

# Sounding Thessaloniki; Architectural Representation of an Invisible City

**Aimilia Karapostoli**

emiliearch@gmail.com

Aristotle University of Thessaloniki, Greece

**Nikolaos P. Tsinikas**

Aristotle University of Thessaloniki, Greece

tsinikas@arch.auth.gr

## Abstract

This study constitutes the first attempt to architecturally represent the sounding city of Thessaloniki. The writers approach sonic urban environment as a field that has always interfered with the formation of architectural realities. The creation of a sound framework and the notion of sonic architectural ecologies construct a new approach towards the urban ecologies, concerning especially Thessaloniki. Solids, networks and communities compose an invisible urban fabric with vast amounts of information concerning the reality of a city, beyond the typical urban studies and sterile three-dimensional geometry.

**Keywords:** Soundscape, sound and architecture, Thessaloniki, urbanism

## 1. Introduction

In October 1995, angry zealots entered Rotonda, a monument that used to be a roman tomb, a christian church and an islamic mosque through the centuries (Ministry of Culture and Sports 2012) and violently interrupted a concert by breaking a piano. They believed that sounds of contemporary music did not create a suitable soundscape for a christian orthodox church (Kannelis 2005). This event created numerous questions to the writers. Is it possible for temporal and immaterial sounds to transform entirely the character and significance of a building and provoke such extreme reactions? Does a structure or a specific area have an appropriate soundtrack? And if soundscape is so important, concerning the identity of a place, why not be exploited by architects?

Due to the economic crisis, there is an existing plethora of built space and empty architectural shells searching fiercely for inexpensive architectural transformation. So, the time has come for architects to start using sound as a major factor in the transformation of the built environment. Hence, how do architects proceed if they want to use sound as an architectural material?

The reality is that architects have already used sound as a factor of the process design. Architectural design describes an architect's utopia in a detailed drawing representation. Additionally, an architectural plan by definition includes methodology and philosophy. Being an architect, means to articulate complex environments. In this paper, the writers reveal how planning and designing of a desired sonic environment, is one of them.

Furthermore, the writers support that by studying the changing urban sonic environment in the field; architects can identify the real questions concerning a city, and understand the essence of its unique residents. An urban exploration related to the older concept of the flâneur (Benjamin 2006) is significant for the formation of an architectural project that really matters.

Lastly, the writers attempt to outline the essence of Thessaloniki's contemporary architecture and highlight the plethora of deep connections with its unique sonic environment.

## 2. Contemporary architecture theory

Regarding the global architecture history, the twentieth century began with notes of optimism, visions of futuristic utopias and slogans like “Towards a new architecture”. It closed with pessimism, reflection and a “rethinking” of architecture (Leach 1997). Crisis has already been a reality in all the domains of art, science and real life in the past decades. Architecture, that traditionally considered to be the creation of forms, autonomous and self-sufficient in relation to other fields of studies, became uncertain towards its identity and created many issues and reconsiderations (Leach 1997). Moreover, praise of individualism over collectivism, alongside with trends having to do with escaping the reality and the city, created new challenges for architectural theory and practice.

### 2.1. Greek architecture theory and practice

Greek architectural reality followed the global architectural styles but there were also numerous local issues that played a role in its formation. In the beginning of the 20th century, neoclassicism was entirely set and in the 1930s modern architecture risen (Filippidis 1984). The contemporary Greek architecture began with the appearance of the first modern block of flats in the cities of Athens and Thessaloniki, with the blessings of the state. The contribution of professional architects to the formation of the rural and urban build environment was rare in this rapid spread of construction, generated because of economic welfare. Responsible for the construction of the majority of the block of flats was the businessman manufacturer who proceeded without any specialized knowledge in academia. As Y. Tsarouchis stated “Only in Athens so many beautiful, old buildings were knocked down in order to be replaced by ugly, out of context block of flats”. The culture of illegal settlements started at that time, having as a highlight the contemporary laws for settling these ongoing illegal constructions by paying a small fee (Official Gazette of the Greek Government 2013).

But what concerned Greek architects, from the beginning of the 20th century, was the structure of the identity of Greek architecture and its relation with the global architectural movements (Filippidis 1984). Furthermore, the case of continuity, concerning ancient Greek, byzantine and Modern Greek culture (Ahrweiler 2000) also played an important role in the shaping of contemporary Greek architectural aesthetics. Last but not least, the changing role and the bigger responsibilities of Greek architects towards the production of space as a whole, not just as an urban scenery, was eventually a vast demand in the 1960s. Unfortunately even until now, these demands have not been answered to a large extent.

## 2.2. City of Thessaloniki

Thessaloniki, the second biggest city in Greece, is located in the north part of Greece, with a waterfront facing Aegean Sea and a current population around 1.100.000 people (Greek Statistical Authority 2011). The city of Thessaloniki can be sensed as a “feeling of the other, the love of the neighbor” (Moscoff 1978) because of the numerous different religious, economic and cultural communities, Greek, Israelite, Slavic, and Muslim, that coexisted for many centuries in the city’s territory. Thessaloniki, Salonica or Selanik had a lot of different names through the history and changed fundamentally after the 1950s, when the majority of Muslims relocated in Turkey and most of the Israelites were killed by the Germans (Mazower 2004). The big fire in 1917 had already destroyed a big part of the spatial construction of Thessaloniki and, in the 1960s, the modern block of flats started to prevail over the urban landscape (Papastathis and Hekimoglou 2010).

## 3. The idea of sounding Thessaloniki

The idea of sounding Thessaloniki was born mainly due to the realization that no sound event can be isolated from the spatial and temporal conditions of its physical signal propagation (Augoyard 2006). Also, researching towards archetypes shaped by G. Bachelard in order to form his response at different scales, from the domestic scale to the city, in everyday shared conditions (Ballantyne 2005) and having as guides “Acoustic Territories” by B. LaBelle and “Image of the city” by K. Lynch, the writers of this paper, interpret the city as a topography of auditory life (LaBelle 2010) inextricably connected with its architecture and its residents’ spatial practices. There are many narratives of Thessaloniki, regarding mainly urban studies, capturing main monuments, infrastructural formations, changing geography, demographics, social communities and economic relationships. For the first time, the writers confront the city as a sum of dynamic, real life, sonic, architectural ecologies and not as a system of static, sterile, three-dimensional, mute objects.

Architectural ecologies, proposed by R. Banham, have nothing to do with the environment, sustainable and green politics, although many scholars believe the opposite (Banham 2009), and do not just signify how to study major buildings in relation to their geographical, social and historical contexts. In order to signify architectural ecologies, it is important to embrace all forms of human structure, from the freeway to the hotdog stand; a plurality of expressions that is not confined only to the aesthetic codes of high architecture (Banham 2009). The writers add to this concept of architectural ecologies the notion of soundscape and they confront the city's contemporary auditory reality as a result of its architecture practices. Furthermore the writers believe that the study of this urban, sound footprint can reveal and interpret the influence of architecture towards the city's inhabitants, a hidden palimpsest of acoustic communities (Schafer 1977) and the existence of changeable temporary and fragile soundscapes of high value.

### 3.1. Solids

The first major category of sonic architectural ecologies has mainly to do with sounds, sonic effects (Augoyard 2009) and soundscapes (Schafer 1977) connected with closed private spaces and some intimate outdoor environments. The design of the house, cell of built space, is responsible for numerous spatial and sound practices of its inhabitants and, according to F. Guattari, architects are those responsible towards the wellbeing of their constructed spaces' inhabitants (Rawes 2013). Hence in Greece, like most countries of Europe, state has set very detailed instructions towards the construction of a building, depending on its use, geography and size, leaving controlled freedom regarding design. Architecture of solids, from the house to the district, is based mainly on the principles of the modern architecture movement that theoretically does not deal with an individual building but with the city as a whole (Lazaridis 1980). The writers believe that regarding the sonic environment, the modern movement truly did not distinguish the public from the private space and the soundscape of the road, unfortunately, occupies intimate areas of a house. Moreover, the absence of any kind of noise control in real life intensifies this existing stressful state. There are three categories of solids: house, block and district.

#### 3.1.1. House

Classifying the majority of Greek residences, primarily apartments in buildings constructed by private initiative and using socioeconomic criteria, the main categories detected are: the peoples, the urban and the luxurious apartment buildings (Vlachos 1979). The layout of the block of flats and the analogy between communal and private space is almost the same in

these three categories. The variable factors are size, materials and topography. The private urban apartment forms the typical Greek house divided in the main space categories: bedrooms, bathrooms, kitchen and common rooms like dining and living rooms. The soundscape of a house is usually consisted of sonic practices of the residents and filtered sounds from neighborhood apartments, which are perceived as an embarrassment. Surveys showed that reinforced insulation blocks the sounds from the outside that could mask the neighborhood soundscape. As a result this unwanted phenomenon of filtration is being amplified (Augoyard 2009). Moreover, the height level of an apartment, whether is on the ground floor or on the highest floor, 8th floor is the highest in Thessaloniki, is very crucial towards the flux of the road's soundscape inside the spatial territory of a private apartment. Sound travels through the ground and through the air. Although it is possible, due to the proper insulation, to be protected from unwanted sounds like traffic drones, bass frequencies related to traffic are almost impossible to be cutoff. Furthermore windows stay open most of the time in Greece because of the mild climate, making the studied sound insulation almost impossible. The sound practices concerning Thessaloniki residents' cars have to do mainly with transforming keynote sounds to sound signals (Schafer 1977). Or the practice of creating a "selfie" (Adewunmi 2013) inside the sound space of a territory.

### **3.1.2. Block**

The next category of solids is constituted by apartment buildings studied in a bigger scale than this of an individual building, the block. There is a plethora of state and private agencies responsible for urban planning of an area. The institutional framework regarding the formation of blocks and further building development is defined by laws regarding the totality of the Greek territory and settings formed by local municipal governments. The function of buildings in certain areas is being defined by Land Use Plan. Basically, the soundscape of a block is inseparably connected with defined use categories, meaning that sounds of industry, commerce, entertainment, housing and free spaces do not mix. The Greek continuous building system that used to prevail regarding urban blocks until 1985 (Aravantinos 1998) ordered apartment buildings to create a closed wall barrier around a block, behaving as a sound barrier between the street and the core of the block (Kang 2007). The design of a private apartment usually places bedrooms facing the open space in the center of the block, and common rooms facing the external part of the block. Therefore, when a resident is placed inside a bedroom, she can listen to a mixed soundscape of neighbors' private moments: sounds of sleeping, making love and personal discussions. Mixed replicated sounds of residents characterize the block's soundscape. Another common spatial practice among

residents is to place their private cars in numerous open space garages existing in the core of the block, which is mainly used as a parking lot and not as a shared green space, or on the ground floor, the so called pilotis. As a result, it is questionable whether the bedrooms of an apartment building should face either the road or the core of the block in order to be suitable for relaxation, sleeping and experiencing private moments.

### 3.1.3. District

The last category of solids is the district. Until 1870 Thessaloniki was limited to its walls and every district corresponded to the national and religious origin of its residents, having a population around 80.000 people (Karadimou - Gerolimpou 2008). Each national group had its own sound practices concerning their usual occupation and religion. For example Muslims were responsible for a vast textile production for the Turkish army, as a result sounds of countless looms in the upper city, the Muslim district, were a common phenomenon. Another distinctive religious theme that occurred at the time being all over Thessaloniki was the calling of a muezzin, climbing a minaret to announce time for prayer, whilst now almost all the minarets have been torn down. A turning point in the course of Salonica's history was the big fire in 1917 that burnt a major part of the city center, the down town, and gave birth to a new functional, urban planning based on modern planning principles. Architect E. Hébrard - commissioned by the Prime Minister E. Venizelos to design the contemporary image of the city; a big part has fortunately not changed until today. After the Second World War Thessaloniki started to spread east, west and north, but without central urban planning and design, and have not stopped until recently. The population stopped growing and remained stable at 750.000 people in the 1990s but, after recent events in neighborhood countries, it is now unofficially around 1.500.000 inhabitants (Karadimou - Gerolimpou 1999).

The contemporary districts of the city can be categorized in; upper town (old), down town (modern), east, west and north part of the town (contemporary). The upper town of Thessaloniki is the oldest part, the one that was not destroyed in the fire of 1917. This district was characterized a traditional landmark in 1979, as it has not been significantly altered by the changes occurred in the rest of the city (Technical Chamber of Greece 2010). The buildings are small in volume, the street layout is serpentine and the soundscape is characterized by direct, tangible bio and geo sounds (Pijanowski 2011) and also a notable absence of car traffic. The down town is constructed based on the planning of E. Hébrard, having an orthogonal road system and monuments as focal points. The existence of the car can be underlined by investigating the soundscape. But here is where the heart of Thessaloniki beats and the soundscape is always changeable, unpredictable and interesting.

The west, east and north districts have many similarities regarding a plethora of roads of high and low traffic, apartment buildings, blocks and their typical soundscapes. One large difference among them is that a major part of the west district is characterized by industrial and degraded areas. Nowadays very few sounds have to do with industry in contrast to the past decades. In contrary, music in large volume from low fidelity speakers and traffic dominate this soundscape. The east district is designated by the water front, many luxurious buildings and villas. The drones of traffic are of lower density, except some high speed roads, and the average environmental ambience is calmer. Lastly, the north district, placed in a higher altitude than the others, is nearer to the forest of SeichSou with a low building ratio and small structure volumes. The bio and geo sounds of the nearby forest are noticeable, the traffic is much lower and the soundscape resembles to this of a rural area.

## 3.2. Networks

The second major category of sonic architectural ecologies has to do with sounds, sonic effects and soundscapes connected with flows and public, open space environments. The design of roads and nodes has preceded the shaping of solids and the edge, a natural border between the city and the sea, played a major role in the formation of the city. Concerning the soundscape, sounds of the street scar urban life and mark indelibly everyday routine. The recent creation of a network of pedestrianized streets and the relief of car traffic, especially in the city centre, mitigated the intrusion of vehicle engine sounds in the daily soundtrack. But flows and places where people concentrate constitute the foundation of public urban life, the places where city's inhabitants coexist and interact. So, sounds related to networks constitute the soundscape of urbanization.

According to K. Lynch, the image of the city was defined by five elements: paths, edges, districts, nodes and landmarks (Lynch 1960) but these element types do not exist in isolation. Therefore, sonic architectural ecologies, proposed by the writers, do not have solid and inviolable boundaries but, coexist in fragile and variable relationships. The soundscape of a path is mixed with the sounds of a house; a place can be considered as a node and at the same time as a landmark. There are three categories of networks: path, node and edge.

### 3.2.1. Path

The first category of networks is the path, namely all the channels for directed movements. They could be roads, sidewalks, canals and railways. Thessaloniki, one might say, is a city exclusively constructed to facilitate car movement. Sidewalks are very small and usually occupied by parking cars. Urban planning uses a functional prioritisation of roads: main roads



in favour of long and high speed transportation, secondary roads serving middle length and middle speed transportation, collective routes and local roads (Andrikopoulou2007). Furthermore, the shaping of the roads, rectangular or radial, is relevant to the age of their formation and the way the city has developed over the centuries.

The soundscape of the road is characterized by a constant drone effect (Augoyard2009) as a continuous sonic background in everyday practice. While sounds of engines prevail for those outside a vehicle, the soundscape inside a car is a whole different situation. Radio, deep bases and popular tunes distinguish from keynote sounds of constant high speed movements of vehicles. However, the street occupied by people can be transformed entirely and bear different messages, ones that have to do with demonstrations and public requirements; a usual phenomenon in the city of Thessaloniki through the history and, especially, the last five years due to the economic crisis.

The soundscape of a sidewalk has a different formula. Sounds that have to do with the body, walking, speaking and personal stereos (Bull 2000) manage everyday movements and flows of people on foot. There are also means of public transport, like buses in this case, that create a unique soundscape for a passenger, mixing sounds of numerous people coexisting in a small, closed, moving place. Again the body is staring in this mass flow, confounded with the recorded voice through the speakers of the bus, informing the passengers in which bus stop they are being at the moment. A last addendum in this category is the occurrence of bike roads lengthwise the seafront. Petals and sounds of cycling redefined movement in the city and also the usual, monotonous soundtrack of motion. The water paths are still pending.

### 3.2.2. Node

The second category of networks is the node, mainly a place where flows intersect and people concentrate. A node is usually the epitome of a district and shapes its temporary identity. The sounds of the nodes play a very important role in the shaping of the districts' character (Almasy 2014). As each district has its own nodes, the writers present the main nodes of the downtown, where the heart of the city beats twentyfour hours a day. The main nodes can be categorized as: a. Educational – Aristotle University and University of Macedonia, b. Cultural and commercial exhibitions – Helexpo and museums' district, c. Pedestrian Roads – Aristotelous, Dragoumi and AgiasSofias Street, d. Entertainment – Ladadika, e. Commercial – closed markets of Modiano and Kapani (Kesidis2014).

Sounds that have to do with the body prevail inside the nodes. Some nodes, like Aristotle University and Helexpo, are large free spaces with few buildings, where direct sounds of individuals fade out. On the other hand, other nodes, like Ladadika and closed markets, are part

of the urban network, where the individual does not lose herself. Soundscapes of the nodes are characterized by their function. Sounds of educational nodes have to do with young people's sound practices: dialogues, concerts, music and demonstrations. Sounds of cultural and commercial exhibitions are unfolded inside the museum buildings and Helexpo buildings. The soundscape of the museums is marked by the same silence asserted inside religious buildings except for some peculiar sounds generated by works of sound art. Helexpo buildings are marked by the sounds of hordes of different professionals attending commercial exhibitions throughout the entire year. Pedestrian roads and Entertainment nodes have almost the same soundscapes except for the fact that roads are characterized by the notion of public street art while entertainment nodes are described by indoors private entertainment. Street musicians on pedestrian roads are being replaced by professional musicians and D.J.s inside the premises of Ladadika. Lastly, closed markets, hybrids of morning commercial life and night entertainment, create varying soundscapes. From the voices of merchants trying to sell their unique products in the morning to the post rock music genre that fills the closed stands during the night, the transformation of these places is spectacular.

### 3.2.3. Edge

The third category of networks is the edge. The most profound, interesting edge and impervious barrier of Thessaloniki is the waterfront. Sounds of sea and traffic mix together in a very interesting formula. After long years of political struggles, Thessaloniki acquired an amazing seafront (Nikiforidis 2014) which highlights the continuous flâneury along the sea. Cars are prohibited, so the traffic noise is calmer and the cycling roads welcome bicycle use. Ambience is calmer and relaxed, in contrast to other small green public spaces that are vanished among the urban solids, and the soundscape is truly unique. The obligatory urban void created by the sea makes urban habitation almost beautiful.

## 3.3. Identities

The last category of sonic urban architectures has to do with sounds, sonic effects and soundscapes which are unique and unrepeatable. There are countless studies and concepts concerning identity, given that identity is always multiple, unstable and paradoxically enduring (Andermatt - Conley 2013). The previous categories of solids and networks have many similarities with other Greek coastal cities. But this category has to do with particular sounds, acoustics and acoustic communities that shape the dynamic and changeable identities of what is called Thessaloniki today. The spatiality of this category is clearer towards landmarks and voids, but very uncertain towards communities. The difficulty, in this case,

lies also towards the absence of a plethora of landmarks that exist only in the memories of older people. It is true that a cognitive map of space is a private construction that includes response to sensory stimuli modified by personal experience (Blessner 2007). So this last category attempts by design to set an impossible unified sonic framework towards individuals and groups who experience Thessaloniki either for the first time or those who have experienced it countless times. The three categories of identities: landmark, void and community.

### 3.3.1. Landmark

Thessaloniki's landmarks can be separated into existing and absent ones. A classification concerning existing landmarks has to do with the historical time of their construction: roman, byzantine and contemporary monuments. Roman and Hellenistic antiquities are located beneath the current urban surface, deep into the ground as large excavation groups. In order to experience these ancient buildings, the visitor has to walk below the usual height of the city's ground level. Large excavations, treated as open spaces, reveal the fragments of previous cultures that used to exist in the same territory. The listener moves from the surface of the city to the bottom of the excavation, experiencing the sonic effect of cut out. Here the drones of street vehicles are slowly disappearing. The rest of the city's soundscape is set on a lower volume and direct bio and geo sounds are clearer. On the other hand, byzantine monuments are characterized as closed spaces with mysterious, sacred acoustics. Architects during the byzantine era knew a lot about acoustics and even more about the potential of music to inspire religious devotion (Howard 2009). Circular domes, naves and secular buildings with extraordinary acoustics, in combination with exclusively vocal religious music, create a unique old soundscape contrasting today's usual sounds. Contemporary monuments, constructed by hard materials with extraordinary geometries, reflect the sound waves and create a feeling of continuous resonance. The sounds cannot be absorbed, due also to the minimal use of soft materials, and produce an infinite atmosphere of being on the cutting edge of consciousness. Contemporary architecture, cold and sharp, is more serious and unquestionable than plain and low budget architectural constructions.

### 3.3.2. Void

Thessaloniki's major urban voids are the sea of Thermaikos and the forest of Seich Sou. Fortunately, there has been no building construction upon the sea neither total deforestation. These voids constitute the necessary pauses inside the thick, urban fabric. The feeling of the city disappears, vision and hearing relax by focusing on bio and geo elements of the soundscape. Nature fights to dominate in the sonic and vision field. Moreover, the existence

of small random voids distracts the density of the urban networks. Empty land estates and incomplete or abandoned due to the economic crisis architectural shells constitute this category. The soundscape is relieved, sound barriers are tiered down and unexpected, non-systemic uses of the abandoned buildings create new acoustic territories (small studios, galleries, self-managed groups, etc.).

### 3.3.3. Community

There are many concepts concerning community (Mayo 2001). In this paper, this category has to do with the notion of acoustic communities defined by M. Schafer (Schafer 1977) and not by B. Truax (Schrimshaw 2011). The writers are interested in the way a community is defined along acoustic lines, always in collision with its spatial territory. These acoustic communities can be defined by sounds concerning religious, every day and particular acoustical practices. The plethora of these acoustic communities is vast and cannot be captured in a paragraph. These unique urban soundscapes concerning individual groups existing in the city can only be highlighted and fully appreciated through the studies of sociologists, anthropologists and other humanities scholars.

## 4. Conclusions

Architects can evaluate urban changes that matter and decode the acoustic, spatial habits of its residents by studying the changing sonic environment and identifying, preserving and improving their sonic urban environments. The conclusions of this study can be summarised as:

- a. The significance of the sonic environment through the architectural study of a place, due to its multiple identities, is inextricably linked with its soundscapes. As a result, an architect is required to study and listen to the place she is going to modify via her practice. Solids, networks and identities reveal a hidden world of fragile relationships that contains vast amount of information worthy of manipulation or preservation.
- b. The study of the sonic environment ought to be continued after the architectural intervention as well, in order for the architect to be aware of the changes she provoked

via her practice. This study ought to reveal how the architectural practice changed the identity of the place.

- c. The exact opposite process is meaningful and important as well. Studying of the changing soundscape concerning solids, networks or identities, may lead to architectural intervention that could preserve or improve not only the sonic environment, but also the sustainable function of a city.

## REFERENCES

- Adewunmi, Bim.** “The rise and rise of the ‘selfie.’” *The Guardian*. <http://www.theguardian.com/artanddesign/2013/apr/02/rise-and-rise-of-the-selfie> (accessed May 28, 2014).
- Ahrweiler, Hélène.** “The Making of Europe, Lectures and Studies”. Athens: Livanis, 2000. (in Greek)
- Almasy, Ray.** “Spike Lee explains expletive-filled gentrification rant.” *CNN*. <http://edition.cnn.com/2014/02/26/us/new-york-spike-lee-gentrification/> (accessed May 29, 2014).
- Andermatt - Conley, Verena.** *Relational architectural ecologies: architecture, nature and subjectivity*. London: Routledge, 2013.
- Andrikopoulou, Eleni, Athina Giannakou, Grigoris Kafkalas, Magda Pitsiava - Latinopoulou.** *The city and urban planning for sustainable development*. Athens: editions Kritiki, 2007. (in Greek)
- Aravantinos, Athanasios.** *Urban Planning for a sustainable development of urban space*. Athens: editions Simmetria, 1997. (in Greek)
- Augoyard, Jean Franc.** *Sonic experience a guide to everyday sounds*. Montreal Que.: McGill-Queen’s University Press, 2006.
- Ballantyne, Andrew.** *Architecture theory: a reader in philosophy and culture*. London u.a.: Continuum, 2005.
- Banham, Reyner and Joe Day.** *Los Angeles; the architecture of four ecologies*. Berkeley: University of California Press, 2009.
- Benjamin, Walter and Michael William Jennings.** *The writer of modern life: essays on Charles Baudelaire*. Cambridge, Mass.: Harvard University Press, 2006.
- Blessner, Barry, and Linda Salter.** *Spaces speak, are you listening? experiencing aural architecture*. Cambridge, Mass.: MIT Press, 2007.

- Bull, Michael.** Sounding out the city personal stereotypes and the management of everyday life. Oxford: Berg, 2000.
- Filippidis, Dimitris.** Contemporary Greek Architecture. Athens: Melissa, 1984. (in Greek)
- Greek Statistical Authority.** "Population of Thessaloniki", 2011 [http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/General/A1602\\_SAM01\\_DT\\_DC\\_00\\_2011\\_02\\_F\\_GR.pdf](http://www.statistics.gr/portal/page/portal/ESYE/BUCKET/General/A1602_SAM01_DT_DC_00_2011_02_F_GR.pdf) (Accessed May 28, 2014). (in Greek)
- Howard, Deborah, and Laura Moretti.** Sound and space in Renaissance Venice: architecture, music, acoustics. New Haven: Yale University Press, 2009.
- Kang, Jian.** Urban sound environment. London: Taylor & Francis, 2007.
- Kannelis, Ilias.** "Thessaloniki that resists." Tachidromos, April 16, 2005. (in Greek)
- Karadimou - Gerolimpou, Aleka.** "The series of Thessaloniki's transformations." Vima, December 19, 1999. (in Greek)
- Karadimou - Gerolimpou, Aleka.** Thessaloniki's anadixis, maps of memories. Thessaloniki: Editions Ziti, 2008. (in Greek)
- Kesidis, Tolis.** "Archades of Modiano and Kapani (Closed markets of Thessaloniki)." exostispress.gr. <http://www.exostispress.gr/Article/stoa-modiano--kapani-agores-tis-thessalonikis-0> (accessed May 29, 2014).
- LaBelle, Brandon.** Acoustic territories sound culture and everyday life. New York: Continuum, 2010.
- Lazaridis, Pantelis.** The evolution of the modern city- the image of the home environment. Thessaloniki: Aristotle University Press, 1980. (in Greek)
- Leach, Neil.** Rethinking architecture: a reader in cultural theory. New York: Routledge, 1997.
- Lynch, Kevin.** The image of the city. Cambridge, Mass.: MIT Press, 1960.
- Mayo, Marjorie.** Cultures, communities, identities: cultural strategies for participation and empowerment. Houndmills, Basingstoke, Hampshire: Palgrave, 2000.
- Mazower, Mark.** Salonica, city of ghosts: Christians, Muslims, and Jews, 1430-1950. New York: Alfred A. Knopf, 2005.
- Ministry of Culture and Sports.** "Rotunda, Thessaloniki.", 2012 [http://odysseus.culture.gr/h/2/gh251.jsp?obj\\_id=1812](http://odysseus.culture.gr/h/2/gh251.jsp?obj_id=1812). (Accessed May 28, 2014). (in Greek)
- Moscof, Kostis.** Thessaloniki, a compradorial city. Athens: Stoxastis, 1978. (in Greek)
- Nikiforidis Prodromos, Cuomo Bernard.** "Réaménagement du Nouveau Quai / Thessalonique - Nikiforidis/ Cuomo." <http://www.nikiforidis-cuomo.com/fr/work/urban-design/3> (accessed May 29, 2014).
- Official Gazette of the Greek Government,** "Law No 4178/2013," August 8, 2013. (in Greek)
- Papastathis, Christos and Achilles Hekimoglou.** The great fire of Thessaloniki (1917). Thessaloniki: E.N.Manos Ltd, 2010.

- Pijanowski, Bryan C., Luis J. Villanueva - Rivera, Sarah L. Dumyahn, Almo Farina, Bernie L. Krause, Stuart H. Gage, and Nadia Pieretti.** "Soundscape ecology: The science of sound in the landscape." *Bioscience* 61: 203-216.
- Rawes, Peg.** *Relational architectural ecologies: architecture, nature and subjectivity.* London: Routledge, 2013.
- Schafer, R. Murray.** *The soundscape: our sonic environment and the tuning of the world.* Rochester, Vt.: Destiny Books, 1977.
- Scrimshaw, Will.** "The Acoustic Community." willschrimshaw. <http://willschrimshaw.net/subtractions/the-acoustic-community/> (accessed May 29, 2014).
- Technical Chamber of Greece.** "Traditional settlement of Upper City. Upgrade Recommendations.", 2010. [http://portal.tee.gr/portal/page/portal/teetkm/DRASTHRIOTHTES/OMADESER-GASIAS/oe\\_paradosiakos\\_oikismos\\_anw\\_poli.pdf](http://portal.tee.gr/portal/page/portal/teetkm/DRASTHRIOTHTES/OMADESER-GASIAS/oe_paradosiakos_oikismos_anw_poli.pdf) (accessed May 28, 2014). (in Greek)
- Vlacos, Xenophon.** *Studies on Greek housing.* Thessaloniki: Paratiritis, 1979. (in Greek)