paradoxical as they point towards almost opposite ways, while discarding responsibility on individual acts towards a collective objective.

3.3. City council Actions

As mentioned before in this thesis, the City Council of Porto developed a noise abatement plan in 2014, a first-time approach to noise pollution as a strategy to diminish the impacts on citizens and to turn the city into a more attractive place to live and visit. In this chapter it is intended to create a parallel between the data collected relating the emotional description of the city soundscape, the relationship that the students that compose the sample have with it, and the Council Noise Abatement Plan – *CPNA* - (Plano Municipal de Redução de Ruído 2.0) [14]. The version used for this thesis is the revision of the initial plan, which took place in 2020, as a mid-term analysis of the actions already taken, those that are still left and those that need to be changed. The approach to urban soundscape is a very murky area as there is several different approaches and methodologies to it, from urbanism, to politics, to acoustics, and sound studies, with a philosophical approach and with intent to combine all the prior. The fragmentation of perspectives can be of great influence for the lack of action and concern on the matter. Here we intend to compare the data collected to the *CPNA* with a first approach of comparing visually what are the points that coincide with the problematic areas that the plan presents, and then a conceptual analysis will be made in order to draw attention, from a sound studies point of view to the problem and to what the sample of citizens understand and feel of the city sounds.

However, we are aware that the connection between the data collected and the *CPNA* might not be direct and that it is open to interpretation. We understand the importance of this parallel between the connection of the emotional and individual perception of the city soundscape and the quantitative measurements and planning as a grounding part, as well as a crucial instrument for this research and thesis. Nevertheless, it is worth noting that the analysis and parallel made between the plan and the data collected for the *HAC4CG* project, and consequently for this thesis, it is about the results of the measurements, analysis and formulas made for the *CPNA*, and not about the methodologies in themselves, as they are not part of our thesis and analysis. The reference and analysis of the *CPNA* is then based on the cartography produced from the calculation and measurement of the *dB* of a certain area. Paradoxically to the plan, this collection as nothing to do with mathematical formulas and quantitative measurements, it rather cares about the emotional relation and approach to the city and its soundscape.

[14] This noise abatement plan can be consulted and analysed in the following link: https://ambiente.cm-porto.pt/ruido/planeamento-estrategico-da-gestao-do-ruido (last viewed: 17 August 2022)

The Council Plan is clear when it comes to identifying zones that are dangerously noisy. The main cause for this issue as these areas surround the freeway that crosses the city (*VCI*) and the junctions of other freeways with it, is clearly traffic noise and those associated with it, from fast- and slow-moving traffic, to car horns and to emergency vehicles. Although this is the most critical area, is not the only one affected by traffic noise, as there are internal city roads that are constantly crowded and congested. These are critical city points, as it affects more residential, working and leisure areas, while the freeways were supposed to not affect the daily lives and routines. But in fact, they do not only affect the area that they cross, but the extended affected area varies with the traffic and time of the day, which disturbs a wider area than what was supposed and desirable.

In this comparison, we did not find any indication or map point in the more critical areas considered in the *CPNA*, namely the freeways junctions probably because there were no students that live on those areas or that were affected by it directly, or because they are users of that pathway to work or university and they are not that aware of the level of noise produced but that city element alone. The option of having a freeway crossing the city in half has an important role in the construction of the soundscape, as it conditions not only the area surrounding it, with the traffic noise, but also its gateways and consequent surrounding areas that might be residential or not. Considering this, the equivalent of the freeway measurements in the data collected by us, are still road sections of the city, areas with a lot of enterprises and businesses, stores, transport accesses and other city connections. Besides, there are commercial areas and areas in the historical center that should be of concern to its conservation. There is no safeguard or protection for the historical heritage when it comes to noise pollution and other types of pollution associated with it, from the vibration of underground structures due to constant traffic and heavy vehicles or to the gases that ultimately degrade the estate, the public art works and much more.

The historical center persists to be the most affected by traffic, as it is still a crucial crossing area for most residents, which turns the soundscape of this area, cacophonic, both by traffic, construction work or the dense tourist population that visit the city everyday day. This constant noise is, without a doubt, a disruptive element in society and in the collective living in the city, however it is also an element that should not have required adaptation, but it did. And so, the disruption caused by noise was normalized to the point of having a collective adjusting to its disruptive presence. The soundscape is also a tool to understand the space that surround

us and how we relate to it and the world, but the disruption of noise makes that understanding and perception harder that it would be in a more *hi-fi* soundscape.

In the data collection, as referred in the preliminary analysis, the difference between the *Quiet* and *Noisy* points selected in the map is mainly the typology of space as the *Quiet* points are generally associated with green spaces, gardens and, in less but still representative cases, beaches. Even these areas and places that are associated with quietness, calmness and sometimes escape from the city, are only associated with this because of its visual clues that relate to calm and quiet places. Hence these are here considered calm in only in comparison with the remain urban area. And the *CPNA* only underlines that with the measurements made, because every area mentioned as calm and quiet is not significantly calmer and quieter than other areas not considered the same.

By way of example, the green spaces mention, with the exception for Parque da Cidade are all green spaces integrated in the city and that are not immune to it noises. This might not be so impacted by road traffic, but it is by airway traffic -, The same happens with the beaches and river side areas that are encircled with busy streets, transportations, and construction work, and come by quiet and calm because of the sea as an overwhelming element. This reinforces the notion of the visual bias that was instilled in us overtime, neglecting the auditory sense (Schafer, 1994), leading us up to this point of noise pollution and with a lack of listening awareness and consciousness towards our soundscape, our actions and surroundings. Considering this, the act of listening could and should be one of extreme importance, as it is also a tool to question and scrape the visual tendency and bias mentioned. This tendency to overlook the act of listening is then reflected on the various problems of the soundscape and that the inhabitants and users of the city cannot point to its source.

For this thesis, it is useful and relevant to understand that the points and areas that were emotionally pointed in the map are extremely similar, if not coincident, to the critical areas shown in the analysis present in the report. However, it is also of interest to note that these critical areas have a complete opposite inside the city, the green spaces that are considered *Quiet* and calm. Most of the justifications we received used visual clues to justify the sonorous, such as how clean or preserved the space was, or the opposite, how dirty and degraded. Hence the association of some points in various categories. Nevertheless, it is essential to emphasize the importance of the act of listening, being collective or individual, in a soundwalk or in our daily lives, because the act of consciously listening frees the individual from constraints as well as a

referential reality and need that a visual perspective imposes, allowing one to explore a paradise of aural possibilities (Voegelin, 2021, p. 33).

The parallel, between the two methodologies and data collections, is more correspondent on the places that are consider *Noisy* than on those considered *Quiet*. In other words, the emotionally *Noisy* places are, in large part, quantitively measured as noisy, while the emotionally *Quiet* places are not always quantitively measured as quiet, for they are only emotionally and with a created and *shared perception* of calmness and quiet. As seen in the pictures presented below, although the areas of more concern are the ones surrounding traffic lanes and highways, there is a large volume of noises populating the city, with few exceptions of calmer and quieter areas. It is worth noting the scale on the side of the picture, that goes from above 0.0 *dB* to above 70.0 *dB*, that can be reached in the critical mentioned areas. The lower measurement represented in yellow in the map is present in most part of the city, however this does not mean that it is *Quiet* and calm. This category goes up to 55 *dB* and there is an emotional and psychological approach that is being forgotten to what means to the individual to be *Quiet* or calm.

The city plan also includes a public consultation in which there is a large margin of inhabitants that are clearly disturbed with the noise produced by traffic, railways, and air traffic. There is also a part of the population consulted that admits having sleep disturbance, being over-exposed to noise sources (Rodrigues, 2020). However, this percentage described it the report is small. This problem has also to do with the urbanistic organization of the city, but that should not be the excuse to the degradation of the soundscape and the immense traffic that can be verified not only in freeways, but also inside the city, deteriorating the urban life and patrimony.

Sennet refers a method of building cities that emphasizes the creation of individual *pieces* rather than a *total form* (Sennett, 2008, p. 108), creating, in a sense, an anarchic sense of forcing the social interaction and the awareness for the issue of noise pollution. While urban planners and social organizers may use ideals of coherence and familiarity to promote community, Sennet sees chaos as fruitful for multifaceted urban structures and relationships (Sennett, 2008). However, this anarchic sense of social organization, can become an overwhelming sense of disorder instead of a solution to an also social problem, such as noise pollution and the deterioration of the soundscape. However, regarding that approach, we could not find, in the data collected, anything that could point to an approximation to the argument presented by Sennet, yet we believe that this did not happen as the students do not feel empowered to relate

to the subject or even consider noise as something possibly positive, encompassing all noises into the broad notion of noise pollution and its negative connotation.

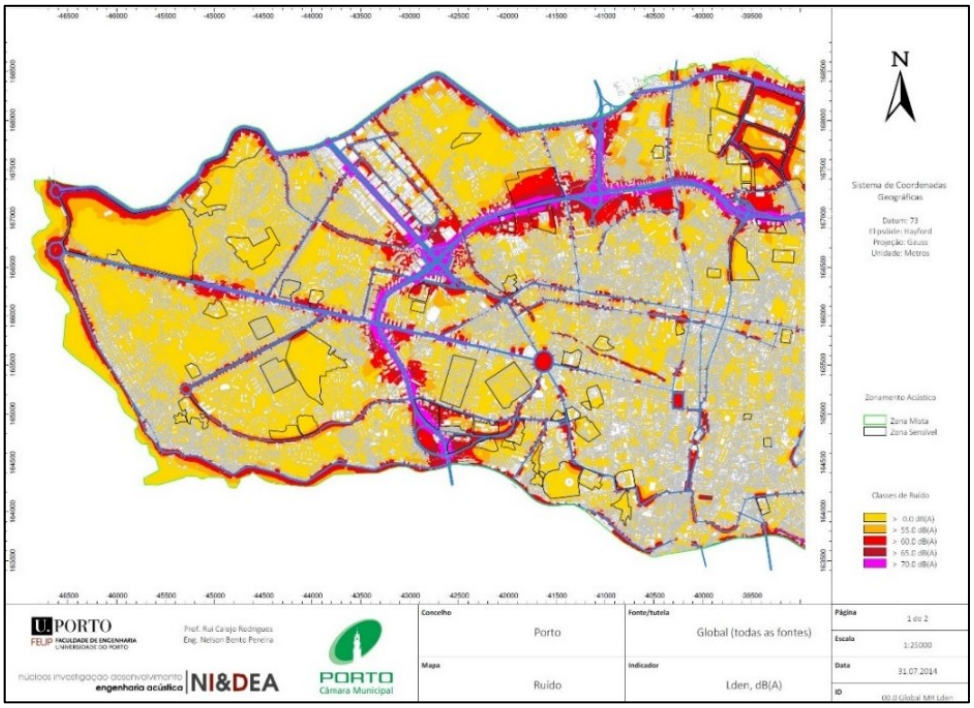

Figure 9 - Noise map produced in 2014 - Western part of the city (author: Camâra Municipal do Porto)

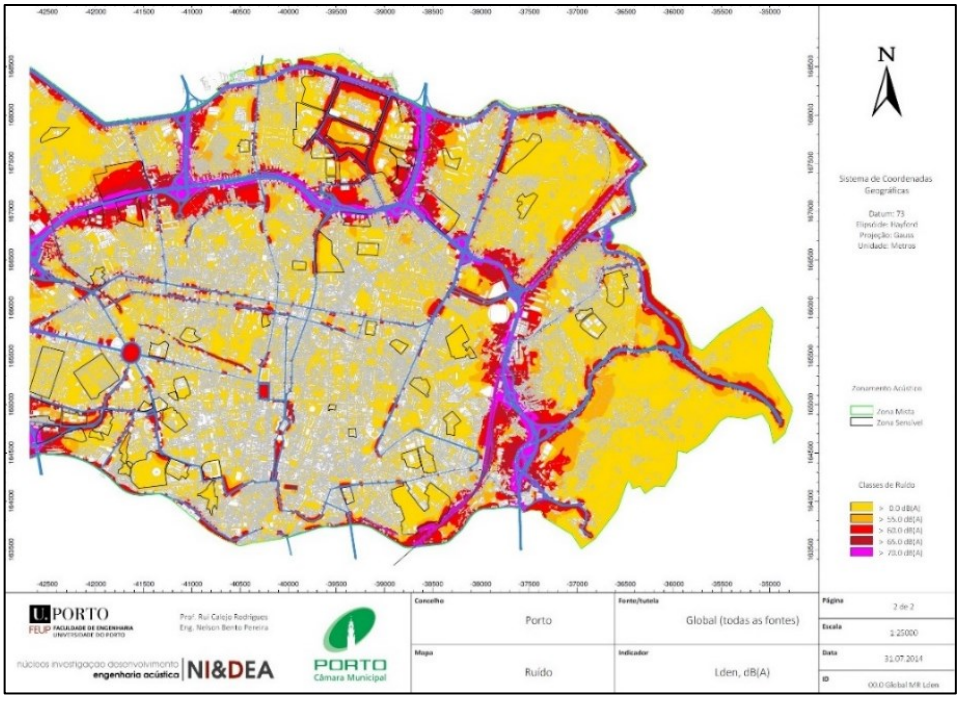

Figure 10 - Noise map produced in 2014 - Eastern part of the city (author: Câmara Municipal do Porto)

The relation of the students that constitute the sample and the soundscape has, as expected, a constant parallel between both an individual and a collective approach. However, they are not separable as represent the *shared perceptions* that are created in the formation of a community, which share some knowledge of the city. This collective approach to the perception of the soundscape gets easily extended to the approach demonstrated regarding the problem of noise pollution, noting the will to act collectively but not necessarily in the individual form. The parallel made in this chapter between the data collected and the Council Plan to Noise Abatement, made a point of noting the areas that were in common and the ones that were not, namely the critical areas that were pointed in the emotional cartography exercise that are also critical in the *dB* measurements made for the report. And so, the fact that these places coincide, reinforce the urgency to act on the issue of noise pollution for an ecological living in a city that needs a conscious approach to listening for a healthier soundscape.

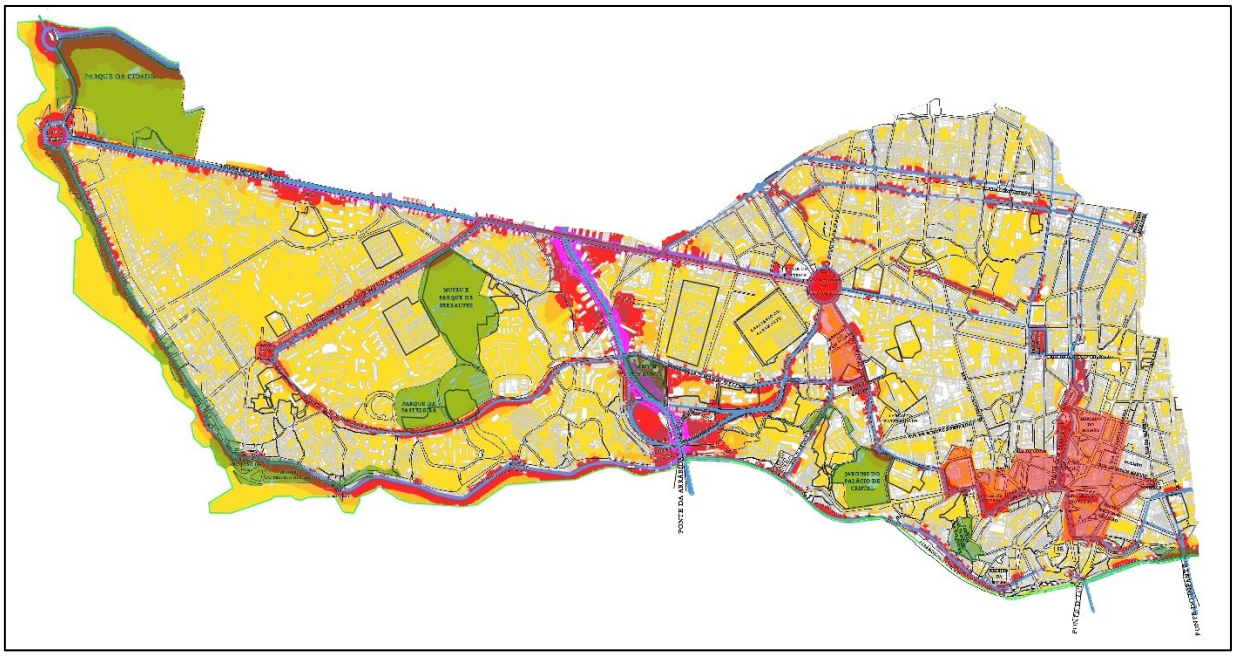

Figure 11 - Data and Council report overlap

4. Creation of the route and Soundwalk

The necessity to raise awareness to the matter of ecology, and particularly in this case, to the matter of acoustic ecology and noise pollution is no less urgent than other sources of climate change, as it is a problem that affects our daily life and our perception of the world. In the moment we live in, the approach to ecology and climate change, only gets enriched by being the most varied and embracing, whether in terms of methodological approach or area of interest. Here, we provide a proximity to art creation, and to how it can be used in an inevitably social and collective matter. However, this artistic take on the thesis will not be explicit here as a practical matter, as this will only serve as a guide to the creation from a data collection similar to the one presented throughout this thesis.

soundwalks can be either a sociological instrument of methodology development or a result of an ongoing research. The latter is the case of the present work, the use of the soundwalk as a result or product of data treatment. As a concept, soundwalk or the act of soundwalking, is a very adaptable one. Besides the route or places/areas proposed, it provides tools useful for the conscious listening of the city, giving the opportunity for the listener to create and interchange places or parts of the route for others of more interest or pure curiosity. This adaptability goes beyond the definition and *score* that Schafer proposes (Schafer, 1994), however is a more suitable one for the necessities, intents and methodologies of this present research.

The creation of soundwalks, in this case, comes from the necessity of exploring the data collected in a useful and productive way so that the community that participated can receive data they provided in a new, meaningful and enjoyable way. This transformation is here analyzed, treated, and that might become a guide to a possible artwork, an art intervention or just the walk itself as an exploration of city and its soundscape heard and felt through others. These possibilities reveal that the intent of this chapter and of the thesis is to expose on how to explore the data collection, associating it with fundamental concepts, to then become a creation of a route and soundwalk.

Consequently, in this final chapter of the thesis, the creation of the route and soundwalk will be explored, as well as the methodology involved. The structure of this chapter will be divided according to the phases that constitute the process of creating the route and consequently the soundwalks, such as a first hypothesis of routes that will then inform the soundwalks. As this chapter and part of the thesis involves a more creative approach to data collection, in the design of a guide to the creation of a soundwalk based on data collection, the methodology used will be explorative and experimental, one that is more suitable for an artistic

approach to the subject. Therefore, the process adopted for the creation of the route and soundwalk was artistic, therefore included our personal experience in the data collection and analysis. By personal experience, we mean that besides the data collected, the non quantitative and qualitative stimuli that were received from the students, such as conversations and verbal opinions will be considered as useful and valid for the course of this chapter. The separation between the creation of the route and that of the soundwalk seemed obvious to us as the route is not and should not be of immediate decision and definition because of the emotional and subjective nature of the data. Therefore, there should be considered several hypothesis and relations between the points and areas chosen by the students. On the other hand, the creation of soundwalk has more to do with the places included in the route, the soundscape present and what should be the procedure and actions during the walk, turning it into a more creative process, almost independent of the data collection and analysis.

4.1. Creation of the route

The creation of the route based on the data collected is, to a certain degree, a complex and problematic work as it raises problems associated with the coherence and correspondence of the data. Meaning that the data collected are points or, in some cases, areas that do not constitute in themselves a route or have a geographical connection between them. Therefore, the work of creating the route comes with the intention of proposing options for it as there is no correct or explicit methodology on which we could rely. Because of this, an experimental methodology will be adopted, in the same way it was for the collection of data. The relation between the data and the final options or suggestions of routes might not be the most direct, as the points will be always omitted from the final graphic representation of the routes. However, the way the data informs these routes and therefore the soundwalk is a crucial step for this thesis, as it transforms the emotional cartography and subjective data into the routes that will ultimately be an instrument for a soundwalk and exploration of the soundscape.

The emotional approach to cartography and the creation of routes is represented on maps for a variety of reasons. It can be used to identify both positive and negative hotspots in the city (Curtis et al., 2014), such as places of fear, and it can be mobilized by marginalized communities and groups to resist unwanted development projects by exhibiting a specific and deep connection to certain places (Graybill, 2013). It can also help urban planners incorporate citizens' perceptions into the planning process (Fathullah & Willis, 2018; Resch et al., 2016; Zeile et al., 2015). In a broader sense, mapping emotions can help social researchers understand

the sorts of connections people have made to different locations. To put it another way, mapping emotions can make it easier for us to comprehend how distinct locations relate to our bodies, thoughts, and senses, such as the act of listening, in this case.

In the case of this data collection, it helps us understand what the general perception of the city is, by the eyes and emotions of the students that constitute the sample, when it comes to the auditory categories proposed and how they relate to them. As there are two opposing categories in the data collection – *Quiet*/*Noisy* - the division of the routes will be correspondent to the categories, but the methodology will be similar in both. The routes will then be thematic, in the sense of all the areas and points that were behind the creation of that route will either be *Quiet* or *Noisy*.

Part of the sketches and proposals for the routes were sketched during the research process, so that the initial sketches still include the full map of the city of Porto. The more advanced ones just include the part of the city considered for this thesis and guide. The final proposal and route suggestion will only include the selected part of the city. The graphic option took for the development of the route were to follow the original map and visual coherence, however the following developments will highlight the information necessary for the perception of the routes, adopting a cleaner visual language. In the graphic representations, the colored sketches will correspond with the color of the categories, being *Quiet* associated to green and *Noisy* to red, in the same way it was represented in the previous analysis.

Urban design frequently overlooks the importance of sound. Soundwalks are walks during which participants examine a route's acoustic ecology, for both decision-makers and city inhabitants and users. The strolls occasionally highlight the distinctive sounds of a city, such as ringing bells or construction work, while other times they are interrupted by unexpected events. The key component of a soundwalk is conscious listening and where the map and route might be considered a sort of score that guide the auditory composition (Schafer, 1994, p. 213) in which the walker should be conscious and aware of. On the other hand, it might seem limitative to restrain the soundwalk to a score, as it can be murky to fall into of giving too many instructions and directions, unless that is the intent. The practice of walking and listening, doing and redoing, turns this sonic approach to the act of listening the geography into an agency. There is just the current physicality playing out in our ears when we listen to our own geography; there is no measure and no map (Voegelin, 2021, p. 25). The work of listening consciously to our soundscape is firstly an individual one, but then it becomes collective, just like the listening object. The invisible perceptions and perspectives of the soundscape created

by this *listening-mapping*, serve to pluralize the landscape's notion rather than to represent it, and so they must be included in the formation of reality, hence the importance of these routes based on the data collected. It is a matter of presenting the emotional relation with a city that is in constant mutation.

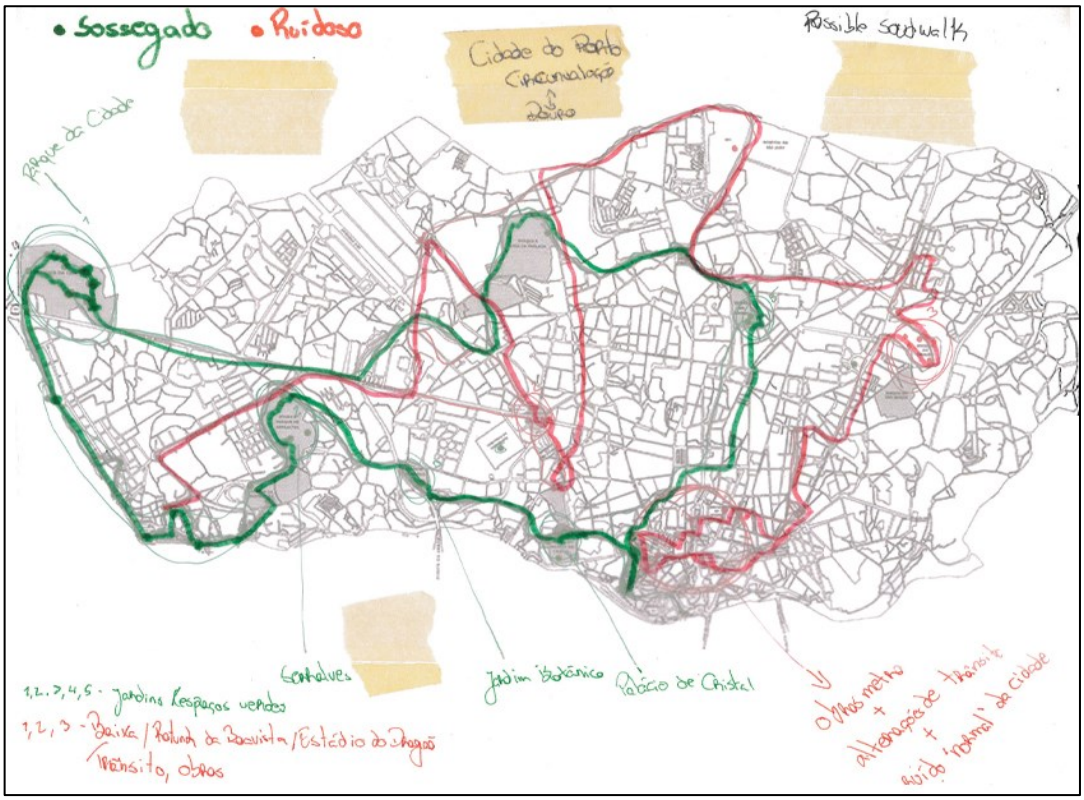

Figure 12 - Initial proposal for the routes - Quiet/Noisy

The initial considerations on the routes were to join in the dots with a criterion of proximity, from the left to the right of the map, so that the route would start in the more costal area, such as Parque da Cidade or Praça do Império, depending on the category, and would end in the historical center, or in a more interior part of the city. This could also be done in a circuit, starting, and ending in the same point. It is important to take note that these circuits or routes are around 20 kilometers long, each, as it tries to put together the quietest places, but without being able to assure the quietest way between them. The biggest problem that we encountered with this type of approach was that besides the concentration of points being very scattered, the first methodology was almost random, without being able to connect the areas in a coherent way. The incoherence between places, meaning the lack of certainty that the spaces and courses between the two places would be the most *Quiet* or *Noisy*, constitute a problem to us. It is a

bigger problem in the *Quiet* category of data, as there are places that can be easily contaminated by the general noisiness of the city. Besides, this first option was thought and created before the decision to only consider part of the city for the lack of representational data, which makes the routes longer and with a long path between selected areas. This also justifies the annotations and brainstorming around the map itself that was important to the understanding and analysis of the data, but also to the evolution of proposition of route.

As mentioned before, the idea of *emotional cartography* is key to the purpose of this thesis and to the creation of these routes. Therefore, it is essential to understand that the routes are subjective and majorly informed by the data collected, being the points on the map or the descriptions written to justify those areas, or even the questions and answers collected in the *4Cs* activity. It is also crucial to understand that these routes and consequently soundwalks, intend to share the city as one feels, sees, and emotionally relates to it. One being the sample of students where we presented the data collection activities. But this study of relating the emotional connection of the students with the soundscape itself and then to the creation of routes – and soundwalks – is challenging, as so far, it has been assumed that noise level is a suitable indicator for perceptions. However, perceptions are affected by a multitude of elements, such as what is happening and the present activity of the listener. As a result, strategies concentrating solely on noise control may fall short (Aiello et al., 2016), and this idea applies to both soundwalks an noise abatement legislation.

From an urbanistic point of view, the routes are prolific in heavy influx areas, more specifically traffic wise. But that is not the only causing issue of noise pollution, as mentioned, and as collected in the data, there is a lot of references to construction work, namely the ones related to public infrastructures or spaces, and also to human and walking traffic, directly related to tourism and to the over population of the city's historical center. The associations of these issues to noise pollution and to the concern of a noisy city, are also linked to other perceptions, senses and stimuli and not only to the auditory and sonorous ones. Senses do not participate equally in the perception of the world (Voegelin, 2021, p. 11), but they all play an important part to how we relate with the world, and also with the other senses, making an unconscious collection of data so that we create an individual and collective awareness, and therefore a collective listening and perception of the soundscape.

The creation of the routes is an individual work based on a collection of a supposedly individual perception of a collective work. However, that individual perception is mostly unconsciously collective in the sense that the points chosen are very similar or in the same area,

creating not so much variety of analyzable material. And so, that led to the limitation of the considered area, as mentioned, but also to the hypothesis of creating interest areas inside the city, besides the routes. In these areas, there would be comprised smaller routes that could be joined to become a larger one representative of what is the *Noisy* or *Quiet* areas of the city. At the same time, it is important to note that these areas, however small they are, they correspond to a relationship that several inhabitants and users of the city pointed out as of some importance to them, either in the map, justification, in the activity of the *4Cs*, or simply during the activity through conversations or comments on the chosen place. The following hypothesis of route intends to create the said areas of interest, but also the possibility for connection.

As represented in the map proposition below, the areas that are considered *Quiet* and some areas that are considered *Noisy* are juxtaposed, with the exception of the historical center, that is mostly an area of extreme concentration of sounds and with a very dense soundscape. This comes with the association already mentioned between green spaces, or coastal areas and calmness or quietness. But this association does not reflect the actual calmness or quietness of the area, only the unconscious and collective perception of the space. Because of this lack of calmer areas that could be fruitful for a route, we are faced with the option of not creating routes for all these areas. Instead, we signal them as *Quiet* – according to the data – and provide the needed description of the space and its soundscape to allow an awareness in listening and to its conscious act towards ecology. This work towards an acoustic ecology goes through the necessity to understand how these routes are thought and constructed from the data collection. The perception of the students that constitute the sample towards the city they live in, or that they are direct users, is as important to the understanding of the city as any quantitative measurement because they are directly affected by the soundscape that they also help to create.

As for the areas that are more prolifically noisy, there is a possibility for the creation of a route, as they are so extended and demarcated areas from the rest of the data. These areas consist of a significant part of the city, at least the part of the city that is less residential and more of a touristic and crossing zone, which also justifies why there are such noise populated areas. It is to note that here, in this category related to noise pollution, there are coincident areas with the category relating to the dirtiness of the city, specially points in the historical center. This parallelism raises the hypothesis that these two categories and characteristics – *Noisy* and *Dirty* – could be merged into one that directly relates to pollution, being noise pollution or physical one. Noise pollution is a type of pollution that, on an emotional level could be associated with the visual stimuli of pollution, how dirty the city is.

Figure 13 - Area Mapping - Quiet (green) / Noisy (red)

The idea of route, here, in parallel with the previous hypothesis and suggestions, is created to provide the possibility of a circuit that ends in the same place where it started. This type of route allows the walker and listener to create a larger awareness of the city soundscape and to return to the initial point with other perspective and consciousness. The extent of the route it can still be a problematic to point out in this as it is difficult to not connect all the areas as they are very close to each other, or they affect the surrounding areas. However, it was expected that these areas would blend as result of a first analysis and of the feedback from the data collection activities, as the city, in a general sense, is noisy and it was hard to choose just one place or area. And this preconceived idea of a noisy city reflects the number of areas that recurrently were selected and that show on the map. The sensory experience, more specifically the auditory one, that a place provides influences how we relate to it and an urban space offers a variety of sonic textures with different qualities and characteristics that physically engage passers-by, linking them to the spot. It influences actions, which in turn influence it (Thibaud, 2011), just as equally influences the soundscape.

Therefore, the perception and emotional relation we collected is, at the same time, a producer and a product of the city and its soundscape. From this idea, it is pertinent to reflect on the data as areas that are used by the students and putting them in the role of noise and sound creators, contributing to noise pollution and to the noisy perception they have on the city. This

tandem justifies the choosing of areas that are typically noisier as they are populated with either road traffic or tourist attractions, but also where the students are also partakers in.

We decided to create two options of routes for the *Noisy* category. The first one, and the longest, travels a distance of 9 kilometres, the equivalent to an almost two hours walk. It does not have a concrete starting point as it is supposed to give the opportunity to start wherever, but in order to adequately describe this route, we will use Praça do Império as a starting point. From there, the route continues to Avenida Marechal Gomes da Costa towards Avenida da Boavista. These areas are an essential path if the destination is the coastal area of the city, and to the connection with the freeway, which justifies the immense traffic present. From Avenida da Boavista, the route extends to Praça Mouzinho de Albuquerque, that acts as a roundabout and accumulates a lot of individual vehicles and public transportation, adding the proximity to the freeway connection. Following this, it goes down Rua Júlio Dinis to Praça da Galiza, where besides the normal amount of traffic there is a lot of construction work relating the new subway line, which conditions every form of traffic, not only in this area, but also in the rest of the city. Then, to return back to Praça do Império, the route will go through Rua do Campo Alegre and Rua de Diogo Botelho, two street segments in a row, that are populated by public transportation, traffic and connection with freeways, but also with universities, schools and work areas. These last two streets are fundamentally crossing points for a lot of people to enter and exit the city on a daily basis.

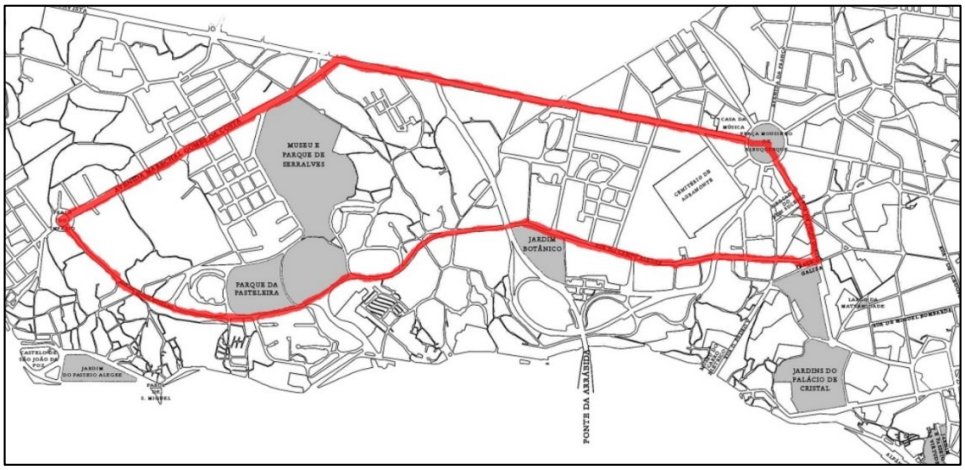

Figure 14 - First Route option – Noisy – Western part of the city

The second route option for the *Noisy* areas of the city is the most critical and the most pointed out too. It is mostly in the historical center of the city, which reflects the issue of noise pollution in an area where there is also a lot of walking traffic and tourism. This route proposal

takes about one hour walking, and it is about 5 kilometres. In the same way as the first proposal, this does not have a fixed starting or ending point and so it can be started and finished at any point. However shorter, this route as a lot of altitude differences along the way, which can make it harder to accomplish. To adequately describe this route, we will consider Trindade subway station as our starting point. From there the next critical point is Avenida dos Aliados, as these two areas are an important crossing point for individual traffic, public transportation, and a landmark of the city.

The path between these two areas can be done through Rua da Trindade, or Rua dos Heróis e dos Mártires de Angola, which are two parallel streets. Here, Avenida dos Aliados on its own is a critical center and it personifies the issues mostly mentioned, tourism and traffic. From there, the route proposes to go up through Rua de Ceuta, until Rua de José Falcão, where it turns left until it reaches Praça de Gomes Teixeira. This route section shares the same issues with Avenida dos Aliados, as it is one of a lot of traffic and that is currently being affected by the construction work of the new subway line. However, it is not directly affected as the construction work concentrate in Avenida dos Aliados, Jardim do Carregal and Praça da Galiza, but as these areas are conditioned, the traffic accumulation directions itself to other places. Continuing from Praça de Gomes Teixeira the route leads to the streets and area surrounding the hospital. These streets do not necessarily accumulate much traffic but the area is a noisy one due to emergency vehicles and all the operations surrounding a hospital.

Still in the same area, one of the most referred points was Jardim da Cordoaria that unlike the other green spaces of the city it is closely surrounded by restaurants, monuments and more importantly, bars. This is the most recurrent issue linked to this area, that also puts it in the most referred areas in highlight when it comes to the *Dirty* category. From this, the route leads down back to Avenida dos Aliados, but this time through Rua dos Clérigos. This segment is highly conditioned by the construction works that completely substitutes the traffic, taking that issue to other areas as the ones mentioned. Then, it seems obvious that the next point to highlight is Estação de São Bento where the rush and noise is constant, from either traffic or the trains. Following that, we suggest going up until Sé as it is an always crowded place, with a lot of bus stops and tourists. Then the route goes through Rua da Porta do Sol until Teatro National de São João, that even with a small amount of traffic, it is referred to noisy as it is a landmark that is on the limit of the historical center, with a lot of services such as restaurants and bars. From there, the data indicates Praça dos Poveiros as a noisy place because of the high amount of restaurants, bars, night life and tourism. After this, we re-entre the more busy and noisy part of

the city, by going down Rua de Passos Manuel until it intercepts Rua de Santa Catarina, to where this route continues until Rua de Fernandes Tomás. This area is a very commerce populated one, as well as with tourist attractions and public transportations. Following Rua de Fernandes Tomás, it will intercept Rua da Trindade, where this route meets again its starting point.

This route takes up the most historical center area that is, as mentioned, the most referred as being *Noisy*, but also *Dirty* and *Degraded*. The association between the three negative categories, and allocated to such a popular and populated area, can be a reflection of the lack of awareness and consciousness that these issues have. The importance of our senses, how we perceive and emotionally relate to world is one to be consciously explored and empowered to be part of a solution to a problem that affects a majority of our sample, and we foresee, the city population.

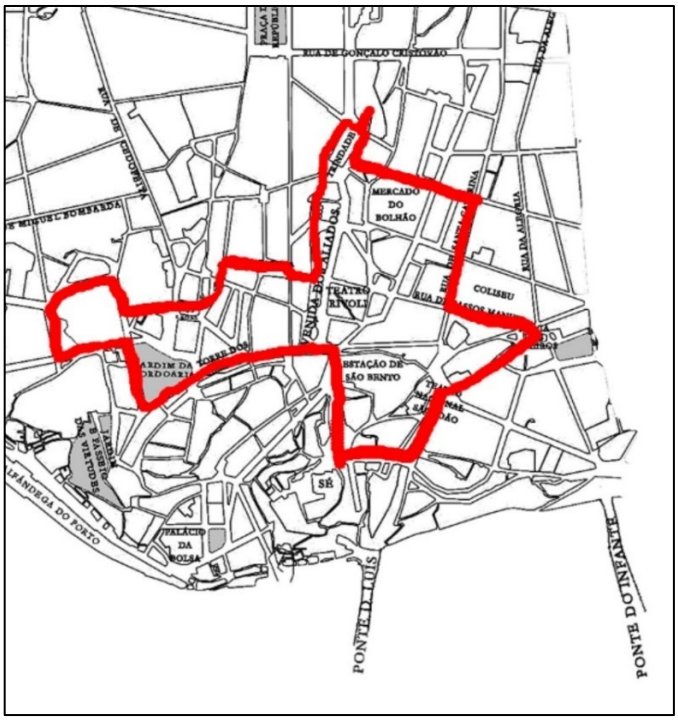

Figure 15 - Second Route option – Noisy – Eastern part of the city (historical center)

Besides the two options already presented for the *Noisy* routes in the city, there is a necessity to explore options regarding the *Quiet* ones. These areas, as mentioned earlier in the analysis, are of fewer mention, and mostly associated with green spaces and with beaches. The issue with these routes is that we have not collected information enough to assure that the path

between one *Quiet* area to the other is in fact *Quiet*, where with the data relating to noise populated areas, that is possible. And so, the routes associated with the *Quiet* category are shorter, which does not mean that are unfit for a soundwalk, on the contrary. The areas will directly inform the guide to a soundwalk instead of being part of a bigger route. It is important to recall that the notion of Quiet, here, is not based on a quantitative measure, but rather on the emotional relationship and experience that the students shared in the activities.

Nevertheless, there is some data that can directly inform a route and two were created two that can be connected as they are not far from each other. They do not appear connected here because we do not have the data to assure that. The first route option is, in fact, the sea coastal line of the city, as in goes from Jardins da Avenida de Montevideu down to the lighthouse and to Jardim do Passeio Alegre. It is about a 3 kilometers walk that would take around forty minutes, substantially less that the other routes presented earlier. This segment may have a quieter component or perception because it is near the beach, but it is also next to a very busy avenue that is rarely quiet during the day. However, it is important to remember that the idea or perception that the beach and the nearby area is calm, is a *shared perception* (Chion, 1994). built collectively and that keeps associated to our relationship with the world even when it is possibly not the most accurate.

As for the second option of route, it is one that involves two parks, however one of them is private and therefore of paid entrance. For that it will only be mentioned and not considered to be visited. This option starts in Parque Urbano da Pasteleira that, even though it is considered *Dirty*, it is also considered *Quiet*. This apparent opposition between *Dirty* and *Quiet* is justified by the fact that this green space is located near a very challenging part of the city, where there are several social housing neighborhoods and a critical drug problem that has been extended for years, however it is still a large green space and to not be troubled by the noise of the traffic nearby. Following that, the residential area between the Parque Urbano da Pasteleira and the Parque de Serralves is a considerably quiet one and it works as a transition between parks, as the next area that was highly mentioned was Parque de Serralves, that which includes a museum and a vast garden and farm. However, it is a private property and cannot be accessed freely.

Figure 16 - First Route option – Quiet – Costal line of the city

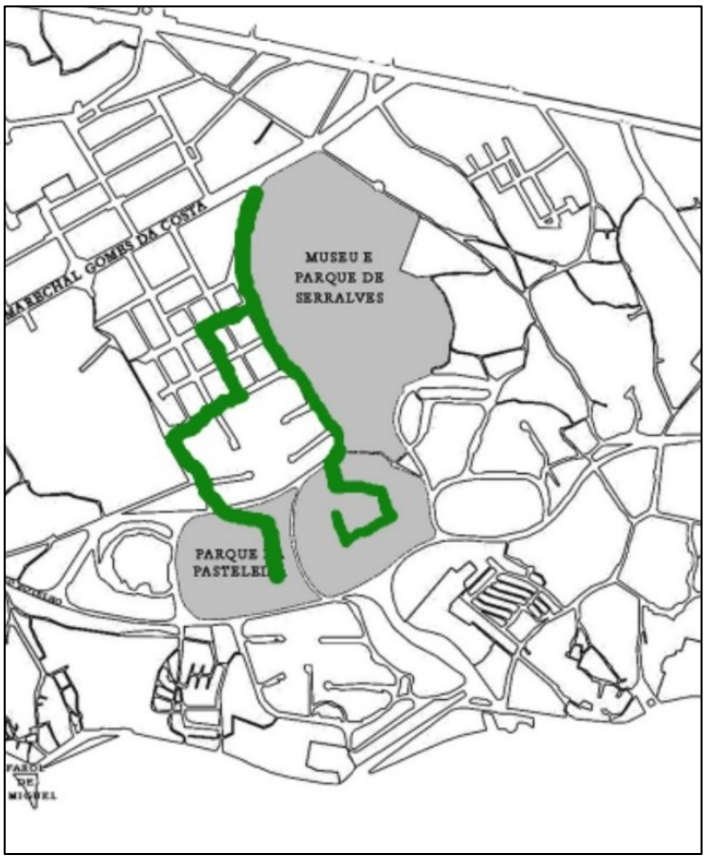

Figure 17 - Second Route option – Quiet – Parque Urbano da Pasteleira and Parque de Serralves

The proposed routes were directly informed by the data collected, from the *Map*, the *4Cs*, the feedback of the relationship the students have with the city. Even though there are not marked points in every street we have pointed out for the route, there is a common perception of a *Noisy* city, which allowed us to confidently define and suggest areas surrounding the points collected. The process of informing these routes was one of almost direct translation of the points and then of adding the data from the justifications, the *4Cs* and the subjective reactions that the students had during the activities.

The sense of collective or *shared perception* (Chion, 1994, p. 29) of the city is very present in this data and it is also an important part of the research, as it is the collective who informs and to whom we return to think of as an active partaker in the issue of ecology. The awareness and consciousness needed on the act of listening so that this constitutes an ecological instrument to explore, analyze and reflect on the soundscape, is provided, and enabled by a soundwalk that has been informed by the emotional relationship between the students – inhabitants or users – and the city.

4.2. Creation of the Soundwalk

So far, we have exposed the data collection, the data analysis, and a preliminary approach to what will now inform the soundwalks, in a more or less direct or obvious way. As mentioned before, the main purpose of any soundwalk is to direction the listener to their surroundings, to pay or shift attention to the individual sounds present at the moment and in the place. The fact that environmental issues are more important than ever to people all over the world, as well as the fact that all such compositions and soundwalks place an emphasis on listener awareness of the sounds engaged, makes it possible for audiences to connect with environmental representation on multiple levels.

The environmental concert holds on to the fact that we live in an overly dense soundscape (Schafer, 1994), one that does not allow the listener to distract themselves from the urban sounds. And the data collected points to that idea as well, to a city that is mostly *Noisy*, mostly with a great amount of traffic influx and one that provides few calm or *Quiet* areas. Besides, the green spaces that we believe are not in reality *Quiet* but share a perception of what *Quiet* means in a cacophonic city. The study, and practice of acoustic ecology is one that can only be accomplished by going to the affected areas, and consider the effects is has on the population, on the environment, on living creatures (Schafer, 1994, p. 205). This practice of acoustic

ecology is a transdisciplinary one, that is informed by several fields of study, which allows it to be very diverse in approaches. But an essential one is that of soundwalks, as an instrument or methodology to explore but also to reflect on the soundscape.

The definition of soundwalk is, as referred earlier in this thesis, a very murky one, as it is dependent on the author or artist that draws its borders. According to Schafer, the soundwalk implies the exploration of the soundscape, but it also suggests that it could be beneficial to include *ear training exercises* (Schafer, 1994, p. 213). These exercises intend to reset the ear and our perception allowing us to have a cleaner earing sense. However, following Westerkamp (2012), the role of an acoustic ecologist is to encourage listening and to create a situation that allows the exploration of soundscapes. soundwalks are crucial in the quest for and preservation of the balance between generating sound and listening. They act as a reminder of our ability to listen, the things we miss when we forget to listen, and our function as sound producers in the environment (Westerkamp, 2012). In the same way we produce sounds for the soundscape, we are affected by them, but not in a conscious way, but in a soundwalk it is possible to be consciously aware of the sound production and relation. In order to counteract the types of soundscapes that led to a non-listening conscious reaction to the acoustic environment, listener-based approaches like *ear cleansing* and soundwalks can be used (Truax & Barrett, 2011). And so, the soundwalks can also act as ecological tools, to empower listeners to be conscious of what their contribute to the soundscape is and how that can be improved. Acoustic ecology is intrinsically tied to conscious listening and awareness of our role as *soundmakers*, and partakers in the soundscape, because it expands our knowledge of the interactions between living things and the aural environment (Westerkamp, 2002).

There can be different approaches to the practice of soundwalks. One that makes use of the map of the area as a score to direction the walker (Schafer, 1994), and other that can add a soundtrack or composition to the walk, total or partial. The first is the one we are proposing here, informed by the routes created and the data collected, however there is space and possibility for a creative approach with the addition of artistic interventions or compositions. In that case, these suggestions will only act as models for the artist to use as a basis or creative ignition to their intervention. What we explore here is a base with an infinite possibility of approaches, as the aim is to expose and explore how we informed this soundwalk and how it is pertinent for it to exist. Therefore, this subchapter is the proposition of the soundwalk as a reflection informed by the data collected earlier in the research, that then informed the routes presented at the beginning of this chapter. The way that the soundwalk will be described and

explored is, mostly to invite and promote the conscious awareness of the act of listening, being individual or collective, as this is the primary tool for a soundwalk to be possible and relevant. The proposals have a starting and ending point, however, the listener can start from any point, or perform just a part of the soundwalk as a listening exercise or to consider, reflect and analyze the soundscape surrounding.

Listening, as an individual or collective act, is one of engaging with the world. As it is an act of engagement, soundwalks provides a more direct and close engagement with the world, in this case, the city of Porto. However, we are used to listen unconsciously, just as a habit and not as a conscious and aware act. This awareness and consciousness are essential to the contribution we, as listeners and partakers in the soundscape, give to a more ecological approach to sound. If we think of listening as a real practice and a conceptual sensibility that, without offering a philosophical viewpoint, poses new issues for the philosophy of art in general and shakes the supposed certainty of a visual aesthetic (Voegelin, 2010, p. xiii). Listening is defined as an act, an interaction, that develops, invents, and demands from the listener a *complicity and commitment* that reconsiders current perception theories (Voegelin, 2010, p. xv).

The proposed soundwalks are not organized in the same way as the route proposals are, between *Quiet* and *Noisy*. Instead, the soundwalks combine the two categories and not limit themselves to what is considered *Noisy* or *Quiet*. However, this does not prevent the soundwalks to coincide with parts of the routes. The creation of these soundwalks will remain as a proposal for being performed as they are a proposal informed by the data collected and this thesis explores the analysis and options of routes and soundwalks. Therefore, the suggestion of soundwalk will act as instruction or score, not including here the possible impressions and perceptions that will come after one performs it. In order to maintain the graphical coherence in this thesis, we will use the same map and consider the same area of the city where the answers were more prolific and maintaining the option of not considering the totality of the city area.

The description of the proposed soundwalks will be a list of instructions that were informed by the data. This is not an artistic work as these soundwalks are a foundation to a continuum of work and to a possible collective work. As for the listener, there is no indication of the number of people to perform the soundwalk, therefore, it can be an individual and then introspective walk, or a collective and then of sharing a collective experience of listening. This collective experience of listening is a challenging one, not only for the listeners, but also to the soundscape and environment (LaBelle, 2018, p. 160). This collective listening provides a collective awareness and therefore consciousness towards the soundscape and the ecological

problems associated to it. The instructions are proposed after visiting and individual testing the routes, areas and instructions. We opted for the individual walk as this was also informed by the individual input from the HAC4CG project and from the activities.

Before any soundwalk instruction, it is important to mention the need to be aware and conscious that this is, at its core, a listening exercise and tool. Exercise in the sense that listening is not only a passive activity, but also an exploratory action, a way of *walking* around the soundscape or the sound production (Voegelin, 2010, p. 4). Tool in the sense that it can be an individual or collective act that provides a different perspective or understanding to the world. The soundwalk is an act that requires attention and the will to prioritize the act of listening for the duration of the walk. The length in time and kilometers of the following walks is variable and do not require that the listener carries out the total of what is proposed. All the soundwalks will be accompanied by a map to facilitate the listener and walker to follow the instructions.

4.2.1. Soundwalk I

In this first soundwalk, we propose a walk mostly along the coastline of the city, with emphasis on the sea and on the reverberation of objects.

As a starting point, Parque da Cidade.

The listener should walk around for a bit until there is no more road traffic on their listening range, if possible.

The listener is now asked to try to identify new sounds that are not common, or that are new to them, trying to keep away from the urban sounds.

Exit the park and walk towards the sea, avoiding the main street – Avenida da Boavista.

When you reach the coastline, walk as close to the sea as possible. If the listener can walk on the sand, it would be preferable

The listener is now asked to find a rock or place near the water where they can sit and concentrate on listening to the sea and the sounds associated to it.

Now, the listener should try and listen to the objects that are resonating with the sea, as the rock they are sitting on.

Then, the next part of the walk is only asked for the listener to walk always as close to the sea as possible, as it has such an overwhelming sound and presence.

This should continue for as long as possible for the listener, trying to keep away from the traffic intervenient and noise.

If the listener reaches the seawall, then walk to the lighthouse, keeping attention to the sound of the waves and wind and its reverb on the concrete walls and its indentations, identifying tones that are created in those indentations.

Then return to Jardim do Passeio Alegre, the ending point of this soundwalk.

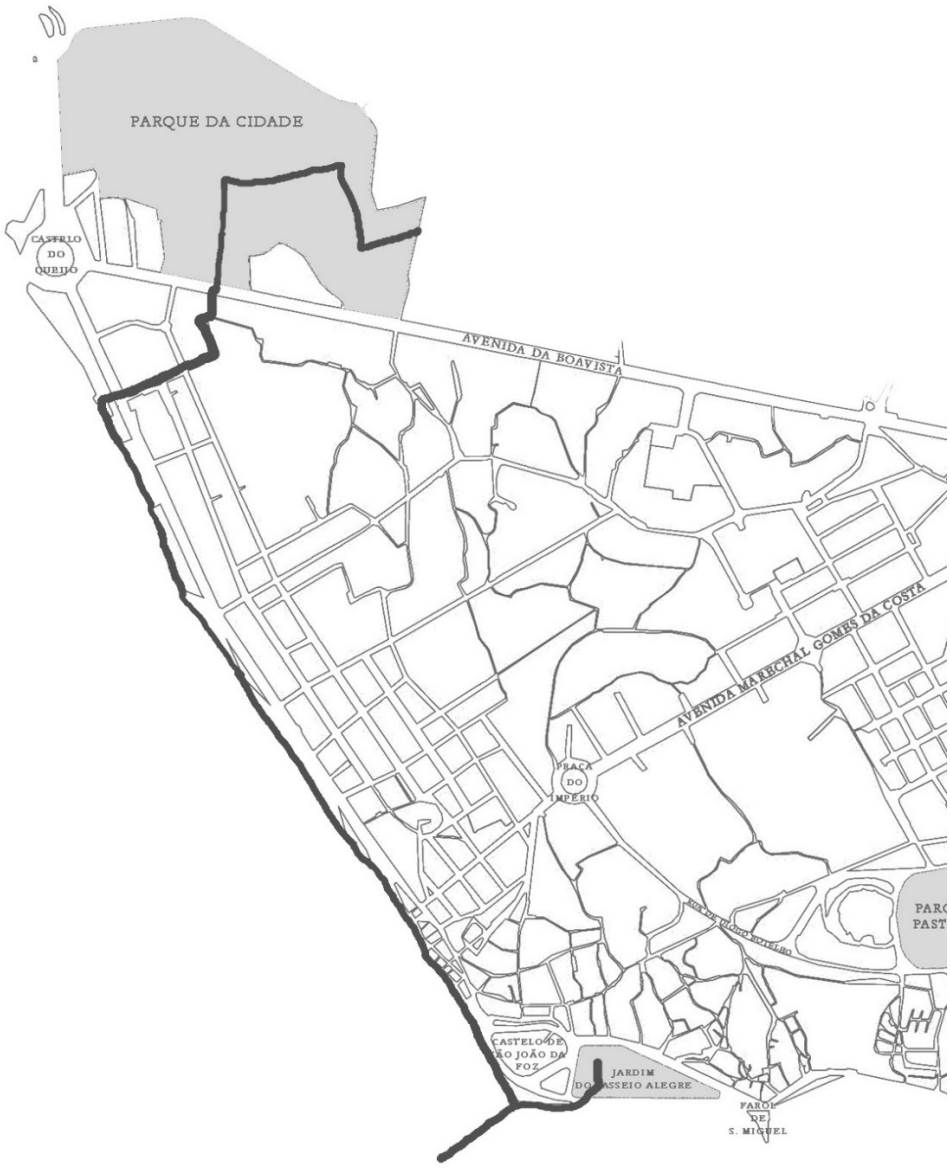

Figure 18 - Soundwalk I

4.2.2. Soundwalk II

In this second proposal the soundwalk will be focused on the densely urban city and therefore, the densely populated soundscape, with emphasis on traffic.

As a starting point, Praça Mouzinho de Albuquerque.

Here, as it has a very dense traffic influx, the listener should try to find sounds that are an antithesis to that influx.

Then the listener should continue to Rua de Júlio Dinis until Praça da Galiza.

There, cross Praça da Galiza to continue on Rua de Júlio Dinis, but while crossing, listen to the construction work and try to describe the area without it.

Continue on Rua de Júlio Dinis until Jardins do Palácio de Cristal.

Then, the listener should enter and walk around Jardins do Palácio de Cristal, identifying animal sounds that seem new or that you never heard before.

The listener should then find a remote area where they can't listen to the urban and traffic noise. And then ask themselves, is that possible? Why?

After the walk around the Jardins do Palácio de Cristal, exit in direction of Rua D. Manuel II until they reach the Hospital.

In this section of the walk, the listener should try to count the time without hearing an emergency vehicle.

The listener should then cross Rua da Restauração to Rua de Azevedo de Albuquerque and then try to describe the difference in the soundscape.

Following Rua de Azevedo de Albuquerque, the listener should arrive to Passeio das Virtudes.

Passeio das Virtudes is the final point of the soundwalk.

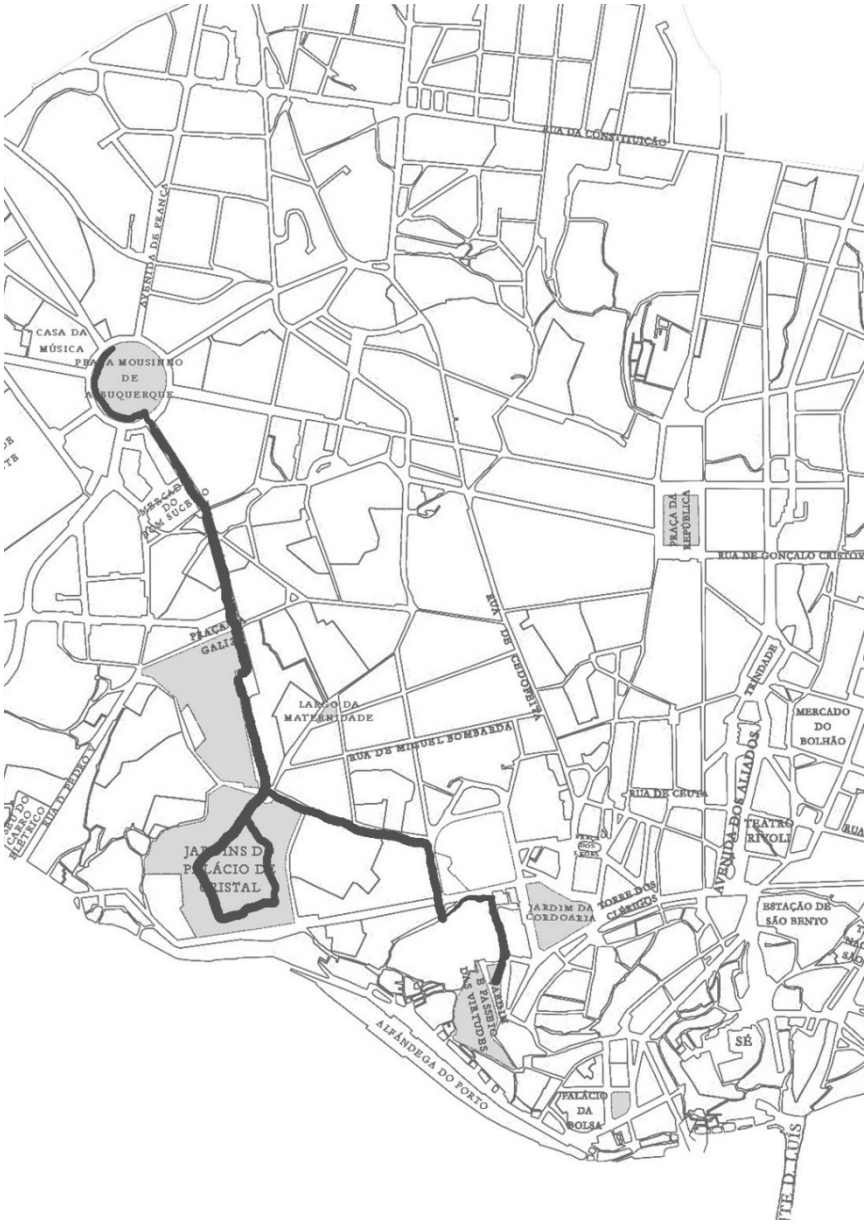

Figure 19 - Soundwalk II

4.2.3. Soundwalk III

In the third, and final proposal of soundwalk makes use of the data in the historical center of the city, proliferate also on traffic noise.

As a starting point, Trindade (station).

Here, the listener should try to identify sounds that are not traffic related.

Then, continue down to Rua dos Heróis e dos Mártires de Angola.

On their way down through Rua dos Heróis e dos Mártires de Angola, the listener should try to listen to the fountain at Praça da Trindade but keeping a distance.

Then, continue going down through Rua Clube dos Fenianos, until Avenida dos Aliados.

Here, the listener should try to find out what noise overlaps the other, traffic or construction work.

Next, the listener should walk up to Rua de Ceuta and follow the bus track until Praça de Gomes Teixeira.

Then walk towards Jardim da Cordoaria.

There, they will find a bandstand. The listener should walk into it and point out sounds of nature.

The listener should Walk through Jardim da Cordoaria.

Next, walk to Clérigos. The listener should wait for the bells to ring.

Following down Rua dos Clérigos down to Praça da Liberdade, the listener should then walk to Rua do Dr. Magalhães Lemos.

Then continue up towards Rua de Passos Manuel.

There, the listener should walk until they reach Rua de Santa Catarina, where they should identify the lady preaching sales.

After that, the listener should continue up to Praça dos Poveiros and Largo da Ramadinha where they will be confronted with a variety of cultures, socio-economical statuses and sound perceptions.

Through Largo da Ramadinha, the listener will get to Jardim Marques de Oliveira, crossing it towards Avenida Rodrigues de Freitas.

After crossing Avenida Rodrigues de Freitas, the listener should proceed to Rua de São Vitor until they reach Praça da Alegria.

There, they should turn left before the school wall, going down towards Alameda das Fontainhas.

Alameda das Fontainhas is the ending point of this soundwalk.

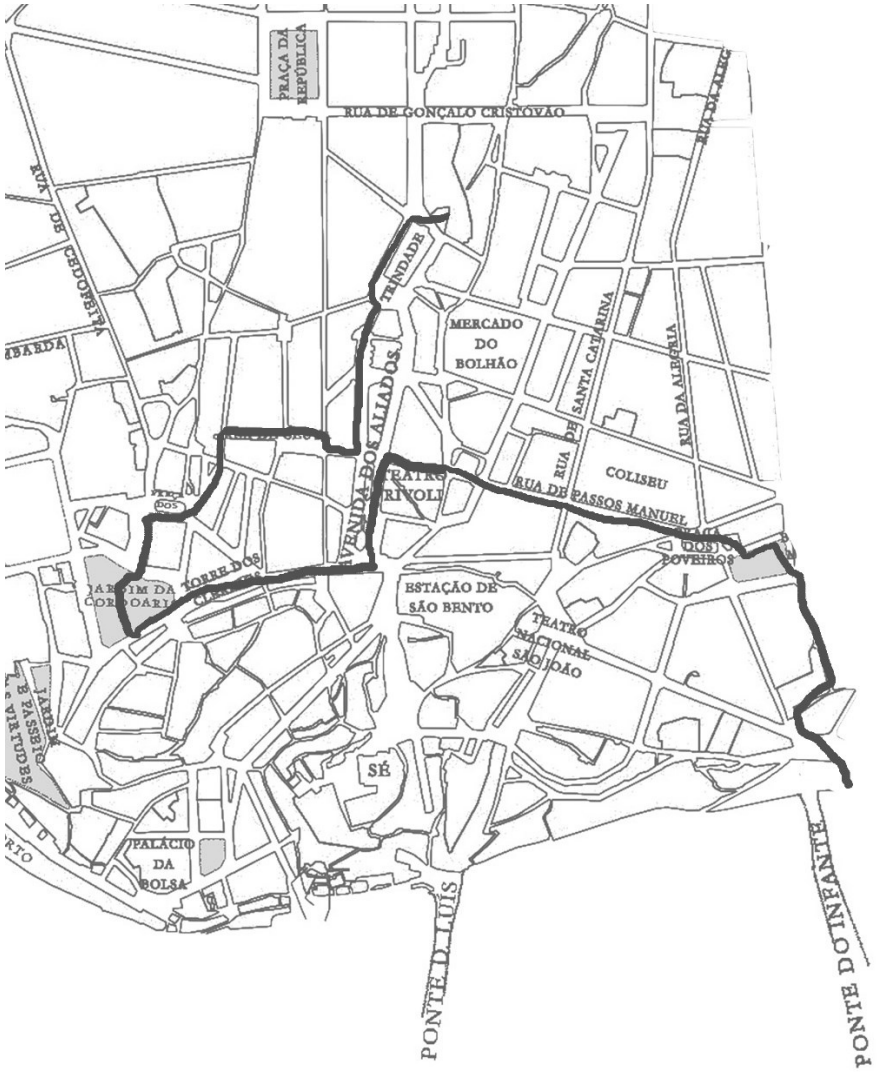

Figure 20 - Soundwalk III

5. Conclusions and Future Work

The soundscape in which we live in, is one of extreme complexity and density, due to the amount of sound sources and producers that are active parts in it. Therefore, there is an ecological need to diminish the impacts of the soundscape in our daily lives. But for that to happen in a coherent way, it is important to collect a variety of inputs and data to reach a conclusion. In that line, this thesis and the *HAC4CG – Heritage, Art, Creation for Climate Change* project play a role of collecting the emotional perspective of an academic community towards the city of Porto. Here, we explored the process from the data collection to its analysis and to the creation of routes and soundwalk propositions informed by the data. Thus, in this chapter, the conclusions of this research are presented, as well as the main difficulties or problems, and the future work that this research provided basis for.

Since all ecological issues are in an urgent crisis, the relationship and connection between those two are becoming more and more important. As they are a component of the climate emergency we are currently experiencing, soundscapes and sound pollution are no different. Throughout this thesis, we have mentioned the urgency to mitigate climate change, however, it became clear through the data collected that the urgency is present in the students' thoughts and perspective, but without feeling empowered to act. As a way of providing the means and power to act, we propose the soundwalks that are informed by the students' emotional relationship with the city. Emotional cartography can assist social researchers in understanding the kind of connections people have created to various locations. To put it another way, mapping emotions can help us understand how different places relate to our body, thoughts, and senses, such as the act of listening.

The methodology of data collection, being one that was looking for the emotional relationship that these students have with the city of Porto, provided an insight that cannot be obtained by means of surveys or traditional qualitative methodologies. This option of methodology was crucial to the understanding of the position the students take and the subjective perspective that turned out to also be a collective one, even though we reinforced that the activity and choices were individual. It appeared almost impersonal to not incorporate them in a more active way in the study by just applying a typical qualitative methodology.

The first analysis of the data collected in the two activities was made together with other two research fellows, with different background fields, Psychology and Heritage. The interdisciplinarity of this group was firstly thought to be an issue, but turned out to be an

advantageous learning experience which provided a more complete analysis. Between the two activities– *4Cs* and *Maps* – we were able to draw from the analysis that the city of Porto is mostly a *noisy* one, and that the areas that are not, are green spaces or gardens, such as Parque da Cidade or Jardins do Palácio de Cristal. The latter are not *quiet* in the sonorous sense, instead they represent a concept of calm and quietness associated with gardens and the countryside, of a *hi-fi* soundscape, where detail and legibility are its best assets. We could then think of the soundscape as an objective of collective perception, but also of collective creation.

Because the concentration of points that translate to *noisy* areas are not concentrated in one region, there are two possible explanations: (1) there are no noisier areas in the city; (2) or every section of the city is *noisy* and densely inhabited with sounds. However, there are critical areas of the city, also corroborated by the City Council Noise Abatement Plan, such as the ones close to high traffic influx – VCI, Praça Mouzinho de Albuquerque, great part of the historical center. Great part of the answers surrounded the same subjects, problems or areas, which we were not expecting in such an expressive way but reflects the collective perception of the city.

We consider relevant to recognize our role as participants in the soundscape and in the issue of noise pollution. As a collective production, the soundscape involves social responsibility as our participation and creation will have an impact on others as well as ourselves. The collective is constantly mentioned as a cause but also as a solution to the issue of noise pollution and the improvement of the city's soundscape. It is also important to refer the association between the areas that are considered *noisy* and *dirty* or *degraded*. This association comes with the perception of pollution as a concept that these categories are part of, being two of them clearly relating to how it visually affects the perception of the city.

The process of creating the routes informed by the data collection began with the totality of the map, but then accompanied the conclusions that only part of the city was pertinent to consider, as the data in the remaining area was scattered. Here, we created four routes, divided between the *noisy* and *quiet* categories, for which we had available data. These routes passed mostly through areas of high traffic influx when it came to the noisy ones. However, in the *quiet* ones, the routes got largely limited as we concluded that it was not possible to assure that the path between points referred was in fact quiet, while in the *noisy* category that became easier.

The creation of soundwalks is as of an instrument to raise awareness to a conscious act of listening. Listening as a conscious and collective act is a tool to explore the soundscape as a collective work. Our interactions with the soundscape should then be of conscious listening and care for the environment that we produce and share as social objects and people. As a result,

the link between soundwalks and ecology is both inherent and clear, as it may be a tool or weapon to better empower communities and encourage them to fight to reduce the impacts of an unhealthy soundscape.

The creation of soundwalks, as an instrument to raise awareness to conscious listening, work as a result from this thesis, but also as a basis for future work. The proposed soundwalks are, as mentioned, a basis for possible artworks and interventions. These guides will now be available to artists for a reappropriation and reinterpretation of the data informed results. From the appropriation, we will consider the results and artistic creations as contribution for future research approaches. In the future we will continue the research on Porto's soundscape, namely with this emotional approach to the cartography and to the data collection, as it is a key subject not only to this thesis, but also for the *HAC4CG* project.

This thesis was enriched by the interdisciplinarity of the project in which it was inserted – *HAC4CG*. It also provided knowledge of the emotional relationship the students the students that constituted the sample have on the soundscape of the city of Porto. In summary, it reflected the awareness of the problem, but not of the solution or how they can participate in it. Therefore, the proposition of soundwalks, comes as a return to the community for their participation, but also as an empowering tool for the exploration of their soundscape as conscious listeners, as partakers in the soundscape and also in the mitigation to an emergency such as climate change.

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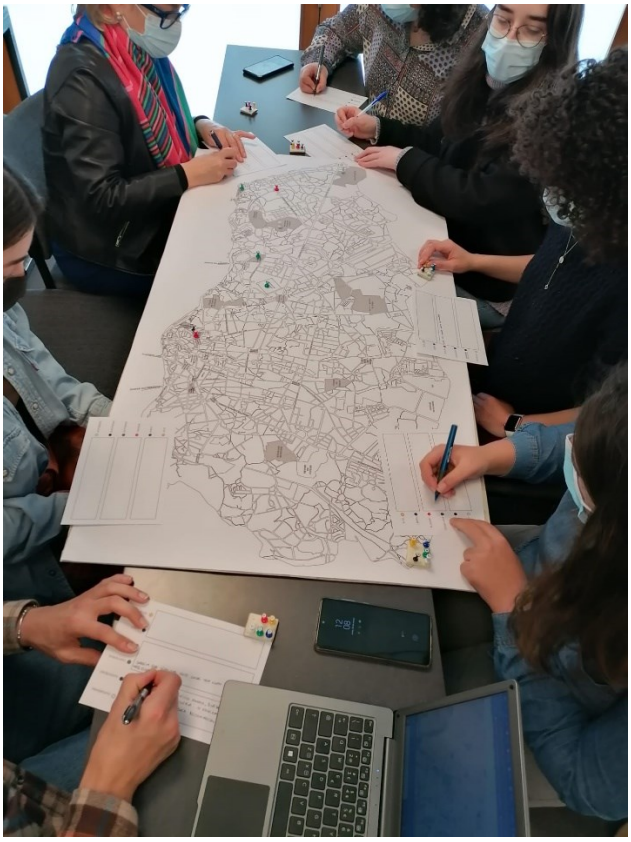
Appendix

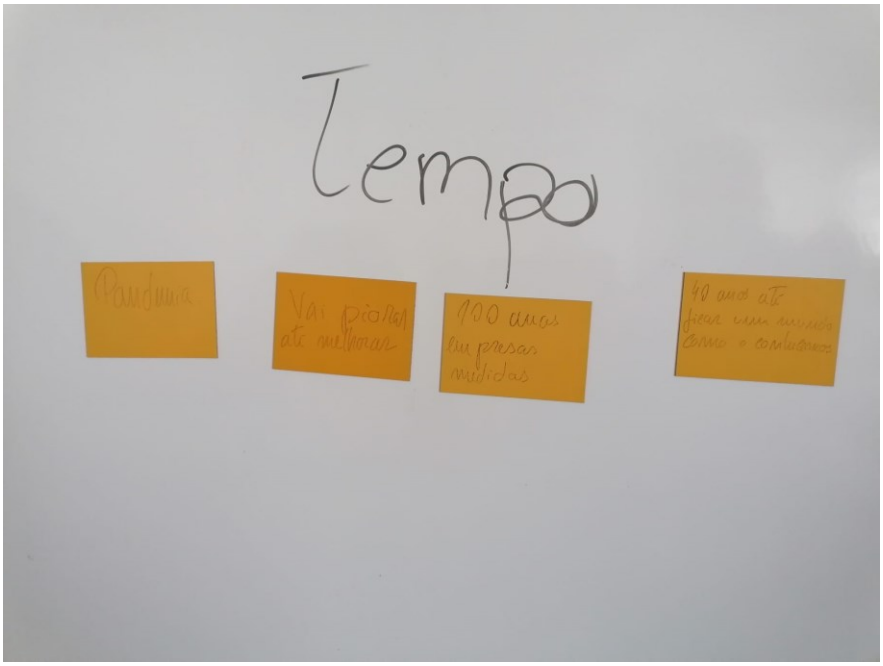
Appendix A

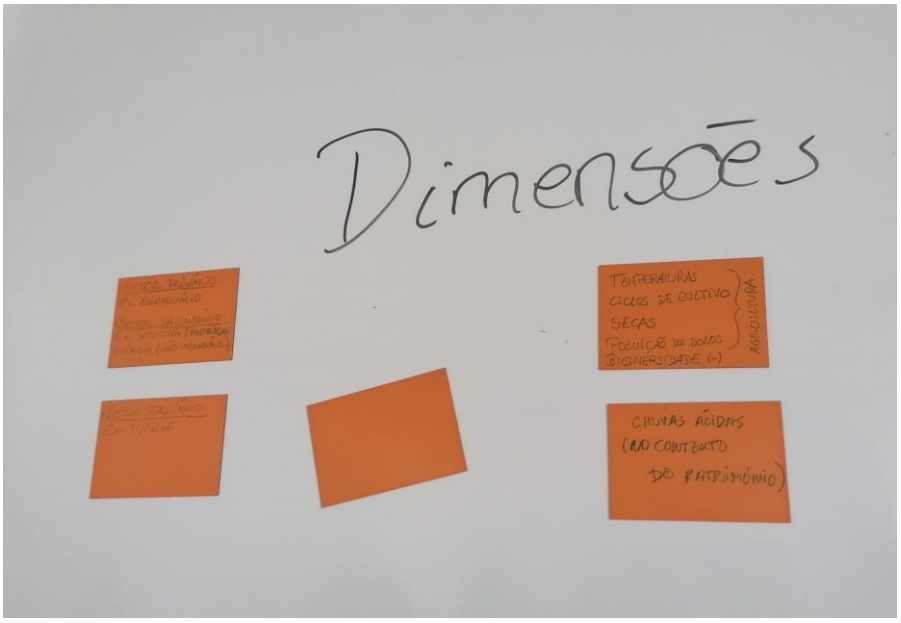
In this appendix are presented pictures of the *Map* activity, as example. The class from which these are taken is a Heritage and Creation one.

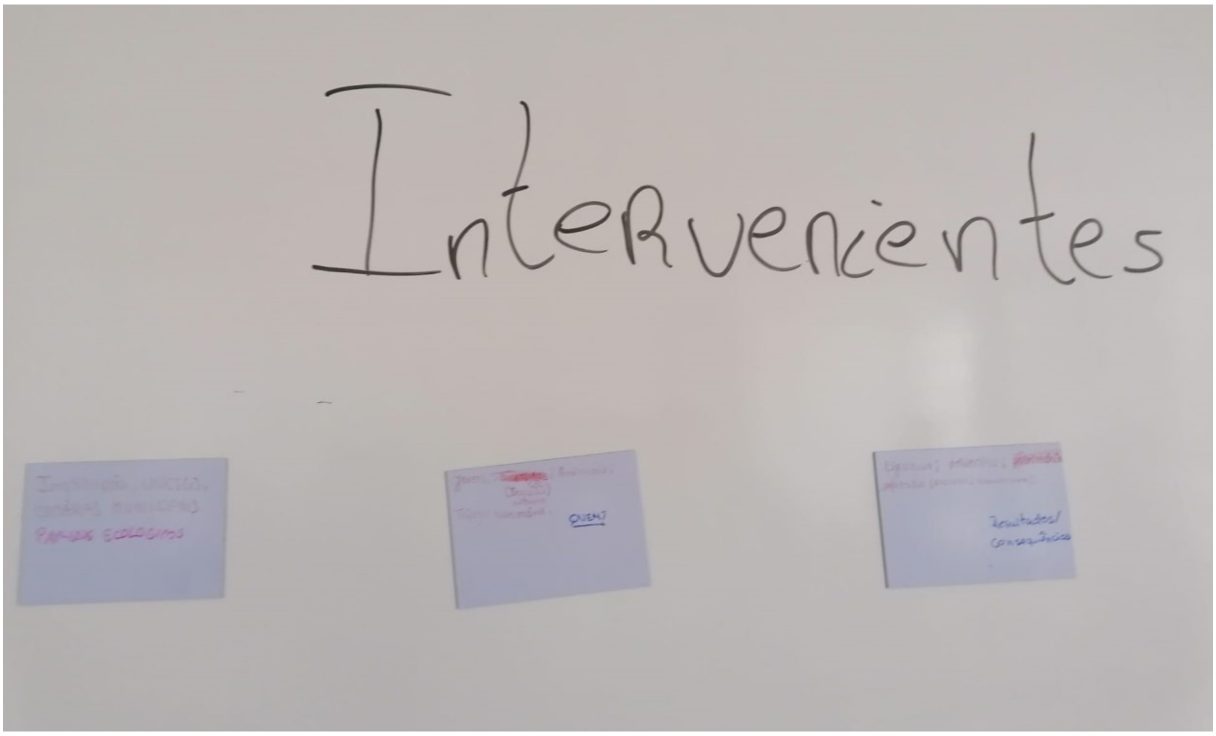


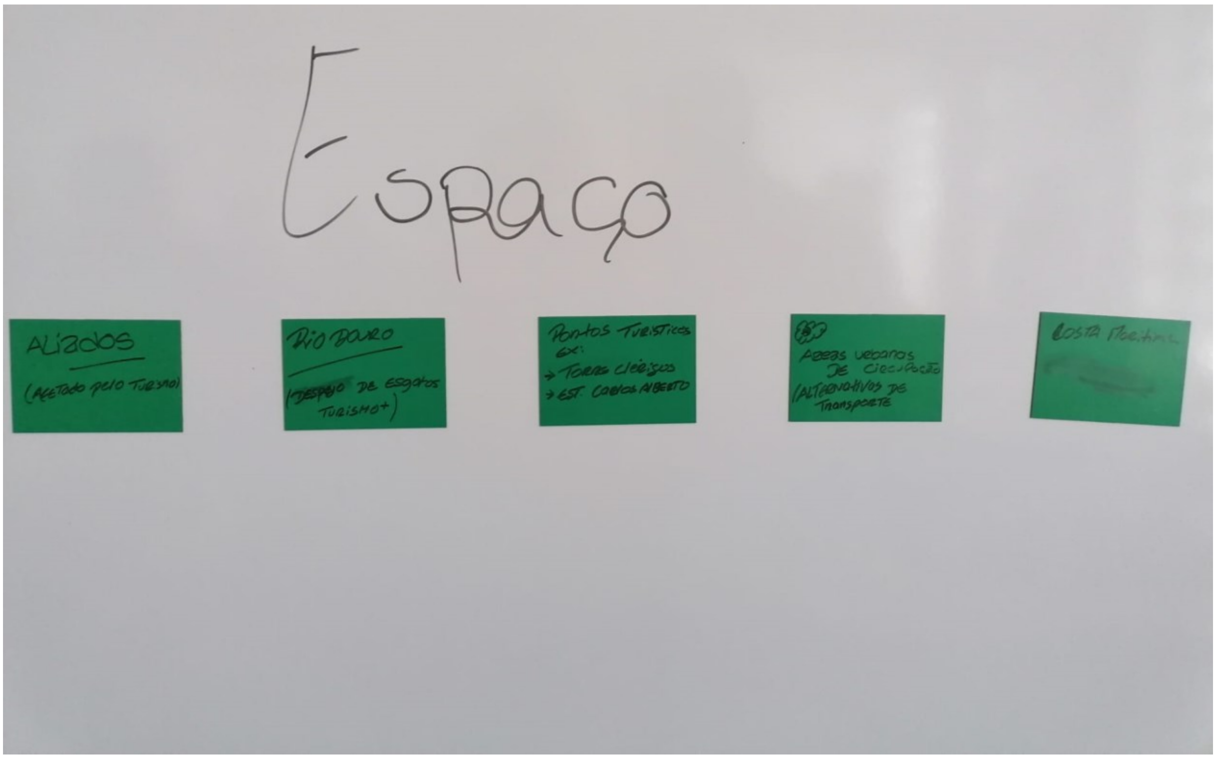
Appendix B

In this appendix are pictures as examples of the answers to the 4Cs activity, not of the classes that participated, but of the answers of the groups.






Intervenientes

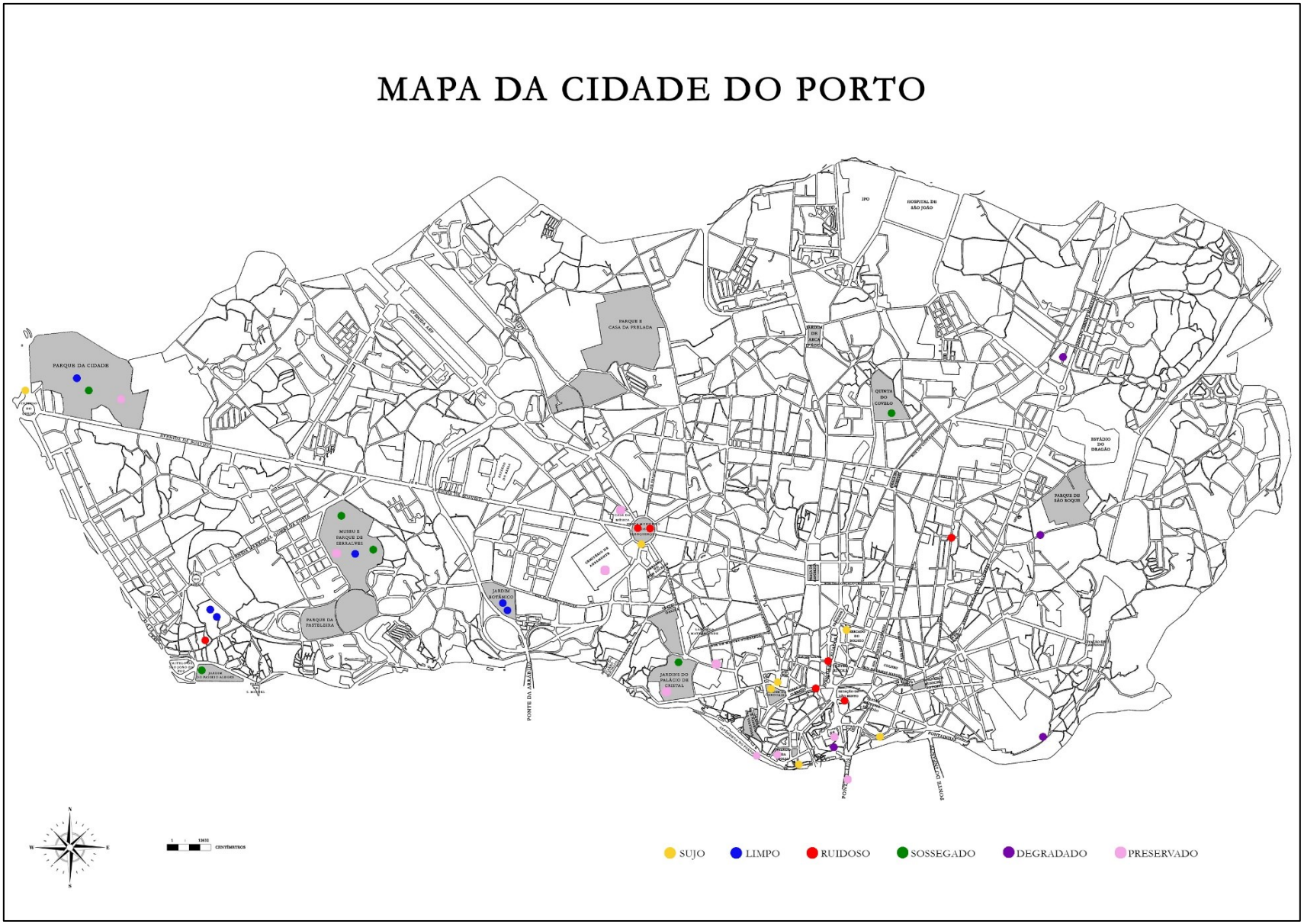

Espaço
Aliados
(Afetado pelo Turismo)
Rio Douro
DE Esgotos
Turismo+)
Pontos Turisticos
ex:
→ Torre Clérigos
→ Est. Carlos Alberto
Areas urbanas
de Circulação
(Alternativas de
Transporte
Costa Marítima

Appendix C

In this appendix is the initial collection of data from the *Map* activity, from each class, on chronological order along with the correspondent justifications.

The maps and justification will be presented in the following order:

1. Masters in Sound and Image
2. Bachelor in Conservation and Restoration, second year
3. Bachelor in nutrition sciences, third year
4. Bachelor in economy and Business Management, second year
5. Bachelor in psychology, first year
6. Bachelor in psychology, third year

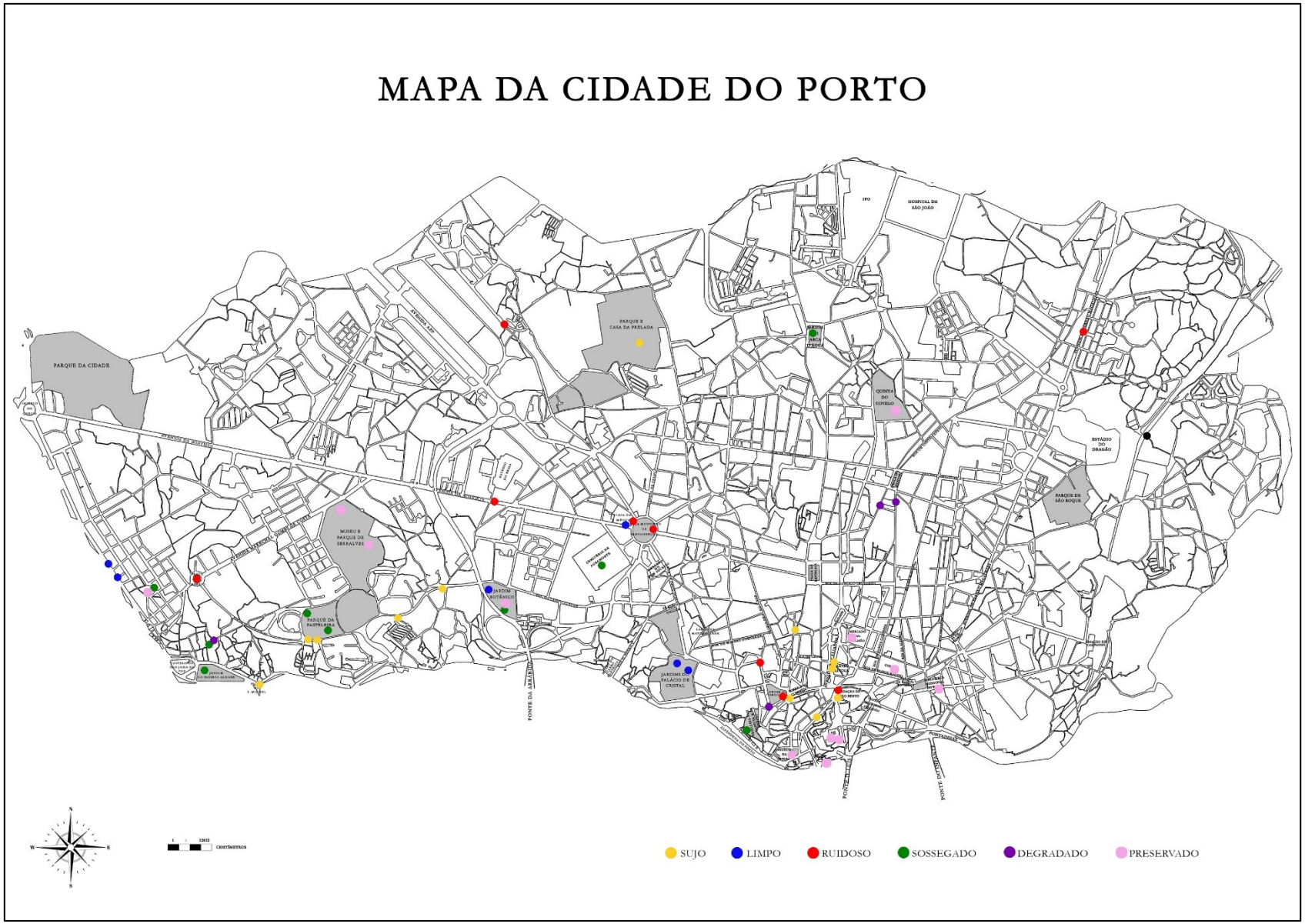

MAPA DA CIDADE DO PORTO
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

MSI1 22.03

1	**DIRTY**	Praia de Matosinhos. Beach with lots of dirt on the sand and polluted sea.
	QUIET	Parque e Museu de Serralves. Place with large green space and very quiet located in a very busy part of the city.
	PRESERVED	Alfândega do Porto. Old building in good condition and home to many cultural events in the city.
2	**CLEAN**	It was an almost spiritual choice. But I felt the space clean in every way. As I have difficulty concentrating on dirty/disorganized spaces, I found here a beautiful space of concentration.
	NOISY	It is a tourist place always very busy. It was always impossible for me to find silence in the heights I passed by.
	PRESERVED	The architecture of the space always takes me to something well preserved despite being recent.
3	**CLEAN**	UCP Campus. I think the campus is very clean.
	NOISY	Rotunda da Boavista. It's a very noisy area, with lots of traffic and buses.
	PRESERVED	Sé. Quite well preserved because of the tourists.
4	**DIRTY**	Rotunda da Boavista. Busy roundabout, lots of buses and lots of garbage on the floor.
	NOISY	Avenida dos Aliados. Constructions for the new metro line: too much noise.
	PRESERVED	Palácio da Bolsa. The building is in excellent condition.
5	**DIRTY**	The street in front of the Mercadona in Pasteleira is dirty due to the illegal consumption activities that are carried out there.
	NOISY	Rua do Veludo is under construction due to the construction of a building that produces a lot of noise.
	DEGRADED	Ponte D.Luís is preserved due to intense automotive, metropolitan and social activity.
6	**DIRTY**	This place is dirty because it's a night zone with lots of people and a lot of associated garbage.
	NOISY	This place is noisy because it's a very moving area.
	PRESERVED	It is a preserved place with well maintained outdoor spaces and good facilities.
7	**DIRTY**	I consider it a space that is not respected because of the bar area, and which results in broken bottles and dirt.
	QUIET	It is a space that, both day and night, transmits me serenity, little noise pollution.

	PRESERVED	I have the impression of little change in space since small, public space respected by all.
8	**CLEAN**	It's pretty clean maybe because of the good work of the cleaning crew.
	QUIET	Only place where there seems to be no one.
	PRESERVED	It is quite well treated and does not seem to have needed renovations.
9	**CLEAN**	Jardim Botânico. It is a closed garden with cleaning and maintenance.
	NOISY	Praça da Boavista. Muito movimentada. Sempre carros a circular.
	PRESERVED	Museu Soares dos Reis. Due to its tourist and artistic character, it has gardens that require some maintenance. Pieces of art that require some attention and restoration.
10	**CLEAN**	I Study in Universidade Católica and in my experience it is a well-treated and clean place.
	QUIET	Parque de Serralves is a place where nature is preserved and protects us from urbanization, making it quite quiet.
	DEGRADED	When I come by train to Campanhã, I pass a view of poor and abandoned buildings.
11	**DIRTY**	Mercado do Bolhão: passing many times through the center of Porto you can see that this area, given its movement, turns out to be very dirty. In addition to lack of care for the people who frequent these streets.
	QUIET	Parque da Cidade, being a place that attracts all kinds of people, it is a quiet place and filled with nature and open spaces.
	DEGRADED	The streets of downtown Porto, although known touristically for their character, are in terrible conditions and difficult to access for many.
12	**CLEAN**	Open space in historic house that is well cleaned
	QUIET	A garden in the city center (near downtown) that serves as an escape to the noise of the city. Despite its location it is a very quiet place.
	PRESERVED	A super preserved historical space, not only for its purpose (because it is a cemetery... it is not advisable to be in ruins) but also for the historical charge it contains and its inhabitants (because it is a historical cemetery of the city and because it contains preserved ancient graves).
15	**DIRTY**	Poorly cared for, trash on the floor.
	NOISY	Cars wake me up every day.
	DEGRADED	Areosa needs more care.
16	**DIRTY**	Ribeira usually gets pretty dirty at night.

QUIET	Quinta do Covelo it is a place of conviviality that is always quiet.
DEGRADED	The area around S.Roque is quite degraded.

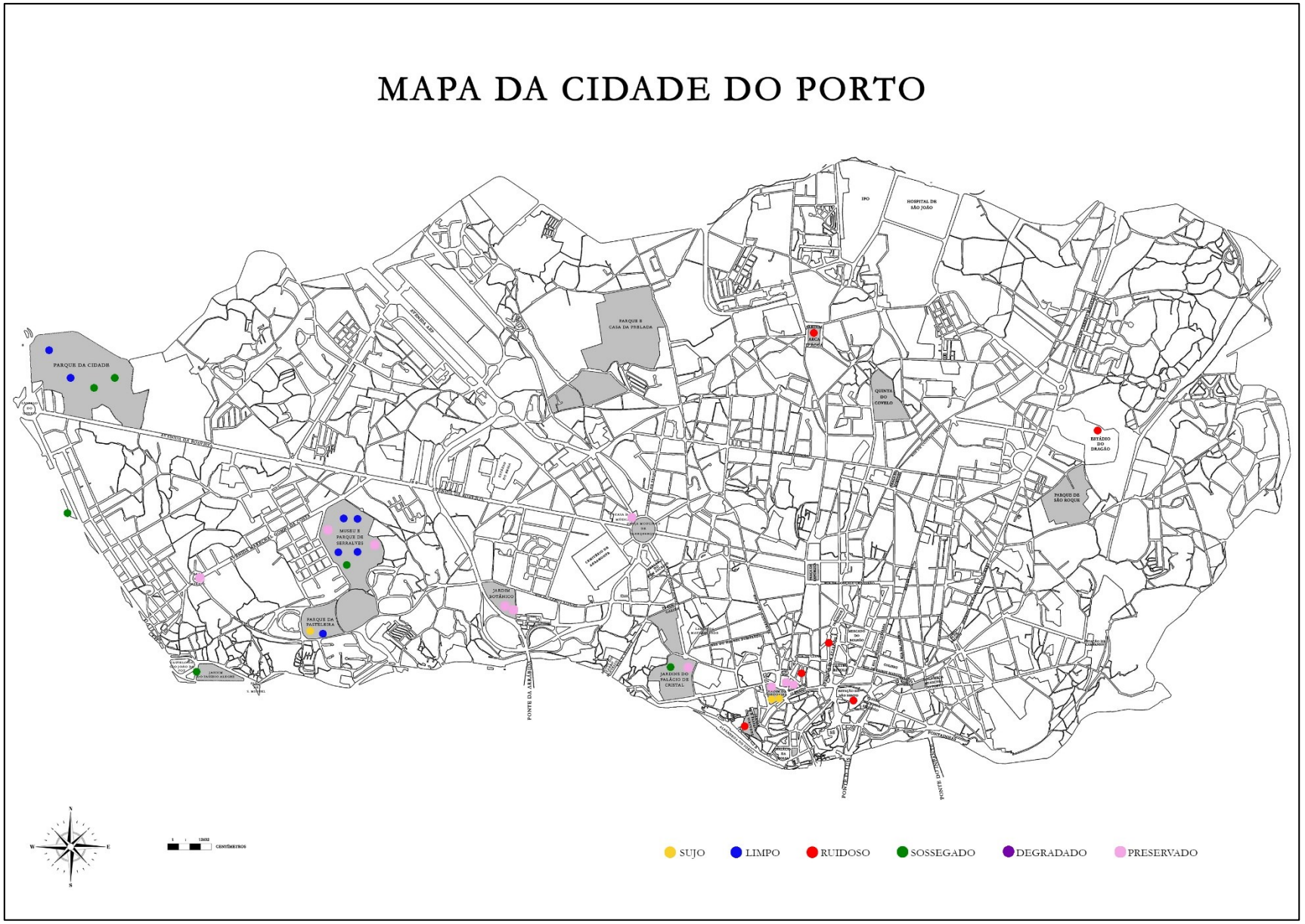

MAPA DA CIDADE DO PORTO
PARQUE DA CIDADE
PARQUE E CASA DA PRELADA
IPO
HOSPITAL DE SÃO JOÃO
QUINTA DO COVELO
ESTÁDIO DO DRAGÃO
PARQUE DE SÃO ROQUE
MUSEU E PARQUE DE SERRALVES
JARDIM BOTÂNICO
PARQUE DA PASTELEIRA
JARDINS DO PALÁCIO DE CRISTAL
PONTE DA ARRÁBIDA
PONTE LUÍS I
PONTE DO INFANTE
CENTÍMETROS
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

LCR2 25.03

1	**DIRTY**	Farol de S. Miguel: Area occupied by fishermen near Farol in Foz. Filled with garbage (fishing material, plastic, etc.) that is on the ground and deposited on the riverbank.
	NOISY	Area next to Casa da Música (transport and traffic).
	PRESERVED	Jardim Botânico (in general it is a place that has good maintenance).
2	**DIRTY**	Fontanário Rua de Mouzinho da Silveira. This monument is filled with garbage, the result of the growing occupation of which it is targeted.
	NOISY	Hospital Sto.António. Confluence between a traffic zone and ambulance noise. The proximity to bars for night life also causes noise.
	PRESERVED	Sé do Porto. Historical area targeted by recent interventions as it is an area with high demand from tourists. The interventions respected the original architecture, thus preserving the heritage.
3	**DIRTY**	Cordoaria: Dirty due to the bars, confectioneries which ends up attracting birds, seagulls and doves, because it is almost always that food scraps are on the ground, walk and road.
	NOISY	Area near estação de s. bento: It is noisy due to the large influx of publicbuses, public buses or tourism, in addition to trains. They create a great sound pollution as well as high vibrations for the historic buildings.
	PRESERVED	It's well preserved, clean facades, in a more or less noisy place. Its interiors are also in good condition.
4	**DIRTY**	Rua do Campo Alegre: Unclean streets with garbage.
	QUIET	Foz velha:Little noise.
	DEGRADED	Foz velha:Very old and degraded houses.
5	**DIRTY**	Pasteleira: site with little care both at the landscape level, because it is sloppy or because the homeless stay overnight often sheltered with umbrellas (tents).
	NOISY	Ramalde. Industry “Sotocal”
	DEGRADED	Viso, area of social neighborhoods.
6	**CLEAN**	Jardim Botânico: Garden well treated and Iimpo.
	QUIET	jardim de Arca d’Água Garden that one can be, because there is no noise.
	PRESERVED	Mercada do Bolhão: Old market that is in the works for preservation.
7	**DIRTY**	Pasteleira - Housing area

	NOISY	Areosa – Student housing area; football stadium; hospital.
	PRESERVED	Foz do Porto - Constantly in construction works (housing)
8	**DIRTY**	Jardim da Paragem Fluvial Norte: Dirty area with high number of homeless. Little security.
	QUIET	Jardim Botânico: Preserved and with little movement. Good maintenance and natural environment.
	PRESERVED	Sé:Preserved place with constant maintenance. Good atmosphere.
9	**CLEAN**	Casa da Musica: Good site maintenance.
	NOISY	Rotunda de Boa Vista: Traffic congestion
	PRESERVED	Place that unites the community, provides a natural and "rural" environment in the middle of the city
10	**CLEAN**	Pérgola da Foz, all renovated. Keep spaces clean.
	NOISY	Praça do Imperio: area with high traffic noise.
	PRESERVED	Museu e Parque de Serralves: A controlled, preserved location. The works, buildings and spaces are well treated.
11	**DIRTY**	Avenida dos Aliados: Site with works that cause dust.
	NOISY	Jardim da Cordoaria: area with high noise level
	PRESERVED	Quinta do Covelo: Recovered and well preserved
12	**DIRTY**	Parque e Casa de Prelada This green space, it's unused. It was once a campsite and nowadays little happens to the general public.
	QUIET	Jardim das virtudes, this place has been more dynamic ized by the inhabitants. The disposal of dustbins and maintenance of the grass should be improved.
	DEGRADED	Miradouro da vitória, annex building. The building is abandoned and deserves to be recognized for its location/season.
13	**CLEAN**	Jardim Palácio Cristal: it's a very big park and for the amount of people who visit it every day, I've never seen garbage on the ground.
	QUIET	Cemitério agramonte: The cemetery is a quiet place and is very large, you can walk quietly.
	PRESERVED	Biblioteca Municipal do Porto: The Municipal Library is very well preserved; it is a building that you can visit and use for study.
14	**CLEAN**	Av. Brasil: well cleaned and treated for sightseeing
	QUIET	Jardim do Passeio Alegre: Leisure area very wooded, good for sightseeing.
	PRESERVED	Museu e Parque de Serralves: Very well preserved and maintained as original, with contemporary influences.

15	**CLEAN**	Jardim do Palácio Cristal: The gardens are very clean. There's not much garbage on the floor. The space is nice.
	QUIET	Parque da Pasteleira It's not very busy. People are nice.
	PRESERVED	Coliseu: The space is well cared for and preserved because it is an important and constantly used space.
16	**DIRTY**	São Bento. Place where a lot of people ignore the trash giving way to the ground like your crate. Beatas on the floor and plastic are our daily bread.
	QUIET	Praça de Líege it is a very quiet, amazing place at the mouth to rest and see cute dogs.
	DEGRADED	Zona dos Marques: is undoubtedly a place in degradation.
17	**DIRTY**	Praça Carlos Alberto e Zona dos Leões. Lots of bottles.
	NOISY	Avenida da Boavista. Lots of cars.
	DEGRADED	Zona do Marquês. Degraded houses.
18	**DIRTY**	Avenida dos aliados: It usually finds itself dirty due to the amount of garbage that can be found along the way.
	QUIET	Parque da Pasteleira: We didn't find much movement, the people are friendly and the park is nice.
	PRESERVED	Ribeira: due to the strong influx of tourism, it is eventually preserved with the reconstitution and rehabilitation of architecture.


MAPA DA CIDADE DO PORTO
PARQUE DA CIDADE
PARQUE E CASA DA PRIMAVERA
HOSPITAL DE SÃO JOÃO
IPO
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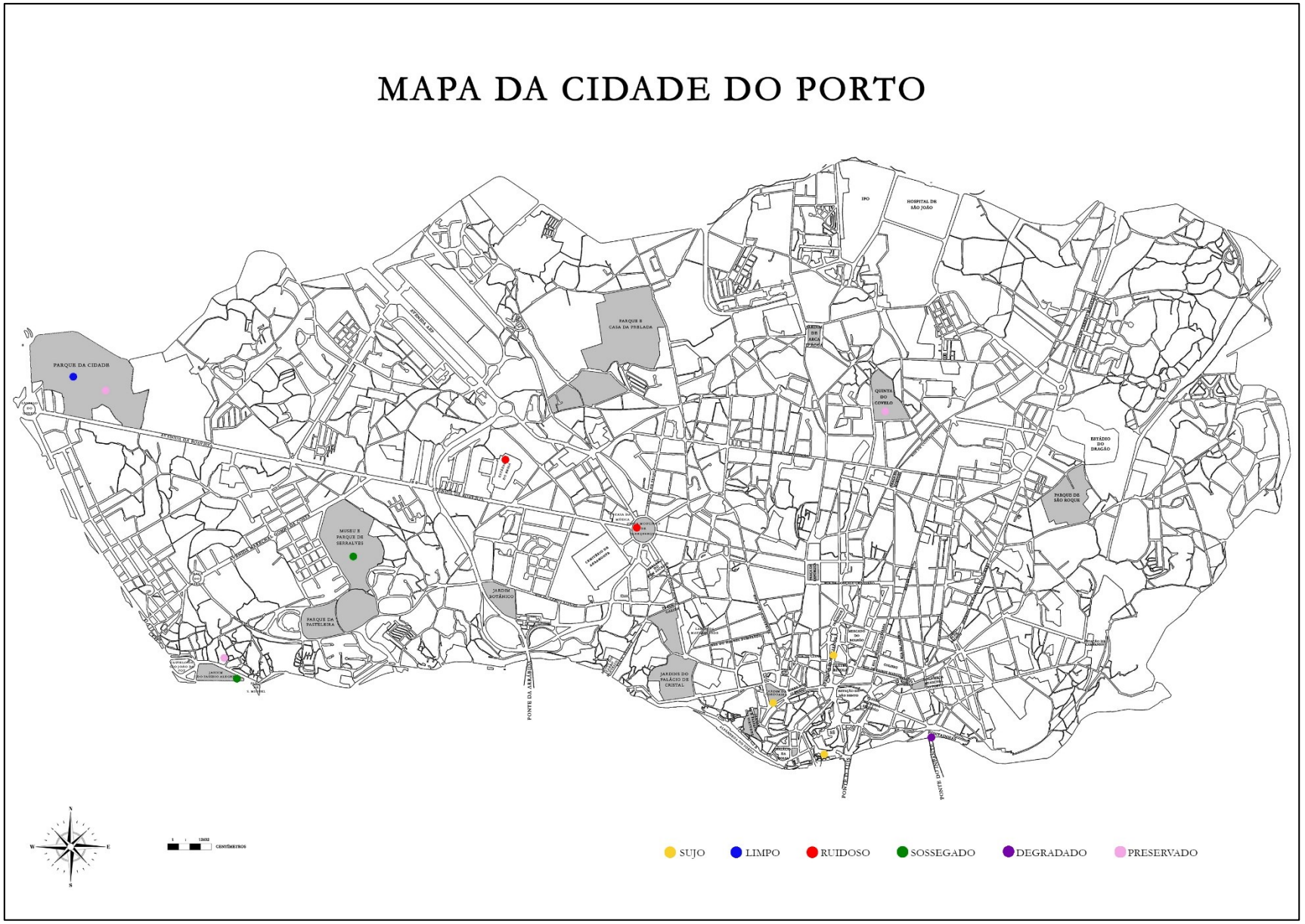
ESTÁDIO DO DRAGÃO
PARQUE DE SÃO ROQUE
MUSEU E PARQUE DE SERRALVES
JARDIM BOTÂNICO
PARQUE DA PASTELEIRA
JARDINS DO PALÁCIO DE CRISTAL
PONTE DA ARRÁBIDA
PONTE DO INFANTE
PONTE LUÍS I
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

LCN3 31.03

1	**CLEAN**	Every time I visit the city park, I think it's always clean.
	NOISY	I consider the garden of Arca d'Água noisy, since in the surrounding area has a lot of movement (cars).
	PRESERVED	Jardim do Palácio de Cristal: Every time I visit it's well preserved.
2	**CLEAN**	Serralves. It's a tourist site, so it's quite clean and organized.
	NOISY	Jardim das Virtudes. A little noisy place, not in a bad way. It's a place of conviviality.
	PRESERVED	JardimBotânico. Tourist site and well preserved and organized.
3	**CLEAN**	Parque da Pasteleira. Clean, nice.
	NOISY	Avenida Aliados. Many people, traffic.
	PRESERVED	Museu e Parque de Serralves: Organization of activities with preservation of nature and buildings.
4	**CLEAN**	Parque de Serralves: You can see that it's a treated place and where people are careful not to get dirty.
	QUIET	Praia da Foz: Seaside (jetty, for example) is a place where I like to be watching the sunset.
	PRESERVED	Jardim Botânico, paid place. As in Serralves, it is well treated.
5	**CLEAN**	Parque de Serralves: It's a well-treated space where people feel good and comfortable and don't see garbage on the floor.
	QUIET	Jardim do Passeio Alegre: It's where I like to go at the end of the day to watch the sunset.
	PRESERVED	Casa da Música: It's a place that's been well used and continues to be well treated, at least it's the idea I get when I pass by
6	**DIRTY**	Cordoaria: Unclean streets.
	QUIET	Parque da Cidade: Transmits a lot of peace
	PRESERVED	Jardins do Palácio do Cristal: Well-maintained gardens.
7	**DIRTY**	Cordoaria: Muito lixo nas ruas.
	NOISY	Galerias de Paris. Noise coming from bars and people on the streets.
	PRESERVED	Fundação Serralves. Because it is a garden and museum there is more care.
8	**9999**	9999
	NOISY	Estação de São Bento It is a place where there is always noise from people talking or trains.

	QUIET	Parque de Serralves. It is a very quiet place where there is a great contact with nature.
	PRESERVED	Torre dos Clérigos. It is a place with a lot of history and is very preserved.
9	**CLEAN**	Museu e Parque de Serraves: It is cleaned by the organizers responsible for the site.
	QUIET	Parque da Cidade: It's a very quiet place with contact with nature.
	PRESERVED	Praça do Império: Local by the city hall of the port.
10	**DIRTY**	Parque da Pasteleira: Trash on the floor.
	QUIET	Jardim do Palácio de cristal: He's in contact with nature.
	PRESERVED	Jardim da Cordoaria: Garden preserved and well cared for.
11	**CLEAN**	Parque da cidade. Very nice place, constant maintenance and cleaning.
	NOISY	Estádio do Dragão. On game days (sometimes on days without game) it is a place of quite moving and noisy.
	PRESERVED	Torre dos Clérigos. Despite the tourism, and because it is a heritage site of Porto and Portugal, it is quite preserved.


MAPA DA CIDADE DO PORTO
PARQUE DA CIDADE
PARQUE E CASA DA PRIMAVERA
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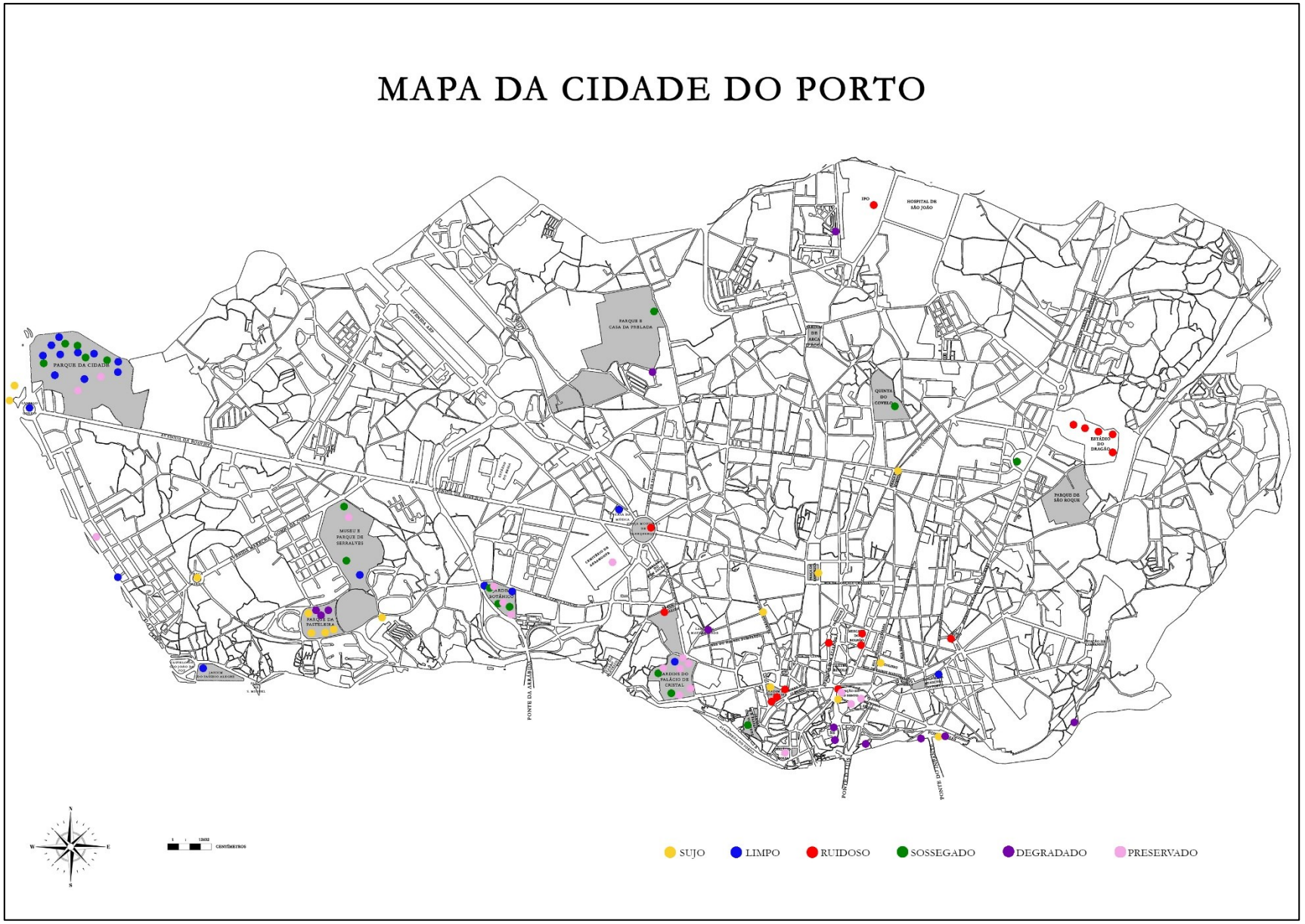
HOSPITAL DE SÃO JOÃO
QUINTA DO COVELO
ESTÁDIO DO DRAGÃO
PARQUE DE SÃO ROQUE
MUSEU E PARQUE DE SERRALVES
JARDIM BOTÂNICO
PARQUE DA PASTELEIRA
JARDINS DO PALÁCIO DE CRISTAL
PONTE DA ARRÁBIDA
PONTE DO INFANTE
PONTE LUÍS I
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

LGEST2 12.04

1	**DIRTY**	Ribeira it is always full of tourists and local people which causes the dirt. This, especially in the festivities of S.João do Porto.
	NOISY	Estádio do Bessa because I remember watching games a few years ago and being one of the noisiest places. However, only when there are games.
	PRESERVED	Eu acho que a Quinta do Covelo proves to be a preserved space. This place reminds me of when I was a kid and I moved to the mini playground. To this day this site remains preserved for other children to have fun.
2	**DIRTY**	Cordoaria: a place with some nocturnal movement which makes it a little dirty.
	QUIET	Serralves, surrounded by culture and music, which relaxes people.
	PRESERVED	Parque da Cidade: a green space where people respect.
3	**DIRTY**	Aliados, people,especially tourists, dirty all that and then as it is on the edge of the cordoaria also gets full of plastic cups.
	QUIET	Foz/Passeio Alegre: Because of the sea and the river, it's a quiet area.
	PRESERVED	As Ruínas da Foz, those traditional little houses.
4	**CLEAN**	Parque da Cidade do Porto: is a place that is quite clean and has a pleasant air due to the trees.
	NOISY	A Praça Mouzinho de Albuquerque combines the noise of cars with the bustle of people and turns out to be a very noisy place.
	DEGRADED	Although downtown Porto has had a positive evolution in preserving it, I consider that the eastern part of the city remains quite degraded.


MAPA DA CIDADE DO PORTO
PARQUE DA CIDADE
AVENIDA DA BOAVISTA
AVENIDA DA REPÚBLICA
PARQUE E CASA DA PRELADA
IPO
HOSPITAL DE SÃO JOÃO
QUINTA DO COVELO
ESTÁDIO DO DRAGÃO
PARQUE DE SÃO ROQUE
MUSEU E PARQUE DE SERRALVES
CEMITÉRIO DE AGRAMONTE
JARDIM BOTÂNICO
PARQUE DA PASTELEIRA
JARDINS DO PALÁCIO DE CRISTAL
PONTE DA ARRÁBIDA
PONTE DA ARRÁBIDA
PONTE LUÍS I
PONTE DO INFANTE
CENTÍMETROS
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

LPSI1 12.04

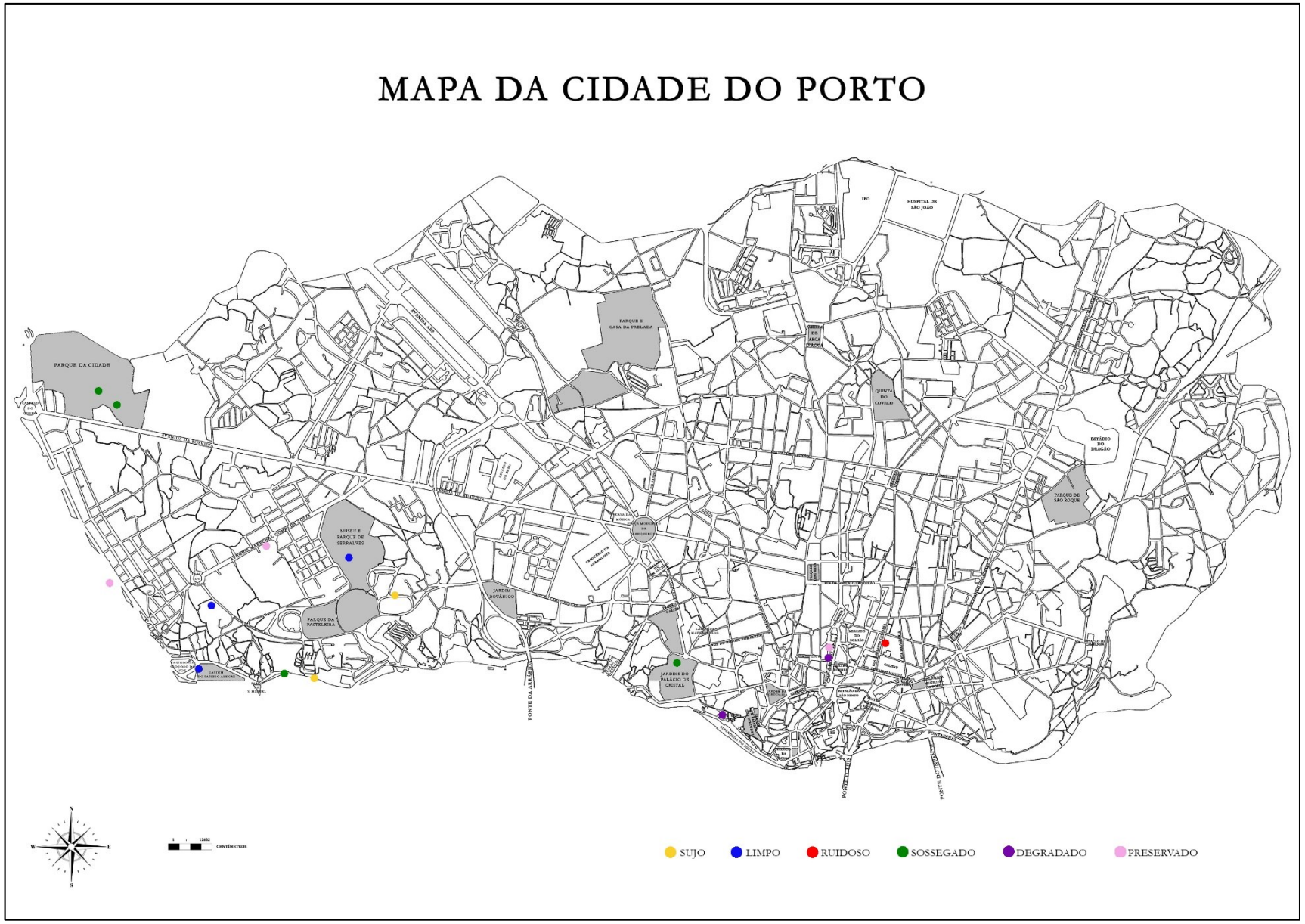
1	DIRTY	Parque da Pasteleira: It is an area with a precarious environment and community and apparently poorly frequented
	NOISY	Estádio do Dragão: Because of thegames, the transition,what happens in those days.
	PRESERVED	Estação de S. Bento: is an area that counts a lot of the city of Porto. It is preserved because it is very careful, in order to keep the tiles that represents us so much
2	CLEAN	Parque da Cidade
	NOISY	Jardim da Cordoaria
	PRESERVED	Jardim Botânico
3	DIRTY	Pasteleira. due to the syringes
	QUIET	Parque da Cidade: You hear the birds
	DEGRADED	Maternidade, old buildings
4	DIRTY	Parque da pasteleira: Due to the poor maintenance of buildings
	QUIET	Parque da Cidade:It's a quiet park
	PRESERVED	Jardim botânico: It is a beautiful and well organized garden
5	DIRTY	Praia Da foz 9999
	QUIET	Parque da Cidade: Calm
	PRESERVED	Jardim Botânico it's very well preserved
6	CLEAN	Biblioteca municipal do porto: Well maintained, slime, hygienic, care and good facilities
	QUIET	Parque da Cidade Quiet, there is no confusion
	DEGRADED	Parque da Pasteleira: Many drug users, dangerous, dirty and damaged
7	DIRTY	Parque Fluvial: Many people consume illicit substances.
	NOISY	Parque da Galiza: Works of the metro station and ambulance because the is close and more buses
	PRESERVED	Estação de São Bento: it seems that's well preserved and the whole avenue of the allies
8	DIRTY	Cedofeita: very busy, active nightlife, lots of tourism (careless)
	NOISY	Cordoaria: excess of person, mostly tourists and many parties
	PRESERVED	Foz. Foz Nova: Renovated tours and caring spaces
9	DIRTY	Praça da republico because there are several people who consume there and constantly leave things on the floor and garbage. There's a lot of homeless people sleeping there.

	NOISY	São Bento: much tourism and movement, many people of all estratos socias...
	DEGRADED	Sé, the houses have no investment so that then people who live and build hotels
10	DIRTY	Fontainhas, investment in the chamber given its low economic possibility. Accumulation of garbage
	QUIET	Jardim do Palácio de Cristal, for being a quiet place, overlooking the Douro River and an environment of Nature
	DEGRADED	Sé has around it old houses that ends up devaluing the see making it a degraded place
11	DIRTY	Praia da foz Water is contaminated because of industry
	NOISY	Rotunda da Boavista Too much traffic and too much confusion
	DEGRADED	Parque da Pasteleira dirty, drug addicts, homeless and dangerous
12	CLEAN	Jardim botânico do porto is a careful site and preserved
	QUIET	Jardim das virtudes: quiet place to despite being visited frequently, is well taken care of. It is quiet because it has a fairly free and clean area
	DEGRADED	Prelada: oldest place and, for lack of care around, degraded
13	CLEAN	Parque da cidade, you see people cleaning and it may even be garbage but compared to other places is well taken care of
	NOISY	Estádio do Dragão, on-the-day games you hear a lot of noise
	PRESERVED	Jardim do palácio de cristal, by age, by the renewal
14	CLEAN	Jardim do Palácio Cristal: for being a guarded place and that's quite careful
	QUIET	Jardim Botânico: enough space, even if they are enough is less noticeable the noise
	PRESERVED	Serralves: Because it is a private place with constant vigilance
15	DIRTY	Coliseu: because of the people who go out on the street drunk
	QUIET	Jardim Velasquez (Praça Dr. Francisco Sá Carneiro): for being a garden, te vegetation, birds and quiet place
	DEGRADED	Fontainhas: has aged and little-looked-after architecture
16	DIRTY	Praça do Marques: because of the drunk people
	NOISY	Mercado do Bolhão: Because it's a trading market
	DEGRADED	IPO (around): because they are older streets; there's no care
17	CLEAN	Parque da cidade because there are people to take care of
	QUIET	Jardim Botânico, because it's a preserved space
	PRESERVED	Museu e o Parque de Serralves because it's a museum and requires care
18	CLEAN	Parque da Cidade: it's a beautiful place, green space with animals and lakes

	NOISY	IPO: hospital and university area, lots of traffic
	PRESERVED	Estação de S. Bento; beautiful place preserved though in downtown
19	DIRTY	Parque da pasteleira becauseitis a more precarious area, which promotes dirt on
	NOISY	Cordoaria: Especially at night, it's very noisy and there are a lot of people
	DEGRADED	Estação de campanha very degradada da because the casas are very old
20	CLEAN	Jardim do passeio alegre is clean because it is in good condition
	QUIET	Park and the casa da Prelada: quiet because it is a green space, quiet and good to visit
	PRESERVED	Jardin do plácio de cristal The gardens of the crystal palace are preserved are close to downtown and are taken care of, including buildings.
21	CLEAN	Parque da Cidade: clean and well-tattered, with gardeners doing this every day
	QUIET	Jardim Botânico: quiet, well maintained and very beautiful
	PRESERVED	Parque da Cidade: well taken care of , clean and preserved
22	CLEAN	Castelo do Queijo: beach and walks and clean and with garbage points
	QUIET	Quinta do Covelo: not too busy and quiet
	PRESERVED	Parque da Cidade: Green Space and with different species, in addition to being well treated
23	CLEAN	Parque da cidade: It has a good space to see of well preserved
	NOISY	Avenida dos Aliados: There's a lot of traffic, a lot of movement, a lot of people
	PRESERVED	Sé: a historio monument that meets well-treated facilities
24	CLEAN	Jardim Botânico: care and esteemed
	NOISY	Mercado do Bolhão high traffic and very concentrated population
	DEGRADED	Pasteleira high poverty and degraded
25	9999	
	9999	
	9999	
26	DIRTY	area of the coliseu: there is a lot of garbage on the streets, a lot of cars pass that also contribute to the increase in pollution
	QUIET	IPO: Area that is almost always calm, showing respect for professionals and patients

	PRESEERVED	Palácio da Bolsa: Place that presents to be cared for and estimated
27	CLEAN	Praia da foz: The beach has no dirt
	QUIET	Museu e arque de Serralves No cars, too much open space
	PRESERVED	Avenina marchal comes da costa Recent houses
28	DIRTY	Praçaa do Império: It is frequented by kids who leave garbage on the floor or leave in the seats
	NOISY	The fans are very enthusiastic
	PRESERVED	Because it's old and well taken care of
29	CLEAN	Parque da Cidade: it's a pretty clean place
	NOISY	Estádio do Dragão: due to the concentration of people when there are football games and there is a lot of noise
	PRESERVED	Palácio de Cristal: is very old and continue to be taken care of
30	CLEAN	Parque da cidade: whenever I go there, I pass by people who are liquevou or arrange the garden
	NOISY	Estádio do Dragão: due to the concentration of people when there are football games and there is quite noisy
	PRESERVED	Jardim do palácio de cristal: is very old and continue to be taken care of
31	CLEAN	Parque da Cidade: From my experience and comparison to other locations is a clean site
	NOISY	Estádio do Dragão: Due to games, fans shout too loudly
	PRESERVED	Jardim do palácio de cristal : is very old and continue to be taken care of
32	CLEAN	A casa da música: frequent is used so it is always and great conditions
	NOISY	Campo 24 de Agosto: a place frequented by many students At night when they go out drinking
	PRESERVED	Cemitério de Agramonte: a cemetery where it has a regular maintenance, tando in the graves as in the cemetery itself
33	DIRTY	Jardim da Cordoaria was chosen for a dirty location due to those who frequent it at night and do not respect with a call of natural beauty
	QUIET	The museum and the park of Serralves is a place with a lot of cultural interest, so those who frequent, admire or its relevance and respect the quiet
	PRESERVED	jardim do palácio de cristal is an outdoor space where the pavilhão rosa mota is located, so the interest in maintaining the space that surrounds it preserved is of great interest

34	CLEAN	Jardim botânico is a clean site because it is managed by the faculty of science
	QUIET	Parque da cidade it's quiet, because it's a big garden with enough green space
	PRESERVED	Torre dos clérigos it is preserved because a tower with many years that is in great condition and is part of the world heritage of unesco
35	CLEAN	Museus e Parque de Serralves: No trash
	QUIET	Jardim do palácio de cristal: Very calm- view of gaia
	DEGRADADO	Fontainhas: House degrades


MAPA DA CIDADE DO PORTO
PARQUE DA CIDADE
AVENIDA DA BOAVISTA
AVENIDA DA REPÚBLICA
PARQUE E CASA DA PERLADA
IPO
HOSPITAL DE SÃO JOÃO
QUINTA DO COVELO
ESTÁDIO DO DRAGÃO
PARQUE DE SÃO ROQUE
MUSEU E PARQUE DE SERRALVES
PARQUE DA PASTELEIRA
JARDIM BOTÂNICO
JARDINS DO PALÁCIO DE CRISTAL
PONTE DA ARRÁBIDA
PONTE DO INFANTE
SUJO
LIMPO
RUIDOSO
SOSSEGADO
DEGRADADO
PRESERVADO

LPSI3 12.04

1	DIRTY	Rua de passeio alegre:It's always clean
	QUIET	Jardim do palácio de cristal: It's a great place to relax or study, as it's quite large and quiet
	DEGRADADO	Zona de alfândega do porto: Despite being rebuilt, many houses are degraded
2	CLEAN	Jardim do Passeio Alegre I usually go around every weekend and it's always clean
	SOSESSEGADO	Parque da Cidade: I usually walk my dog and give me peace of mind
	PRESERVED	Avenida dos alaidos It was recently renovated with a good presentation
3	DIRTY	Bairro da Pasteleira: This area has an integrated social neighborhood which makes a dirty place by the needs in the rua, clothes, belongings to sleep, etc..
	QUIET	Passeio alegre It is a locationl in front of the sea, which gives it for my tranquility
	PRESERVED	Avenida marchal gomes da costa: It is a preserved area, renovated and that recently has been very careful associated.
4	CLEAN	9999
	NOISY	Rua de Santa Catarian There's a lot of people
	PRESERVED	9999
5	CLEAN	Museu e Parque de Serralves: I like the gardens, it gives me peace and it seems very clean and if the confusion of the city
	QUIET	Parque da Cidade It is a nice and large space and so it ends up transmitting tranquility and being quiet.
	DEGRADADO	Avenida dos aliados: As it is currently in the works, it turns out to be a bit boring and more degraded.

Appendix D

In this appendix is the initial collection of data from the *4Cs* activity, from each class.

LCR3 21.03

Date: 21/03

Class: 3rd Degree in Conservation and Restoration

Number of students: 11

DRAFTS

9999

TRANSCRIPT

Dimensions

We can see there are through climate change in the impact mainly on the

biodiversity, which is most visible in the city. It has a political impact not only on the municipality chamber in the central government. And it has an economic and social and negative impact.

Space

In relation to space, as at the moment the growth of demographics lead to increased constructive construction, or vice versa. With the increase in buildings in the city space, the number of people increases. This leads to a consequence, it would be the garbage, the plastic that pass pollute the waters, which would be other spaces. Pollution caused by the excessive number of vehicles on the streets due to this demographic density would lead to the degradation of outdoor works, for example, due to this pollution. The constructive density leads to the absence of green spaces, and consequently generates differences in temperatures. Of these microclimates, for example, the center becomes warmer than the periphery.

Intervenients

We asked 3 questions

The first was more general, who participates positively or negatively in climate change, in this case was very specific. And the main answer was man, though positively and negatively. There were those who spoke of public figures who have some intervention as Greta Thunberg, Leonardo DiCaprio. In this case positively, youth has already demonstrated some capabilities. Negatively, large companies, especially those that live on profit selfishness, were spoken some specific companies as oil companies. Specific cases have also been reported regarding construction, policy and industry.

The second question who in art publishes intervenes negatively. The main answer was no one wants to know, that is, go to meet the man. Our life strategies are not of primary concern to the preservation of public art

The third question who can improve our relationship with climate change: voted whether again to man, especially or younger who can be instructed and who can be empowered to do so. And the state itself also has strategies to defend and companies are less intended for profit not directed to profit. More directed to preservation.

Time

We realize that we are actively living the losses, that is, we are already feeling the consequences of pollution today. The other question we asked was whether we can fully reverse what has been done so far. The answer was no, but that partially with small gestures we can generate big changes, that is, if each of us does little things, we can partially reverse, not totally, but in part. For this you need the collective, that is, if I change something, it will not change. So we think we need to change the mindset in general, in order to achieve something. One of the situations we most noticed this time action is that for example, a few days ago were 20 ºC, deep down we no longer have the 4 seasons, we have two summer and winter, and we walk here

POST-IT

DIMENSIONS	INTERVENIENTS	TIME	SPACE
Political impact	Man; public figures; selfishness of profit.	Totally? No!	Increased demographic density and construction density
Social impact	Man Animals	Collective	Garbage (plastics) and water pollution
Impact on biodiversity	Younger people; Companies; State	Small gestures can generate big changes	Degradation of exterior and public art; pollution
Economic Impact		4 seasons – 2 seasons	Temperature differences Center vs. Periphery
* sad emoji *		Actively living the losses	Absence of green spaces

OBSERVATIONS

The group initially did not understand the objective of the study or activities, and were not very collaborative at the beginning of the activity, but throughout the exercise they were more collaborative.

LCR1 28.03

Date: 28/03/22

Class: 1st year in Degree in Conservation and Restoration

No. of alunos: 17

DRAFTS

Dimensions

- Which sector has the most influence?

Intervinents

1. Key players? Young people, tourists, animals ; individual action is required (e.g. recycling)

2. What do they affect? Where? What? Garbage, gases emitted by cars;
3. As for the heritage? tourists (increased circulation of tourist buses→ further degradation of heritage). Because tourists think it affects others they don't think

Space

1. Douro River: super polluted and very affected
2. Sights generate pollution as the torre dos clérigos
1. Malternatives to circulation to avoid pollution but do not avoid people
2. More animals in the cities because of the bathing areas.
3. Saint Anthony- granite
4. Avenue of the Allies
5. Cordoaria
6. stream
7. Rivers and seas
8. Monuments due to acid rains
9. Street peripheries (bushes and parks)

Time

10. You're asking how many years are it until we have the world as we know it?
    1. What is the period of time in which there was the greatest pollution?
11. Pandemic Information
    1. Very hot, fluency of tourism the Will prior until the change happens the Will get worse up to 5 to 6 years
    2. Winter, there is no rain and summer temperatures are extreme

TRANSCRIPTS

Dimensions

On the part of the dimensions, we divide our research by the dimensions that are most affected by climate change and those are more causative. In the ones that are most causative, we think first of the primary sector in the agricultural industry. In the secondary sector, industry in general for the pollutants they cause, we call attention to non-renewable energy production such as burning coal, etc. In the tertiary sector, mass tourism. In areas that are most affected by climate change, most people mentioned, we call the dediating of agriculture for example in the variation of temperatures, how they affect crop cycles, droughts, soil pollution, so forth. Then also the acid rains in the built heritage.

Intervenients

We divide the actors into the actors that cause climate change and those who help to try to minimise it. Those who find those who cause in the city of the port, we came to the conclusion that most of it was due to overpopulation. Which then resulted in internal car traffic, which ends up causing a lot of pollution in the city in general. Also tourism, I call the conclusion that many people thought that tourism had a lot of impact, because in overpopulation and ended up spending a lot of resources for the spaces we have. The consequences were street litter, pollutants in the heritage. The actors will be the institutions here in the port there are institutions that try to minimize this impact to UNESCO in the case of heritage and the town hall that has some projects and ecological parks.

Space

In space it was agreed that by most the douro river would be affected because it is a large part of the city. The allies by the proximity of the douro river and how it is in the center of the city. We being restoration students also thought of the sights in the moments by the acid rains. On the sea coast, I live here the border usually go to the beach as we have the Port Leixões, once and for all while I find tar and physical oil on the beach. The effect of tourism that has already been said by other people.

Time

My group was the weather, not in the meteorological sense, but of the amount of years that climate change both in the past and in the future. A period of time that in unanimous decision, which everyone spoke about was the pandemic; it was a period of time when climate change did not sit so much due to car traffic in the city and excess population, namely tourism. It has also been addressed that it will get worse until it improves, i.e. over the course of the year, climate change may have more impact until it reduces this impact with measures that can be taken by the government, the city or businesses. As for companies, the measures can last 100 years until they establish that they fight climate change, I do not know it will be so much time or less time, all depend on who is in charge of the company. And it will take some time for our city m issue to stay perhaps as it was, in other times, where there was not so much influx of tourism, as to mass tourism should be the biggest pollution factor of the city.

POST-IT

DIMENSIONS	INTERVENIENTS	TIME	SPACE
Primary sector: e.g. Agricultural Secondary sector : E.g. industry/ energy production (non-renewable)	(Results/consequences) Street trash; pollutants; affected heritage (facades, monuments)	It's going to get worse before it gets better	Aliados: affected by tourism
Tertiary sector: ex. turism			
Agriculture: • temperatures • cultivation cycles • droughts • soil pollution • less Biodiversity	Institutions, UNESCO, city councils, ecological parks	100 years companies measures	Rio Douro (sewage disposal)
Acid rains (in the context of heritage)	Young people; animals; Car traffic.	40 years until the world comes back to how we know it	Touristic sights: torre dos clérigos; carlos alberto
		Pandemic	Urban areas of circulation (transport alternatives)
			Coastal area

OBSERVATIONS

This group is initially having difficulty understanding the exercise, throughout the activity their collaboration has been increased.

MPDRH1 11.04

Date 4/11

Class: 1st year of PDRH Master's Degree

Number of students: 8

DRAFTS

Dimensions

1. Dimensions the Defrost the Ozone Layer or Rise in Temperatures
    1. Rise in the average sea level
2. Questions (Answers) What are the dimensions associated with climate change? (Recycling, island of plastics in the oceans, energy transition, green spaces, improvement of public transport)
    1. Where is the most harmful thaw? (At the poles)
    2. What is the phenomenon most associated with climate change? (Yes it affects in particular in the port so there is a plan for the requalification of the maritime ode and the buildings to be demolished
    3. Does rising water level affect our daily life? In what way?
    4. Signs that more and more we go from 4 stations to two? If you go out, which ones? (Summer and winter; hot season or are cold)

Intervenients

- Questions (Answers) or Who are the actors who suffer the most from climate change?

  (General population) o In Porto, what are the main industries that are having the greatest impact on climate change (Textile industry)

1. Do you know groups that propose or carry out initiatives to combat climate change? (VO. U nature)
2. Do you consider that there are actors that benefit from climate change? If so, which ones? (Industries)

Space

1. Questions what spaces in Porto have been modified in the last 2 years? (Aliados; metro line; crystal palace; city park)
    1. Qual o impacto do aumento das construções na zona metropolitana do Porto? (increased traffic, reduced space for pedestrians on the road; more noise)

2. What green space do you like most in the port area that has changed in recent years? (City Park)
3. What is the impact of climate highs on the spaces of Porto? (Increased pollution)

Time

2. Questions how long before we run out of resources? Not even 50 years
    1. Annually how many months it takes to exhaust the Earth's resources during the Twelve months? Three months or how long does the plastic

    take to appear? Over 30 years, years.

TRANSCRIPT

Dimensions

Dimensions was a more global level so we chose to try to think about dimensions that we associated more with climate change

Based on what we have collected with our colleagues we have come to the conclusion that at the level of things in the port city of dimensions that show an improvement. Positive points for climate change we highlight the increase in green spaces in the port city as well as the improvement of public transport networks. The most negative things, the dimensions that we highlight most that may have a more negative influence in the city of the port was increased sea water level, and the port city has a plan to requalify the maritime ode and there is a risk of the buildings being demolished due to increased water level.

Finally, the part of the two stations, we increasingly stopped having four stations and we started to have two. in our interview, there were those who said that they considered only summer and winter, or who mentioned that there is a hot season and a cold season.

Intervenients

The actors who suffer the most from climate change responded to animals, plants and green spaces and the general population. The main players in climate change said textile industry that exists here in the port. Groups that can help fight climate change that is a volunteer association that is VO. U by nature. Those who may be benefiting from climate change or what is happening may be that industries can choose more harmful materials and methods but make more monetary profit.

Space

The first we did was what spaces were modified in the last year, what they said were the metro line, the aliases, crystal palace and the city park

What is the impact of the buildings in the metropolitan area of Porto, they mentioned the reduction of spaces for pedestrians, more traffic and more noise.

What green space do you like the most in the port area that has changed in recent years? They mentioned the city park

Finally, what impacts of climate change on the city of proto said increased pollution

Time

We asked a first question which is how long until we more or less exhaust the resources available on the planet? The answer was not even 50 years.

How much time in the year natural resources run out for that year The answer was three months, but in reality it's a little more for now.

We also ask how long does plastic take to decomm? They answered 30 years, but it's really 450 to 500 years, which is serious. Then in the conversation at the end, we come to the conclusion that we are counting down so that the city of the proto is evaded by the increase in the level of the sea augas.

POST-IT

DIMENSIONS	INTERVENIENTS	TIME	SPACE
Raising the average sea level; the city o Porto has a plan to requalify the seafront + buildings to be demolished	Animals Plants Green spaces	We're counting down to port cities like the port to see each other "invaded" by the river/sea.	Reduction of space for pedestrians; + traffic; + noise
2 Seasons	Textile industry	More than 30 years for plastic to disappear from nature after use, but in reality it is 450 to 500 years	Increased pollution

Increase in green spaces, Improvement of public transport.	Population	We don't have 50 years to exhaust the planet's resources.	Metro line; Parque da Cidade; Palácio de Cristal
	Industries that opt for materials and methods + harmful to the environment to get more profit	Annually, the resources that should last for 12 months, are spent in 7/8 months.	Parque da cidade
	V.O.O. Natureza		

OBSERVATIONS

- Greater involvement in the task, but just went to talk who was closest so the groups only talked to a group.

LGE2 12.04

Date 4/12

Class: 2nd year of management and economics degree (SHARED UC) **Student numbers**: 9

DRAFTS

Dimensions

Do you think that noise pollution is as or more harmful than the air pollution of the city of Porto?

Can you distinguish between the four seasons throughout the year?

When would public transport help to address poor air quality?

Intervenients

Who contributes the most to climate change?

1. Countries: ministers of the environment
2. Activities: factories and oil
3. Lifestyle of society: young people (car mentalities and private transport

Who is most harmed by climate change

4. 1st living and human beings
5. At this time: all (it is possible to notice these changes through temperatures, seasons and lack of rain
1. Future: the next generations

Time

9999

Space

9999

TRANSCRIPT

Dimensions

We asked three questions

If you think noise pollution is so much more damaging than the pollution you're talking about in the harbor city? As a general response we said that it is not so harmful, but that it is noticed, and that it has a great difference with the rural world.

Second question, if people can make the distinction of the four seasons? Most of them say not as much as they used to be.

As far as public transport is, would greater support help to address poor air quality? Of course it would help as alternatives, scooters, pubic transport and walking.

Intervenients

We asked two questions the first was who contributes the most to climate change, the answers we got were the ministers of the environment, i.e. the government, the factories, and oil extraction, private transport, lifestyle and the mentality of young people

(the recording was missing, but at the end of the activity the information was collected)

Who is most harmed by climate change

1. 1st living and human beings
2. At this time: all (it is possible to notice these changes through temperatures, seasons and lack of rain
3. Future: the next generations

Time

We asked a few questions some groups the first was whether there is still time for climate change not to evolve? What we have been told in general is that there are effects that are irrevocable, but that there is still time to reduce the effect of some problems.

The other question was more focused on the port, if Rui Moreira with the time he still has mandate can still implement some measures that make change this? What they told us was that he still has time to make decisions to change and solve these problems, but don't know (the students) if this is his real focus.

Space

We asked if there was any green space that had to have been replaced by a work? Or on the contrary a work that has been replaced by a green space? First we talk about example, the square of Galicia that had a park and a green area that is now being replaced by a construction of metro line. On the other hand, a few years ago there was an area of Maia of a giant work of some pools that at the time failed and remained only the structure of the work, and which, however, was demolished to build a green space.

The second question we asked was in relation to certain buildings that were deteriorated more than normal due to environmental changes, gave as an example the station of are bento due to dirt and also several buildings that in general due to air pollution and also the street buildings of fontainhas.

POST-IT

DIMENSIONS	INTERVENIENTS	TIME	SPACE
Not so harmful, but notes a big difference in relation to the rural	Ministers of the Environment and other areas; City Councils	There are irrevocable effects, but there is still time to solve problems.	Praça da Galiza: Park X Metro
	Industries (factories and oil holdings)		

October in the spotlight, very high temperatures compared to normal.	Lifestyle: Private transport (cars); Young mentality	Rui Moreira, in his term still has time to make decisions to help solve the problem	Pools – green park
Alternative: bicycles, electric scooters, electric cars and public transport in general.	All but especially the next generations; Temperatures, seasons; lack of rain.		Estação s.Bento Rua das fontaínhas

OBSERVATIONS

Students understood the instructions and their involvement increased throughout the activity.