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**INVESTIGATING GENTRIFICATION TYPOLOGIES FOR THE
PERSPECTIVE OF URBAN DEVELOPMENT IN ATTIKI BASIN**



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ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
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Οι απόψεις και τα συμπεράσματα που περιέχονται σε αυτό το έγγραφο εκφράζουν την συγγραφέα και δεν πρέπει να ερμηνευτεί ότι αντιπροσωπεύουν τις επίσημες θέσεις του Εθνικού Μετσόβιου Πολυτεχνείου.

*“Cities have the capability of providing something
for everybody, only because, and only when,
they are created by everybody”*

- Jane Jacobs, The Death and Life of Great American Cities

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ΠΕΡΙΛΗΨΗ

Ο αστικός εξευγενισμός επικρατεί σε πολλές πόλεις του κόσμου, με σημαντική κοινωνικοοικονομική επιρροή. Παρόλο που ο αστικός εξευγενισμός ενδεχομένως ωφελεί την πόλη, υπάρχουν ενδείξεις κοινωνικών διαχωρισμών και εκτοπισμού στον αστικό πληθυσμό. Είναι απαραίτητη η αναγνώριση των αρνητικών επιπτώσεων, ώστε να ληφθούν μέτρα για τον περιορισμό τους. Η διπλωματική εργασία διερευνά την εμφάνιση του αστικού εξευγενισμού στο λεκανοπέδιο Αττικής, ώστε να κατανοηθούν τα μοναδικά χαρακτηριστικά του φαινομένου. Επιπλέον, ο σκοπός της εργασίας είναι να κατηγοριοποιηθούν οι διαφορετικές τυπολογίες του φαινομένου (marginal gentrification, mainstream gentrification and super gentrification) και μελετηθούν η δυναμική και η ανάπτυξή του τα επόμενα χρόνια. Τα δεδομένα έχουν ληφθεί από το Χαρτογραφικό Πανόραμα και την Ελληνική Στατιστική Υπηρεσία. Επιπλέον, εφαρμόστηκαν μέθοδοι χωρικής ανάλυσης. Οι υπό μελέτη παράμετροι είναι τα δημογραφικά στοιχεία, όπως η ηλικία, επίπεδο εκπαίδευσης, εθνικότητα (πρόσφυγες και μετανάστες), επάγγελμα και κατοικία (ιδιοκατοίκηση ή ενοικίαση). Η Αθήνα είναι μία από τις πιο τουριστικές πόλεις της Ευρώπης, λόγω των πολλών και σημαντικών μνημείων. Η βιβλιογραφία δείχνει πως ο αστικός εξευγενισμός δεν επικρατεί τόσο σε τουριστικές περιοχές όσο το φαινόμενο της «τουριστικοποίησης». Μάλιστα, η Αθήνα ενσαρκώνει το μοντέλο της «Τουριστικής Πόλης». Για να καθοριστεί η επιρροή συγκεκριμένων σημείων ενδιαφέροντος στον αστικό ιστό (αρχαιολογικοί χώροι, σταθμοί μετρό, πεζόδρομοι, ποδηλατόδρομοι, πλατείες), αλλά και του οδικού δικτύου, εφαρμόστηκαν μέθοδοι συντακτικής ανάλυσης, προκειμένου να αξιολογηθεί η δυναμική επέκτασης του φαινομένου και σε άλλες συνοικίες. Τα αποτελέσματα δείχνουν την εμφάνιση marginal gentrification στις δυτικές περιοχές, mainstream gentrification κοντά στο Κέντρο και super gentrification στα βόρεια και νότια προάστια. Η εξάπλωση των τυπολογιών συνδέεται με τα δημογραφικά χαρακτηριστικά του πληθυσμού. Επιπλέον, το μετρό επηρεάζει σε σημαντικό βαθμό την ανάπτυξη αστικού εξευγενισμού. Τέλος, είναι πιο πιθανό να αναπτύχθηκε το φαινόμενο της τουριστικοποίησης στο ιστορικό κέντρο παρά το mainstream gentrification. Τα αποτελέσματα δείχνουν ότι είναι σημαντικό να ληφθούν τα απαραίτητα μέτρα, ώστε να βελτιωθεί ο αστικός σχεδιασμός και να αποφευχθεί ο εκτοπισμός των πολιτών από τις κοινότητές τους.

Λέξεις-κλειδιά: αστικός εξευγενισμός, λεκανοπέδιο Αττικής, συντακτική ανάλυση, δημογραφικά, εκτοπισμός, συνοικία

ABSTRACT

Gentrification is a phenomenon prevailing in many cities around the world, affecting them socioeconomically. Although gentrification may benefit a city, there is evidence of segregation and displacement in urban population. It is crucial to be aware of any negative consequences, in order to take action and mitigate them. This thesis investigates the manifestation of gentrification in the Attiki basin, to promote a better understanding regarding any unique characteristics. Additionally, the purpose of this thesis is to categorize gentrification in three different typologies (marginal gentrification, mainstream gentrification and super gentrification) detect the potential and development in the next years. The data was retrieved by the Hellenic Statistical Authority and the Mapping Panorama of Greek Census Data. Also, spatial analysis methods were applied. The parameters taken into consideration were demographics, such as age, education level, nationality (refugees and immigrants), profession and tenure. Athens is one of the most touristic cities in Europe, due to the rich ancient history and important monuments situated in many areas. It is indicated from previous authors that gentrification may not be such a prominent urban typology in touristic areas, but rather touristification. Athens embodies the role model of a “Touristic City”. In order to determine the influence of certain points of interest in the urban fabric (archaeological spaces, metro stations, pedestrian areas, bike lanes, squares) as well the road network, Space Syntax methods were applied. The latter was used to assess the potential dispersal of gentrification in other neighborhoods. The findings show that there marginal gentrification is to be found in the western areas, mainstream gentrification near the City Center and super gentrification in the northern and southern suburbs. The dispersal of those typologies is linked to the specific demographics of the population in each area. Moreover, the metro lines influence in a great level the development of gentrification. Finally, touristification is likely to have developed in the historical center rather than mainstream gentrification. These findings indicate that it is crucial to take action, in order to enhance regional urban planning and prevent citizens from becoming displaced from their communities.

Key words: gentrification, Attiki basin, Space Syntax, demographics, displacement, neighborhood

ABOUT GENTRIFICATION

The term gentrification is generally used to describe undergoing economical and sociodemographic changes in cities. According to Oxford Learner's Dictionaries, it is "the process of improving an area of a town or city so that it attracts people of a higher social class than before" (Oxford Learner's Dictionaries, n. d.). The term is derived from the word "gentry", which was used to indicate that a person belonged to the lower noble ranks of society (Oxford Reference, n. d.).

THEORY OF GENTRIFICATION

The term gentrification was used for the first time by Ruth Glass, in order to describe the displacement of working class residents by the middle and higher social class from the district of Islington in London, England, which changed drastically its social profile. Glass outlines gentrification in London as "One by one, many of the working-class quarters of London have been invaded by the middle classes - upper and lower. Shabby, modest news and cottages-two rooms up and two down - have been taken over, when their leases have expired, and have become elegant, expensive residences. Larger Victorian houses, downgraded in an earlier or recent period - which were used as lodging houses or where otherwise in multiple occupation - have been upgraded once again...Once this process of 'gentrification' starts in a district it goes on rapidly until all or most of the original working-class occupiers are displaced and the whole social character of the district is changed" (Glass, 1964).

In 1986, Neil Smith and Peter Williams defined gentrification as "the rehabilitation of working-class and derelict housing and the consequent transformation of an area into a middle-class neighborhood" (Atkinson, 2002). Smith argued that gentrification lays the ground for the creation of the revanchist city, which appeared for the first time in nineteenth-century Paris. After a period of intense gentrification, degentrification occurs, where the disinvestment in certain urban spaces intensifies inequality, segregation and polarization. The social problems are disproportionately projected in mass media, in order to create a notion that the city is "stolen" by lower income classes and other marginalized social groups and declining due to their presence. This provokes negative, vengeful reaction from the residents and the authorities, who wish to "reclaim" the city (Smith, 2002).

David Ley defined gentrification as “a process of social change where by a social transition occurs as lower-income groups are progressively replaced in inner-city neighborhoods by middle-income groups who reinvest and revitalize the inner-city” (Ley, 1996).

Despite definitions from Smith, Williams and Ley have a lot in common; the starting point of each is quite different. Ley refers to the cultural aspects of gentrification. He believes that it is driven mostly by people rather than the capital. People as consumers generate gentrification, because they seek to consume what a city has to offer. The phenomenon is mainly linked to the spatial aspect of the city. The urban space is commercialized and the city center becomes “historical” rather than “decaying”, with buildings that are “listed” and not “decadent”. This space is transformed into an exciting place to live and experience (Ley, 1996). Furthermore, gentrification can be induced by people seeking a place, in order to create and express their collective identity, which may surpass that of social class or income. For example, in the districts of Castro in San Francisco, USA and Masais in Paris, France live predominantly gay men, regardless of their social class. Their lifestyle is what induced gentrification in both areas (Castells, 1983, Sibalis, 2004).

Although the definitions are somehow similar, many authors disagree on which factors and circumstances initiate gentrification. For example, Markusen (1981), Bondi (1991) and Warde (1991) link gentrification to demographic changes, such as married women entering the workforce. However, Smith supports this notion, but argues that there is also a political aspect in gentrification, strongly connected to the reinvestment of the capital to the city, engaging a Marxist rhetoric, as well as an economic one, as “old but structurally sound properties can be purchased and rehabilitated for less than the cost of a comparable new house” (Brown-Saracino, 2010). Smith strongly supports the theory of “rent gap”, which refers to the fact that the value of properties must at first decline, in order to reinvest in the district and gentrify it (Smith, 2002).

Zukin argues that the new standards on consumption and cultural innovation are a significant force that drives gentrification. A lot of people seem to be fond of historical buildings with interesting architectural styles and they also support their restoration. Moreover, the transformation of former industrial areas into cultural and artistic points of interest reinvents the manner of new residents, namely gentrifiers, live and consume. Their impact on the gentrified areas alter its character altogether and it seems as they are “reclaiming” it from former residents (Brown-Saracino, 2010).

On the contrary to the opinions above, Hamnett argues that neither culture nor the capital are responsible for gentrification, whereas Lees (2000), opposing to this idea, states that gentrification is a complex phenomenon which inherently involves both capital and culture (Brown-Saracino, 2010).

Freeman described the general pattern of gentrification. It occurs in city center, in neighborhoods where low-income people live. These neighborhoods are usually decaying, because they are disinvested. As gentrification begins, people with higher educational level choose to move to these areas, which change the socioeconomical landscape, thus inviting investments and raising the prices of housing. Another factor that contributes significantly is the State. Whether it comes to creating new infrastructure or initiating policies, the State can both facilitate and hinder gentrification (Zuk et. al, 2018).

GLOBAL FRAMEWORK

This phenomenon is influenced by many different factors, but it is important to investigate the legal framework and networks in urban planning that could facilitate gentrification. In 2015, all



Image 1: The 17 Sustainable Development Goals

United Nations (UN) Member States adopted the 2030 Agenda for Sustainable Development set 17 Sustainable Development Goals (SDG) in an attempt to tackle crucial problems around the globe, such as poverty, hunger, inequalities, clean energy, etc, by promoting sustainable practices (United Nations, n. d.). According to the United Nations, the world's population is

increasing rapidly, which could intensify current urban and human settlement issues. SDG 11 describes the basic principles of future sustainable cities (“Make cities and human settlements inclusive, safe resilient and sustainable”) and remarks the importance of an innovative, urban planning model, which allows habitants to thrive. Table 1 outlines the targets of SDG11 (The Global Goals, n. d.).

Table 1: Targets of SDG 11 (Reference: The Global Goals, n. d.)

TARGET	TITLE	DESCRIPTION
11.1	Safe and Affordable Housing	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
11.2	Affordable and Sustainable Transport Systems	By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
11.3	Inclusive and Sustainable Urbanization	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
11.4	Protect the World’s Cultural and Natural Heritage	Strengthen efforts to protect and safeguard the world’s cultural and natural heritage
11.5	Reduce the Adverse Effects of Natural Disasters	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
11.6	Reduce the Environmental Impact of Cities	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
11.7	Provide Access to Safe and Inclusive Green and Public Spaces	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities
11.8	Strong National and Regional Development Planning	Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
11.9	Implement Policies for Inclusion, Resource Efficiency and Disaster	By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion,

	Risk Reduction	resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels
11.A	Support Least Developed Countries in Sustainable and Resilient Building	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

CREATIVE CITY

Sustainable cities’ development requires culture and creativity, as they could promote economic development, social cohesion and urban regeneration on spatial terms (UNESCO,

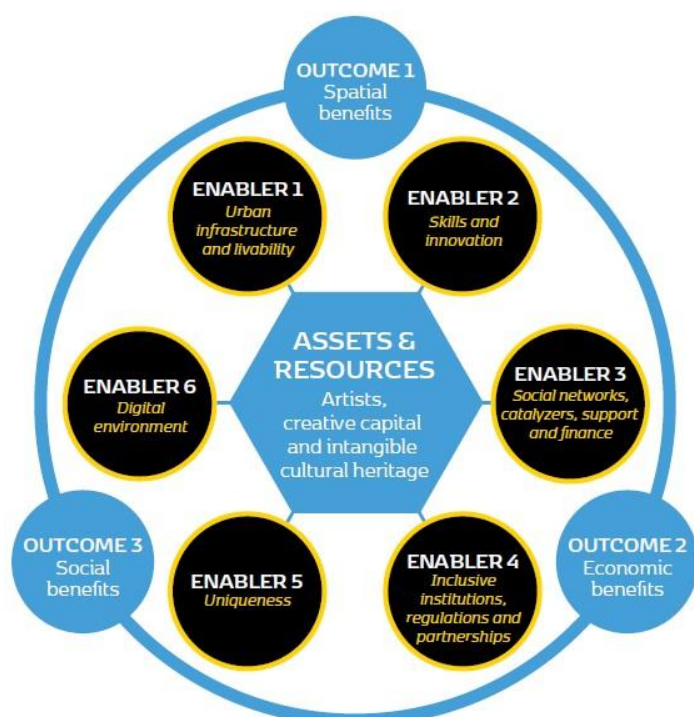


Image 2: Cities, Culture and Creativity Framework (Reference: UNESCO, World Bank, 2021)

World Bank, 2021). The New Urban Agenda was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in 2016 and communicates guidelines for future urban planning. It creates a link between “sustainable cities” and “creative cities”. One of the commitments embodying the UN vision (point 50) states that “we commit ourselves to sustaining and supporting urban economies to transition progressively to higher productivity through high-value-added sectors, by promoting

diversification, technological upgrading, research and innovation, including the creation of quality, decent and productive jobs, including through the promotion of cultural and creative industries, sustainable tourism, performing arts and heritage conservation activities, among others” (United Nations, 2017).

The character of a creative city mainly stems from the cultural heritage, both tangible and intangible, as well as artists and other creative people. It is necessary for the city to have

enabled in the past cultural and creative activities, as it provides an adequate head start; yet, it is important to provide the essential resources to maintain the desired development. Furthermore, the city has the duty to provide sufficient and affordable housing and workspaces. Artistic and creative people often seek to live in the same spaces, thus creating communities on a spatial level, which require specific infrastructure. It is common for former industrial buildings to be converted into housing and workspaces (UNESCO, World Bank, 2021).

Other significant services that enhances the city's attractiveness, besides water, electricity, hospitals and schools are accessible and good quality transportation, which also enables walkability throughout the city, as well as digital infrastructure that provides adequate information for decision making on local and political issues. In addition, the citizen should have access to education (vocational training, university) and the State should promote entrepreneurship (e.g. start-ups), enforce frameworks for protecting intellectual property rights and promote diversity and tolerance (UNESCO, World Bank, 2021). One significant aspect of such cities is to create partnerships and networks, which promote interaction and participation between citizens and will in prospect solve issues (e.g. crime) (Landry, Bianchini, 1998).

SMART CITY

The United Nations Economic Commission for Europe (UNECE) and the International Telecommunication Union (ITU) have defined the smart sustainable city as "...an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects". As a response to SDG 11, the United Smart Cities Programme was launched in 2014, in order to assist cities on their path towards becoming smart and sustainable and adopting the necessary practices (UNECE, n. d.). However, Kozłowski and Suwar argue that a universally accepted definition of a smart city has not been developed, as the existing ones do not describe fully all the characteristics of it (Kozłowski, Suwar, 2021) and without a specific definition, it is challenging to develop an according urban planning strategy and assess its results. Moreover, the term seems to overlap

with certain others, such as intelligent city, knowledge city, wired city, etc (Manville et. al, 2014)

According to the European Parliament, the six dimensions that constitute a smart city are Smart Governance, Smart People, Smart Living, Smart Mobility and Smart Environment and three components, namely technological, human and institutional (Manville et. al, 2014). Lombardi, Giordano, Farouh and Yousef (2012) have analyzed the aforementioned aspects from EU handbooks and texts and categorized them in clusters. They also selected some relevant indicators.

Smart Governance relates to the general use of the Internet and technology, especially in e-governance. Another indicator is the access to education, whether from universities or online courses, as well as funding opportunities for students and researchers.

Smart Economy is described from several economic indices (GDP per capita, unemployment rate, debt rate). The local economy should focus on high tech, energy, business, culture, transport and tourism sectors, as well as innovation and R&D. Finally, the city shall provide funding for education and there should be research funding opportunities from international collaborations.

Smart Human Capital is indicated by the citizens' education level, especially in foreign languages and computer skills, as well as the civic engagement and female city representation

Smart Living refers to cultural aspects of the citizens' life, such as museum and library visits and availability of other recreational spaces, such as green spaces. Mobility and accessibility, especially for people with disabilities are taken into consideration, as well as expenditures on health. Tourism is considered to be an important sector; therefore, available accommodation is one of the most important parameters.

Smart Environment relates to eco-friendly policies, pollution monitoring for the protection of citizens' health, sustainable mobility and peoples' involvement in sustainable activities and the protection of the environment (Lombardi et. al, 2012).

POSITIVE ASPECTS

Gentrification has spread across the world, impacting the lives of millions of people and offers several positive aspects in city life. When it comes to areas with distinctive architectural style, gentrification could induce a general improvement of the area in question.

In some countries, such as the United Kingdom, the State has subsidized over time the purchase of houses and buildings for the residents. In some cases, this is not necessary for an area to be developed, in order to gain citizens' interest. As the upgrading continues, the area becomes attractive to new residents (Atkinson, 2004).

Another crucial point is that gentrification contributes to social mixing, which enhances social cohesion (Atkinson, 2004). Also, as the cities revitalize and become more attractive, more and more middle and high income residents arrive, which increases the economic activities (jobs, commerce, etc) and results to an increased tax based (Sumka, 1979). This is quite beneficial for the city, because it increases the revenues from city taxes (Atkinson, 2004).

One advantage of gentrification is that it attracts public investments, which is an important leverage for development. Public investment can improve public schools, transit and general infrastructure, thus creating a thriving environment for new businesses and shops. All these new services, amenities and opportunities are available not only to the new residents, but also to the existing ones (Atkinson, 2002).

Finally, it is considered that gentrification will improve significantly the city as a whole. By gentrifying the least developed and mostly deprived neighborhoods, positive change is generated on regional level, which contributes to the city's upgrade and improvement (Atkinson, 2004).

WHY IS IT A PROBLEM?

One of the most important problems that gentrification brings is displacement of current residents. Whether private or public housing, it is common for current residents to be forced (directly or indirectly) to leave their homes. Regarding public housing in USA, it is interesting to investigate the case of Chicago, as Derek S. Hyra describes it. The city authorities decide to revitalize such areas, because they are considered degraded. The buildings should improve and other social problems, such as crime, must be tackled. Therefore, a grant from the State and new urban planning is supposed to solve some of those problems. By demolishing public housing buildings, former tenants are supposed to relocate to other neighborhoods. Despite the city's administration supporting those families financially and preparing them for their new housing, this effort fails. Some public servants assisting this project report that the preparations of the families relocating are substantially inadequate. The outcome of such project is displacement of former residents, who struggle to develop a sense of belong in their

new community and do not enjoy the amenities created at their former neighborhood. Also, they tend to live in segregated neighborhoods away from the city center. Unfortunately, low income people do not have a lot of options in private housing, due to the rising housing market (Brown-Saracino, 2010).

It is interesting how Marcuse (1985) argues that displacement is a direct result of gentrification, yet it is neither the only consequence, nor the most devastating one. There are also other types of indirect displacement, such as “exclusionary displacement” and “pressure of displacement”. The first one describes the situation where households are not able to move in neighborhoods that were once affordable, due to increase in rent prices. The latter refers to the fact that the neighborhood in questions is transformed in such a manner that the sense of community is destroyed. This concerns not only the social aspect but also the services provided. For example, facilities are not as affordable as they used to be (Cocola-Gant, 2015).

It is quite common for gentrification to appear as an effort for urban regeneration, especially concerning old and “decaying” buildings with interesting architectural style or with historical value for the city. Although realizing those urban projects is supposed to revitalize a disadvantaged part of the city, which is habited mostly by people with lower income or from marginalized social groups, it could assist social segregation (Patatouka, 2010). As mentioned above, gentrification is considered to benefit the city moneywise, but in most cases the rising property values burden low-income residents wishing to purchase a house or those who seek to rent an apartment (Lang, 1982). The middle and high class newcomers to these neighborhoods are usually people that already live in the city; therefore the tax base does not broaden, as some may consider, which proves that the tax revenue does not increase. Instead, the negative outcome is that former residents won’t enjoy the new amenities provided from developers or public investment (transit, schools, parks, etc) (Atkinson, 2002).

Many policies that induce gentrification are perceived as a positive change for the city, because they change the neighborhoods’ composition, inducing social mixing. However, some authors support that social mixing does not benefit communities; on the contrary it disrupts them, because residents are forced (directly or indirectly) to relocate. In some cases, displaced residents are denied to locate in areas, due to social mixing, because people from the same ethnic minority already live there, thus narrowing down their housing options. It is interesting that tenure diversification aiming to house people that work in the same district is not always achieved. Bolt and van Kemper found that due to the American HOPE VI programme and the Dutch urban restructuring policy, ample demolitions took place in specific

areas which hindered professional from finding appropriate housing (Bolt, Phillips, van Kempen, 2010). Davidson and Lees (2005), Porter and Swan (2009) and Watt (2008) remark that in Britain, social mixing policies in former social housing areas or in declining housing market ones may lead to displacement of current low income residents, as the neighborhood changes mostly to tailor the needs of high income people. It is interesting that Porter and Swan (2009) and Lees (2003) characterize social mixing as an effort of the State to induce gentrification (Colomb, 2011).

Notwithstanding the fact that social mixing is beneficial for social cohesion, it is not always the case. There is evidence that tenure mixing (which is a direct outcome of gentrification) does not lead to actual social mixing, as it only alters the population composition and does not create the social networks in the neighborhood. Since the 1970s, Sweden has pursued social mixing by tenure mixing and it did not produce the desired results. Also, the concentration of poverty did not influence negatively the probability to stay in employment, but this depends on the level of education (Manley, van Ham, Doherty, 2011).

SUSTAINABLE CITY AND GENTRIFICATION

According to the 97th point of the New Urban Agenda, “we (the United Nations Conference) will promote planned urban extensions and infill, prioritizing renewal, regeneration and retrofitting of urban areas, as appropriate, including the upgrading of slums and informal settlements, providing high-quality buildings and public spaces, promoting integrated and participatory approaches involving all relevant stakeholders and inhabitants and avoiding spatial and socioeconomic segregation and gentrification, while preserving cultural heritage and preventing and containing urban sprawl” (United Nations, 2017).

It is evident that the Committee recognizes that there is a risk of gentrification from implementing the New Urban Agenda. This point recognizes that these policies might facilitate gentrification. All these policies contribute into making the city more attractive for medium and high income residents, which attracts public and private investments, on the expense of lower income people.

CREATIVE CITY AND GENTRIFICATION

The emergence of a creative city, with a distinctive culture and vibe, becomes attractive to high income residents and may lead to displacement of the previous, low income inhabitants.

Furthermore, the potential rise of real estate values could enforce gentrification. These outcomes will alter the character's area and eventually its previous desired qualities (UNESCO, World Bank, 2021).

The fundamental values of a creative city are creativity, culture and arts, which is likely to influence the social structure of a city implementing such model. Therefore, Miles (2013) argues that it does not contribute positively to social cohesion. Because the ethical values of arts and culture are perceived as superior to the culture of "everyday life", it could function as a disruptive force in society (Miles, 2013).

Furthermore, it is evident that one of the most prominent economic activities in creative city is tourism. The modern vision of urban tourism is that of cities with interesting cultural and artistic profiles (UNESCO, 2021), which leads to the development of culture as a product, rather than an identity and values of residents of a certain area. Inherently, the city and its culture become a commodity. In a globalized world, the cities will compete on attracting tourists, which intensifies the competition and is likely to prioritize the city's development accordingly, at the expense of permanent residents. In cases, such as Frankfurt am Main, Barcelona and Glasgow, there is evidence that cities' commercialization induced gentrification (Καλαντίδης, 2006; Plaza, 2000).

The transformation from a conventional city to a creative city might create a social chasm between residents. The creative sector includes economic activities that may exclude current residents from employment. For example, Chatterton and Hollands (2003) found that in Leeds, United Kingdom, the local economy shifted from manufacturing to entertainment-based. In this case, gentrification did not benefit former residents, who had previously adapted to a certain economic model (Holland, 2008).

The environment of the creative city might foster gentrification. It is up to policy makers to create an appropriate framework, in order to mitigate the adverse effects of gentrification (UNESCO, World Bank, 2021).

SMART CITY AND GENTRIFICATION

Hartmann and Jansson (2022) shifted their focus from classic gentrification research means and argued that media play an important role. Specifically, there is an effort to create a new type of city, the "geomedia city", where media and data influence governance and citizenship.

Although a lot of authors use different terms to describe it, it is mostly known as “smart city”. McQuire (2016) analyzed the term and defined four basic components.

Ubiquity describes the fact that media and more specific media platforms are constantly available to the public and that people are “online” or “connected” almost all the time, due to mobile devices

Real-time feedback refers to the vast amount of information that is constantly available to all people, with social media platforms contributing significantly to this.

Location awareness relates to the fact that data and content on the internet are distributed according to the users’ locations and movement.

Convergence describes how institutions, media and other participants are closely connected, thus creating a new reality, which contradicts its traditional perception (Hartmann, Jansson, 2022).

However, this new reality poses a threat. By altering so drastically the interrelations of governance and citizenship, it could lead to a new “social regime”. Not only does it influence the public sphere, but it changes how people interact and associate with each other (Hartmann, Jansson, 2022; Annunziata, Rivas - Alonso, 2018).

Another crucial aspect is that sometimes technology is perceived as a solution to most of the problems that a city faces. Although technology can become a solution in some problems, it is not a panacea, as it cannot address all problems. Also, Heberlein (1974), Dunlap, Lutzenhiser and Rosa (1994) argue that there is a danger of technology shaping, policies, governing and decision making, thus impacting negatively personal freedom of citizens (Beretta, 2018).

Furthermore, Brenner and Theodore (2002) support that it is recognized and broadly accepted that the smart city emphasizes on entrepreneurship for development (Hollands, 2008). In order to achieve cost effective smart growth, it is imperative for the private sector to participate, as “only private capital markets can supply the large amounts of money needed to meet the growing demand for smart growth developments. If investors, bankers, developers, builders and others do not earn a profit, few smart growth projects will be built”. This is problematic, because the city prioritizes the facilitating of these private investments. In fact, “Expediting the approval process is especially helpful to developers, for whom ‘time is money’. The longer it takes to get approvals, the longer the developer’s capital remains tied up in land and not earning income. For smart growth to flourish, state and local governments need to make development decisions about smart growth more timely, cost-effective, and predictable for

developers. By creating a supportive environment for development of innovative, pedestrian-oriented, mixed-use projects, government can provide smart growth leadership for the private sector” (Smart Growth Network, n. d.).Expediting approval processes could hinder the participation of citizens in shaping their habitat. Instead of having a bottom-up governance model, it is reversed to top-down. Although smart cities focus on creating communities within cities, these circumstances are very advantageous for gentrification to flourish, which causes the exact opposite (Hollands, 2008).

Smart cities include some so called “eco-innovations” which aim to better the residents’ daily life. Such eco-innovation could be the monitoring of air pollution, which benefits all residents. It is important to shift our focus on mobility projects, which seem to be the engine of “eco-gentrification”. These initiatives are focused on certain areas, specifically the city center, without involving the outskirts. Thus, not all citizens can enjoy these amenities (Beretta, 2018).

ENTREPRENEURSHIP AND GENTRIFICATION

Gentrification does not affect only housing in areas. Commercial gentrification is a term used to describe the changes on business that a neighborhood undergoes. Specifically, in such areas, local small businesses that cater the everyday needs of the residents (low-value businesses) are replaced by high-value businesses or more competitive ones (Ferm, 2016).

Commercial gentrification develops in similar ways as any other kind of gentrification. Due to the declining manufacturing and industrial sector in some cities, there is available space for “pioneering creative entrepreneurs” to establish their own businesses. Once those businesses become successful, the area becomes an attractor for many customers. However, the neighborhoods value rises, which consecutively attract other high-value businesses, as well as new residents that embody a more “hip” culture and lifestyle. Previous manufacturing areas are renovated into trendy lofts, which directly or indirectly forces shop owners to move to another area (Ferm, 2016).

According to Ley (2003), gentrified areas have a distinctive character regarding the businesses that have been established after the first stages of gentrification. Craft production and craft retail stores have a rather authentic character, something that mostly gentrifiers seek for. A study showed that in Tallinn, Estonia, once the first entrepreneurs open such businesses, the follower effect takes place. The next wave of entrepreneurs is more likely to

adopt the same type and authentic character for their shops (e.g local craft breweries, handmade items shops, organic shops, farmer's market, etc) (Pastak, 2019).

One example of commercial gentrification can be found in Seoul, South Korea. Many local shops were replaced by food and beverages stores at first. After that, those stores were replaced by large scale clothing businesses. Unfortunately, by the last stage of transformation, the streets lose their vibrant character, which was what started this growth and development process in the first place (Yoon, Park, 2018). Another study regarding the area surrounding the Gyeong-ui Line Forest Park, Seoul showed that due to the rapid expansion of food and beverages stores, old residential areas became commercial, in the expense of available housing (Cho et al., 2020).

The impact of gentrification in businesses can be observed in other cases as well, for example, the Indische Buurt (Indies neighborhood) in Amsterdam, The Netherlands. After middle-class white people left the neighborhood and moved to the suburbs, it was inhabited mostly by non western minorities since the 1970s. According to van Gent (2013) during the 2000s, the Municipality launched a series of policies, in order to gentrify the neighborhood. Sakızlıoğlu and Lees (2020) while studying a specific commercial street showed that gentrification affected the social mixing of entrepreneurs. Although it did not favor ethnic minority groups, as it “deepened existing ethnic and class inequalities”, specific minority groups, such as the Turkish were more able to adapt to the new reality , due to their social , cultural and economical resources (Sakızlıoğlu, Lees, 2020).

TOURIST CITY AND GENTRIFICATION

The phenomenon of touristification is not yet absolutely defined. Mostly, this term is used in order to describe the social and geographical impact, as well as economic dynamics that manifest by the growth of tourism, especially urban tourism in places of historical value. A link has been underlined between gentrification and touristification (Ojeda, Kieffer, 2020). Regarding the relationship between them and explained from the economic perspective, there are two prevailing scenarios. Firstly, it is argued that both phenomena co-exist, but are limited in “tourist areas” (Judd, 1999). However, the other point of view is that in urban areas that have already undergone gentrification become also “tourist areas” (Cocola-Gant, 2018). We believe that this happens due to various qualities of the neighborhood (cultural, infrastructural, etc) that render it as attractive.

The factors that create and determine these urban transformations are different. For example, gentrification is classically associated with the upper-middle class, which increasing interest in certain neighborhoods results to the rise of housing and rent prices was displacement follows. However, Squera and Nofre (2018) argue that tourist areas with vibrant night life become less attractive for residents. Those who can afford to move to other areas, especially the more affluent residents, may choose to live in areas close to their previous home, which will increase the demand of housing and consecutively inflate housing cost. As a result, it is likely for some less affluent residents to be displaced to neighborhoods with cheaper housing cost. On Table 2, Sequera and Nofre (2018) have outlined the differences between touristification and gentrification.

Table 2: Differences between gentrification and touristification (Sequera and Nofre, 2018)

	GENTRIFICATION	TOURISTIFICATION
Displacement	Working classes	Cross-class displacement
Class	Up scaling class	Class diversity
Retail Changes	“Chic”, “Sophisticated”	“Disneyfication”
Demographics	Population replacement	Depopulation
Urban conflict	Class war	Worsening of community liveability
Properties	Owners	Transnational and local real estate market & Risk investment funds Owners
Housing	Residential	Temporary accommodation

Cocola-Gant (2018) refers to the problems of displacement regarding housing, not only due to rising cost, but also because housing in such areas is transformed to cater the accommodation needs of the tourists, which makes housing for permanent residents less accessible. Moreover, Fainstein, Gladstone (1999), Sandford (1987) and Zukin (1995) describe the transformation of the the amenities offered. The local shops are affected by the presence of tourism. The new facilities are mostly oriented towards leisure (restaurants, bars, etc), which alter the neighborhood entirely. It is referred to as “commercial gentrification”. Finally, it is argued that the residents become disassociated from their neighborhood due to the overbearing presence of tourists.

For example, in the Vila de Garcia, one of the most touristic neighborhoods in Barcelona, Spain, the Festa Major de Garcia takes place every year in August. The residents reported that it used to be a festival that brought residents together and strengthened social cohesion.

However, the festival has lost this feature and “has become a dysfunctional element that disengages residents from the neighborhood”, due to the massive participation of tourists, as it is one of the main attractions. Another interesting point is that newer residents of the neighborhood feel more threatened by tourism rather than those who have been living there for a longer period of time. The latter suggest that their neighborhood is threatened far more by upper-class newcomers. Consecutively, the new residents “become co-producers of urban transformation process that they evaluate negatively” (Milano, González-Reverté, Mòdico, 2023). For longterm residents in any tourist city, which faces an increase of rent prices, not only tourists pose a threat, but also wealthy newcomers (Cocola-Gant, 2018).

It should be noted that in the “Tourist City”, both lower and middle class residents feel that their neighborhoods are disrupted. Over the time, there have been anti-gentrification and anti-touristification movements with participants of all classes. The overbearing presence and activities of the tourist creates an environment where residents feel “trapped” (Sequera, Nofre, 2018).

GREEN AREAS AND GENTRIFICATION

Green spaces, such as parks and small green forests within urban limits, are of great importance. It contributes the physical and mental health of citizens, as well as in their happiness and social support (Kwon et al, 2012). It is obvious that access to parks and other green areas may benefit all residents.

In many cities, green spaces are ample, whereas in others, a need for restoration or creation of such areas is recognized. In the United States there have been cases where disinvested areas, mostly populated by socially fragile groups attract investors and developers. The development of infrastructure and real estate projects will eventually alter the character of the neighborhood, which sometimes is referred to as a “clean-up”. With the arrival of the first, “pioneering” gentrifiers, it is safe for developer and investor to continue investing in the neighborhood, especially in urban greening projects. Another significant player is the public sector, which by public-private partnerships assist the efforts for the construction of green spaces. However, a question arises: who will have access to them? This process is called greening gentrification and has presented similar socioeconomic impacts to other types of gentrification, such as rising housing costs and direct and indirect displacement (Anguelovski, I., Connolly, J., Brand, A. L. (2018).

Montaner (2004) Sauri Pares and Domene (2009) and Anguelovski (2014) argue that in other cases, such as in Barcelona, it has been observed that although greening projects were realized in cooperation with the neighborhoods, since the preparations for the 1992 Olympic Games, the City Council placed emphasis on the development of the required infrastructure by negotiating mostly with developers rather than the residents. In a study conducted by Anguelovski, Connolly and Brand (2018), it was found that all parks constructed due to the Olympic Games contributed vastly to the manifestation of green gentrification and those that were built shortly after had a moderate impact on gentrifying the cities (Anguelovski., Connolly, Brand, 2018).

However, the paradigm of Nantes, a city in France shows that greening projects do not create the circumstances for green gentrification necessarily. In contrary, while those projects took place, not only was it guaranteed that areas will be reserved for public and social housing, but the dispersal of them in different parts of the city ensured that the residents would not live segregated, a relatively common situation in French cities (Garcia-Lamarca et al., 2021).

It is possible that cities manage to promote greening projects that are not realized in the expense of less affluent, socially fragile and minority residents. It is up to the city to create policies and frameworks where better quality of life is provided in urban areas, without further escalation of existing inequalities (Garcia-Lamarca et al., 2021).

TRANSIT AND GENTRIFICATION

Regarding research on the impact of public transportation on gentrification, it is difficult to compare the results and sum all findings up to a final conclusion. The findings of some studies are very interesting. For example, Turner (2001) found that in Washington DC, metro access was one of the main five indications of gentrification in above city average housing sales. Yet, these studies are not able to capture successfully all the aspects of gentrification, because of their specific focus (Baker, Lee, 2013).

Cervero et al (2004) state that house prices present a rise of 6% up to 45% if the property is close to transit stations, compared to equivalent housing options further from public transportation. Debrezion, Pels and Rietveld (2007) found that housing within 0.25 miles from transit stations have a rise of 4% in price (Dawkins, Moeckel, 2016). This factor could hinder access to such housing for low-income people.

Padeiro, Louro and Marques da Costa (2019) reviewed several studies and argue that areas near transit are prone to gentrification. However, there could be a bias regarding transit-induced gentrification; therefore, it is important to further investigate the phenomenon (Padeiro, Louro, Marques da Costa, 2019). Another study regarding rail lines built in several cities in the United States (Newark-NJ, San Diego-CA, Seattle-WA, and St. Louis-MO) managed to measure gentrification by using eviction data as indication of direct displacement in areas that are likely to be gentrified, due to their demographic characteristics. However, there was no strong evidence that transportation infrastructure affected eviction rates. The only case were those rates increased in the same period of the opening of the line in the city of St. Louis, but it is not clear whether it was the sole reason, as it happened during the financial crisis (Delmelle, Nilsson, Bryant, 2020).

Yet, in the case of Los Angeles, USA, census data showed that transit-oriented areas are more likely to be gentrified. The intensity of the phenomenon is not the same in all transit-oriented area due to other factors such as transit ridership, income, density and zoning. However, it is recommended that policies should be carried out, in order to retain the availability of affordable housing in transit-oriented areas (Sustainable LA Grant Challenge, n.d.).

Moreover, the impact of light rail transportation to gentrification in Manchester, United Kingdom was investigated and it was found that areas with public transportation and transit stations could possibly be gentrified. Public transport creates development for the impacted neighborhoods, as it upgrades them. However, the existence of public transportation does not induce gentrification, but rather an important factor (Fernando, Helnen, Johnson, 2021).

In the New York-Northern New Jersey-Long Island area, there is a link between transit and gentrification. The demand for transit is relatively standard in most low-income residents and some middle-to-high-income residents. Also, in neighborhoods where mostly very low and low-income residents live, public transportation is not quite accessible, which inevitably requires that they spend more money and time for their transportation. In neighborhoods where middle-class people live, with higher incomes, public transportation is easier accessible (Chen, Xi, Jiao, 2023).

Studies have shown that there is an ambivalent relationship between transit-induced gentrification and commercial gentrification. According to Cervero (2006) and Cervero and Duncan (2002), in San Diego County and Santa Clara County in California, areas accessible by public transportation (in a 400m radius) have increased property cost for businesses.

Regarding the same radius, Ray (2017) found that in Los Angeles, businesses are far more likely to fail, although the construction of transport infrastructure does not affect revenues. Furthermore, while investigating the Los Angeles and San Francisco Bay Area, Chapple et al. (2017) found that commercial gentrification was proliferating, but it was not quite related to rail transit stations. Finally, in Waterloo, Canada, in areas where the light rail transit has been constructed, business owners agree that there has been a commercial gentrification sprawl, a fact that is supported by quantitative methods as well (Webber, 2022).

DIFFERENT TYPOLOGIES

Although there has been extensive research on gentrification, there are aspects of this phenomenon that are not quite clear. There are different kinds of gentrification that have different outcomes. There are also cases where re-urbanization or the upgrading of a district is falsely considered to be gentrification (Van Creikingen, Delcroy, 2003).

There are three different types of gentrification. Clay (1979) has argued and has been widely accepted, that there are four stages of gentrification. The first stage is the “pioneer gentrifiers”, mostly liberal, bohemians and artists, who seek an alternative from the suburbs. It coincides with the term “marginal gentrification”. Rose describes it as “fractions of the middle class who were employed or modestly earning professionals and who sought out niches in inner-city neighborhoods-as renters in the private or non-profit sector, or...as co-owners of modestly priced apartment units” (Rose, 1996). Marginal gentrifiers might be the first wave of gentrifiers, who wish to benefit from the vibrant, non-conventional, socially mixed city life (Mendes, 2013).

The most well known type is mostly referred to as “gentrification”, but can be defined as “mainstream gentrification”. It follows marginal gentrification, because marginal gentrifiers transform and upgrade the neighborhoods that they live in by renovating their homes, creating new social structures and making it more attractive altogether (Mendes, 2013).

The last stage of gentrification involves a typology called “super-gentrification”. Lees (2003) described this type of gentrification in Brooklyn as a situation where “property-rich, high earning Brooklyn professionals” are displaced (Brown-Saracino, 2010). The second wave of gentrifiers, which belong to the middle class, are displaced by upper class newcomers.

Gentrification has some similarities with upgrading, as in both cases improvements and renovations take place. Yet, upgrading neighborhoods are not disinvested; usually the

residents are older middle or upper-class residents. The new residents make these improvements, but neither have they altered the neighborhoods character, nor are other social groups excluded. Holocomb and Beauregard (1981) describe another version of upgrading, namely incumbent upgrading, where long-term residents decide to reinvest in their neighborhood and upgrade it. There is little to none population change and no displacement, therefore it is not considered to be harmful for previous residents (Van Creikingen, Delcroy, 2003). Furthermore, re-urbanization presents some similarities with gentrification, because according to Boddy (2007) re-urbanized areas attract “younger single people or childless couples”, but social exclusion or displacement does not take place (Yee, Dennett, 2020).

GENTRIFICATION IN GREECE

In Greece, gentrification has occurred only in the country’s two biggest cities, Athens, which is the capital, and Thessaloniki.

Plaka

The first urban regeneration of Plaka took place in 1979 and had the following principles:

- Preservation of current ownership status
- Protection and revival with participation of all stakeholders
- All initiatives are discussed with and accepted by the residents
- The State is reliable and effective regarding
- All intervention transitions for traffic and pedestrian networks are done gradually

All regeneration initiatives were done, in order to highlight Plaka’s monumental character and beautify the area. According to Kalokairinou (2009), since the 1980s, all high noise industrial activities were banned, which paved the way for gentrification and other activities, such as leisure and entertainment. The residential part of Plaka was restricted to areas where restaurants, cafes, and bars are not dominant (Nikoli, 2014).

The drawbacks of the regeneration project were the lack of communication between the State’s services, which resulted to traffic and parking issues. Finally, residents are displaced, due to rising land values, which also makes the area less attractive for new residents (Nikoli, 2014).

Kerameikos

In the early 2000s, the openings of several bars, restaurants and cinemas, as well as the restoring of two former factories and their transformation to cultural spaces indicate the beginning of gentrification in Kerameikos. Gradually, the neighborhood's character evolves in two different entities; leisure activities are developed closer to Gazi and the area near Metaxourgeio are of cultural interest. During the 2000s, residents such as Roma, Greek Muslims and working-class residents tend to be replaced by managers and freelancers (Gourzis et. al, 2021).

According to ReMax (2020), after 2013, due to the development of short term rent market, rent prices rose (Gourzis et. al, 2021). First-wave gentrifiers stated that as richer people (the majority of them coming from Global North Countries) moved to Kerameikos, they recognized the possibility of them being displaced (Gourzis et. al, 2021).

Psyri

Psyri is part of the historical center of Athens. It used to be a residential area and during the 1960s, it became part of the Athenian industrial area, as the city center expanded in other areas. The President of the Republic changed the legal framework with two Presidential Decrees, one in 1984, which banned craft businesses apart from footwear and leather goods manufacturing and one in 1998, which favored traditional craft businesses. In 1996 the Municipality of Athens and Ministry of Regional Planning, Building and Urban Development approved of certain plans to rejuvenate Psyri, in order to give prominence to its distinctive historical and cultural character (Kalatheri, 2008).

In this case, gentrification is driven by the entertainment sector by the development of bars, cafes and restaurants which holds back the construction of new housing buildings. Gentrification is also facilitated by the State, as rather than activities of cultural interest, such as museums (Tararaki, 2014).

Gazi

Gazi was one of the industrial areas in Athens and it was named after the Gasworks Plant. The neighborhood was a disinvested, poor and dangerous area, as crime rose. However, it had a quite traditional and vibrant character, and the residents helped and support each other. During the 1970s, many residents moved and after 1974, it was populated by internal

immigrants, predominantly Muslims from Thrace. Since 1985, the neighborhood begins developing economically, mostly involving cultural activities and entertainment. During the late 1990s until 2004, the old Gasworks Plant was restored and buildings were reused. According to Stefanatou (2010), until today, it is renamed to Technopolis and it serves as a museum for industrial history and as a cultural center, where many concerts and other activities are hosted (Tararaki, 2014).

Regarding gentrification, Gazi does not present all typical aspects of the phenomenon. Although land use is changing from industrial to cultural and entertainment, there are few housing projects dispersed in the area, which do not contribute drastically to displacement of current residents. However, the neighborhood could be gentrified in the future by capitalizing on the many abandoned buildings (Tararaki, 2014).

Koukaki

At Koukaki, gentrification started around 2014 and was signaled by the opening of some bars and restaurants, which gave a distinctive trendy and hip character to the neighborhood. After that, other shops and bars opened, preserving the same character. Later, the Municipality of Athens redesigned some squares and removed some sex workers. Gourzis et. al (2021) have documented the opening of tourist and entertainment-related establishments, as well artist workshops. Tourist flows have increased since 2009 due to the opening of the New Acropolis Museum. Also, land value has risen and rents have climbed up to 75% in 2020 (Remax, 2020). This also results to the recycling of different businesses in the area, as shop owners struggle to pay rent. The shop owners have noticed that their old clientele is gone, due to displacement and employees report that working conditions have deteriorated because of very intense competition between businesses (Gourzis et. al, 2021).

Metaxiourgeio

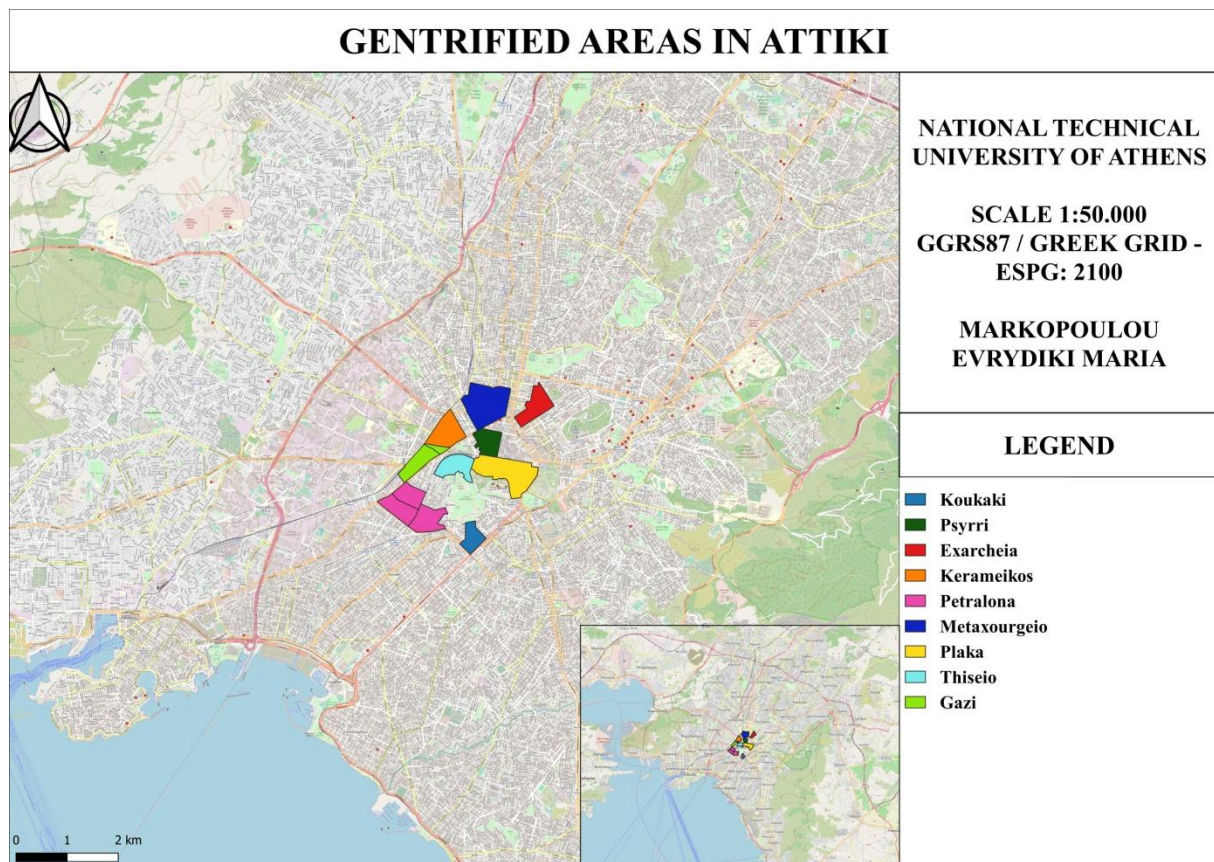
The most well-known case of gentrification is the district of Metaxourgeio in Athens. It is located in the city center. Previously, there have been some urban regeneration projects, which are not sufficient per se to classify this area as gentrified. Yet, it is the nature of those projects that link the urban regeneration to gentrification. Specifically, the aforementioned projects were small scale and were initiated by the private sector. Another important indication is that major construction firms purchased large properties from the Interwar

period, which were later renovated and transformed into luxury housing and professional buildings. Also, the President of Republic issued a Presidential Decree (19/8/1997-FEk 616D), which changed the land uses; workshops, small factories and other similar uses were removed and replaced by housing, entertainment and cultural activities (Sourila, 2010).

Petralona and Exarcheia

According to Alexandri (2015), Petralona and Exarcheia have common grounds. The latter is considered to be a neighborhood with a distinctive cultural and political character, as it used to be and still is a point of interest for artists and the intelligentsia. Many left movements and collectives have been created in Exarcheia. However, the presence of the police is permanent at certain roads and the square and the media often portrays the neighborhood as a dangerous area (Alexandri, 2015). In the last few years, Exarcheia have become quite popular for foreign tourists.

Many residents of Petralona are former residents of Exarcheia and oppose to the changing character of their neighborhood and its commercialization. As Petralona transform into a “hip” place with vibrant nightlife, many residents have created movements, in order to fight the negative aspects of gentrification in their neighborhood (Alexandri, 2015).



Map 1: Gentrified areas in Attiki

Ladadika

In Thessaloniki one neighborhood has been gentrified, namely the district of Ladadika. Before the urban regeneration, the neighborhood was infamous, as it attracted mostly people from marginalized social groups and the main economic activities were wholesale and prostitution (Gerolympou and Chastaoglou, 1996), The urban regeneration not only did it change the district's character from underground to anentertainment nightlife area; it was an attempt to “purge” the district from drug users and ex drug users by removing the local department of “KETHEA” (KEΘEA), which is the largest rehabilitation and social reintegration network in Greece (Patatouka, 2010).

METHODOLOGY

Gentrification is a socioeconomic phenomenon that is highly correlated to demographics. Many authors have argued about the factors that influence gentrification and although it has spread around the world, there are distinctive differences. These differences in each case stem

from each region having different culture, national context and economic model and prevailing industries. Therefore, it is important to explore which parameters influence gentrification per se.

In Greece there has not been extensive research on differentiating gentrification from other neighborhood development typologies or the spatial prediction on it. This study aims to map gentrification and other urban typologies in the Attiki basin and predict their evolvement. The literature review has pointed out the relationship between all urban typologies and economic and sociodemographic factors. There seems to be a connection between public transportation as well.

According to the National Neighborhood Indicators Partnership, there are some indicators of specific resident characteristics, neighborhood conditions, real estate market and economic activity used to map gentrification.

Race and Ethnicity

Historically in the USA, race has been an important factor into many aspects of life, including housing (Cohen, Pettit, 2019). Although in Greece this is not the case, since 2015 there has been a significant rise on the influx of refugees and immigrants from Middle East and African countries. According to ESTIA, a housing programme for refugees and immigrants for the enhancement of their living conditions, the majority of apartments available for them are “in areas such as Attiki Metro Station, Kato Patisia, Kypseli Square, Amerikis Square, Koliatsou Square, and Victoria Square” (Cerednicenco, 2020). Therefore, it is crucial to investigate the spatial aspect of refugees and immigrants living in the same area, because these areas could be prone to gentrification.

Income

As mentioned before, low-income people can be susceptible to gentrification. One indicator of an area gentrifying is the rise of income, whether household or non-family. One of the proposed indicators is the per capita income, which provides insight on the prosperity of a neighborhood. Additionally, the poverty rate or the percentage of “households earning below 30% of the area median income” depicts the economic problems that the residents face (Cohen, Pettit, 2019).

Education, Age and Household Type

This information represents the social background of the residents. The typical gentrifier is a young professional, childless, with higher educational level. Areas prone to gentrification change, in order to cater the needs of new residents. Therefore, there should be different indicators on education, age and household type (Cohen, Pettit, 2019). Some researchers create an additional indicator measuring educational attainment, for example “the number of residents 25 years old and over holding bachelor’s degrees” (Langnese, 2019).

Business activity

Gentrification can change the character of a neighborhood. Business may open or close, according to residents’ preferences and needs. Consequently, it is crucial to investigate the number and type of businesses that provide residential services (Cohen, Pettit, 2019). As cities develop according to certain guidelines (sustainable, creative, smart), businesses may change accordingly. For example, in a creative city, where arts, culture and tourism are the major forces driving development, it is more common for cafes, restaurants, hotels and artist workshops to open rather than manufacturing units (a common pattern in the tourist city and commercial gentrification as well).

Tenure and rental prices

Tenure is an important indicator, because it describes the status quo of property owning in an area. If the residents of a neighborhood are predominantly renters, in case of gentrification taking place, rent will increase and it will become less affordable for low income people, which can be a reason for resident displacement. Also, an increase on homeownership can indicate that wealthier people are moving to an area or investing, which could lead to gentrification as well (Cohen, Pettit, 2019).

Transit Access and Use

Previously, the importance of transit was discussed and how it can affect the course of development in a neighborhood. So, an according indicator can be created by investigating the

median household income and the geographical position of transit station and routes, as well as the patterns in public transportation use (Cohen, Pettit, 2019).

Crime and Safety

It is considered that disinvested areas have higher crime rates than the gentrified ones. However, there is a controversy between researchers. McDonald (1986) argues that when an area is gentrified, crime rate reduces, whereas Taylor and Covington (1988, 1989) have found that crime does not reduce, but it is shared between different crime categories. Still, the relation between crime and gentrification is not clear (Atkinson, 2004). The National Neighborhood Indicators Partnership suggests that safety is not only defined by crime rates, but also by cooperation and cohesion between neighbors, “policing and feelings of belonging”. Crime is also influenced by several other factors, such as policy, lack of economic opportunity, etc. (Cohen, Pettit, 2019). Therefore, it could be used as an indicator, but it is not as indicative as other factors.

Infrastructure investment

Public investment is usually done by enhancing current infrastructure or creating new. By tracking such public investment geographically and moneywise, it can indicate changes in the residents’ everyday lives and the neighborhoods character (Cohen, Pettit, 2019).

Public and subsidized housing

In a neighborhood, the existent of public and subsidizing housing is pinpoints that it is resilient to gentrification. However, there are differences between public housing subsidizing housing, because residents in subsidizing housing could be susceptible to gentrification, if owners decide to sell their property or drive current residents away, in order to create expensive houses for high income people (Cohen, Pettit, 2019).

In Greece, there are 3 types of such housing. There is labor housing (ergatikes katoikies), which are houses provided by the State to people with lower income and certain social profile. After acquiring such house, the residents buy the property for a relatively small price. As for subsidizing housing, the State also provides to people with certain social and economic

characteristics an amount of money monthly. The same goes with university students, but in this case, the subsidy is paid annually.

Vacant properties

Vacant buildings are a sign of disinvestment in an area. Also, such properties may serve as a “pool” of potential buildings to be renovated and then transformed into expensive housing. They could also be demolished, in order to construct new buildings. Either way, it is an indicator of gentrification (Cohen, Pettit, 2019).

Transit

Atkinson and Bridge (2005), Filion (1991) Skaburskis and Mok (2006), Walks and Maaranen (2008) have found that there is a connection between gentrification and transit, however, there has not been extensive research regarding this specific aspect (Grube-Cavers, Patterson, 2015). According to the Sustainable Communities and Climate Protection Act of the California Air Resources Board, “transit oriented development is defined as being within half-mile (0.8 km) of transit stations with transit services having a headway of not more than 15 minutes”. As for rail transportation, Gurerra et al. (2012) argues that a half-mile (0.8 km) distance from rail stations is considered to provide adequate accessibility to public transportation (Chapple et al., 2017). These areas may be considered attractive for residents, because it provides an important amenity.

DIFFERENTIATING URBAN TYPOLOGIES

Gentrification is not a uniform phenomenon and entails different typologies. Rose (1984) was one of the first authors to describe them and although cities have transformed since that era, there are some aspects that still remain the same. In order to successfully address the issue of gentrification, it is important to understand the how these typologies are shaped and how they are linked.

Marginal gentrifier profile

According to Rose (1984), marginal gentrifiers are people with relative high level of education but low income. They usually do not work full time or work under precarious

conditions. Their way of living represents the notion of urbanity; counter to the suburban areas of conformism and spatial monotony, they choose to live in the city center, which seems to be more authentic and tolerant to other lifestyles, such as those of artists, young couples, single-parent families, etc. The presence of marginal gentrifiers does not displace former residents and it is usual for these new residents to undertake almost by themselves any renovation work that is required, in the spirit of the DIY movement (Mendes, 2013).

Mainstream gentrifier profile

It is the most common and well known typology and succeeds marginal gentrification. Upper-middle-class people with relative high level of education and income are drawn to an area, due to factors such as its vibrant character etc. (Rerat, 2012). As more and more new residents move in the neighborhood in question, former residents that lack the financial soundness to keep up with the rising of living cost are indirectly forced to move away (Byrne, 2003).

Super-gentrifier profile

This type of gentrification occurs in areas that have already been gentrified in the past. Neighborhoods that were previously classified as mainstream gentrified areas are now attracting people with much higher income (Shi et. Al, 2021). New residents share some characteristics with the first gentrifiers, such as a relative high level of education. However, mostly in western countries, super-gentrifiers belong in a rich and powerful class, that is employed in corporate service industries (Lee, 2003; Butler and Lee, 2006;Rofe, 2004). As the neighborhood's character alters to cater the needs of the newcomers, once again, former residents cannot afford inflated housing cost and are displaced.

Yee and Dennett (2020) have managed to differentiate gentrification and other urban typologies. Regarding the variables, this research incorporates additional to those mentioned before, such as place of birth, religion, car ownership, density and dwellings, dwelling type, occupation, work conditions, transportation used to travel to work, class according to the National Statistics Socio-economic classification and degree level qualification. Housing prices and sales, planning permissions and population churns are also taken into consideration.

Table 1 presents the difference in values in this research. It is obvious that there are similarities between gentrification, incumbent upgrading and re-urbanization. Yet, in

gentrification, there is a significant increase in “rate of planning permissions granted for conversion of existing residential properties”, “rate of planning permissions granted for new-build residences” and “average population churn”, which are the most prominent characteristics described in the literature of this field. In incumbent upgrading, there is an increase in “households with dependent children”, “average population churn” and “rate of planning permissions granted for new-build residences” but significantly less than the percentage in gentrification. Finally, in re-urbanization there is a significant increase in “rate of planning permissions granted for new-build residences” and “residents aged 65+”, as well as a significant drop in “households with dependent children”.

Table 3 Differences between gentrification, incumbent upgrading and re-urbanization (Source: Yee, Dennett, 2020)

Variables	Labels	Gentrification	Incumbent Upgrading	Re-Urbanisation
		Values in actual terms		
Rate of planning permissions granted for conversion of existing residential properties (per 1,000 dwellings)	conv_rates	+5.36	+0.77	+1.58
Rate of planning permissions granted for new-built residences (per 1,000 dwellings)	newbtl_rates	+3.08	+1.39	+5.89
Average Population churn	avg_churn_01_10	+2.47%	+2.27%	+2.04%
Change in % of residents aged 65+	agePop_chg	+0.16%	-1.03%	-5.00%
Change in % of households with no children	hse_noKids_chg	+0.86%	+1.07%	+2.65%
Change in % of households with dependent children	hse_depKids_chg	+0.82%	+3.15%	-5.90%
Change in % of households with no dependent children	hse_noDepKids_chg	+0.74%	+0.87%	-2.52%
% of residents aged 65+ in 2001	agePop_01	10.49%	14.39%	10.57%

Regarding the differences between types of gentrification, all present a significant increase in “% change in median house prices” and “% change in median income”. Concluding the results from Table 2, in super-gentrification, house median prices in 2001 were already high. Marginal gentrification presents a significant drop in owner-occupied houses and a rise on people who rent houses without any subsidy. Gentrification shows a significant drop in socially rented houses and a significant rise on people who rent houses privately. Also, people that live in super-gentrified areas working lower/higher managerial and administrative occupations. Less than those live in mainstream-gentrified and far less regarding marginal-gentrified areas.

Table 4: Differences between super-gentrification, marginal gentrification and gentrification (Source: Yee, Dennett, 2020)

Variables	Labels	Super-	Marginal	Mainstream
		Gentrification	Gentrification	Gentrification
Values in Actual Values				
Change in % of residents in the Higher Managerial, Administrative & Professional Occupation (NS-SEC Class 1)	SEC1_chg	+2.73%	+1.30%	+3.81%
Change in % of residents in the Lower Managerial, Administrative & Professional Occupation (NS-SEC Class 2)	SEC2_chg	+4.09%	+0.65%	+4.95%
Change in % of residents in the Intermediate Occupation (NS-SEC Class 3)	SEC3_chg	+1.48%	+1.33%	+1.26%
Change in % of residents in the Small Employers & Own Account Workers (NS-SEC Class 4)	SEC4_chg	+2.36%	+3.05%	+1.87%
Change in % of residents in the Lower Supervisory & Technical Occupation (NS-SEC Class 5)	SEC5_chg	-0.14%	+0.13%	+0.26%
Change in % of residents in the Semi-Routine Occupation (NS-SEC Class 6)	SEC6_chg	+0.27%	+1.47%	-0.85%
Change in % of residents in the Routine Occupation (NS-SEC Class 7)	SEC7_chg	+0.27%	+1.45%	+0.27%
% change in median house prices	hseP_chg	+163.9%	+181.5%	+143.6%
% change in median income	inc_chg	+46.65%	+45.23%	+54.27%
Change in % of residential properties owned by occupants	owned_chg	-2.78%	-7.34%	-2.00%
Change in % of residential properties socially rented by occupants	socRent_chg	-2.01%	-2.05%	-11.36%
Change in % of residential properties privately rented by occupants	pteRent_chg	+2.05%	+8.48%	+11.36%
Median income in 2001	inc_01	£37.24K	£27.14K	£25.13K
Median house price in 2001	hseP_01	£352.5K	£124.3K	£139.1K

SPACE SYNTAX

Space Syntax is a theory that was developed by Bill Hillier and colleagues at the Bartlett College London during the 1970s. Space syntax methodology creates spatial models regarding road networks and also calculates topological spatial relationships. It assists engineers and urban planners in general to visualize any social effects that will be induced by altering any spatial features of the urban space (van Nes, Yamu, 2021), but it also depicts the movement of people in space, their perception of the urban space they interact with. In fact, it provides an insight on how space and the collective logic of society's interactions. The society's values influence the design of the city. However, as spatial patterns are created, they have the power to transform the spatial aspects of the people (Kayvan, 2018).

According to Hillier and Hanson (1984), space syntax is a valuable tool that can describe the occupancy and evolution of urban spaces and also link them to social dynamics. As gentrification is a combination of a spatial, economic and social issue, we believe that Space Syntax theory will provide an understanding regarding the current state of the area that is being investigated, as well as any changes that will follow. Space syntax has been used in global and local integration segment maps, in order to find whether the historic center of Vigo, Spain was gentrified (Misa, Viana, 2015). Finally, it has been applied in order to correlate crime data with space syntax analyses, combined with fieldwork for the purpose of

improving neighborhoods in the Netherlands and making them more safe (Van Nes et al., 2013).

METHODOLOGY

The methodology that was utilized throughout this thesis is presented in the following diagram:

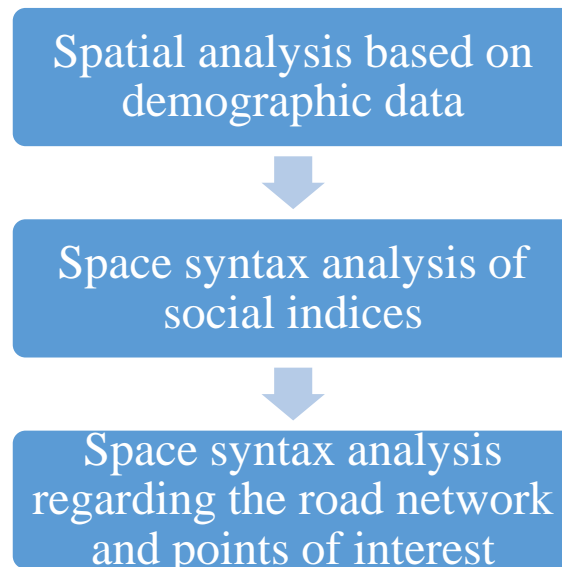


Image 3: Methodology

SPACIAL ANALYSIS

Athens is the largest and most populous city in Greece but is not a homogenous city, as it consists of different municipalities. There are significant differences along areas regarding their sociodemographic profile and quality of life. The same goes with public and private investment. The purpose of this thesis is to investigate the development of gentrification and other urban typologies in the Attiki basin and to predict their future expansion to other areas and municipalities as well.

The analysis consists of four different elements. The first step is to proceed with classical gentrification measurements by creating demographic and other social indicators. The purpose of these indices is to map the distribution of certain population characteristics that influence the development of gentrification. Furthermore, it will assist the classification of these areas to each typology. The data of all indices was retrieved from “Mapping Panorama of Greek Census Data” and the relevant period was the census of 2011. It should be stressed that one

parameter solely will not determine if an area is to be gentrified and if so, to which typology it will be categorized.

The proposed indicators are:

- age
- education
- nationality
- income
- profession
- tenure

Real estate prices should be taken into consideration but unfortunately, it is not possible to find reliable data on tract-level, hence no such data will be used.

The second aspect of the analysis is to use the road network and run a space syntax analysis to find out whether integrated and segregated areas exist, as well as any issues with connectivity.

The third component of the analysis is to explore the impact of spatial factors on gentrification. The most prominent factor is public transportation. In the case of Athens, subway is the most popular mean of transportation, because of its ability to connect distant areas. The area surrounding subway stations can be attractive for living, as it facilitates movement in remote areas (Dawkins, Moeackel, 2016). Another significant spatial aspect influencing gentrification is pedestrian areas. According to Özdemir and Selçuk (2017), investing on pedestrianisation projects could lead to gentrification, due to the increasing attractiveness of such areas and cities for habitation (Özdemir, Selçuk, 2017).

Last but not least, it is crucial that the impact of tourism is explored. The city center of Athens is quite popular among tourist due to the existence of ancient monuments. Although these monuments attract millions of tourist per year, which is beneficial for the local economy, it could lead to gentrification and displacement of current residents. Evidence of such jeopardy is presented by many authors while describing various cases of World Heritage Sites around the world. Despite circumstances being different, it is likely for gentrification to follow. Some examples of such cities are Krakow, Rhodos, Amsterdam, Cusco, Shanghai, Visby, etc. (Gustafsonn, Ripp, 2022).

Another distinctive case of gentrification is the “Barcelona Model”. Policy makers realized many urban regeneration projects, mostly in the historic center, which “focused on public spaces, cultural infrastructures and the provision of opportunities for entertainment, however,

it did not address the issue of housing rehabilitation”. Nowadays, Barcelona attracts a large number of tourists from all around the world. Nevertheless, interviews of the area’s residents pinpoint many problems, including displacements. Others referred to the replacing of consumption facilities with tourist attractions that promote a quite different lifestyle, lack of free communal spaces, which impact negatively their community (Cocola-Gant, 2015).

Social Indices

The data will be retrieved from the Panorama Greek Census Data, which edits data from the Hellenic Statistical Authority and creates maps, as well as for the latter. For this reason, the data will be tract-level.

Age Index

The age index represents the distribution and density of specific age groups. Buzar et al (2005) and Van Criekingen and Decroly (2003) argue that especially the younger ages of this group are more likely to pursue higher education, which inevitably rises the demand of housing in cities and mostly in areas near colleges and universities. Also, many young people are not that eager to settle down due to various social and economical factors (e.g. precarious work conditions) and choose alternative lifestyles, which usually take place in urban settings. We believe that an area is more likely to be gentrified when there is a higher concentration of people of ages 25-54. This age group represents the most active part of society, as they constitute the majority of the workforce. Moreover, families tend to choose neighborhoods that offer job opportunities, good education for the children and other amenities such as public transportation, leisure and food service activities (Hochtenbach, Boterman, 2018).

The age index was calculated according to the following function:

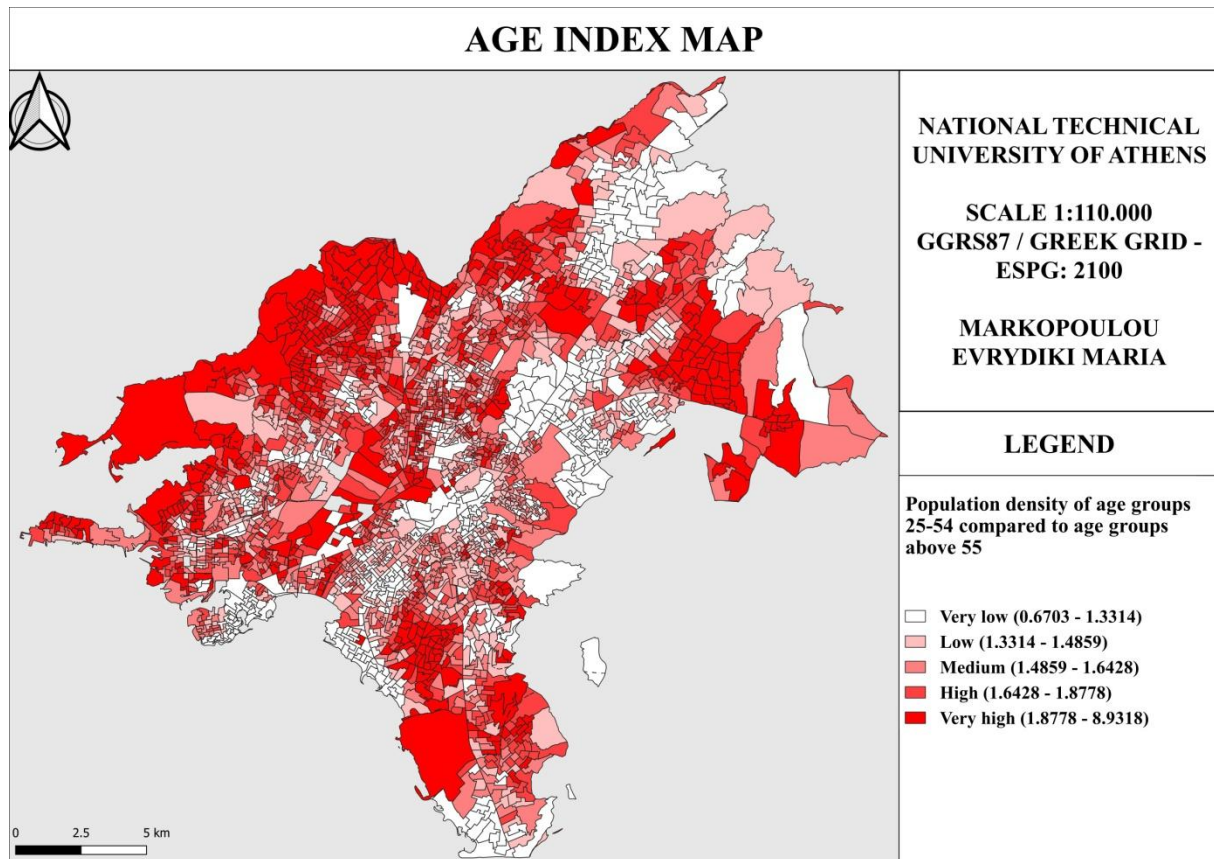
$$\text{Age Index} = \text{population } 25-54 / \text{population } >55$$

The results are presented at the following map.

As shown on Map 1, there seem to be clusters of relative high age index, which signify that those areas are populated by younger people. The most prominent neighborhoods are:

- City center
- Korydallos
- Elliniko

- Acharnes
- Gerakas
- Marousi
- Koropi
- Aspropyrgos



Map 2: Age index map

Although those areas have a similar age index, their character is quite unlike. Neighborhoods like Elliniko, Gerakas, Marousi and Koropi are considered to be upper-middle-class, whereas Aspropyrgos, Acharnes are not. It is obvious that if any of these areas are to be classified as gentrified, they would probably not belong to the same typology. However, the population's age itself is not adequate to define its typology.

Education Index

According to Byrne (2003), the gentrifiers are usually "affluent and well-educated" (Byrne, 2003). Smith (2005) argues that students will for the new generation of gentrifiers. Education is an important factor regarding gentrification, not only as a social characteristic per se, but

also because people with a higher level of education tend to attain higher paid and/or executive positions. The presence of such a social group in a neighborhood can accelerate the development of gentrification. Moreover, as mentioned before, many young people move to the city or more central locations, in order to attend higher education. Their prevailing presence inevitably transforms the neighborhood, in order to cater their needs (e.g. students-specific businesses) (Hochtenbach, Boterman, 2018).

The education index shows the distribution and density of specific education groups.

The Census data regarding education are categorized as following:

- PhD (1)
- Master's degree (2)
- Bachelor's degree (3)
- Former technical institute's degree (4)
- High school diploma (5)
- Middle school graduates (6)
- Elementary school graduates (7)
- Elementary school attendees (8)

The age index was calculated according to the following function:

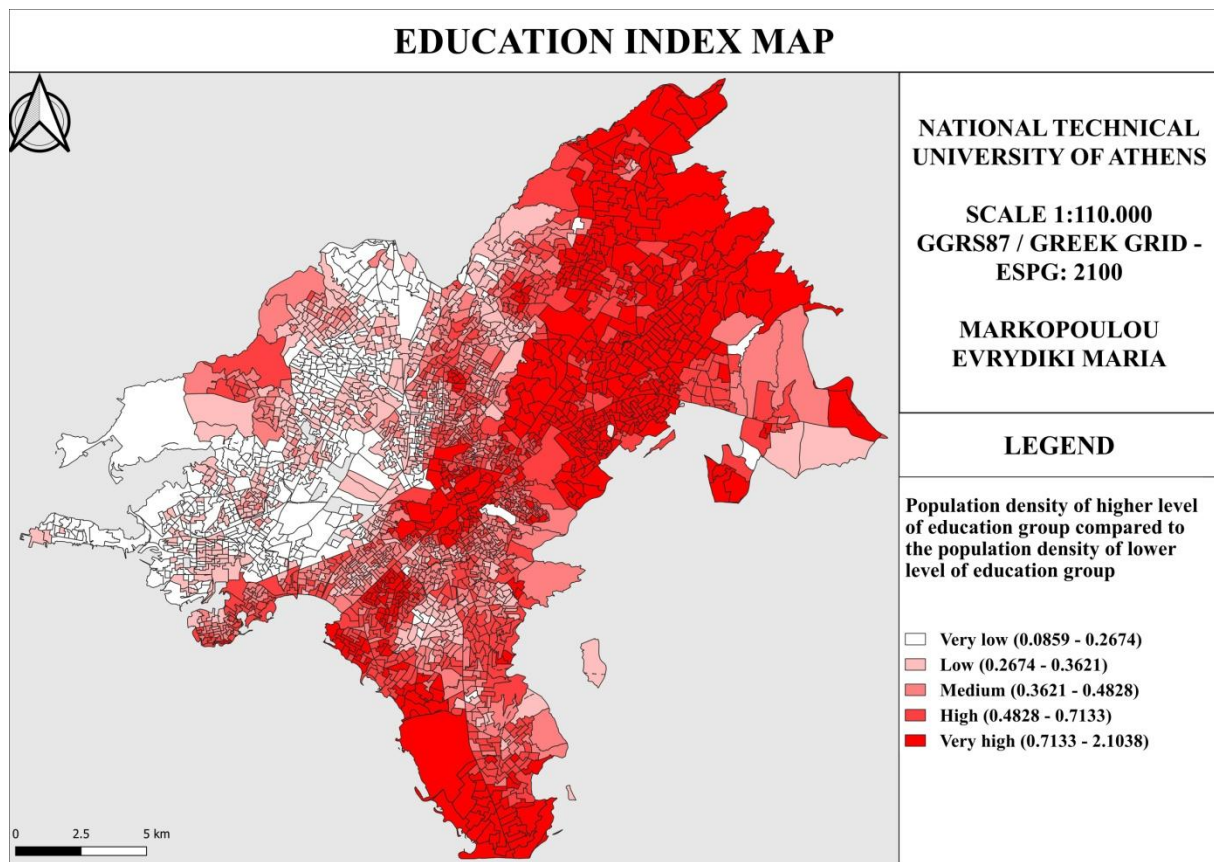
$$\textit{Education Index} = (1+2+3+4) / (5+6)$$

The results are presented at the following map.

The vast majority of high education index clusters are in the following neighborhoods:

- Kifisia
- Ekali
- Dionyos
- Ntrafi
- Psychiko-Philothei
- Marousi
- Papagos
- City center (southeast of the commercial triangle)
- Elliniko
- Voula

Most of the aforementioned areas belong to the north suburbs of Athens and the city center, which are historically regarded as relative "rich" areas and many high-income people live and



Map 3: Education index maps

work. Therefore, they could be areas prone to super-gentrification. However, because super-gentrification usually follows mainstream gentrification, it is unlikely for the assumption to hold up. This is not the case for the areas near the city center, as it is traditionally more prone to gentrification than other areas. The neighborhood around the first cemetery of Athens is also historically a rather upper-middle-class neighborhood, thus concluding that it could be super-gentrified in the future.

Nationality Index

Nationality is an important parameter regarding the typology and development of gentrification. In the USA, there is evidence that areas mostly populated by immigrants at a certain point tend to face gentrification by predominantly white population (Hwang, 2020), partly due to the increase of the areas attractiveness for them (Hwang, 2015). Neighborhoods where mostly immigrants from developing countries live are often disinvested, which creates propitious conditions for gentrification.

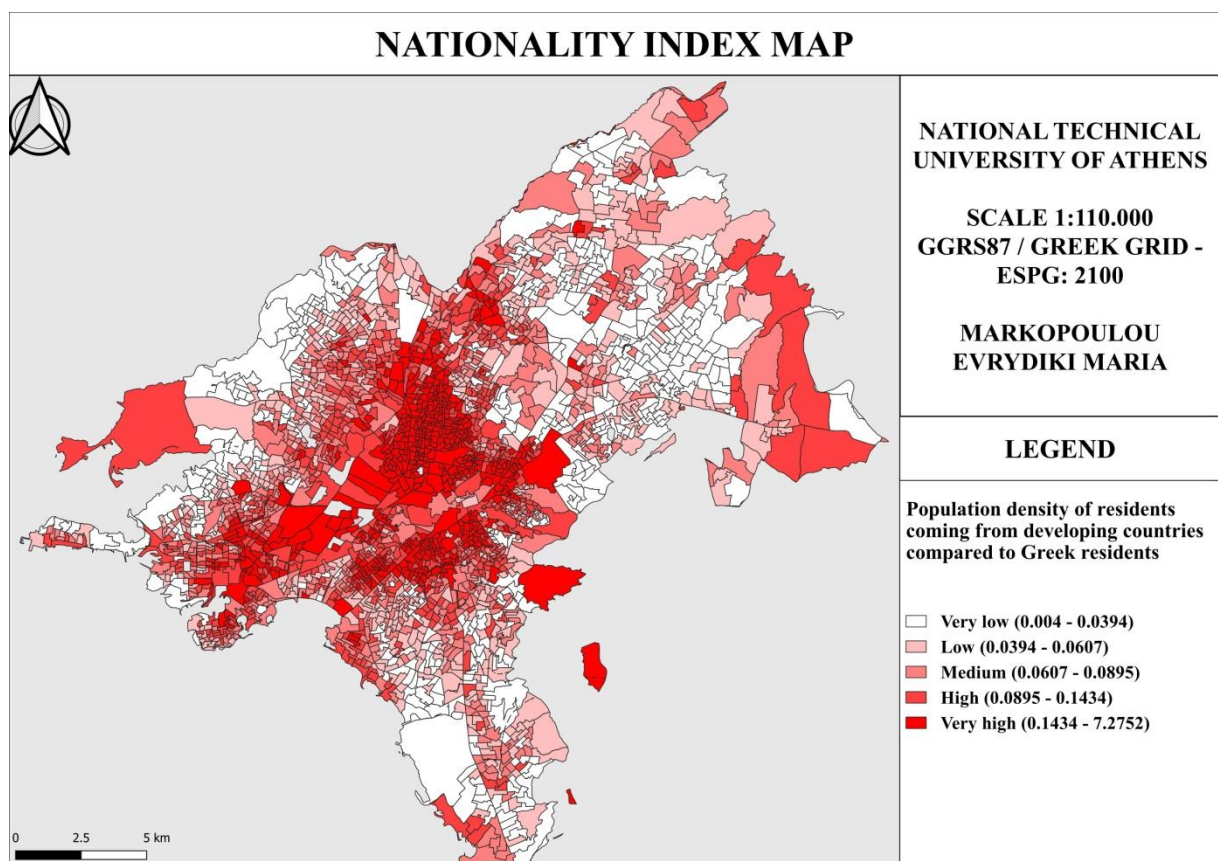
Athens has been a home for immigrants and refugees for many years. Tzirtzilaki (2009) described the circumstances and neighborhoods where immigrants and refugees from various

countries lived in Athens. In most cases, they live in the City Center (Omonoia, Monastiraki, Victoria, Psyri), Kipseli, Agios Panteleimonas, Keramikos, Metaxourgeio, Kolonos, Stathmos Larissis (the neighborhood near the hellenic railway station).

In order to investigate the distribution of immigrants and refugees in Athens, the Nationality Index was calculated according to the following function:

$$\text{Nationality Index} = \frac{\text{population origination from developing countries}}{\text{population with Greek nationality}}$$

The results are presented at the following ma



Map 4: Nationality index

It is obvious that the vast majority of this population lives in the city center, near the Triangle. The same ratio can be found northern from the city center.

Comparing Map 4 and 5, it appears that in 2009, immigrants and refugees were more dispersed in the city. However, it is well known that since 2015, Europe and especially Greece has received many refugees and immigrants and as it was mentioned before, the Estiaprogramme is providing housing in specific areas in the city center for those social groups. Additionally, the nature of Tzirtzilaki's work and that of the Hellenic Statistical Authority, as Tzirtzilaki is a researcher that realized a lot of field work and the latter is a government organization that can document only the demographics of the population that lives in Greece under "legal" status.

The areas depicted in Map 5 are rather prone to marginal gentrification at first. Neighborhoods that are the home of refugees and immigrants have a more multicultural character, which could attract artists, students and other social groups that seek anti-conformist and more socially tolerant environments to live. The existence of population from development countries could be a factor of an area to blight and become disinvested, which can create the essential circumstances for mainstream gentrification to follow.

Profession Index

As mentioned previously, the professional profile of the population is a significant parameter regarding the typology of gentrification (mainstream, marginal, super-gentrification).

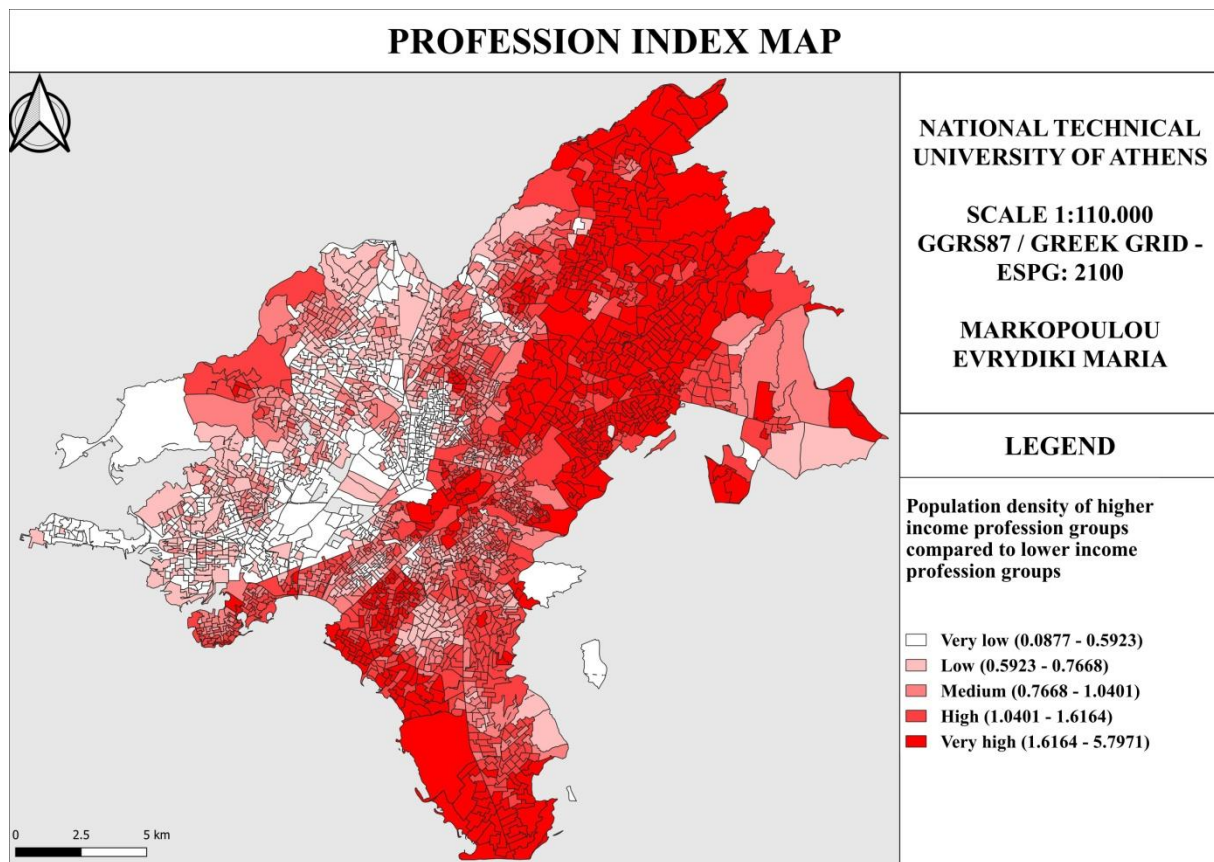
The Census data are divided into the following categories:

- Science professions, self-employed (1)
- Managers and executives (2)
- Office employees (3)
- Traders, salespeople and employees of the service industry (4)
- Employees in agriculture, husbandry, forestry, fishery and hunting (5)
- Craftsmen, workers and public transport drivers and operators (6)

The age index was calculated according to the following function:

$$\textit{Profession Index} = (1+2) / (3+4+5+6)$$

The results are presented at the following map.



Map 5: Profession index map

The neighborhoods with the highest profession index are:

- Elliniko
- Papagou
- Psychiko-Philothei
- Chalandri
- AgiaParaskevi
- Marousi
- Ntrafi
- Kifisia
- Dionysos
- Thrakomakedones

Most of them are considered as relative “rich” areas and the fact that the profession index is higher points that there could be a possibility for some of them to be super-gentrified. The Profession Index plays a similar role as the Education Index. Once again, the population employed in higher paid jobs, especially those of the corporate service industries, is the one

that drives super-gentrification. Mainstream gentrification is driven by the social group that has slightly lower paid jobs and is employed in other sectors as well. Finally, marginal gentrification is led by the population employed in far less paid job or that work under precarious conditions.

Tenure Index

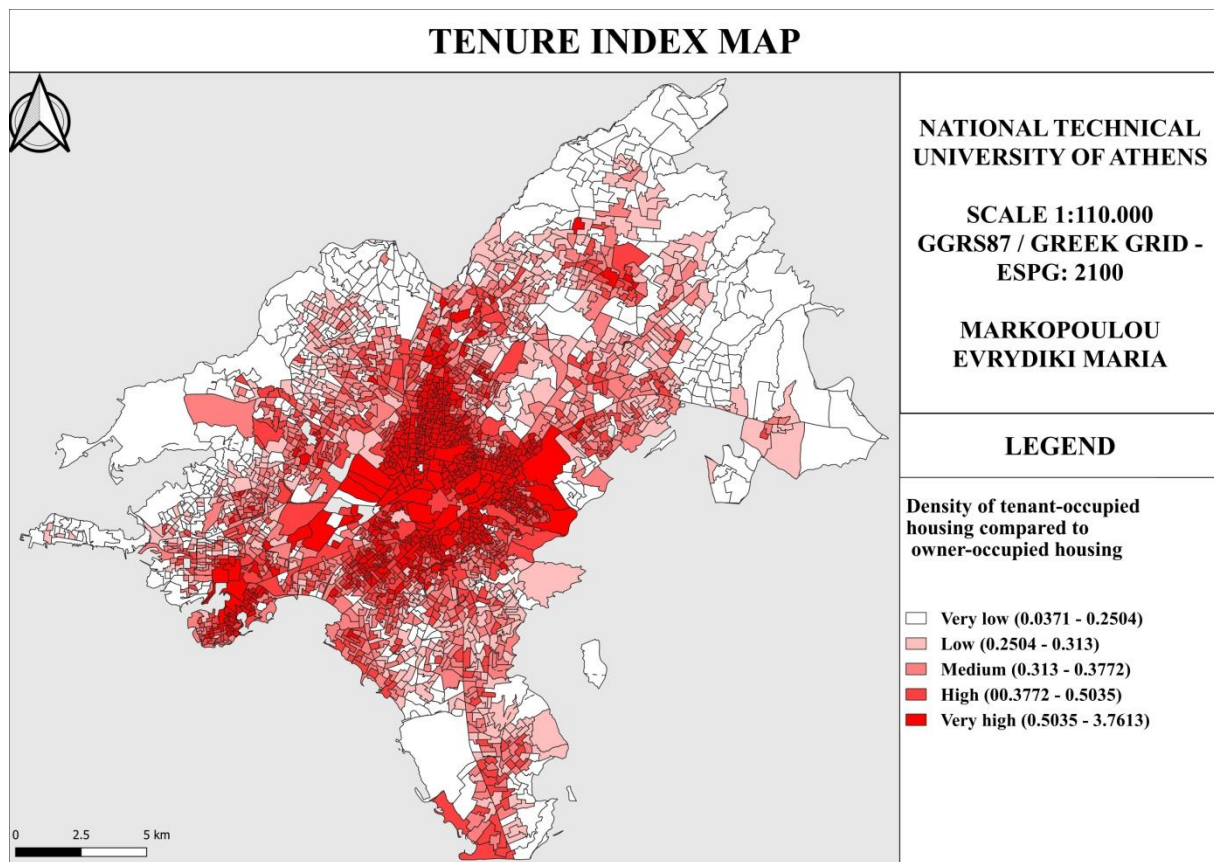
The housing market and gentrification are correlated. When housing cost rises in predominantly working-class neighborhoods, residents cannot cope with such changes and are displaced. Many authors agree that there are specific factors influencing the housing market to that direction, one of those being the sharing economy. AirBnB is a major player in the housing sector (Rabiei-Dastjerdi, McArdke, Hynes, 2022).

AirBnB is a rental platform that provides short-term-rental apartments, houses and rooms. Hoffman and Heisler (2020) argue that many owners have registered their long-term-rental properties to AirBnB, transforming them to short-term-ones, which reduces the available long-term rental housing, which leads to inflated rental prices. According to Balampanidis, Maloutas, Papatzani and Pettas (2019) in Athens, AirBnB is an “emerging driver of gentrification” and strongly linked to tourism. Athens is a city with a dynamic tourism sector, which makes AirBnB’s spatial impact huge (Rabiei-Dastjerdi, McArdke, Hynes,2022).

It is obvious that tenant occupied housing is more susceptible to gentrification than owner occupied. There is evidence that tenants can be one way or another forced out of their homes by their landlords (Wong, 2019). This is a significant parameter regarding all typologies of gentrification and in order to investigate it further a tenure index was calculated by the following function:

Tenure index Index = tenant occupied / owner occupied

The results are presented at the following map.

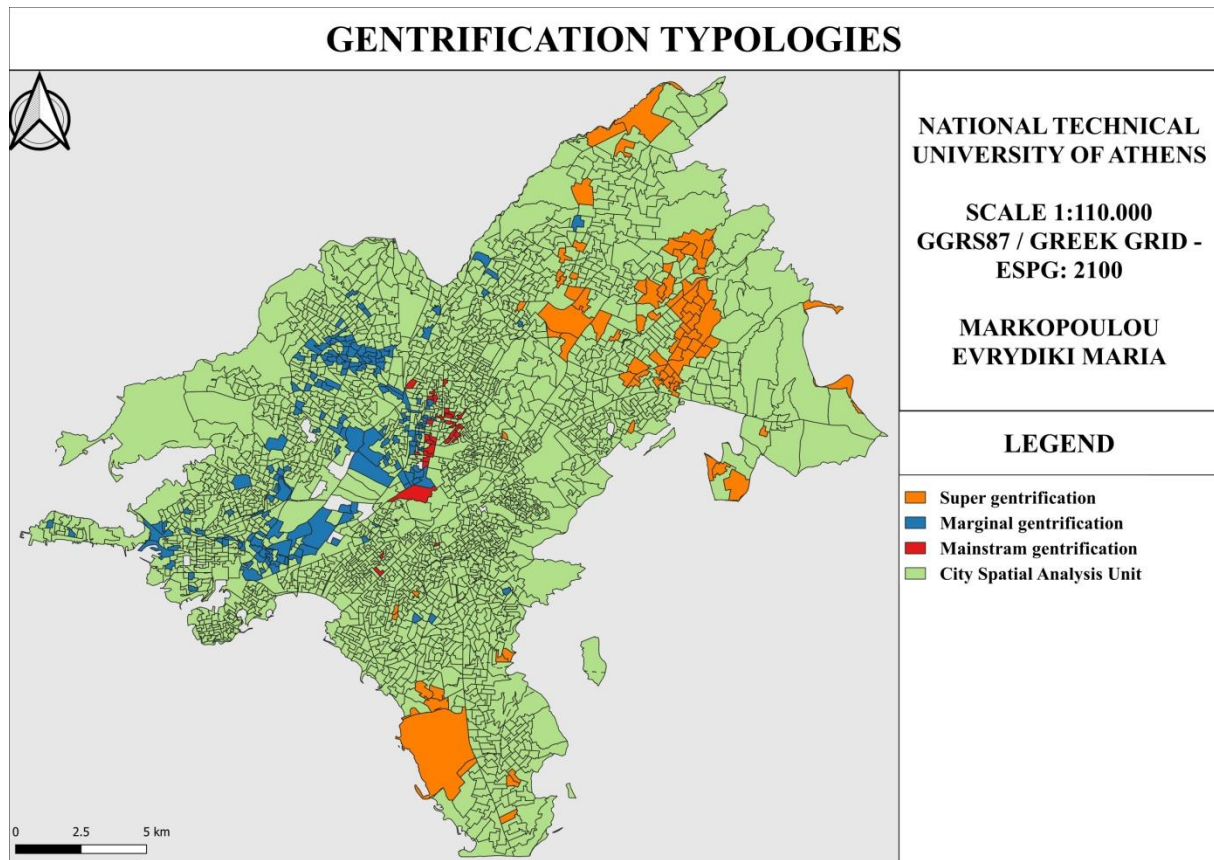


Map 6: Tenure index map

Most tenant-occupied houses can be found near the City Center (Patissia, Zographou, Ampelokipoi, Kaisariani) and in Piraeus.

As shown in Map 7, almost all renter occupied housing is located in the city center, which makes the area prone to gentrification. The city center is not homogeneous regarding demographics. Neighborhoods such as Kolonaki are regarded as upper-class, while Exarcheia have a left wing profile. Consequently, the typology of gentrification that they belong will be determined by the previous indices.

By using the indices as presented above, we classified the Attiki basin according to their typology. Map 8 presents the results.



Map 7: Gentrified area classified in specific typologies

SPACE SYNTAX AND POINTS OF INTEREST

Gentrification is not solely defined by demographics. Policy plays a major part as well, especially practices that affect the city spatially. The same goes with any other distinctive cultural characteristics of a city. Hence, it is crucial that the effect of any spatial parameters involved is identified. The spatial patterns of those parameters will provide insight to whether an area could be gentrified.

Space Syntax (toolkit) provides a variety of different indices, such as Reach, Angular Choice, Angular Integration, Attraction Reach, Attraction Distance, Attraction Betweenness, Network Betweenness and Network Distance. While taking into consideration all indices, we have selected Attraction Reach, Attraction Betweenness and Network Betweenness.

Attraction Reach

According to the PST Documentation, Reach reflects the connectivity of a certain network. Specifically, it “is defined as the part of the network that is reachable from each line of the network within the given radius”. However, in this study, we aim to explore not only the

connectivity of the road network, but also to investigate the creation of kernels. Those kernels pinpoint the areas where the development of gentrification is most prominent. We hypothesize that the social characteristics influence the creation of those kernels. We intend to use all social indices as weights in the space syntax analysis, therefore we use the Attraction Reach. The radii used in all space syntax analyses are 400m, 800m and 1500m.

In order to determine which socioeconomic indices should be applied together as weights, the R^2 values if the correlation between indices was calculated. Table 2 presents the results.

INDICES	R^2
Age – Education	0.0491
Age – Nationality	0.4769
Age – Profession	0.0418
Age – Tenure	0.0016
Education – Profession	0.8799
Education – Tenure	0.0002
Nationality – Profession	0.0341
Nationality – Tenure	0.2040
Profession – Tenure	0.0258

As shown above, education and profession indices are very correlated, which is expected. Obviously, people with a higher level of education are more likely to be employed in executive positions. Furthermore, age and nationality indices are relatively correlated, as well as nationality and tenure index. This is an indication that refugees and immigrants are more likely to belong in the age group of 25-54 and is more likely for immigrants and refugees to rent apartments rather than Greeks.

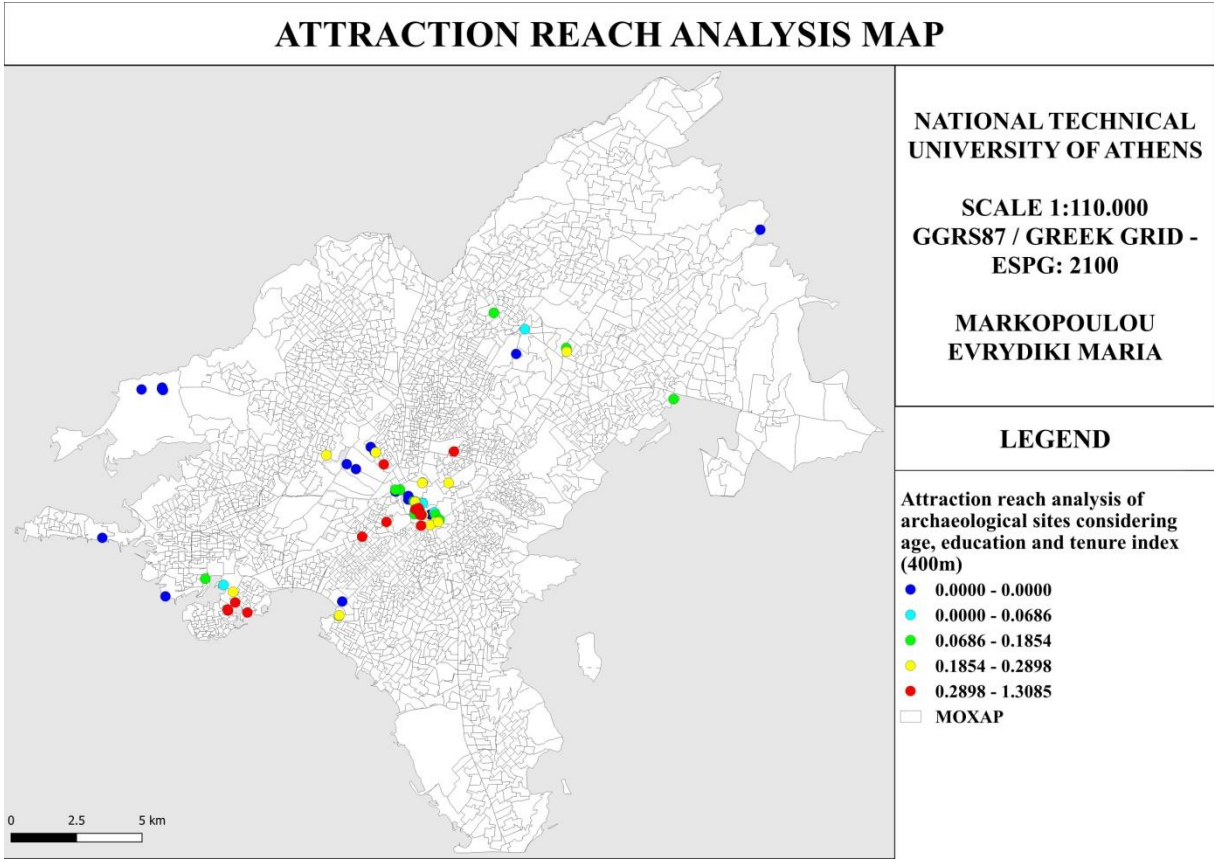
Consecutively, we believe that by combining age, education and tenure index, possible kernels that could be related to marginal or mainstream gentrification could be mapped. For mapping super gentrification, we use age, nationality and profession index.

All spatial data was retrieved from QuickOSM plugin in QGIS 3.22 Biatowieza. The data came in three different units of spatial information: polygon, line and point. For this analysis, only points were utilized. An Attraction Reach analysis was carried out, in order to investigate which of the points are more accessible. After that, a Catchment Analysis on a 400m and 800m radius was executed so that we would detect the areas impacted by the presence of the points of interest.

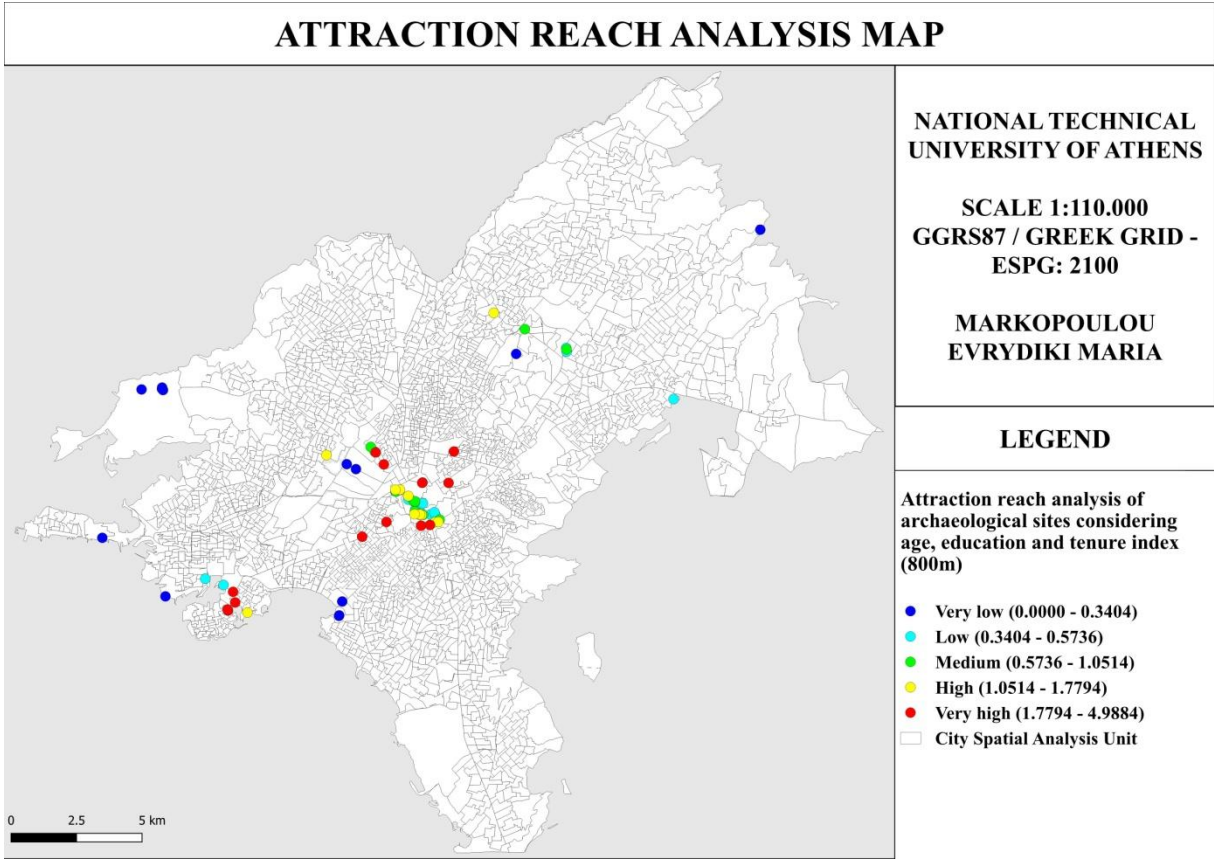
Archaeological monuments

Athens is a city with ample archaeological monuments that attract millions of tourists all around the year. Tourism is one of the most important economical industries of the city and it is obvious that it will affect the socioeconomic profile of the most tourist-prominent areas.

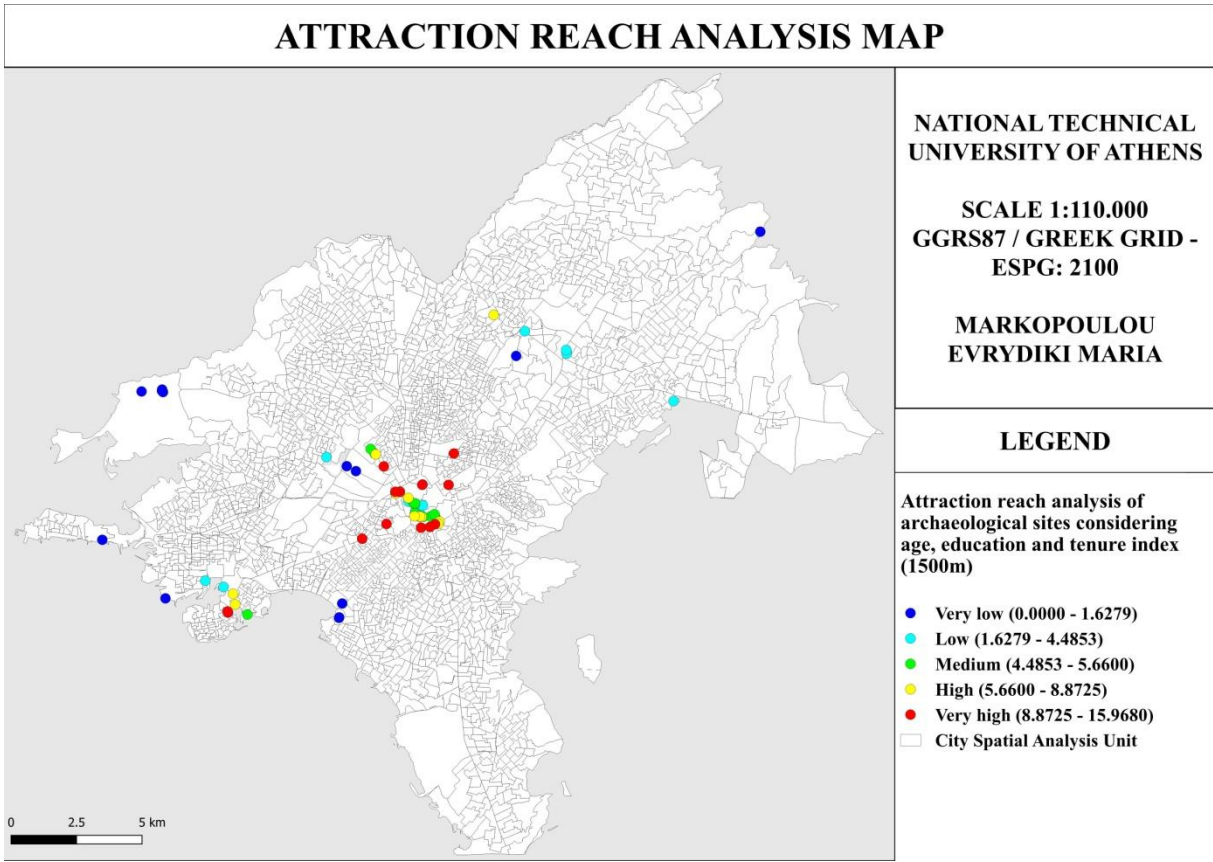
The archaeological points of interest were retrieved. Maps 8-13 present the results of the Attraction Reach analysis. On Maps 8-10, the weights that were used are age, education and tenure index and on Map 11-13, age, nationality and profession index were used. Finally, Maps 14-17 present all Catchment Analysis maps.



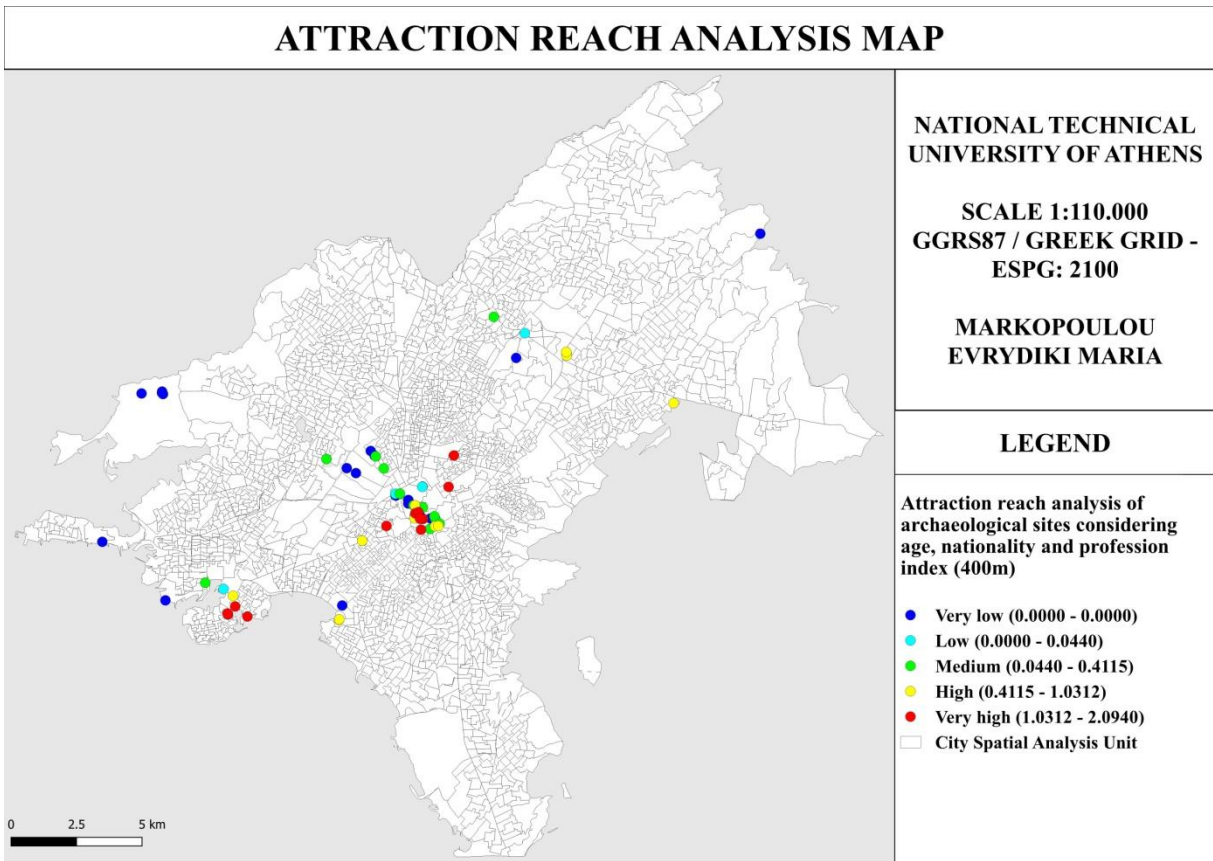
Map 8: Attraction reach analysis map on archaeological sites (radius 400m) regarding age, education and tenure index



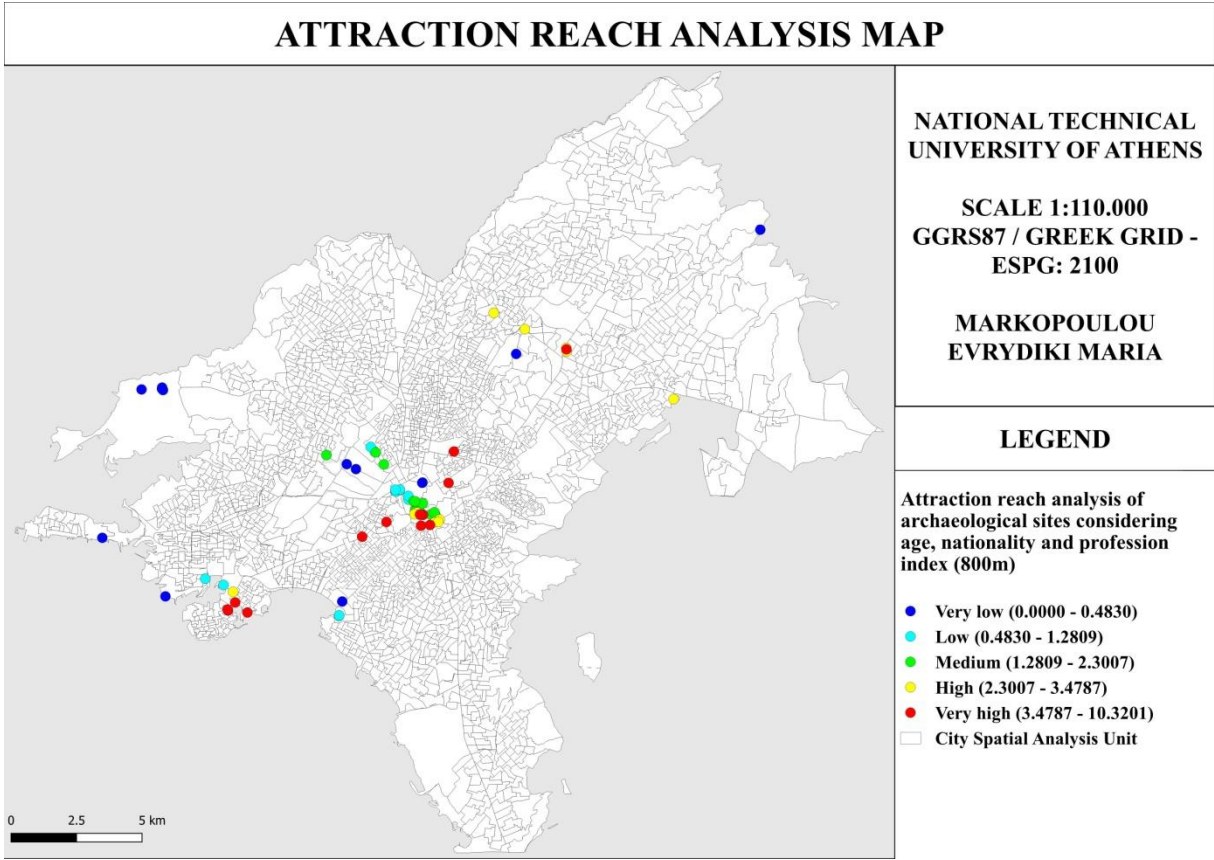
Map 2: Attraction reach analysis map on archaeological sites (radius 800m) regarding age, education and tenure index



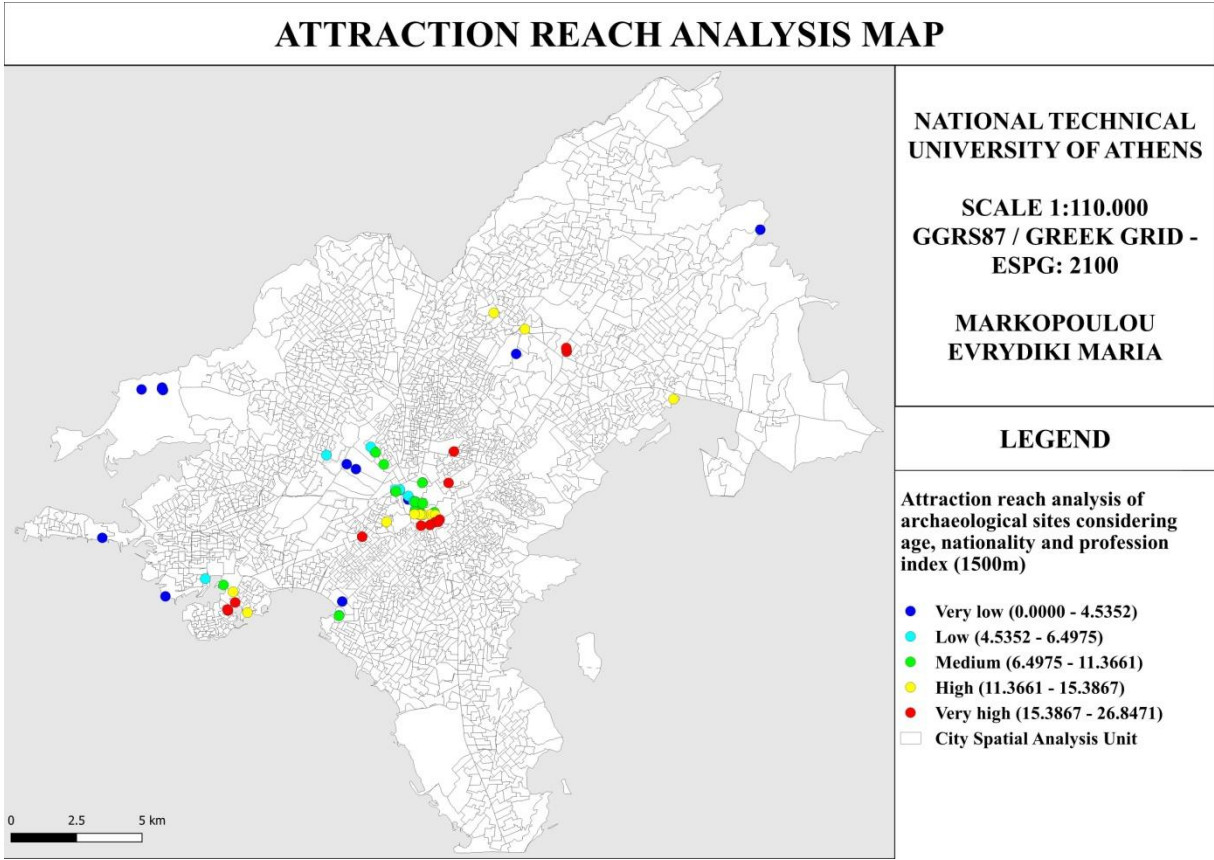
Map 10: Attraction reach analysis map on archaeological sites (radius 1500m) regarding age, education and tenure index



Map 11: Attraction reach analysis map on archaeological sites (radius 400m) regarding age, nationality and profession index



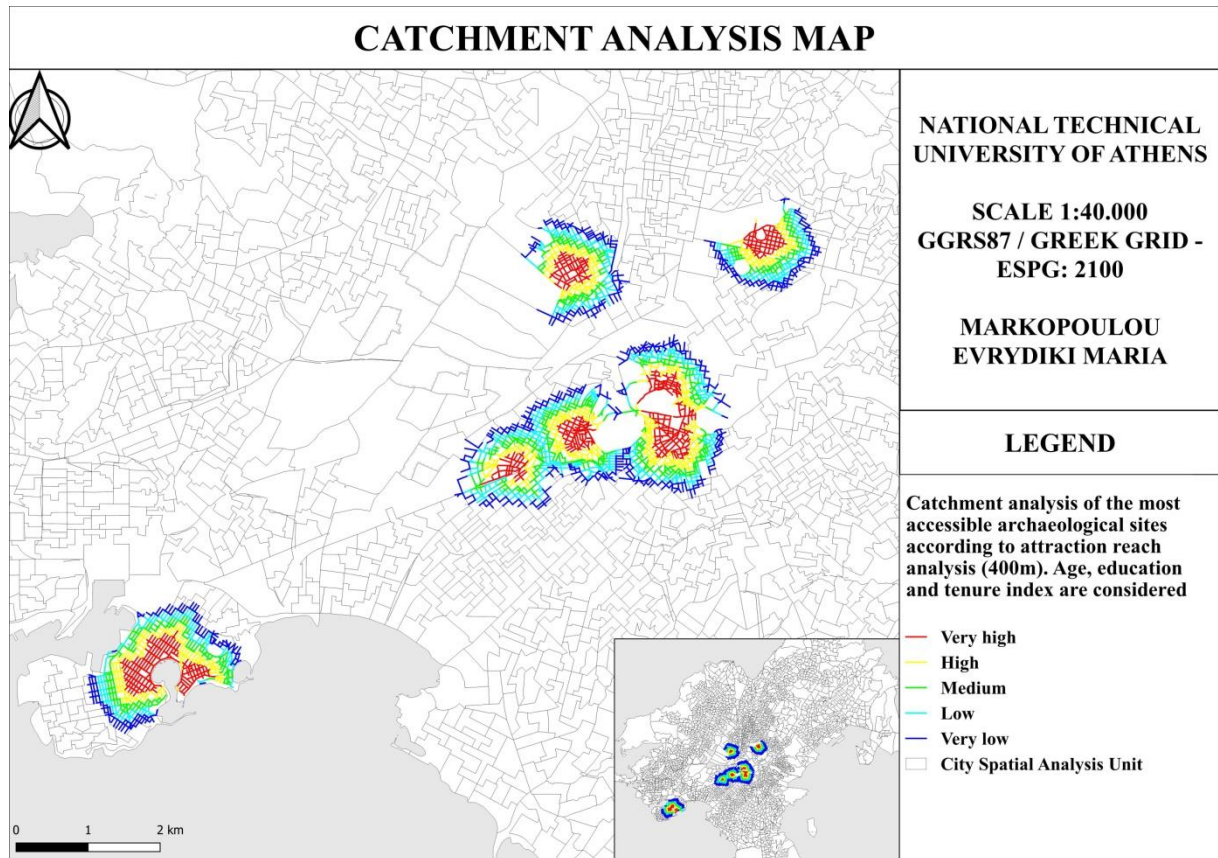
Map 12: Attraction reach analysis map on archaeological sites (radius 800m) regarding age, nationality and profession index



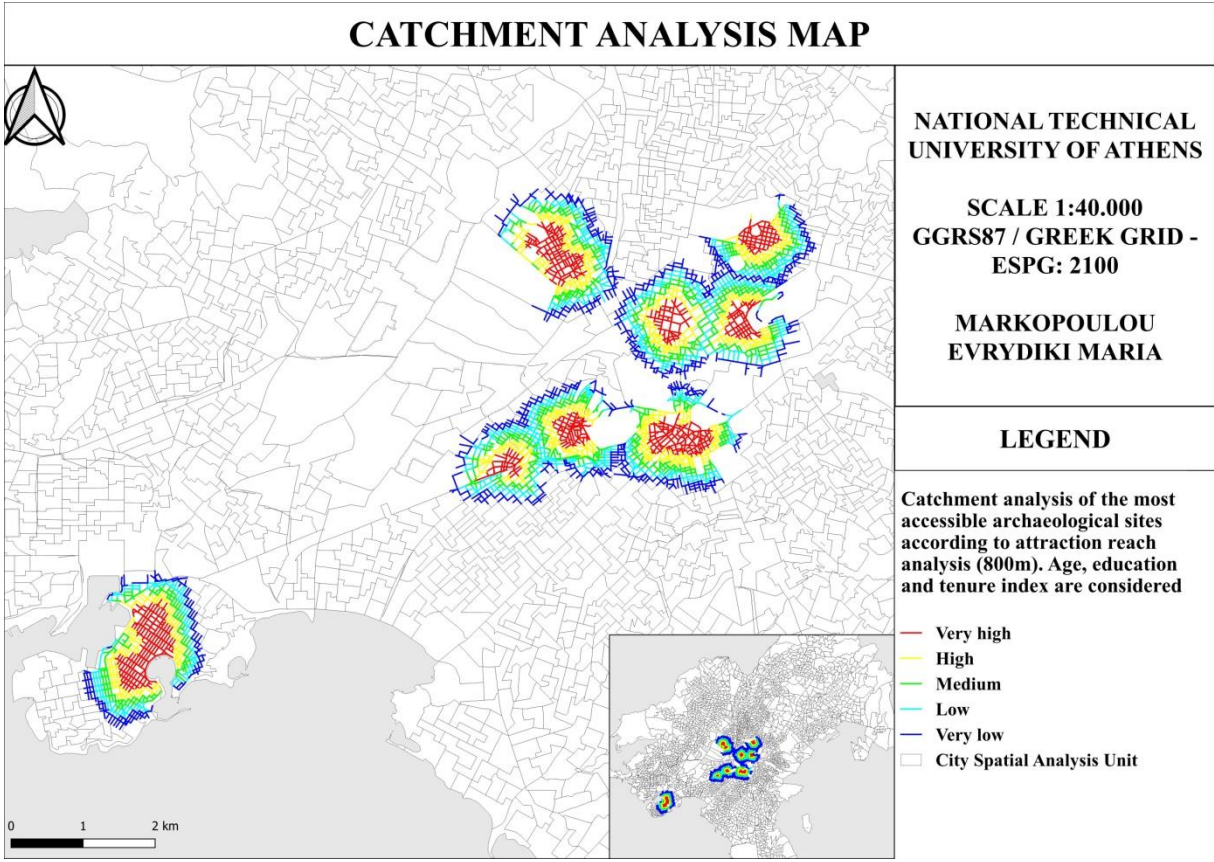
Map 13: Attraction reach analysis map on archaeological sites (radius 1500m) regarding age, nationality and profession index

The analysis pinpoints that the most accessible archaeological areas of interest are at the City Center, Piraeus and Metaxourgeio and Keramikos, which is confirmed in all radii.

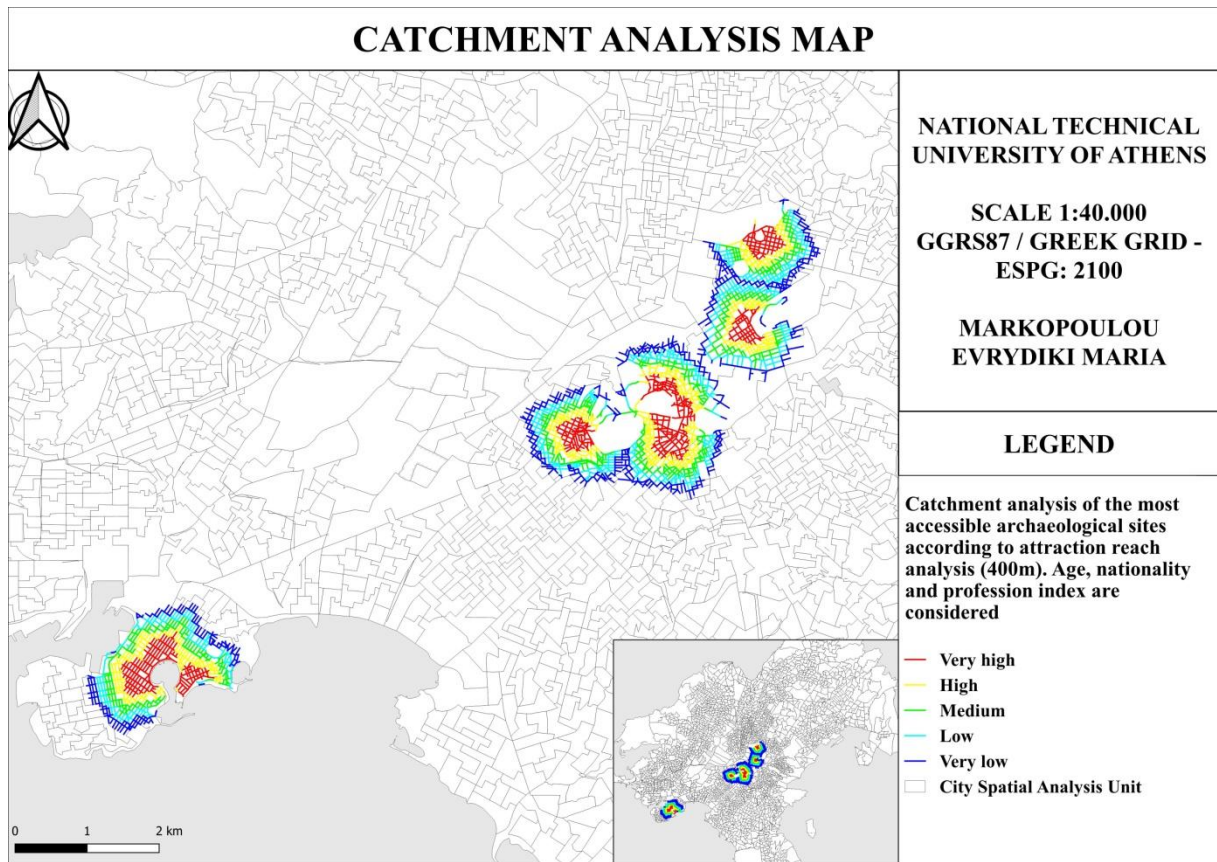
The Catchment analysis maps depict the effect of the most accessible archaeological sites on the surrounding areas.



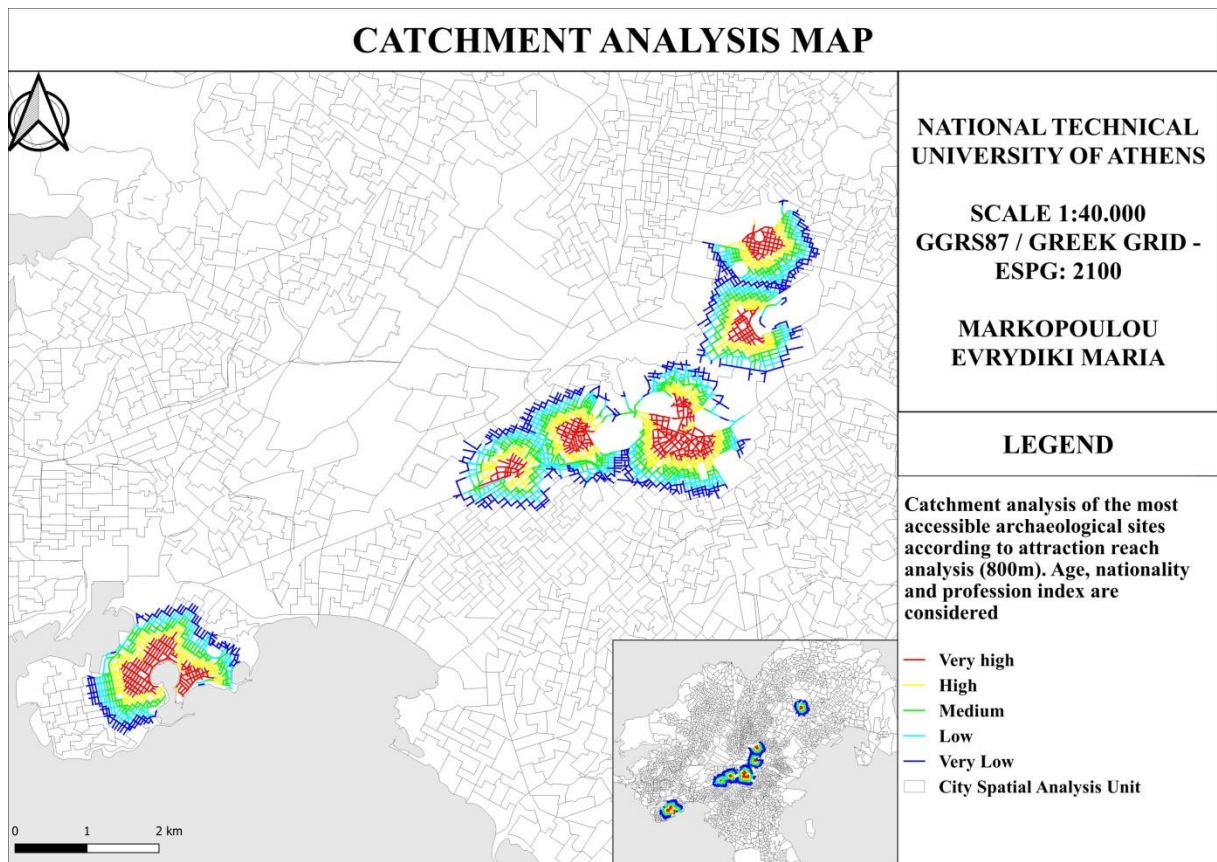
Map14: Catchment analysis map on the most accessible archaeological sites (radius 400m) regarding age, education and tenure index



Map 15: Catchment analysis map on the most accessible archaeological sites (radius 800m) regarding age, education and tenure index



Map 16: Catchment analysis map on the most accessible archaeological sites (radius 400m) regarding age, nationality and profession index



Map 17: Catchment analysis map on the most accessible archaeological sites (radius 800m) regarding age, nationality and profession index

The analysis shows that the most accessible archaeological sites are located in the City Center and Piraeus and that the areas affected by their presence are Exarcheia, Pagrati, Metaxourgeio, Keramikos and Piraeus.

Subway stations

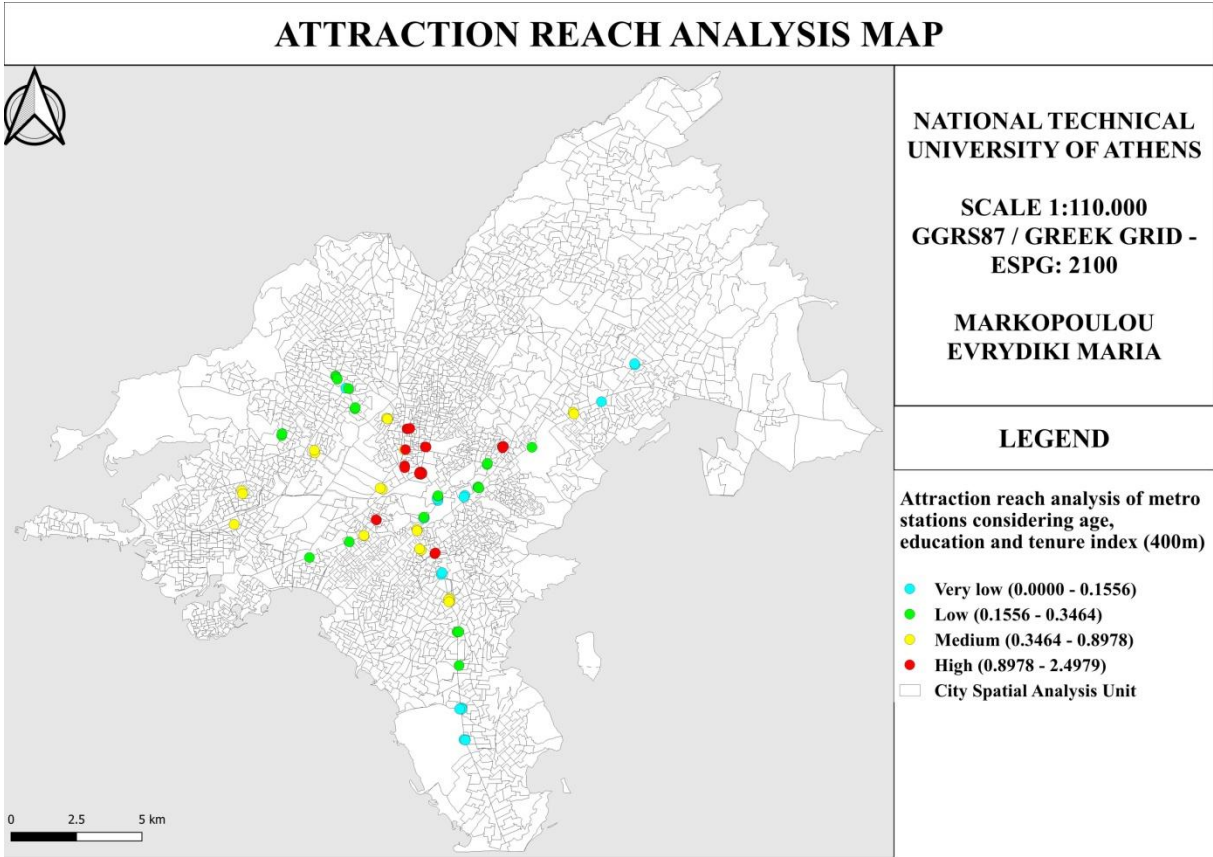
According to the TCPR (2004), some scholars argue that the presence of transit stations in an area may prompt gentrification. Public transport provides convenience in transportation across the city and eliminates disadvantages of moving by car. Consequently, areas with access to public transportation are more likely to attract people with higher income. As demand rises, so do housing costs, which leads to the displacement of residents that face economic difficulties (Zuk et al, 2015).

The second component of the analysis is public transportation. The Municipality of Athens has one urban train line, the line 1 (green), which covers the distance from Kifissia to Piraeus port. The metro line 2 (red) links Anthoupoli, the northeastern of the metropolitan area to the southern part of Elliniko. An expansion is also programmed, in order to extend the line further to the northeast. The metro line 3 (blue) runs through the east to west axis of the area, linking the International Airport “Eleftherios Venizelos” to the Piraeus port. Finally, the construction of line 4 is to be finished by 2029.

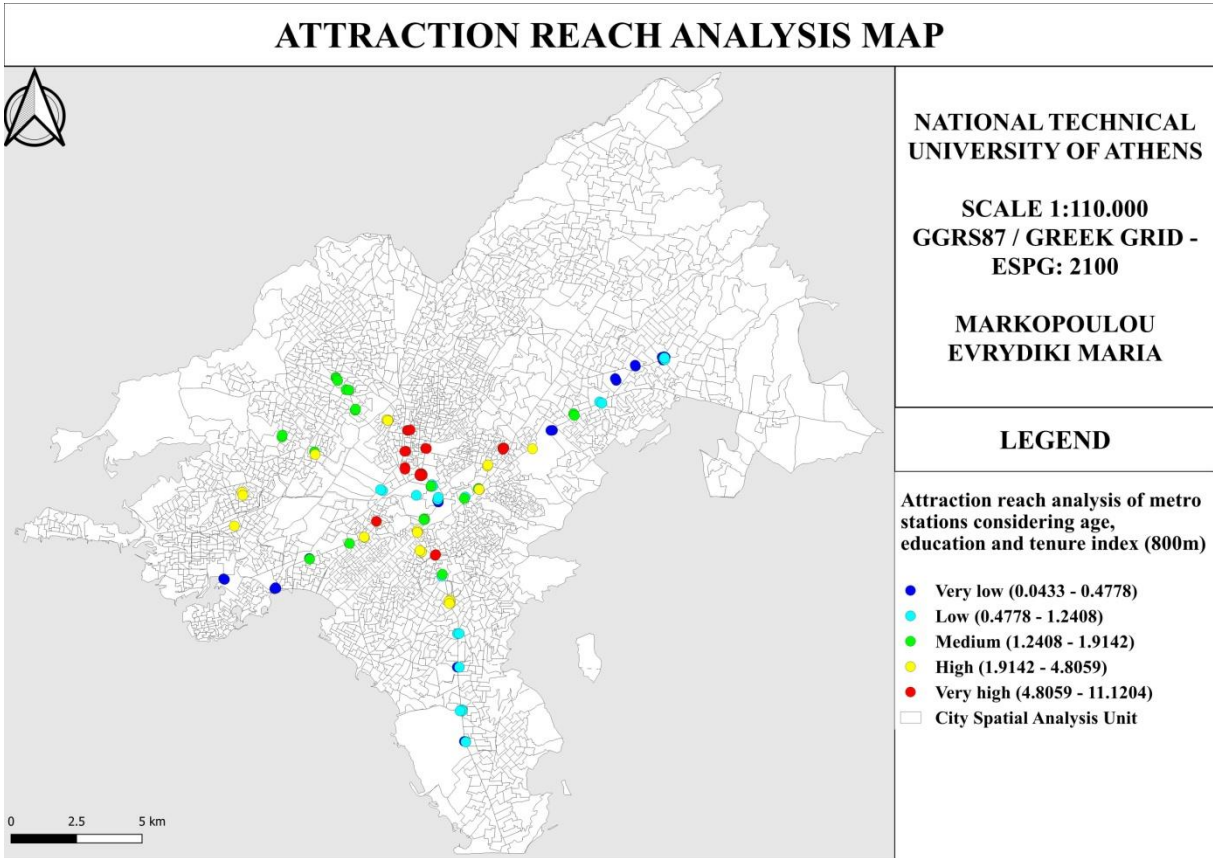
The points represent every existing metro station. The Attraction Reach analysis (age, education and tenure index on Maps 18-20 and age, nationality and profession index on Maps 21-23 shows that the clusters are located along all metro lines. Nevertheless, most clusters can be found near the city center, as well as in:

- Chalandri
- Peristeri
- Dafni
- Agios Dimitrios
- Argyropoli
- a broader area near Piraeus

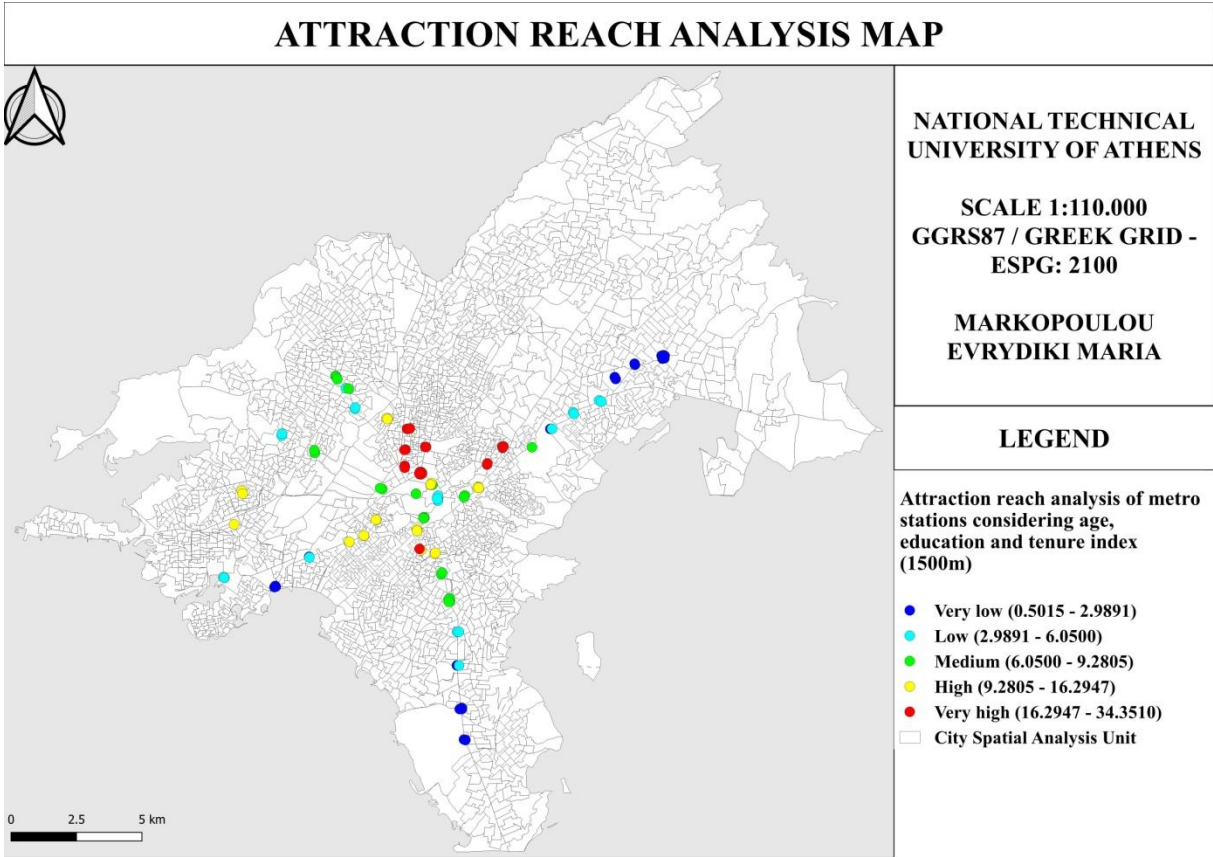
Once again, the Catchment analysis will reveal the affected areas.



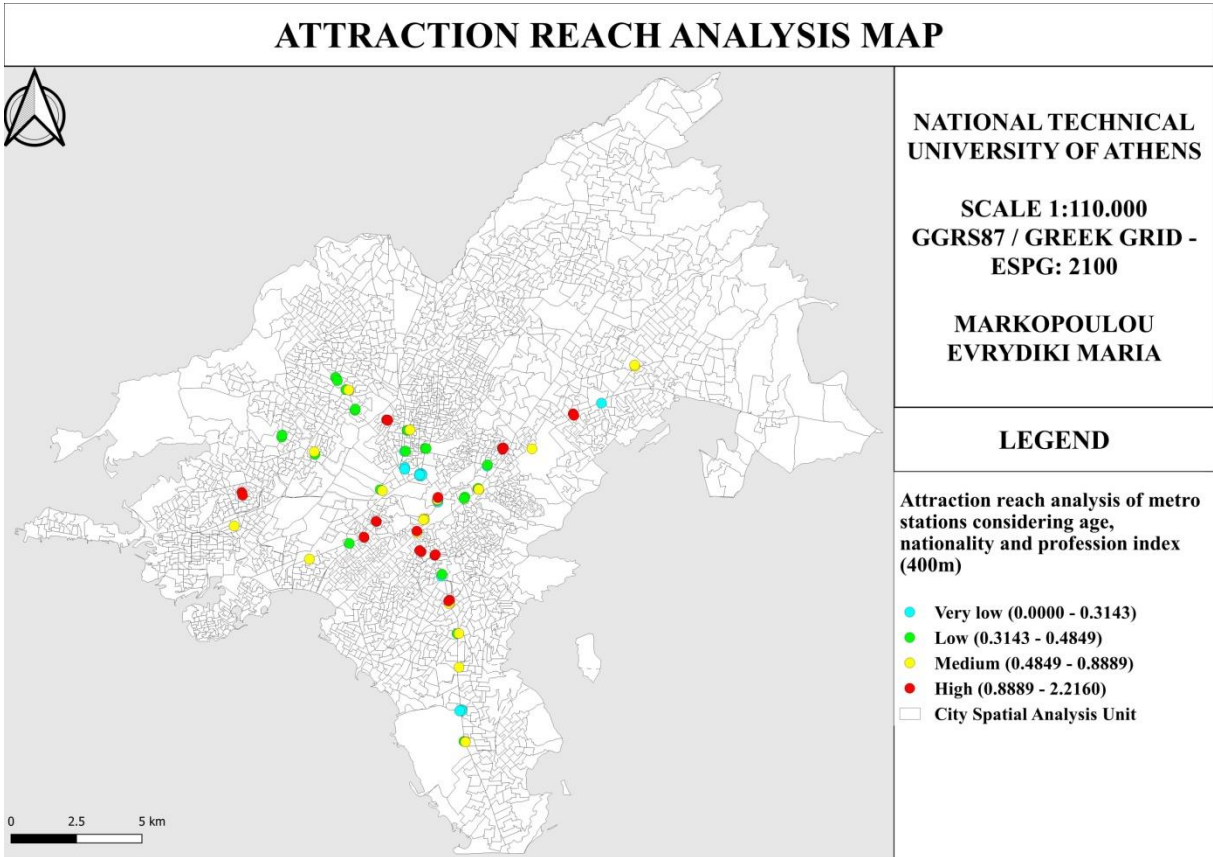
Map 20: Attraction reach analysis map on subway stations (radius 400m) regarding age, education and tenure index



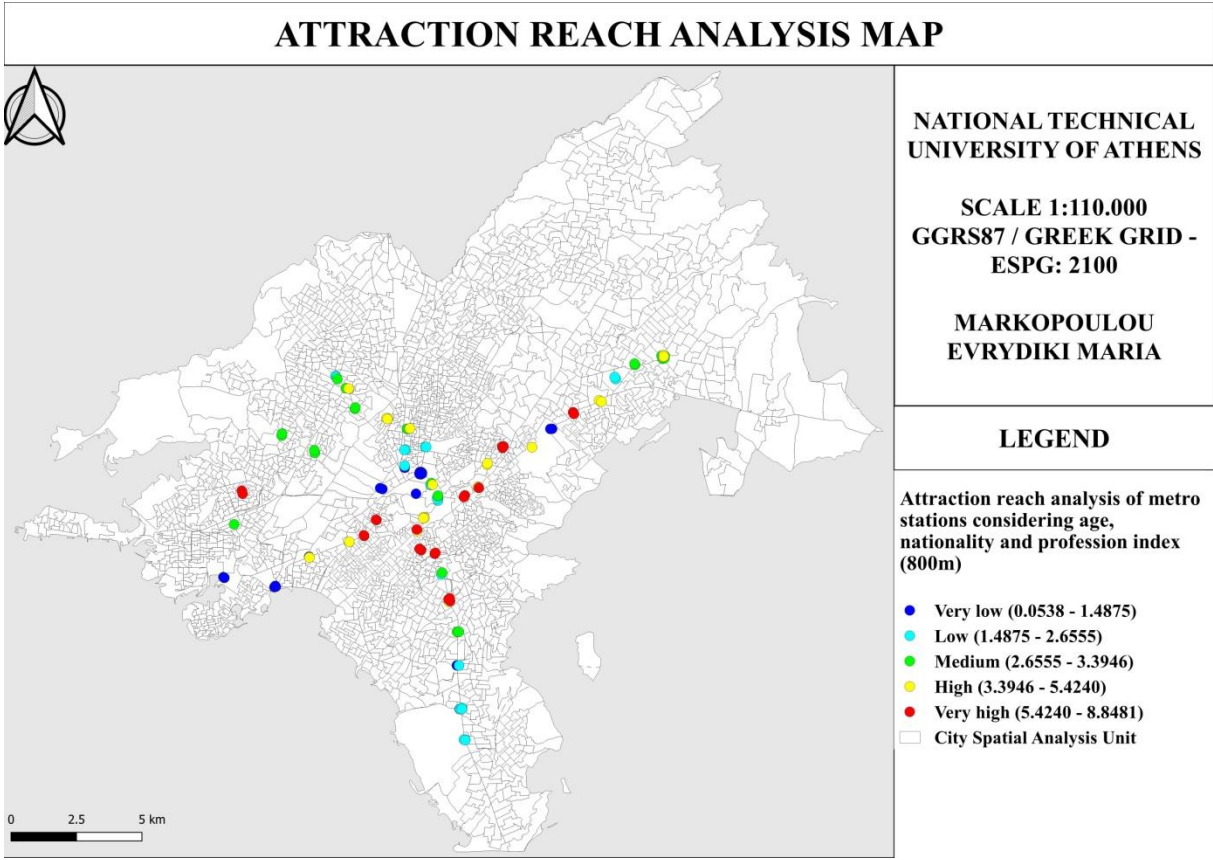
Map 21: Attraction reach analysis map on subway stations (radius 800m) regarding age, education and tenure index



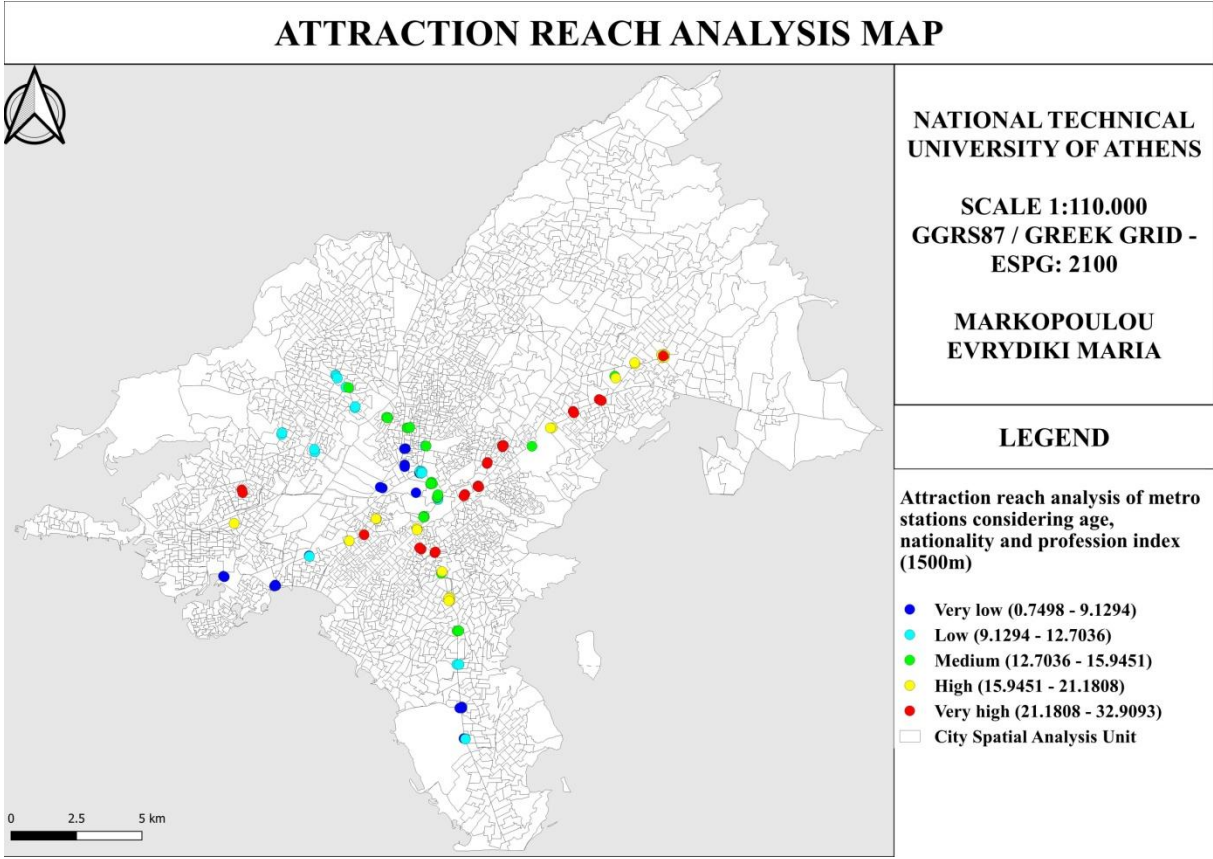
Map 22: Attraction reach analysis map on subway stations (radius 1500m) regarding age, education and tenure index



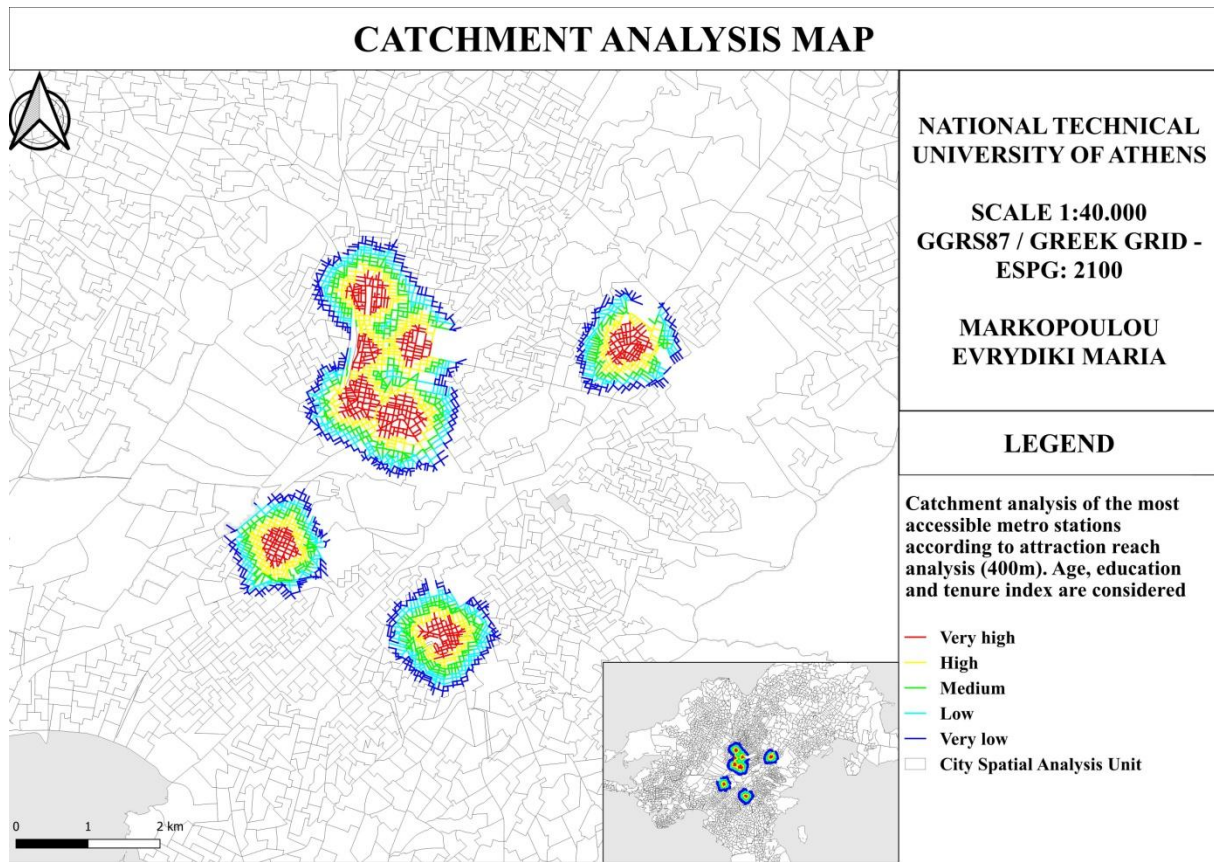
Map 23: Attraction reach analysis map on subway stations (radius 400m) regarding age, nationality and profession index



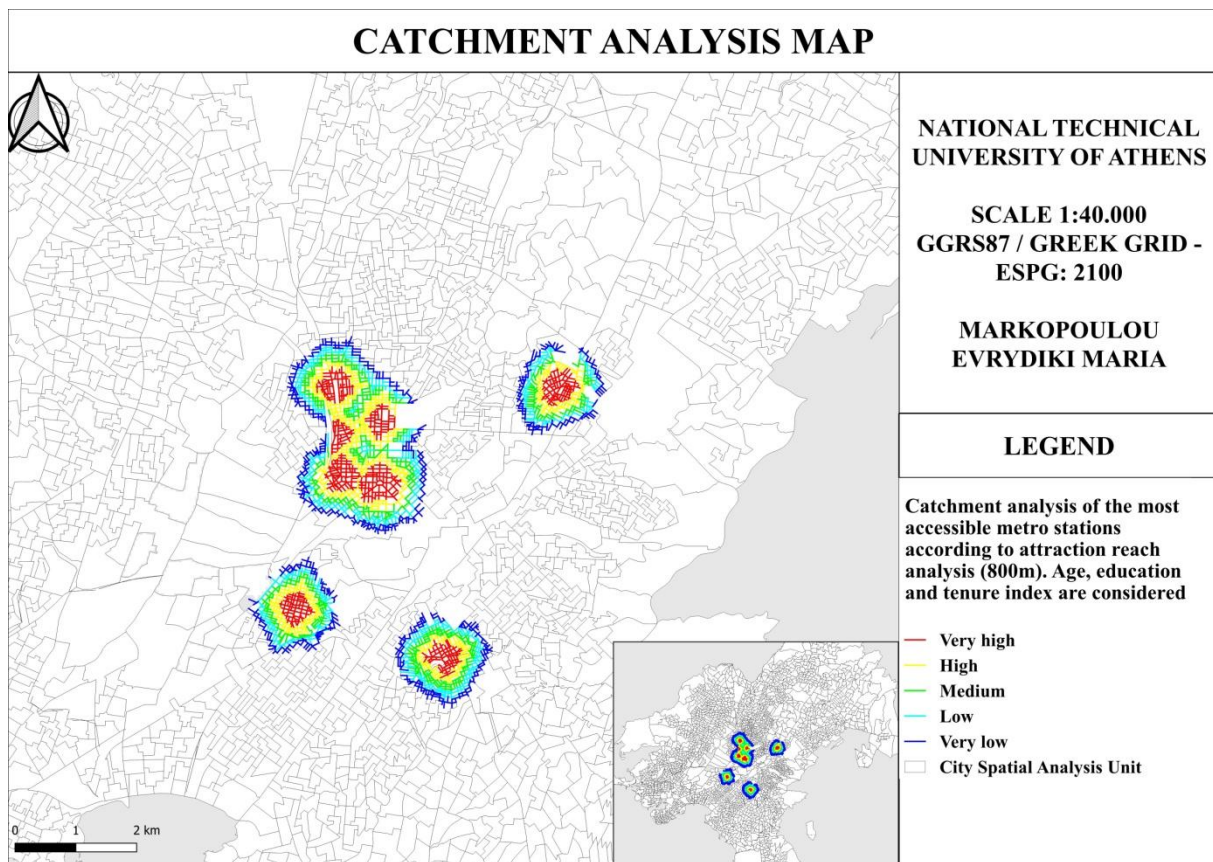
Map 24: Attraction reach analysis map on subway stations (radius 800m) regarding age, nationality and profession index



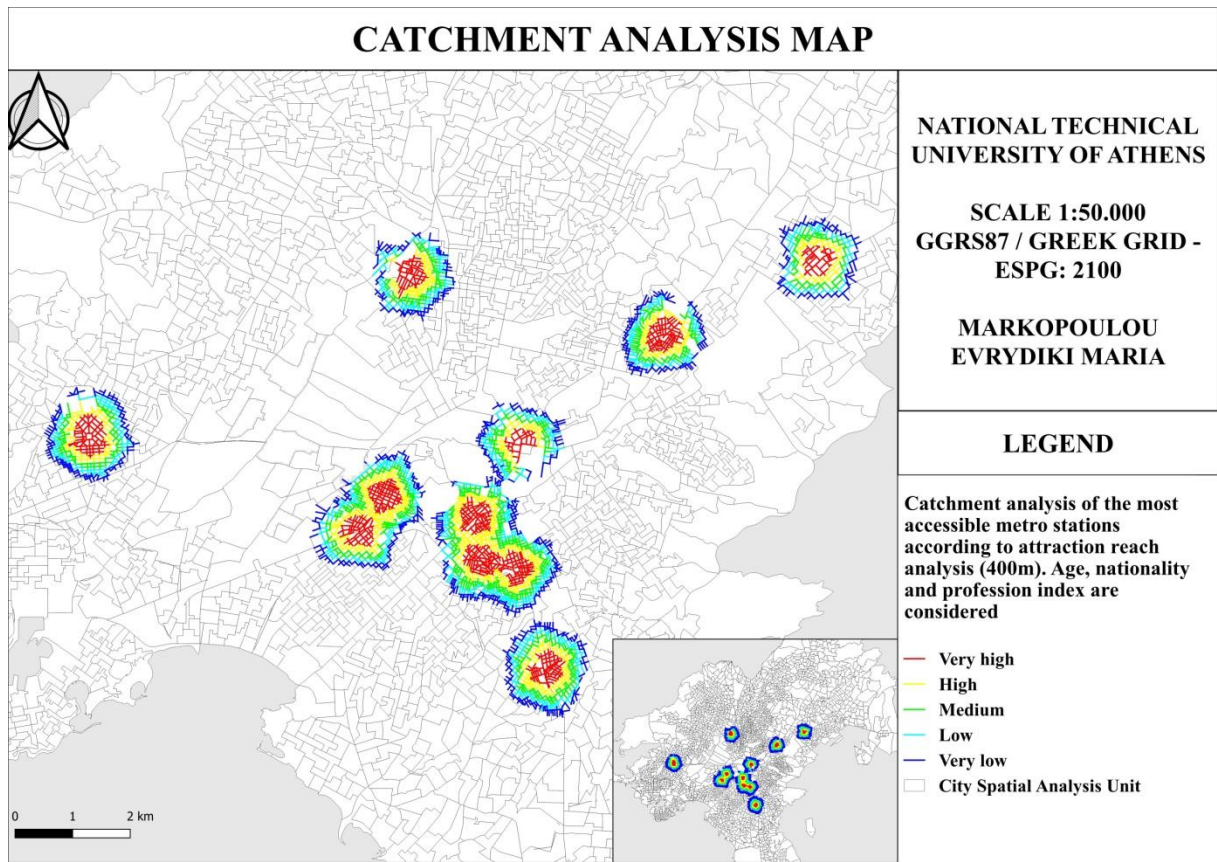
Map 25: Attraction reach analysis map on subway stations (radius 1500m) regarding age, nationality and profession index



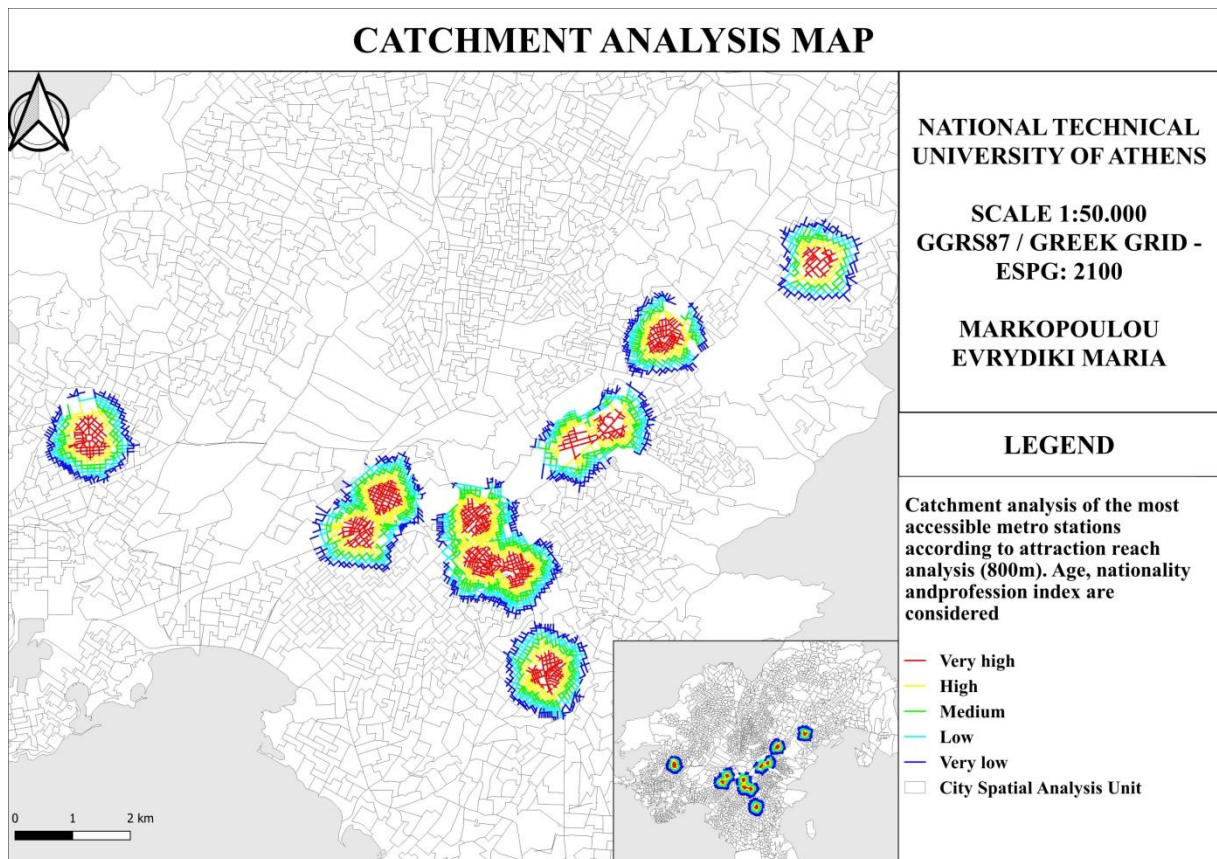
Map 26: Catchment analysis map on the most accessible subway stations (radius 400m) regarding age, education and tenure index



Map 27: Catchment analysis map on the most accessible subway stations (radius 800m) regarding age, education and tenure index



Map 28: Catchment analysis map on the most accessible subway stations (radius 400m) regarding age, nationality and profession index



Map 29: Catchment analysis map on the most accessible subway stations (radius 800m) regarding age, nationality and profession index

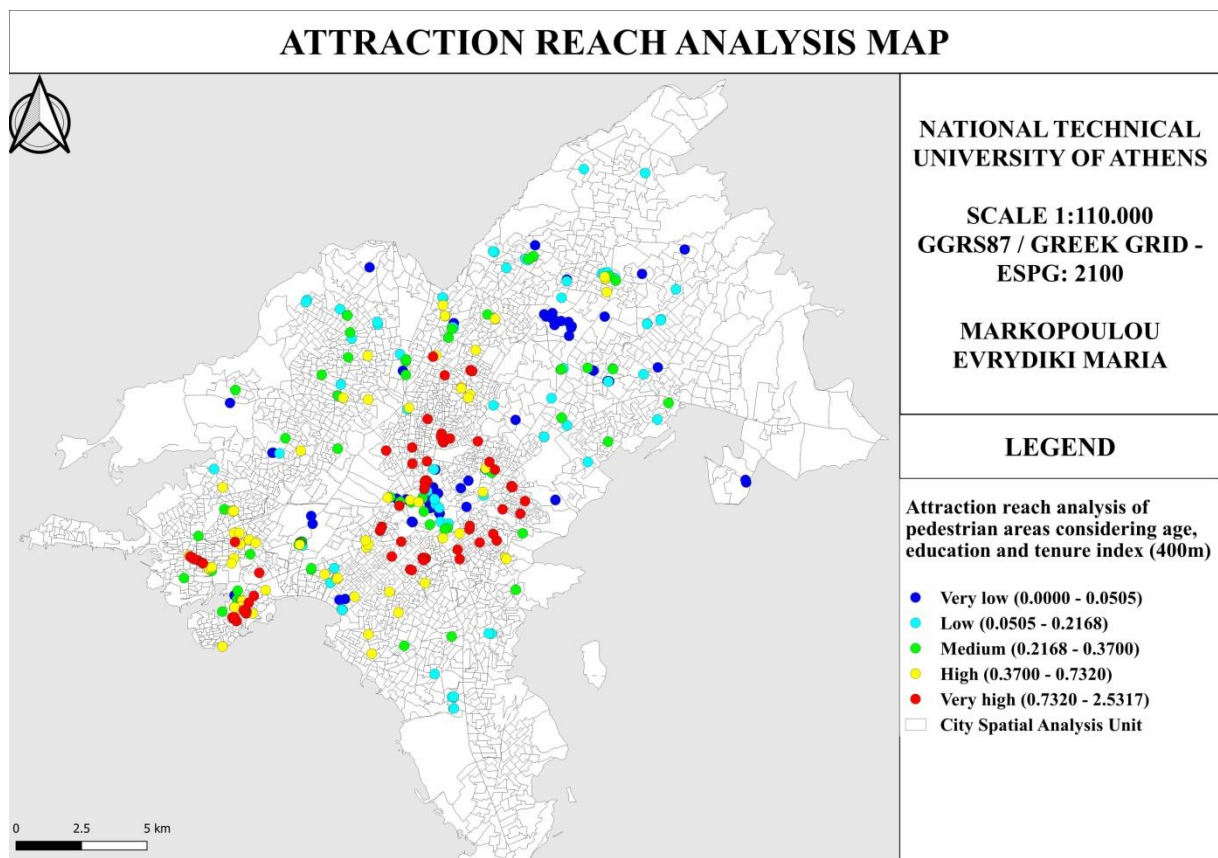
The catchment analysis show that the areas of interest are more dispesed.

Pedestrian area

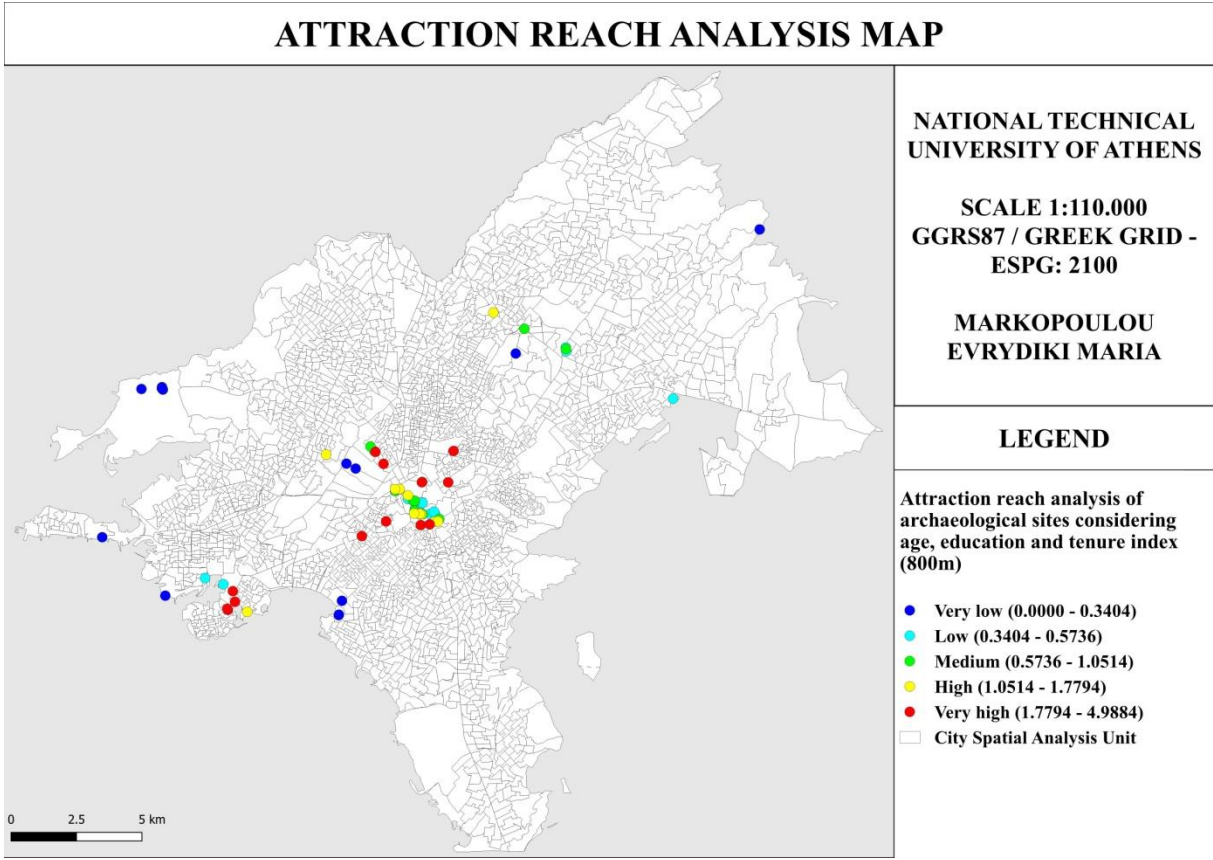
Özdemir and Selçuk (2017) argue that when pedestrianization projects occur, the city becomes more livable and increases its economical competitiveness, which may attract new residents. The increased demand affects the property values, which are likely to rise. Although the city and owners may benefit from it, tenants have to face inflated housing cost and potential displacement (Özdemir, Selçuk, 2017).

Once again, the same weights were used. The Attraction Reach analysis (Maps 30-35) pinpoints clusters in:

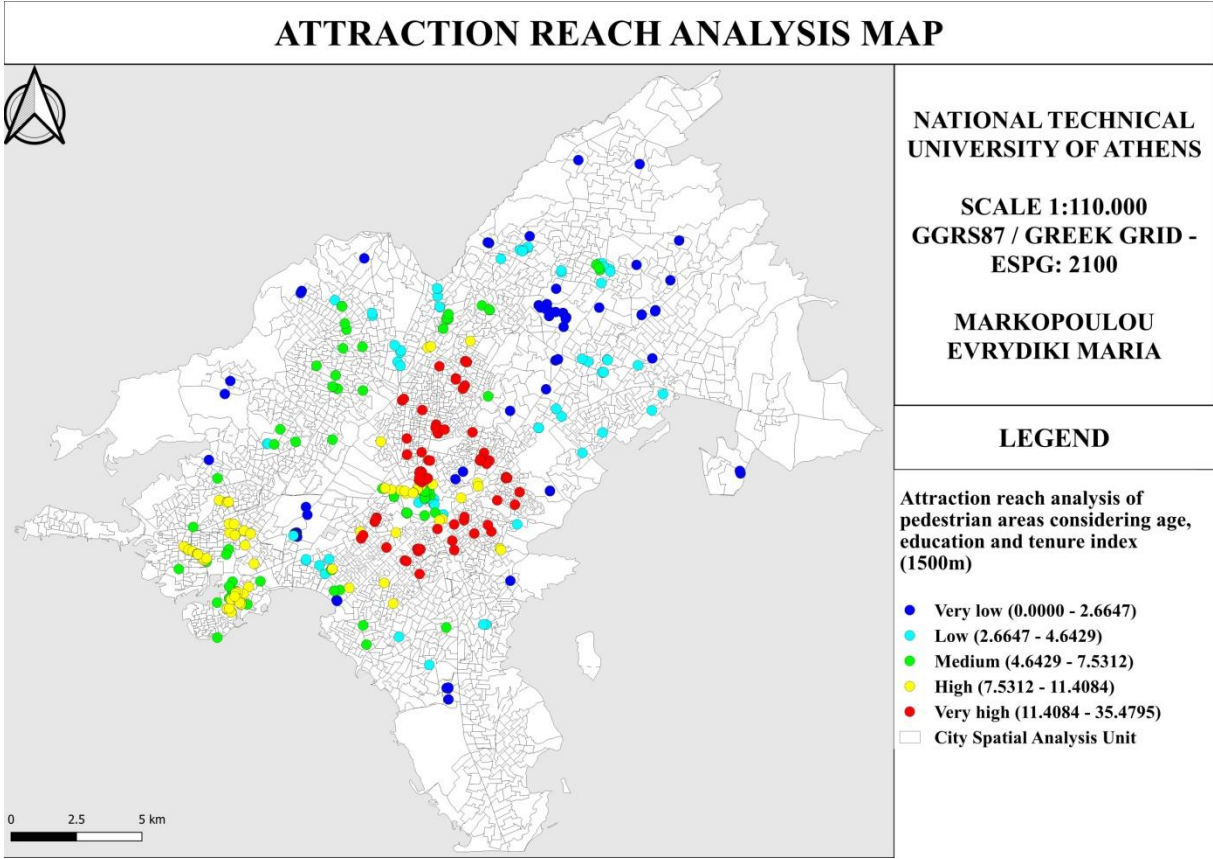
- city center
- Piraeus
- Kallithea
- Agios Ioannis Rentis
- Nikea
- Nea Philadelphia
- Marousi



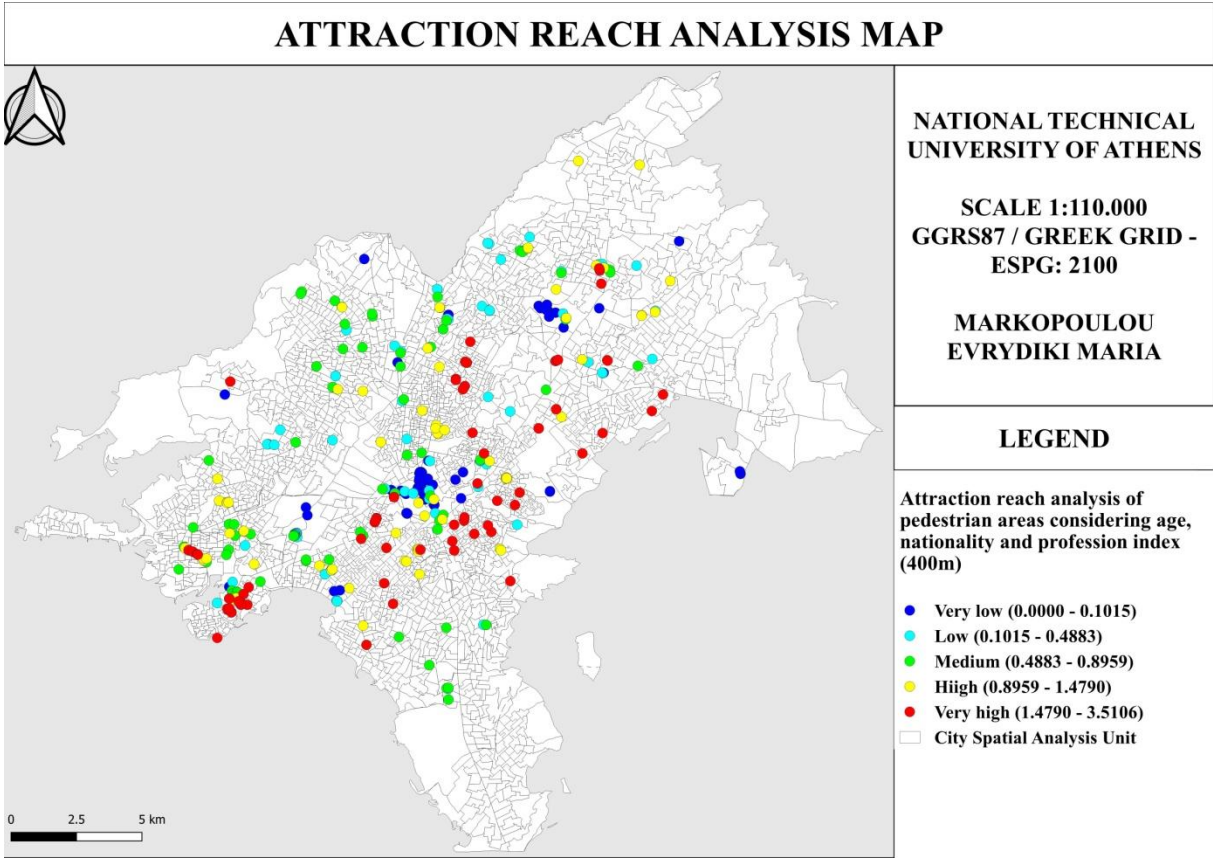
Map 30: Attraction reach analysis map on pedestrian areas (radius 400m) regarding age, education and tenure index



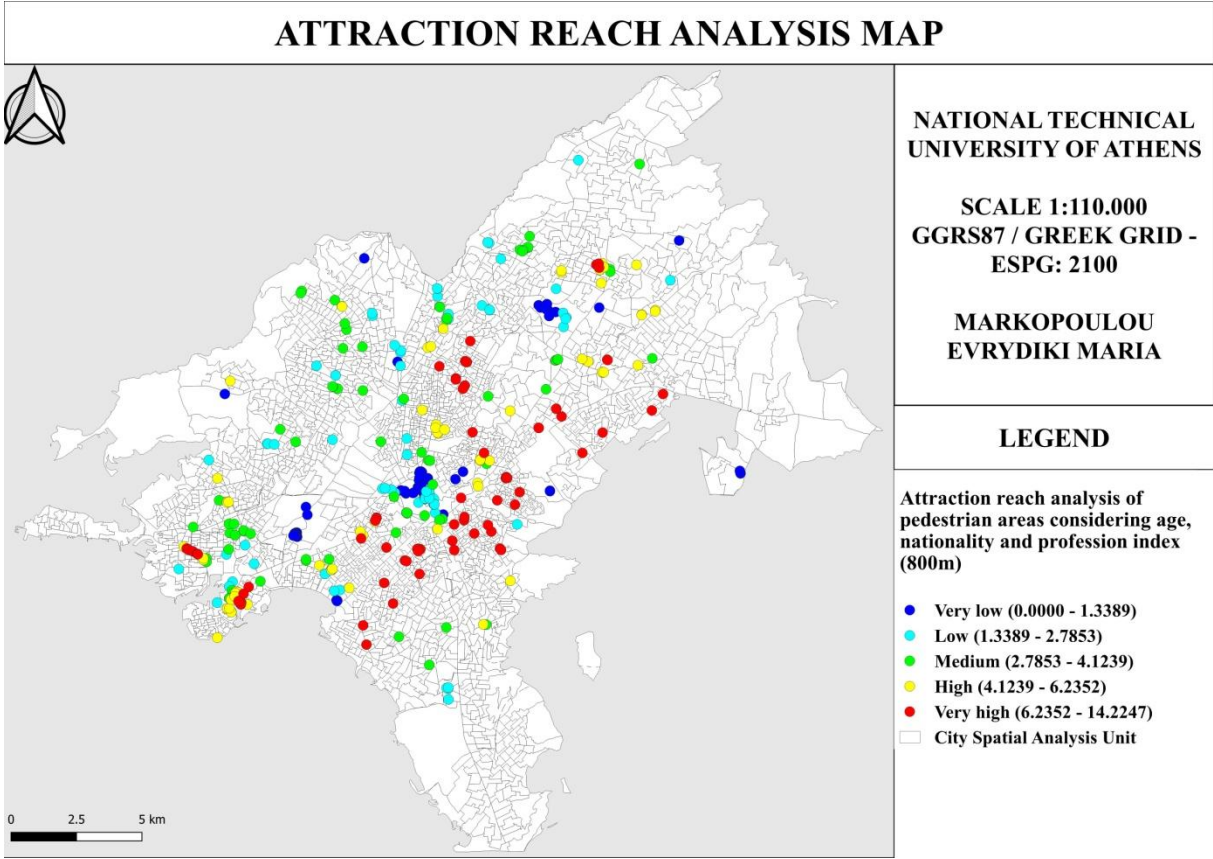
Map 31: Attraction reach analysis map on pedestrian areas (radius 800m) regarding age, education and tenure index



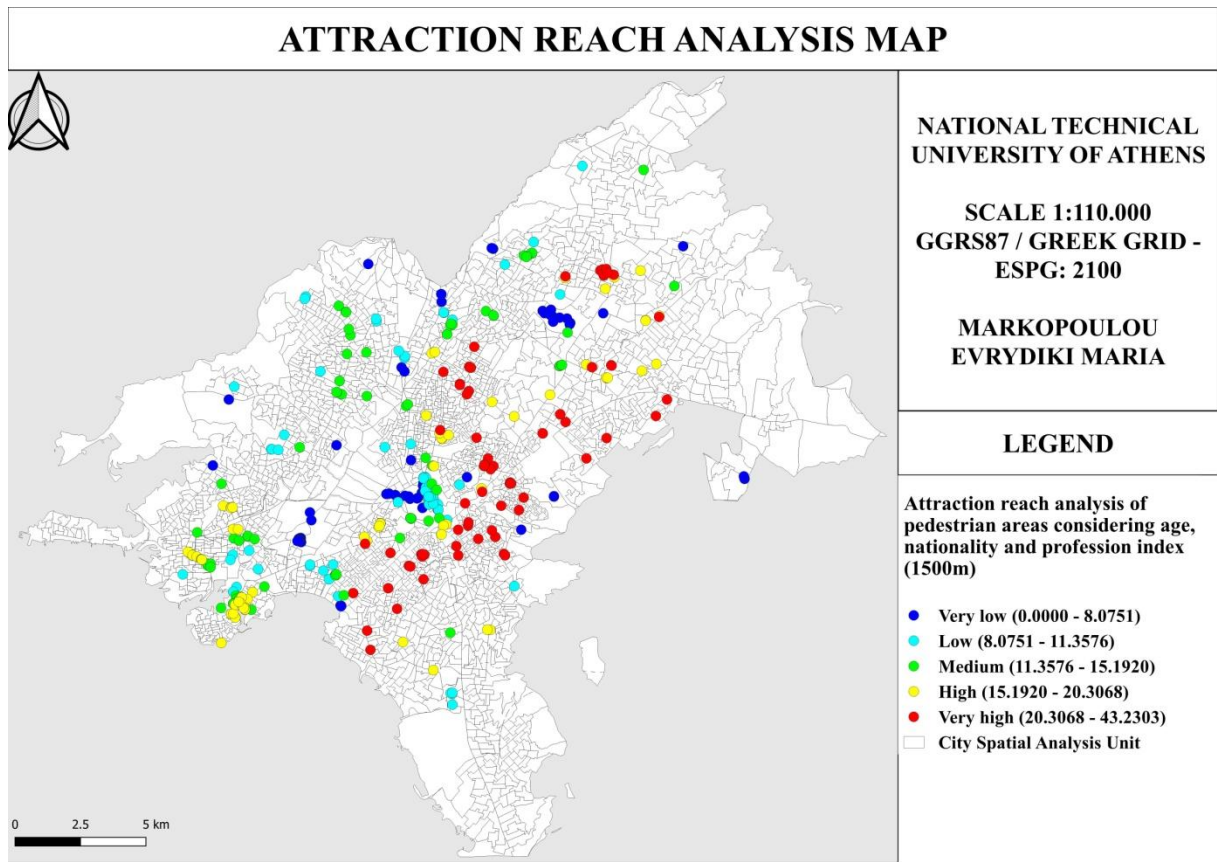
Map 32: Attraction reach analysis map on pedestrian areas (radius 1500m) regarding age, education and tenure index



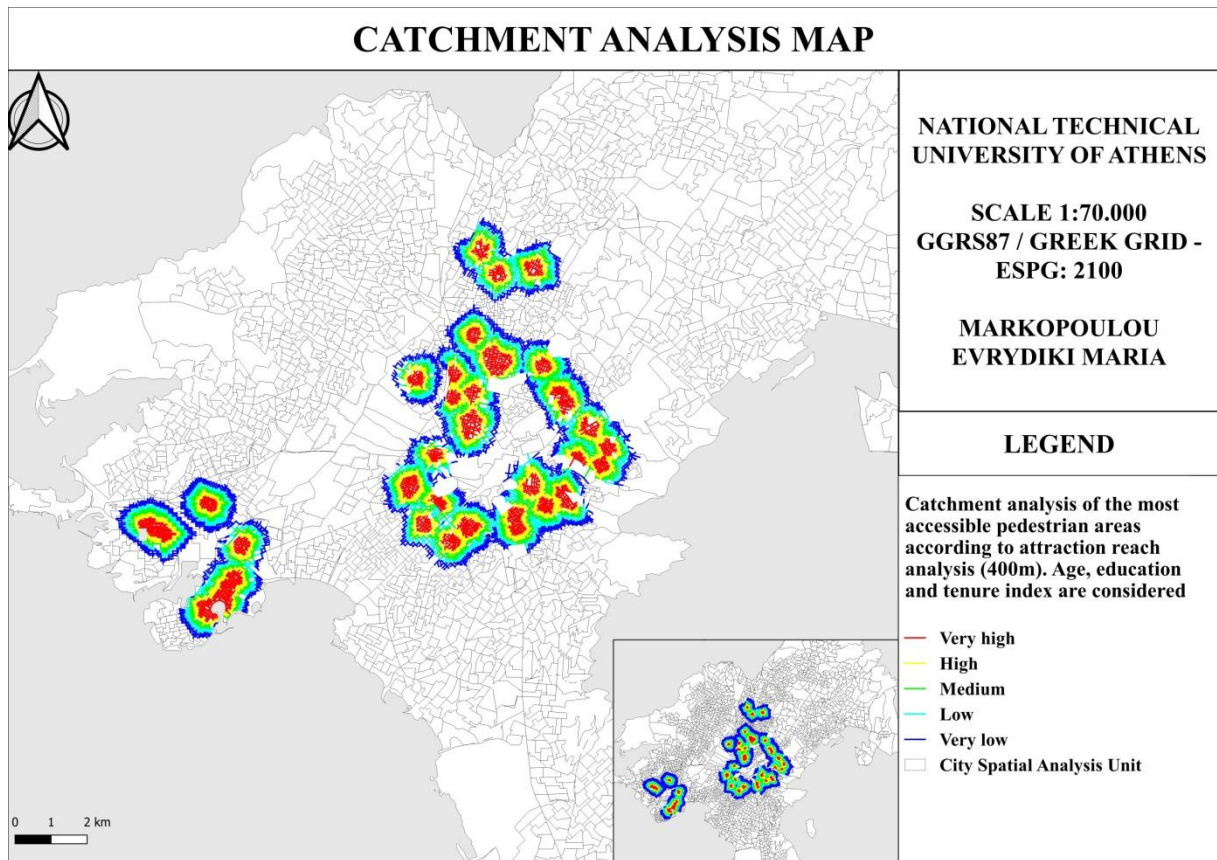
Map 33: Attraction reach analysis map on pedestrian areas (radius 400m) regarding age, nationality and profession index



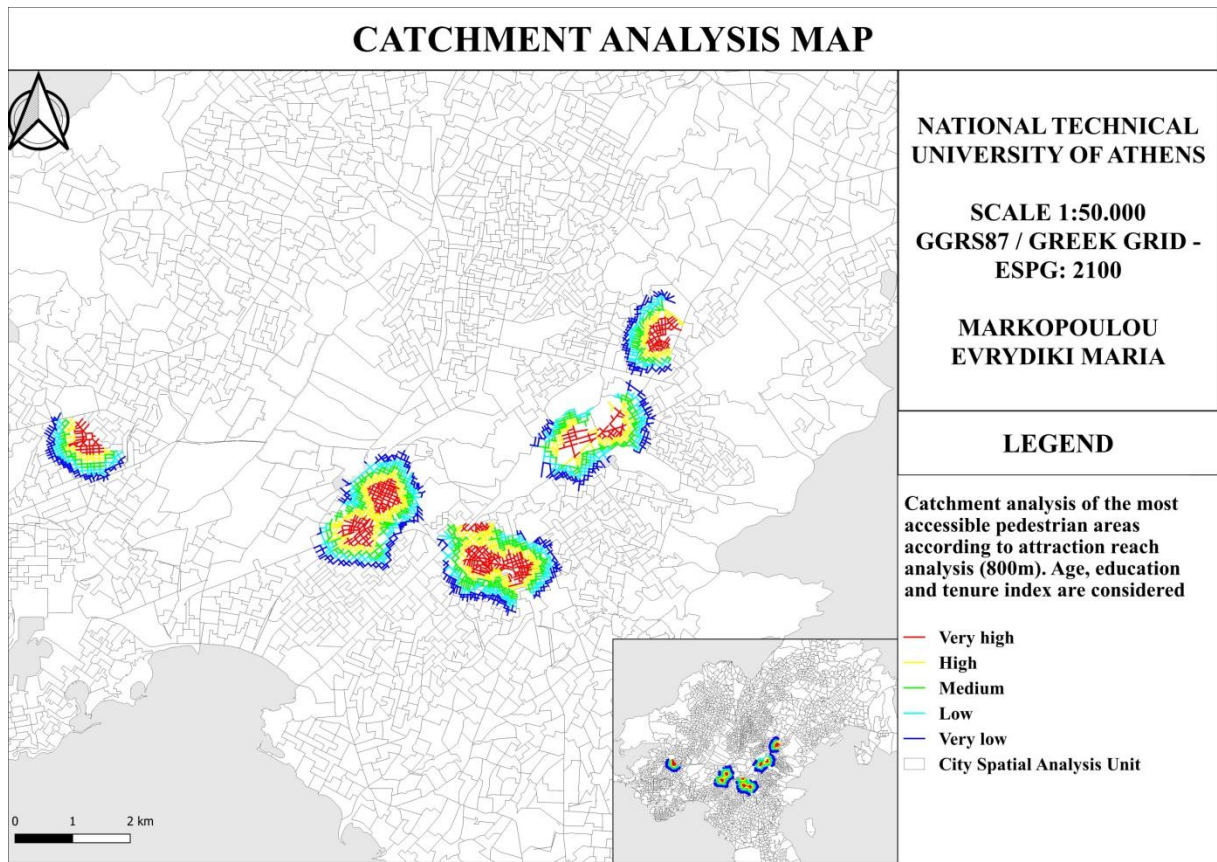
Map 34: Attraction reach analysis map on pedestrian areas (radius 400m) regarding age, nationality and profession index



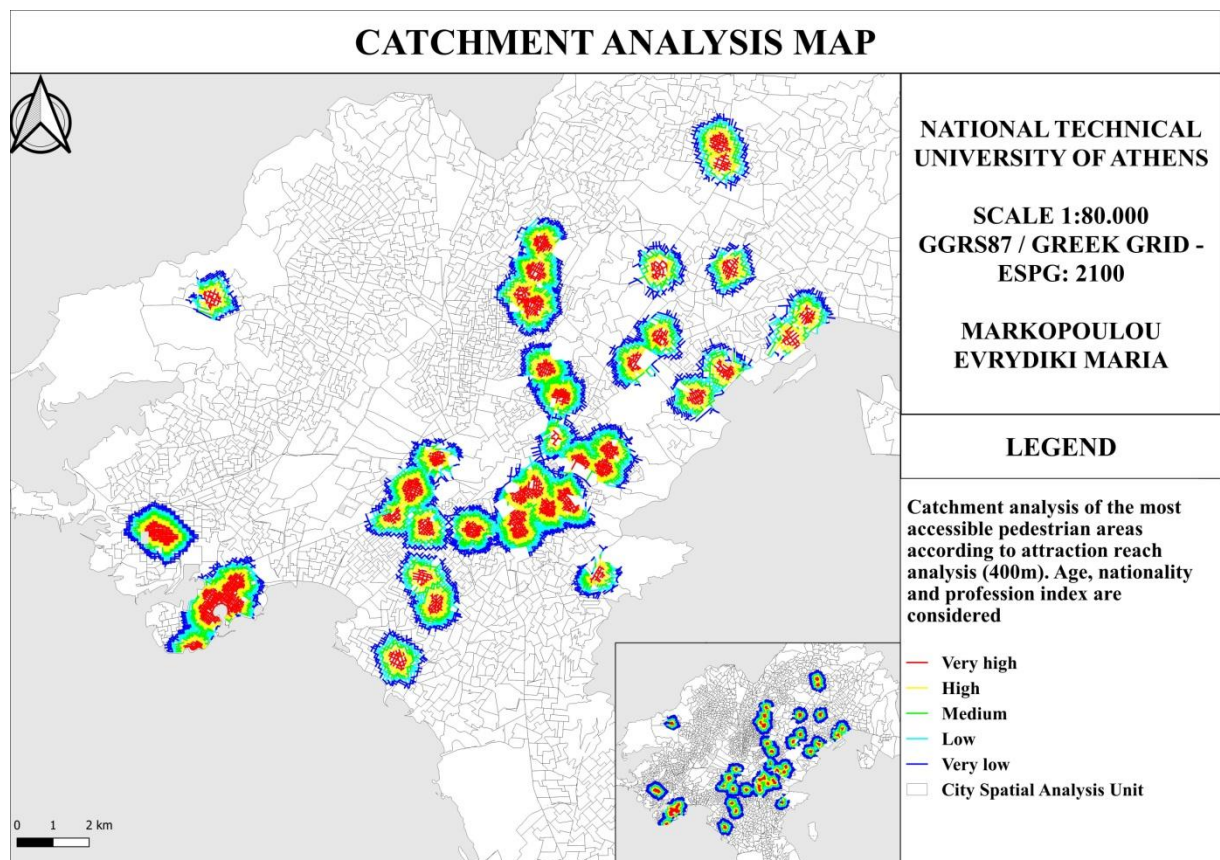
Map 35: Attraction reach analysis map on pedestrian areas (radius 1500m) regarding age, nationality and profession index



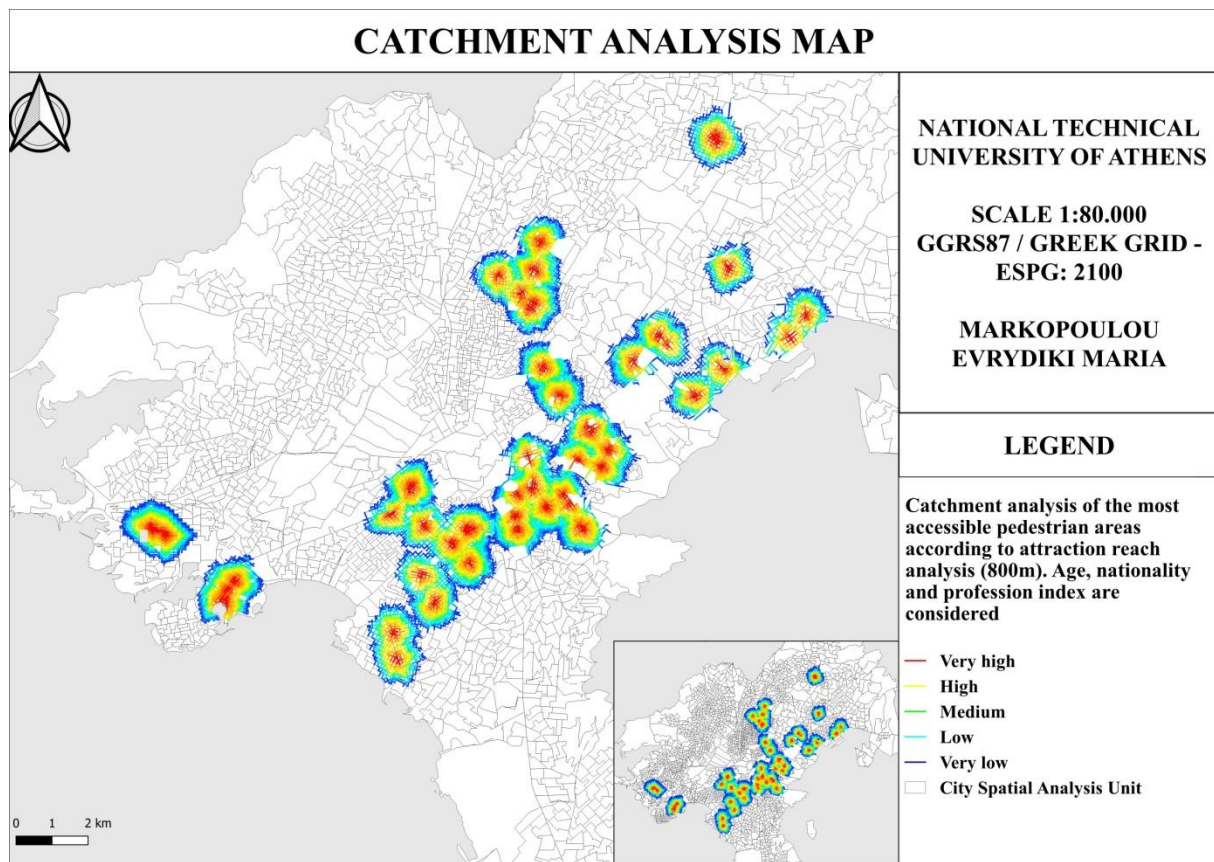
Map 36: Catchment analysis map on the most accessible pedestrian areas (radius 400m) regarding age, education and tenure index



Map 37: Catchment analysis map on the most accessible pedestrian areas (radius 800m) regarding age, education and tenure index



Map 38: Catchment analysis map on the most accessible pedestrian areas (radius 400m) regarding age, nationality and profession index

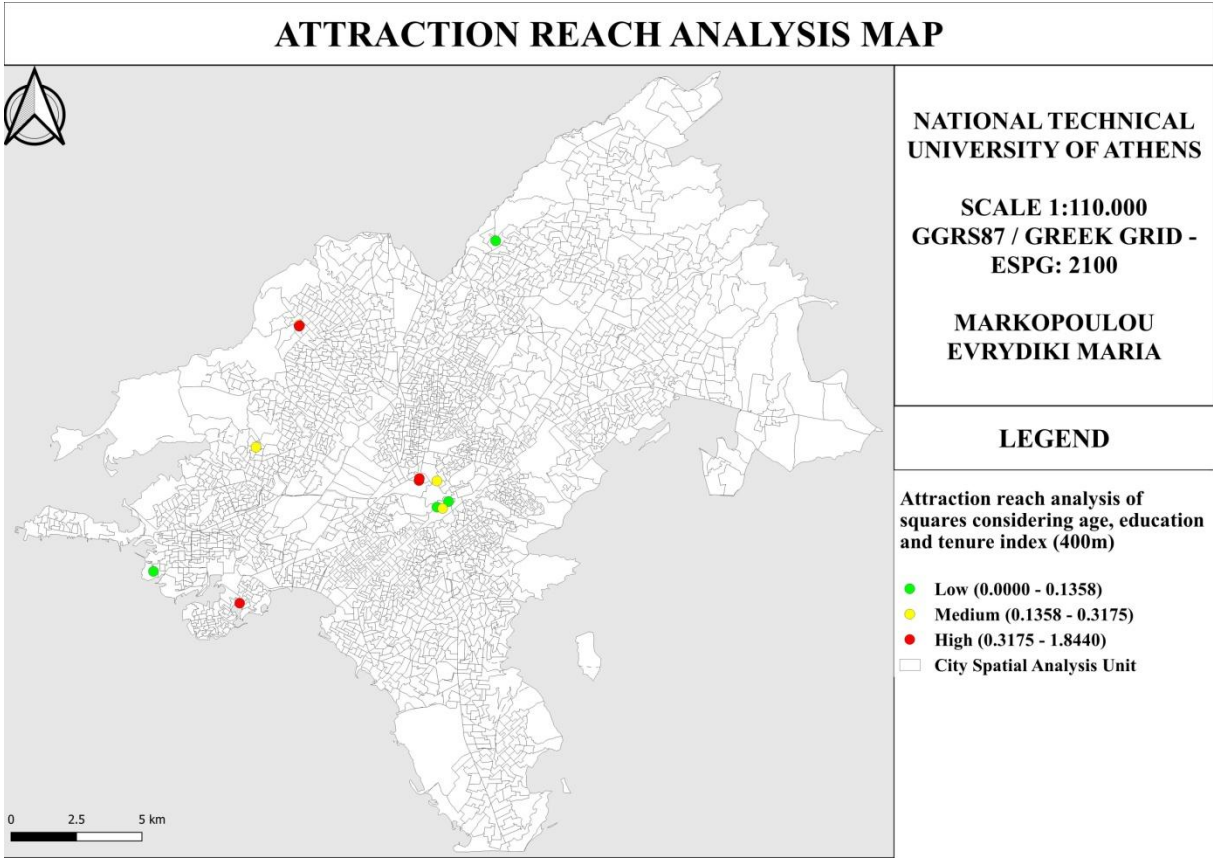


Map 39: Catchment analysis map on the most accessible pedestrian areas (radius 800m) regarding age, nationality and profession index

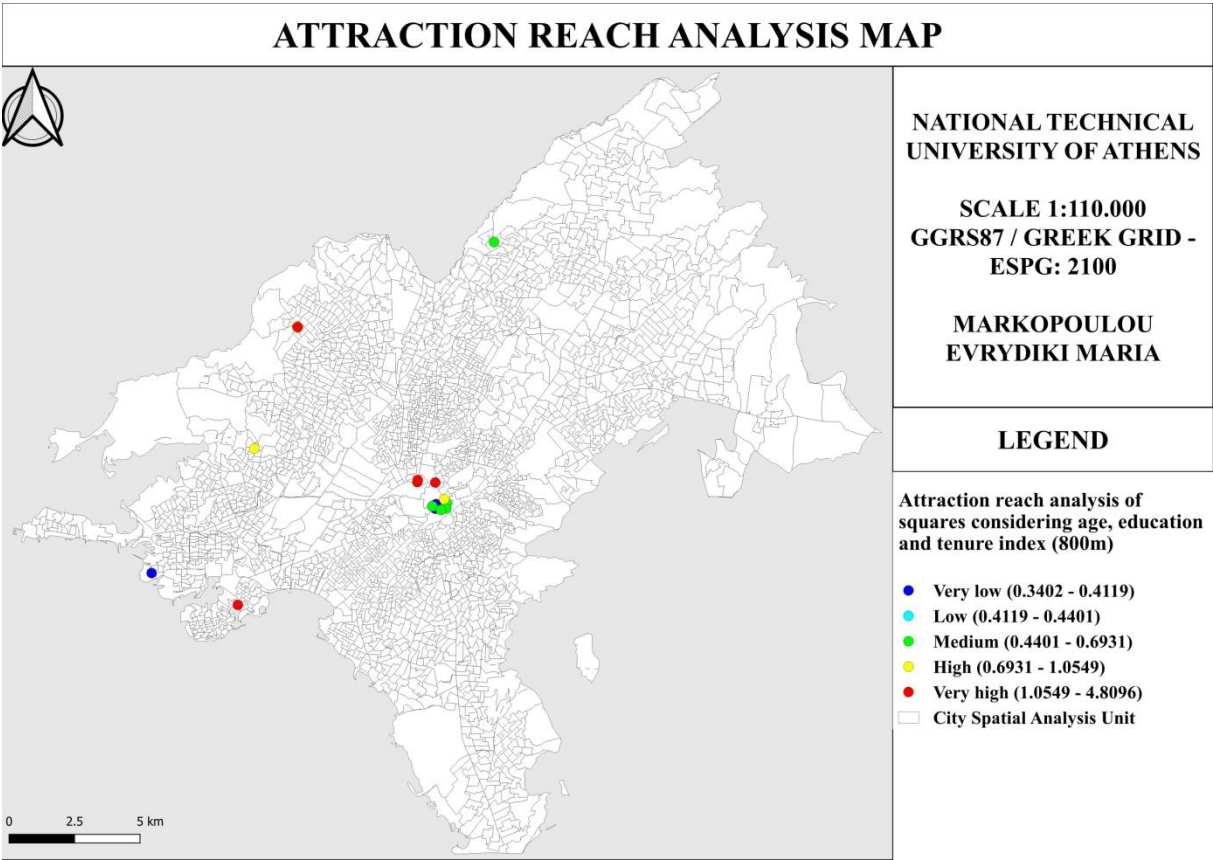
Catchment analysis maps show that most affected areas are situated at the southeast part of the Attiki basin.

Squares

Similar to pedestrian areas, squares affect the city's spatial patterns and transform it. The Attraction Reach analysis (same weights used as in previous maps) on a 400m radius shows clusters in the City Center, Piraeus and Keratsini (Map 19).

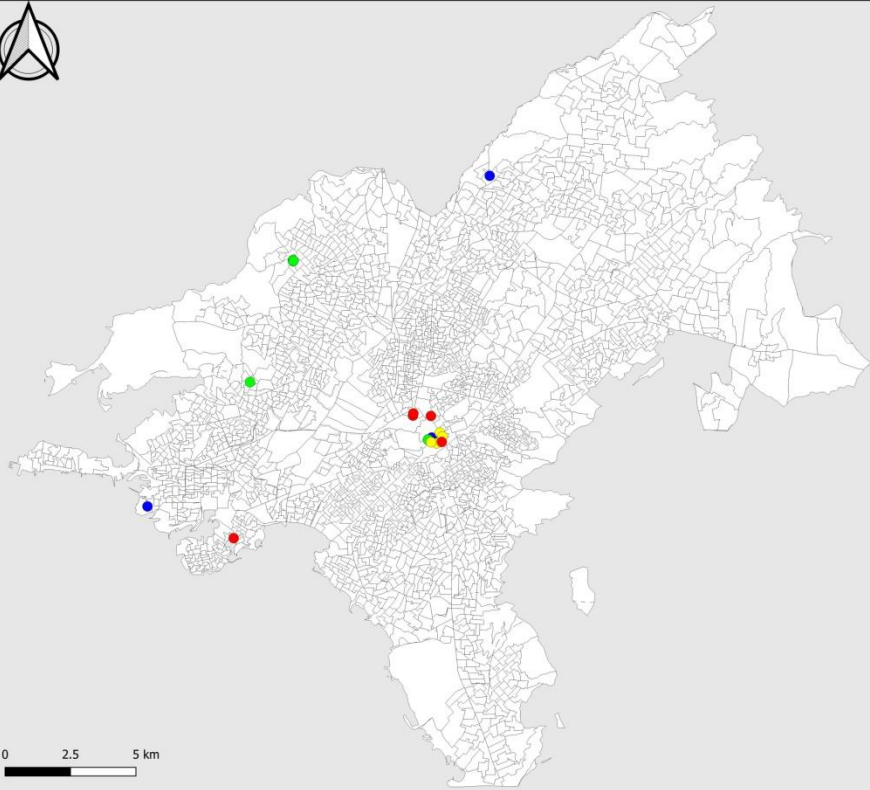


Map 40: Attraction reach analysis map on squares (radius 400m) regarding age, education and tenure index



Map 41: Attraction reach analysis map on squares (radius 800m) regarding age, education and tenure index

ATTRACTION REACH ANALYSIS MAP



NATIONAL TECHNICAL
UNIVERSITY OF ATHENS

SCALE 1:110.000
GGRS87 / GREEK GRID -
ESPG: 2100

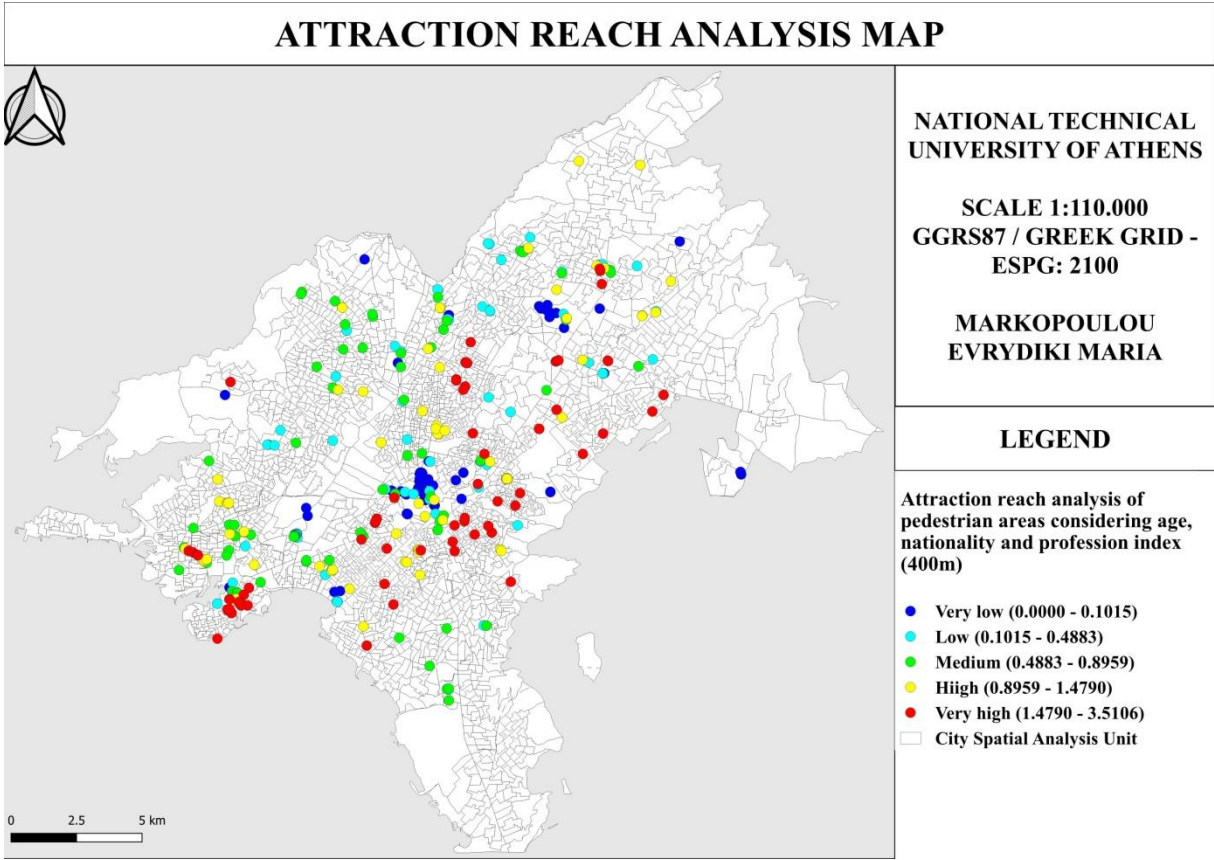
MARKOPOULOU
EVRYDIKI MARIA

LEGEND

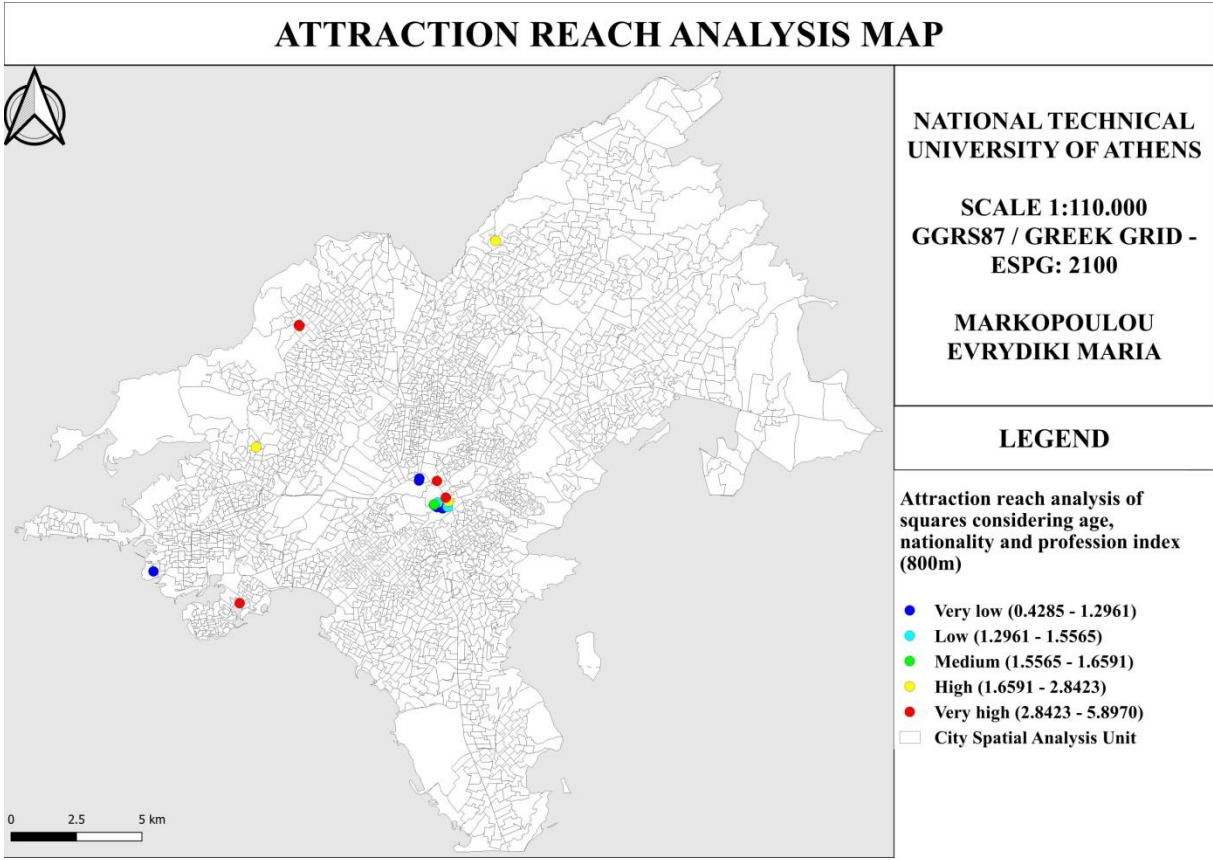
Attraction reach analysis of
squares considering age, education
and tenure index (1500m)

- Very low (1.2092 - 3.3404)
- Low (3.3404 - 3.5859)
- Medium (3.5859 - 4.0397)
- High (4.0397 - 6.4916)
- Very high (6.4916 - 16.3773)
- City Spatial Analysis Unit

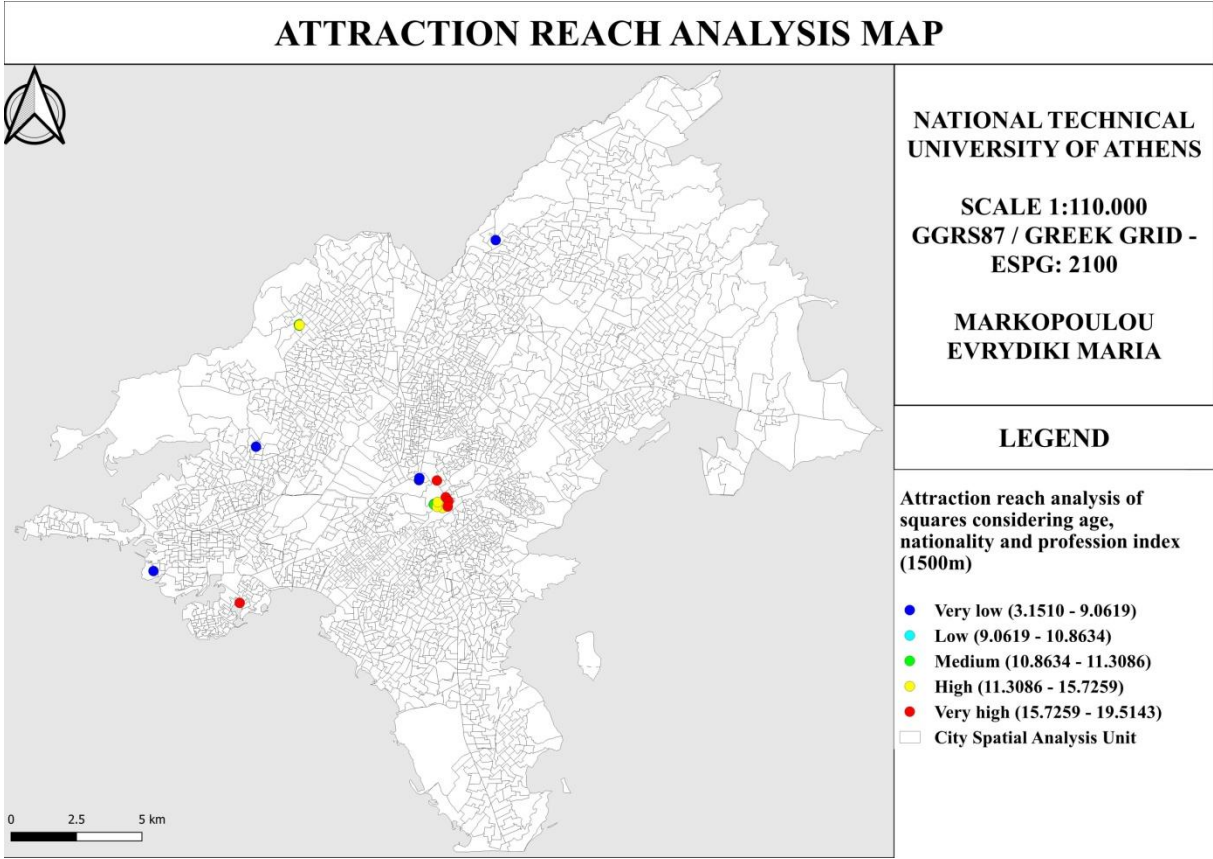
Map 42: Attraction reach analysis map on squares (radius 1500m) regarding age, education and tenure index



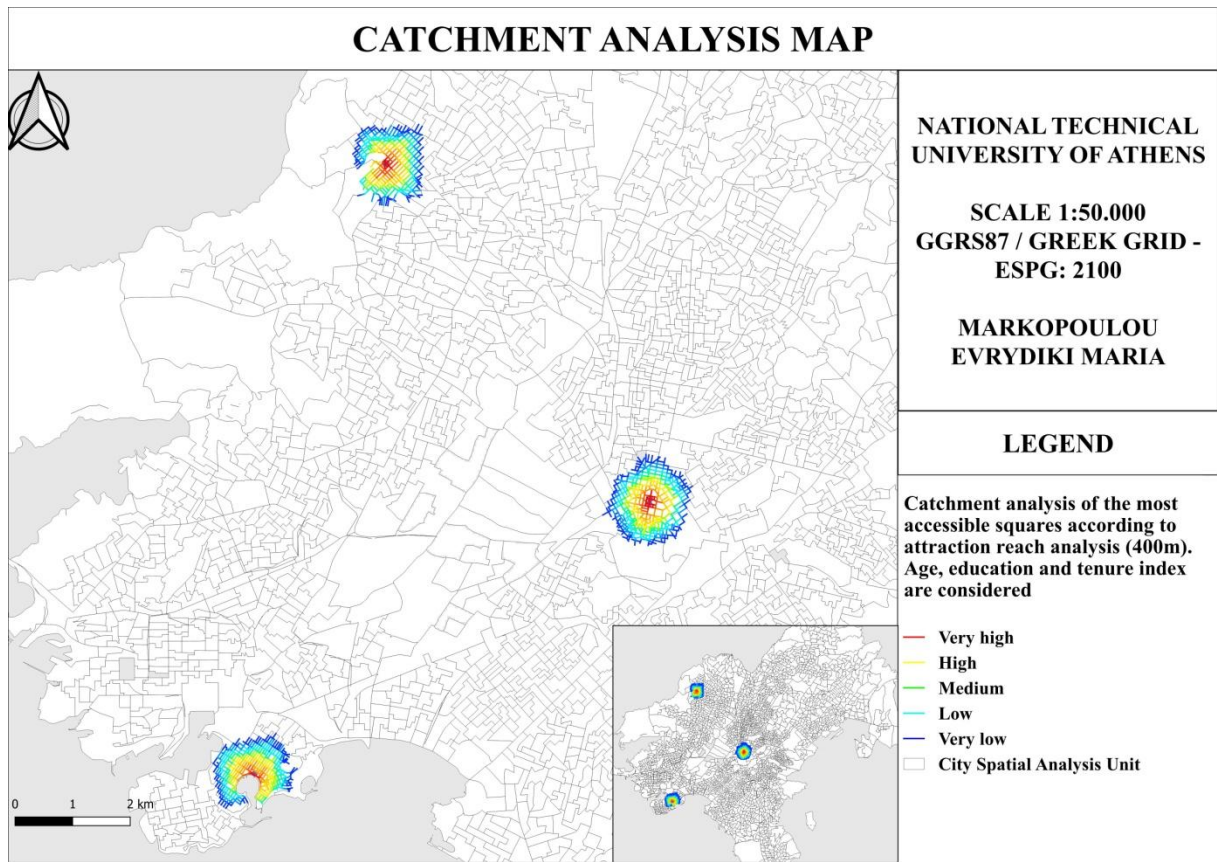
Map 43: Attraction reach analysis map on squares (radius 400m) regarding age, nationality and profession index



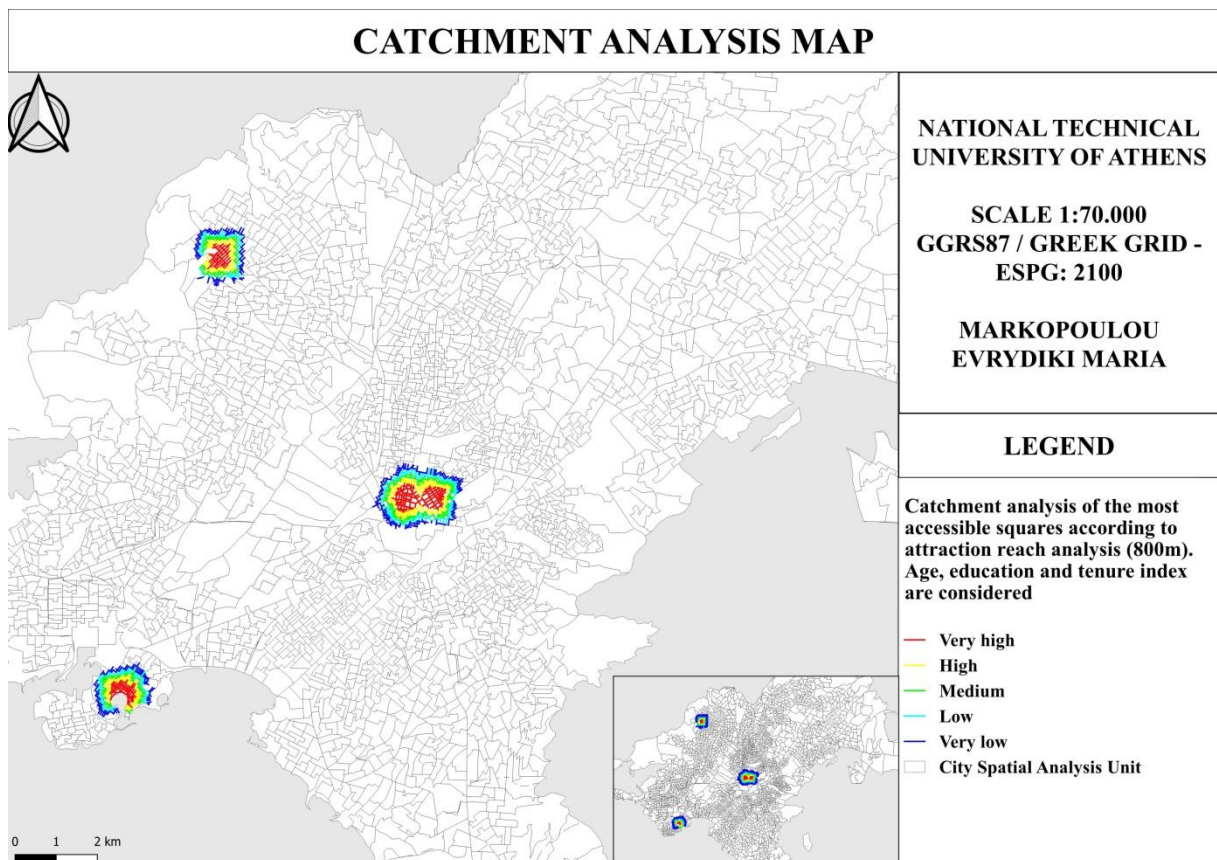
Map 44: Attraction reach analysis map on squares (radius 800m) regarding age, nationality and profession index



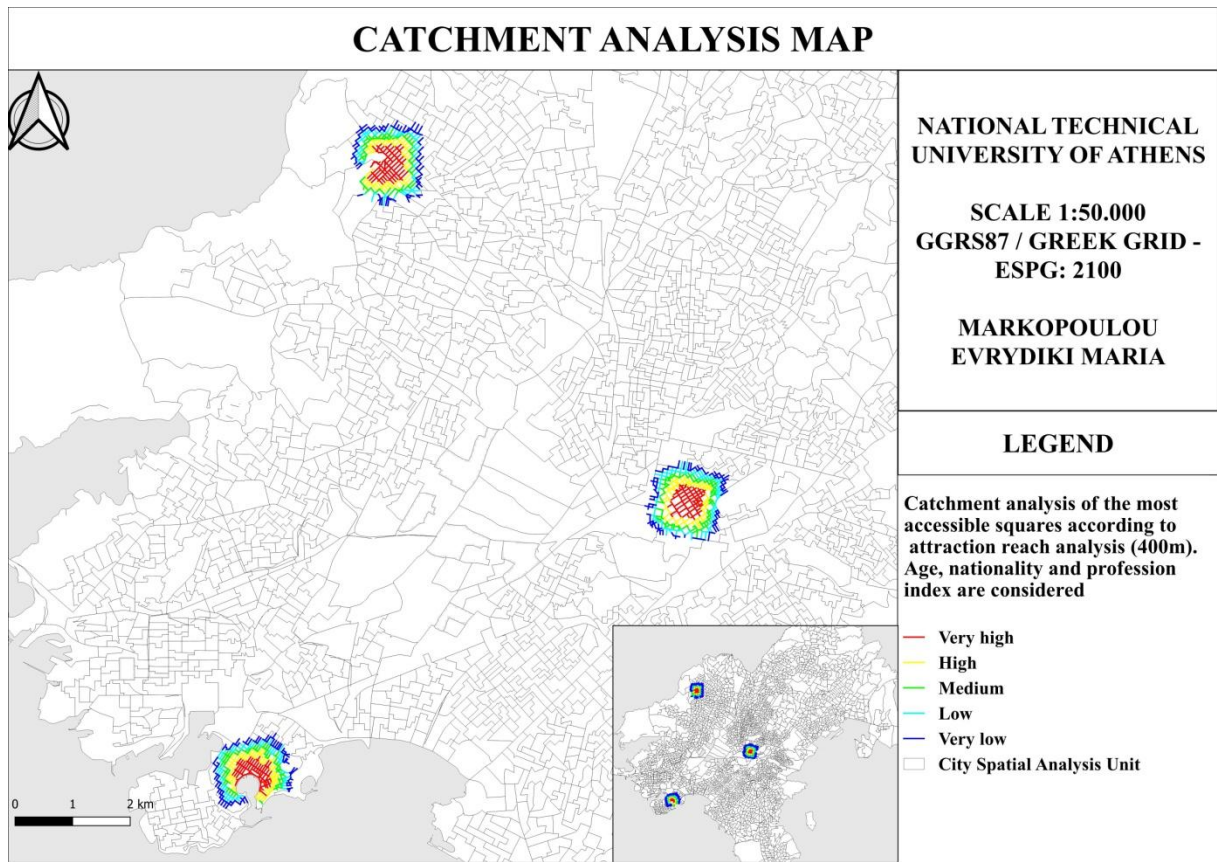
Map 45: Attraction reach analysis map on squares (radius 1500m) regarding age, nationality and profession index



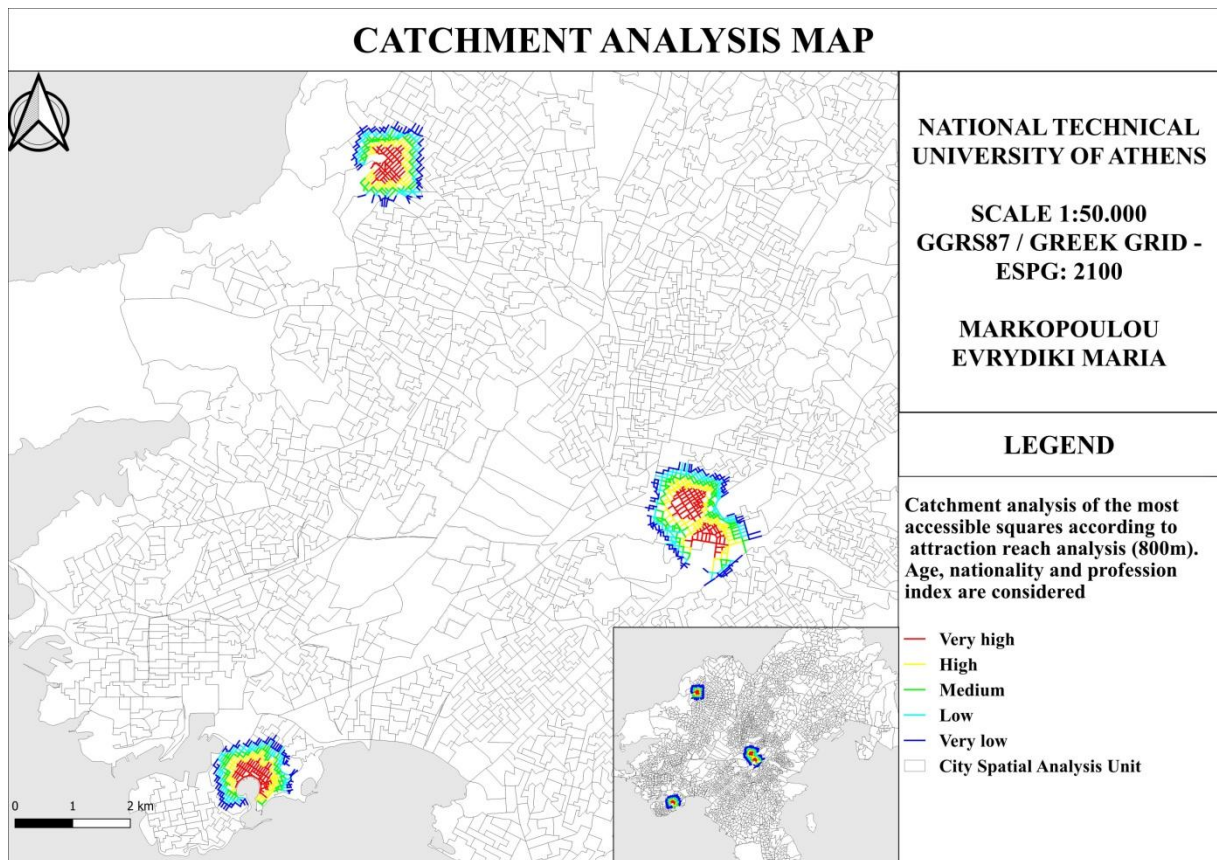
Map 46: Catchment analysis map on the most accessible pedestrian areas (radius 400m) regarding age, education and tenure index



Map 47: Catchment analysis map on the most accessible pedestrian areas (radius 800m) regarding age, education and tenure index



Map 48: Catchment analysis map on the most accessible pedestrian areas (radius 400m) regarding age, nationality and profession index



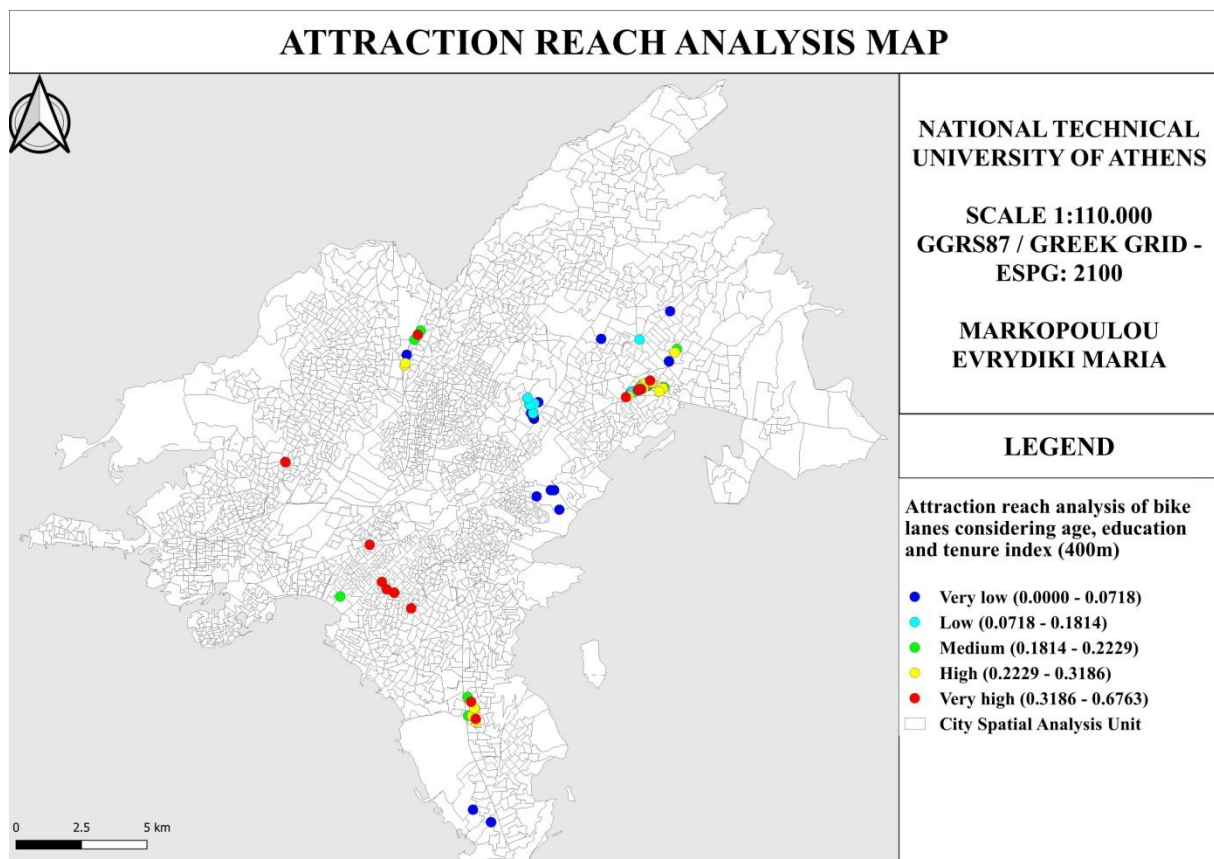
Map 49: Catchment analysis map on the most accessible pedestrian areas (radius 800m) regarding age, nationality and profession index

Catchment analysis maps show that the areas are quite dispersed and mostly situated in Piraeus and the City Centre.

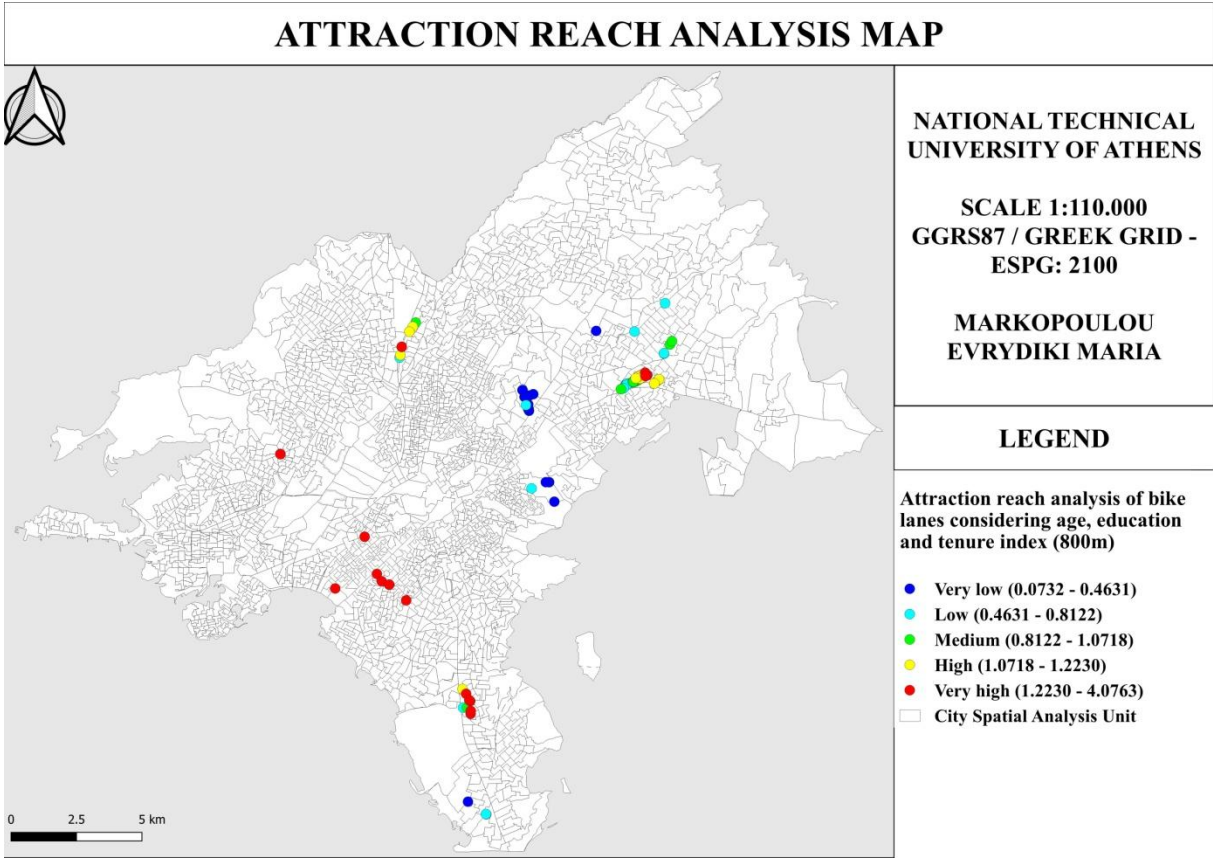
Bicycle lanes

Bicycle lanes play a similar role as pedestrian areas and squares. Therefore, they will also be considered into the analysis. Regarding Attraction Reach analysis, there is a cluster in Agia Paraskevi. Some others appeared as well, but are not very significant. Those clusters are located in:

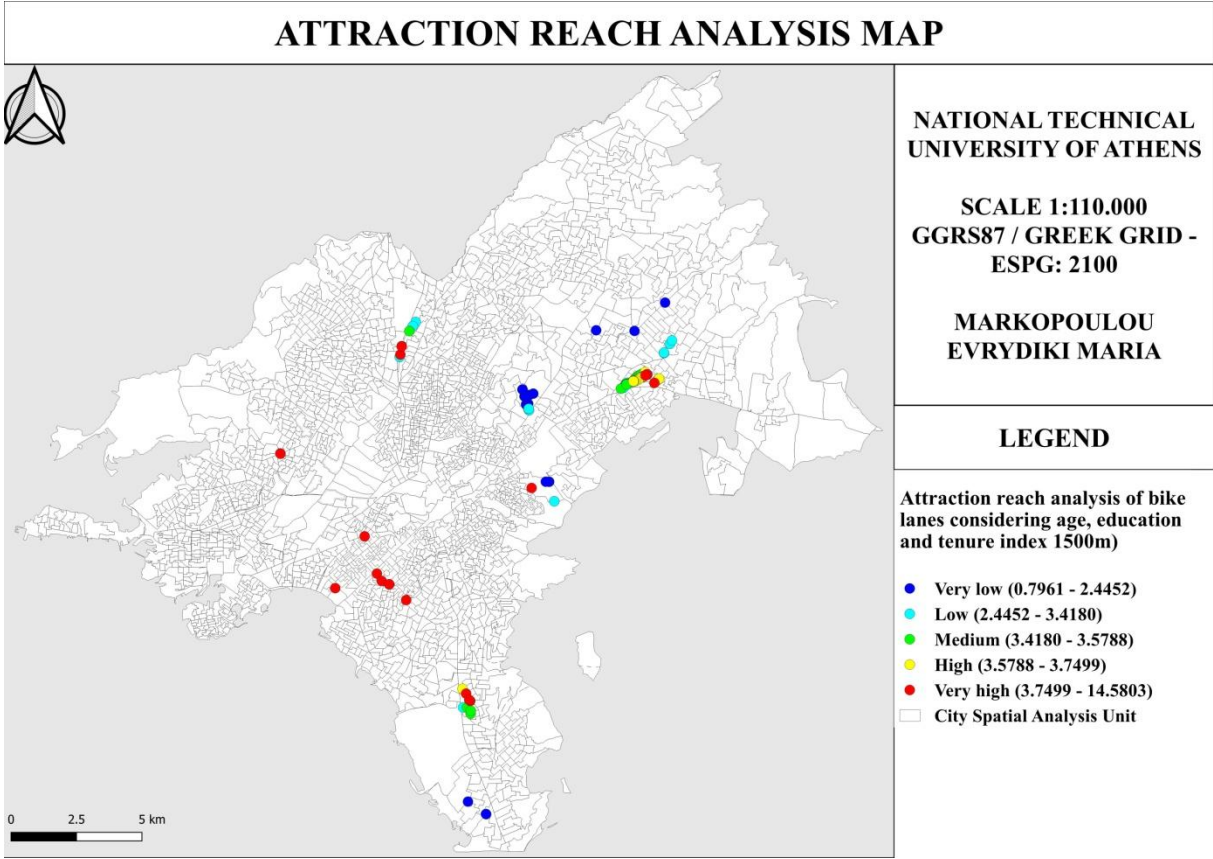
- Psychiko
- Papagos
- Agioi Anargyroi
- Zografos
- Nea Smyrni
- Argyroupoli



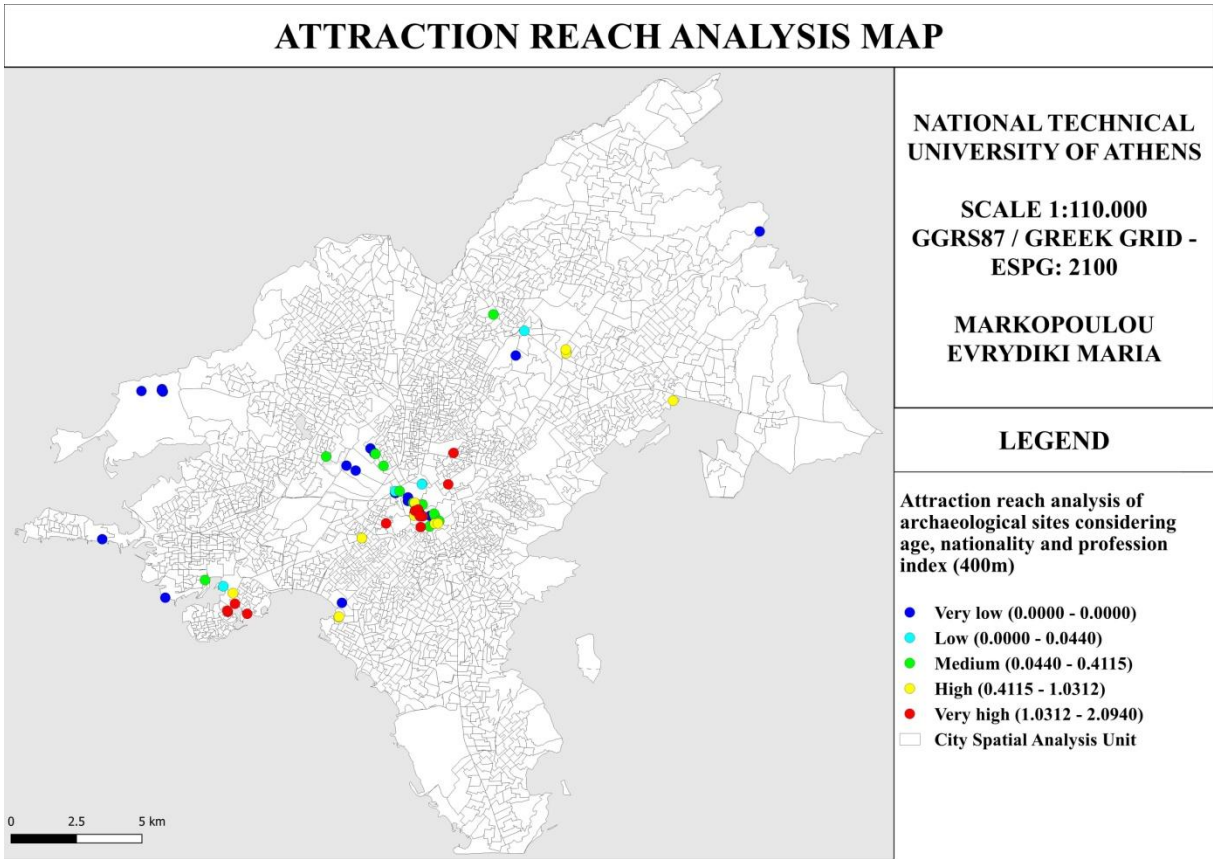
Map 50: Attraction reach analysis map on bike lanes (radius 400m) regarding age, education and tenure index



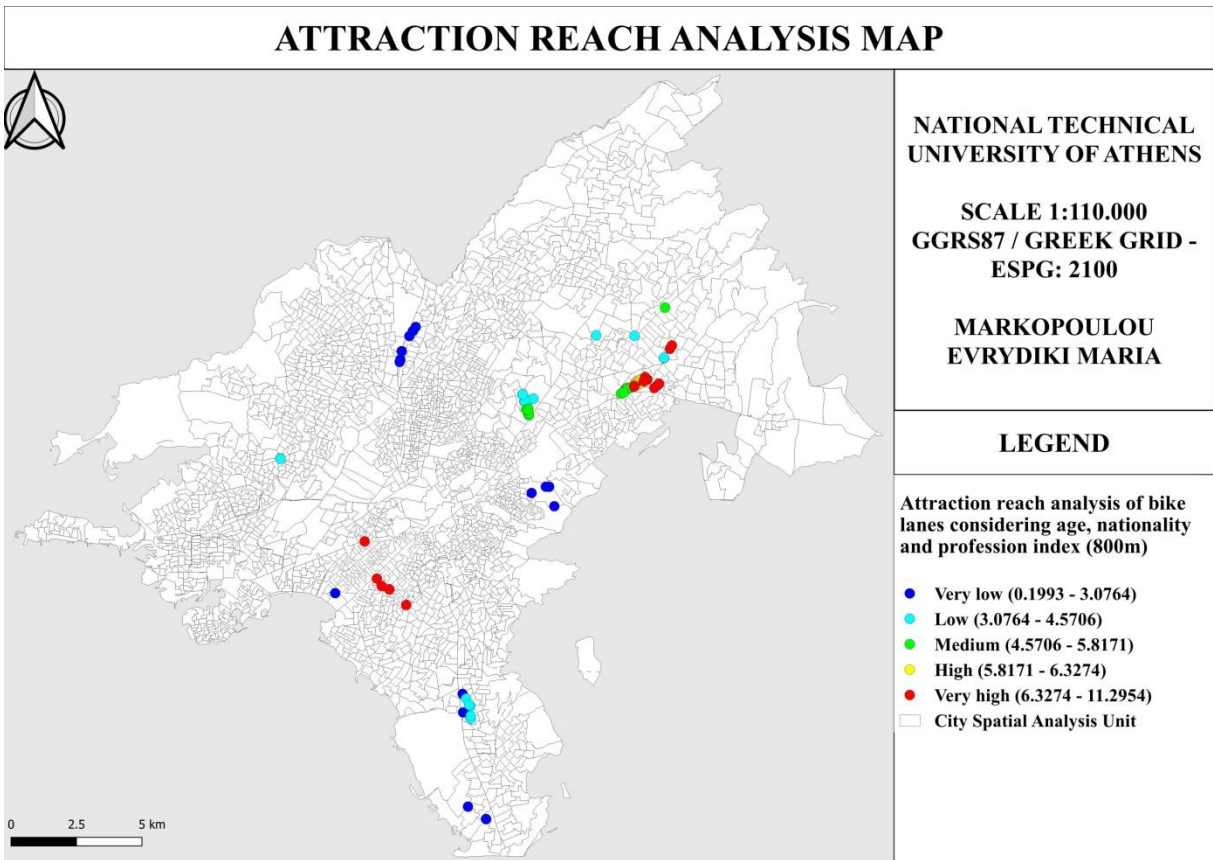
Map 51: Attraction reach analysis map on bike lanes (radius 800m) regarding age, education and tenure index



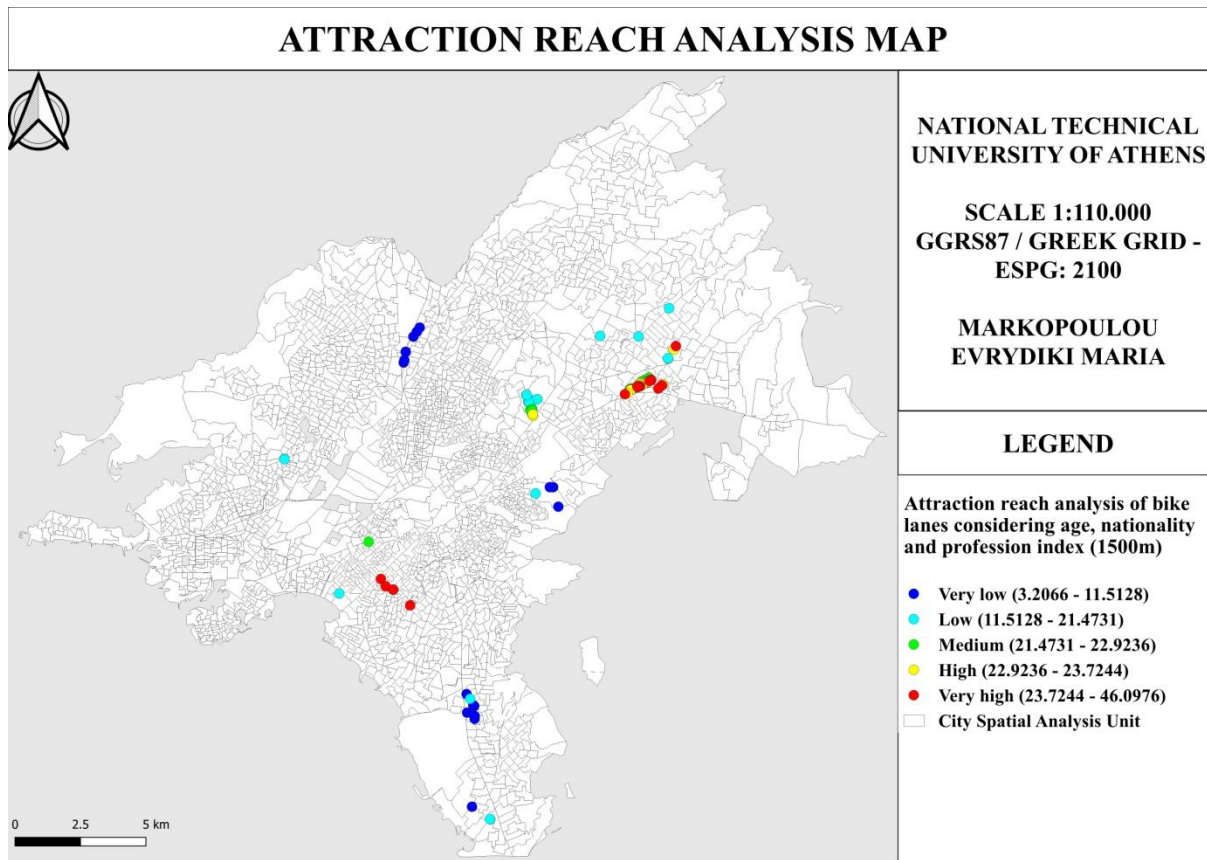
Map 52: Attraction reach analysis map on bike lanes (radius 1500m) regarding age, education and tenure index



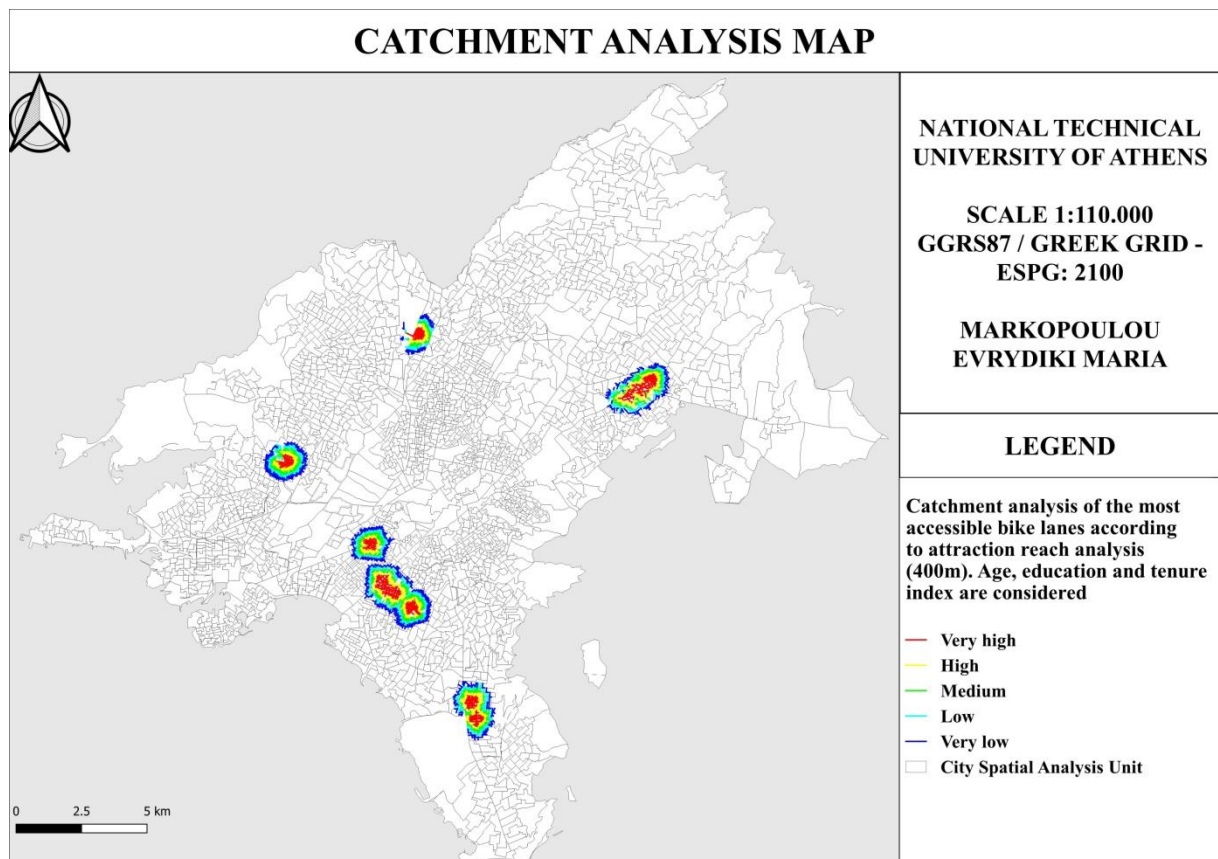
Map 53: Attraction reach analysis map on bike lanes (radius 400m) regarding age, nationality and profession index



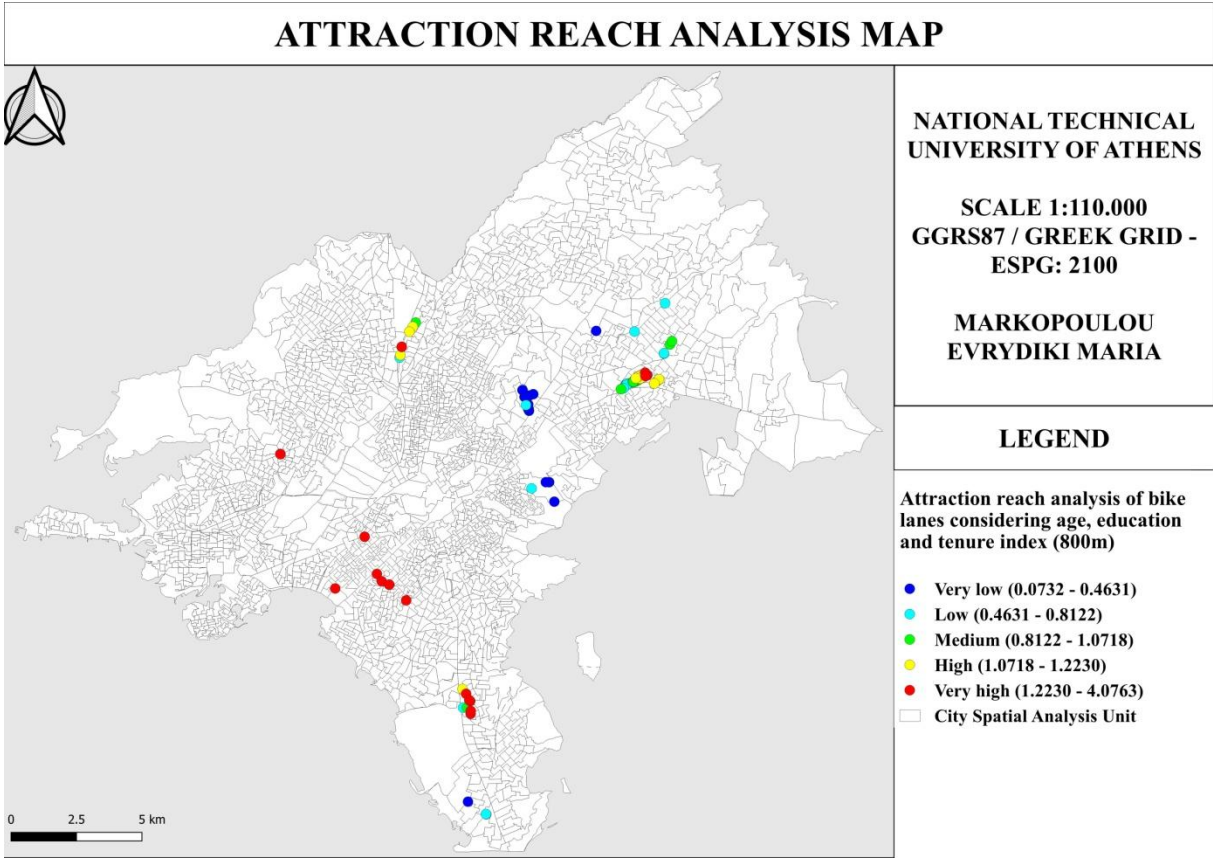
Map 54: Attraction reach analysis map on bike lanes (radius 800m) regarding age, nationality and profession index



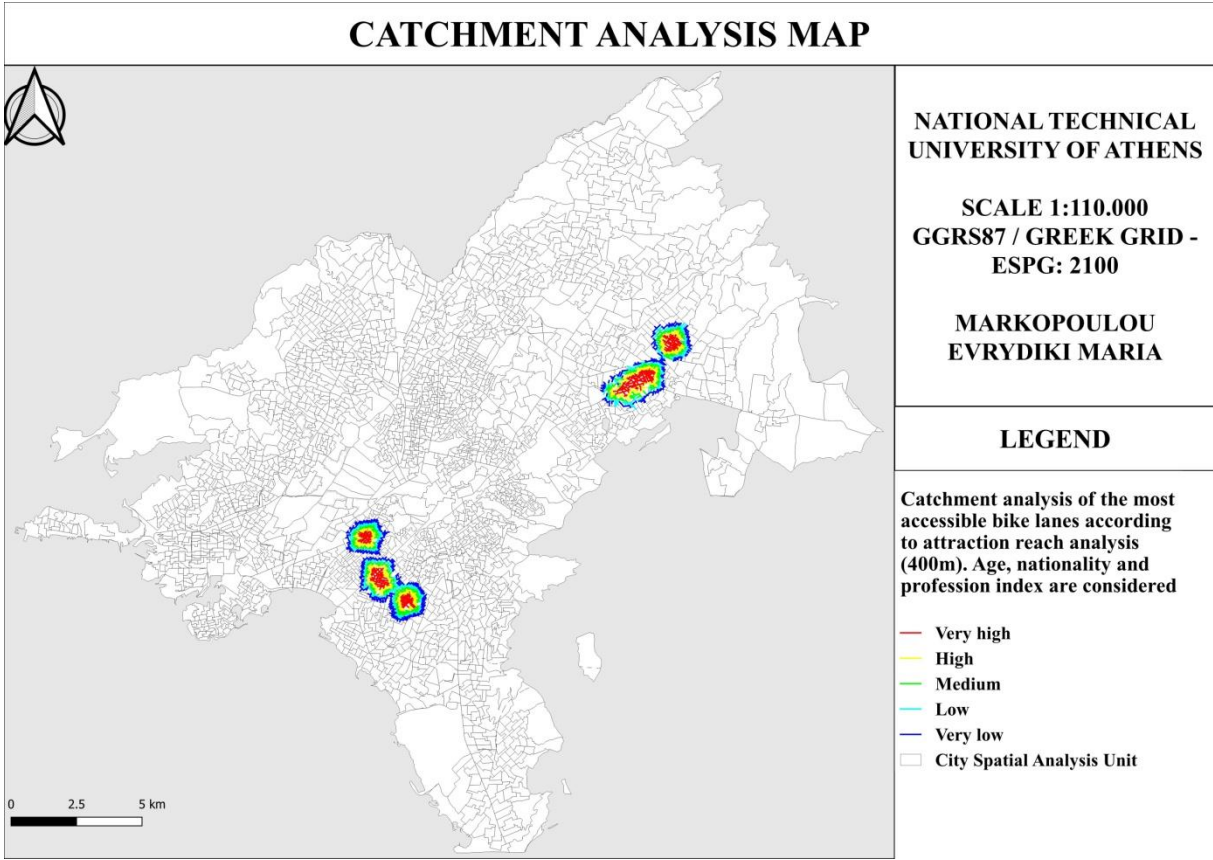
Map 55: Attraction reach analysis map on bike lanes (radius 1500m) regarding age, nationality and profession index



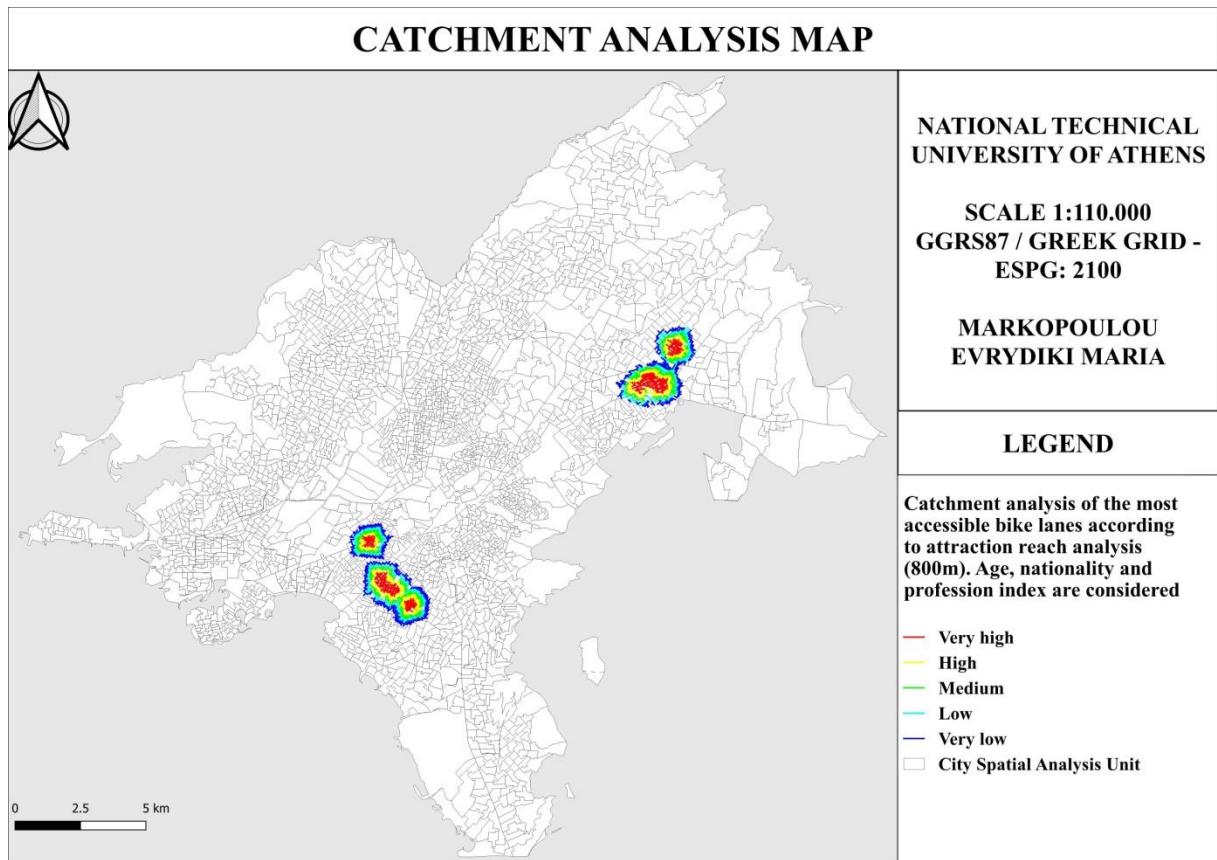
Map 56: Catchment analysis map on the most accessible bike lanes (radius 400m) regarding age, education and tenure index



Map 57: Catchment analysis map on the most accessible bike lanes (radius 800m) regarding age, education and tenure index



Map 58: Catchment analysis map on the most accessible bike lanes (radius 400m) regarding age, nationality and profession index



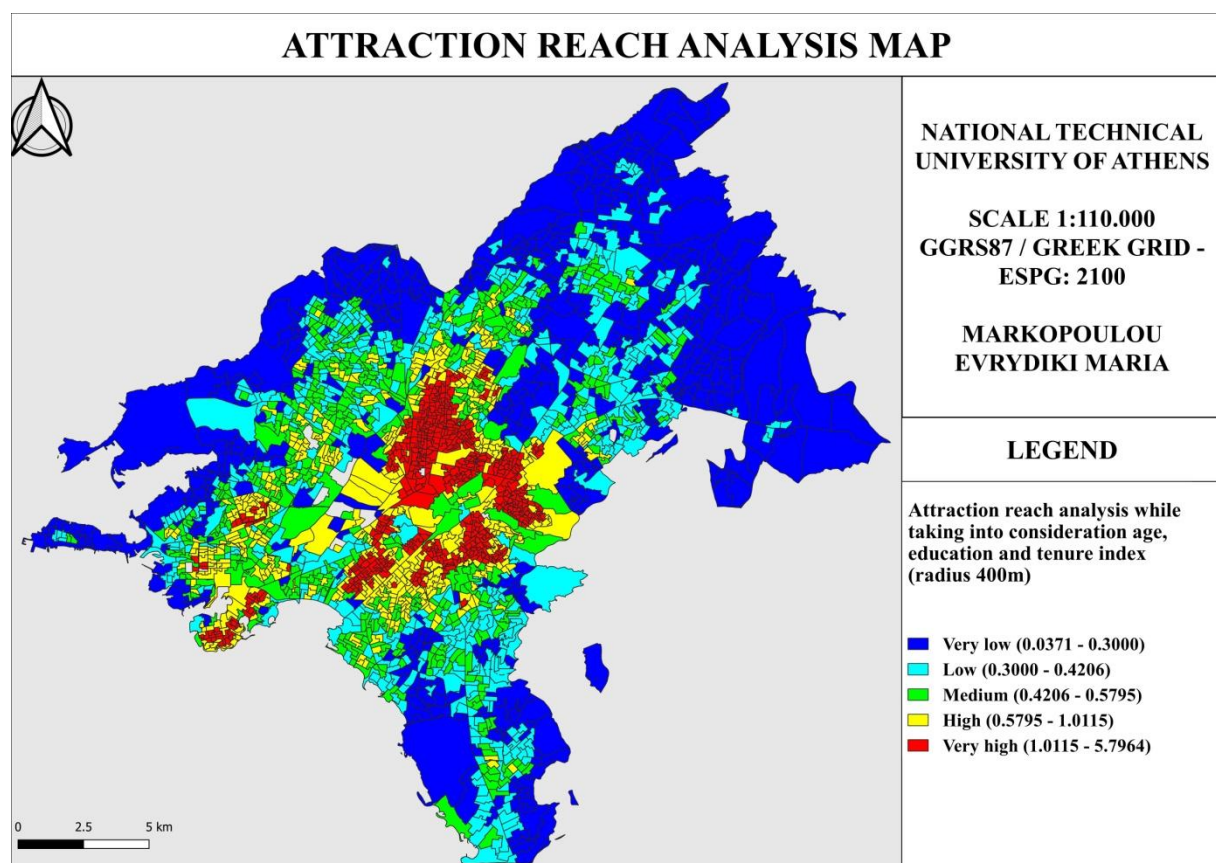
Map 59: Catchment analysis map on the most accessible bike lanes (radius 800m) regarding age, nationality and profession index

Catchment analysis depicts that the areas of interest are Egaleo, Kalithea and Marathonas.

The final stage of our methodology is to determine which areas are to be gentrified in the future and to classify them in a specific typology.

The following maps show which areas are expected to be gentrified in the future. The indices taken into consideration are more likely to depict mainstream and marginal gentrification typology. Although age, education and tenure are relevant for all typologies, profession is the index that separates the aforementioned typologies from super gentrification.

On Maps 60, 61 and 62, the combination of age, education and tenure index are used as weight. The 400m radius displays the areas that are accessible through walking. Our area of

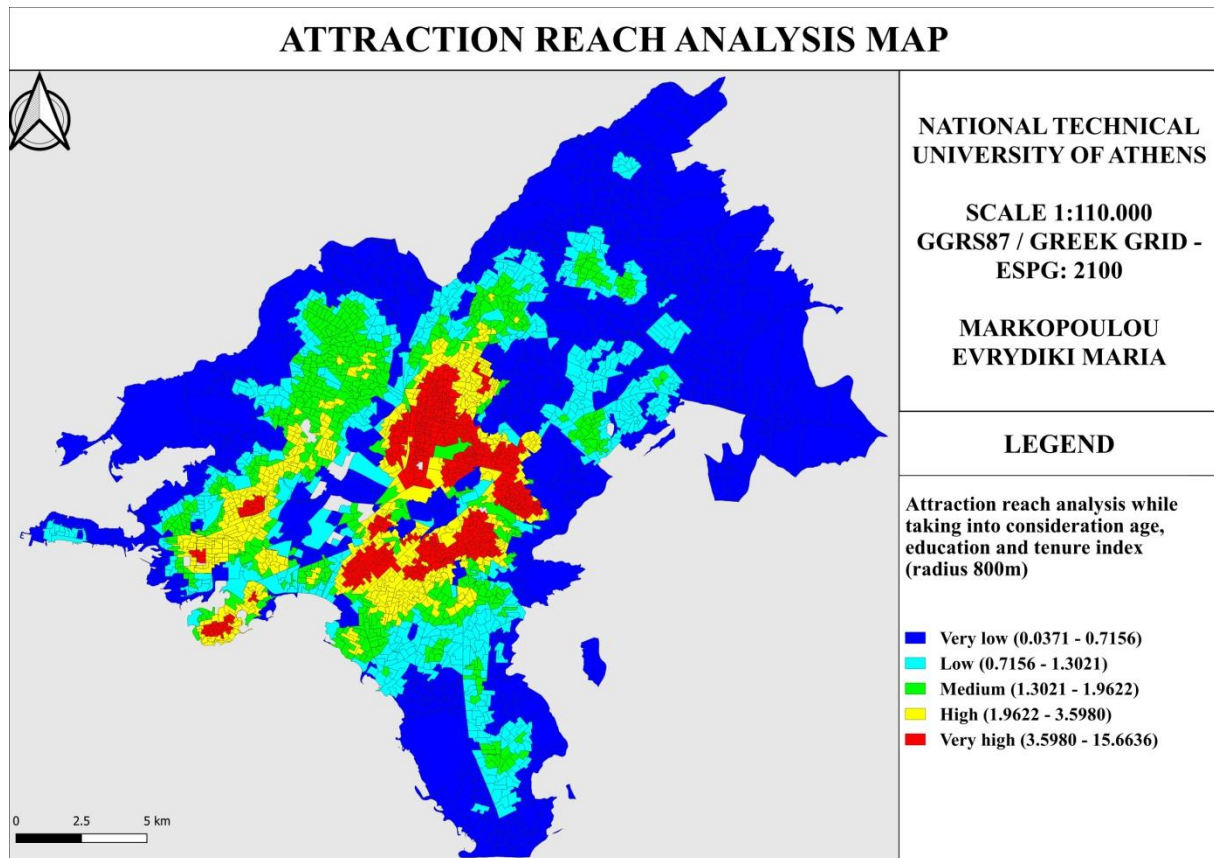


Map 60: Attraction reach analysis (radius 400m) regarding age, education and tenure index

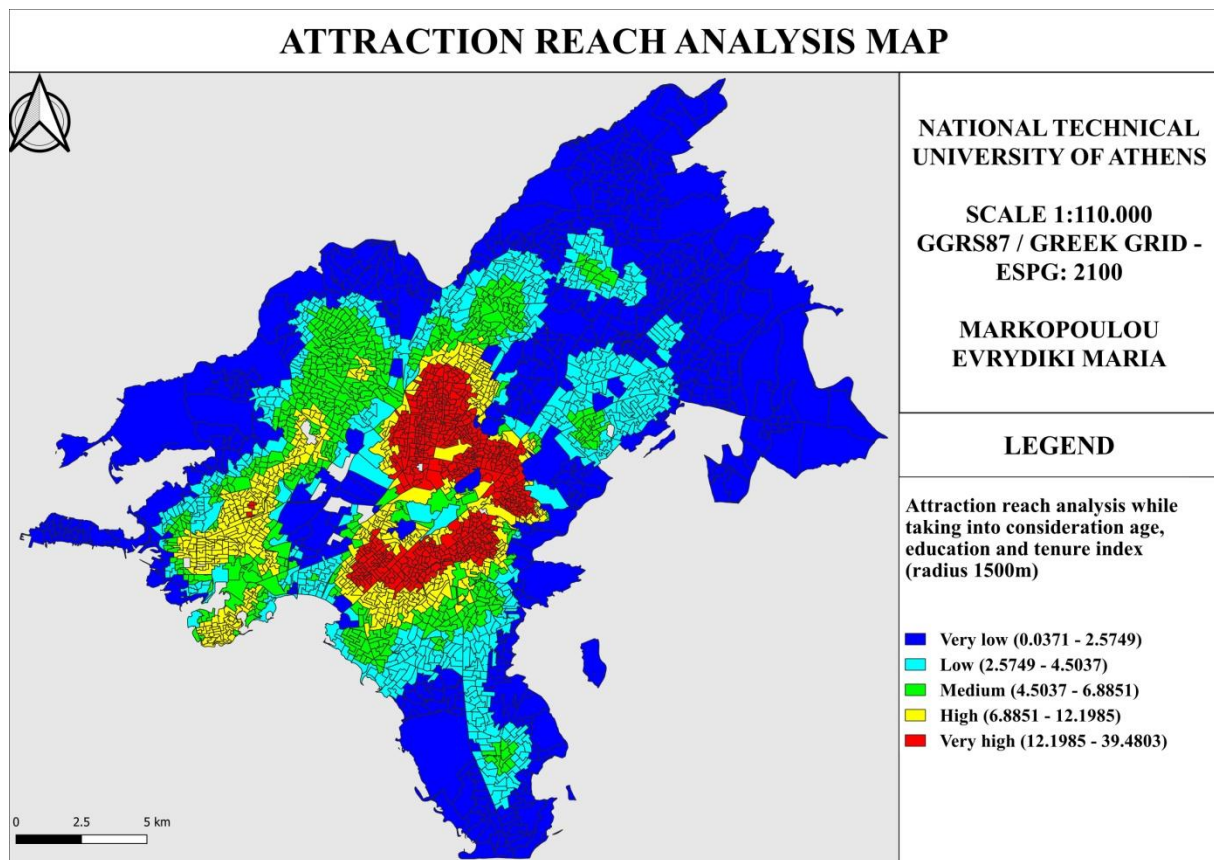
study is disproportionately larger. So, the kernels represent local areas of interest.

On Map 60, kernels can be found in the City Center and in neighborhoods slightly northern (Ano and Kato Patissia, Agios Eleftherios). More kernels are appear eastern from the City Center the neighborhoods of Ampelokipoi, Gyzi. Furthermore, the same applies for the Municipality of Chaidari, Keratsini, Zographou, Kallitheas, Neas Smyrnis, Kesarianis and Peiraias.

When examining the 800m radius, the kernels are similar to the previous map and the same areas stand out. Regarding the 1500m radius, all the aforementioned kernels are present, except of those in Western Attiki.



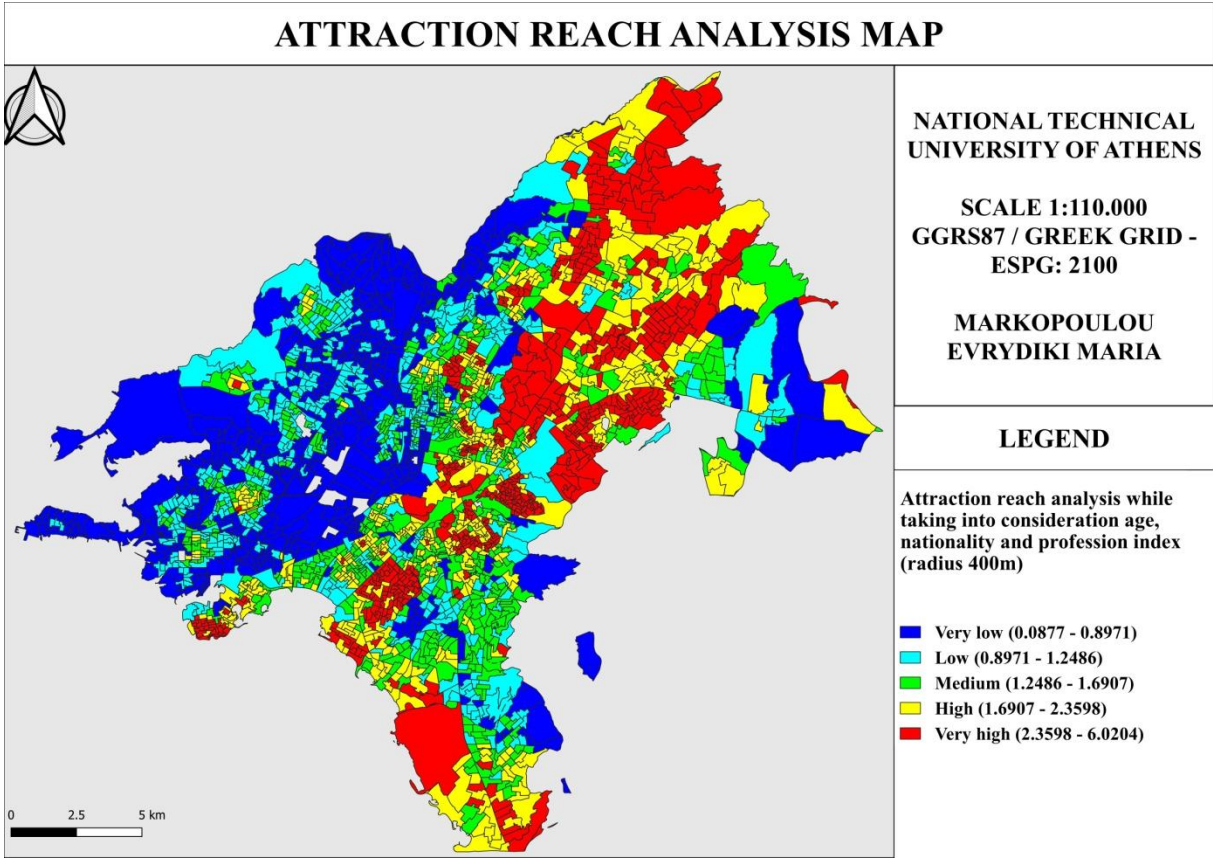
Map 61: Attraction reach analysis (radius 800m) regarding age, education and tenure index



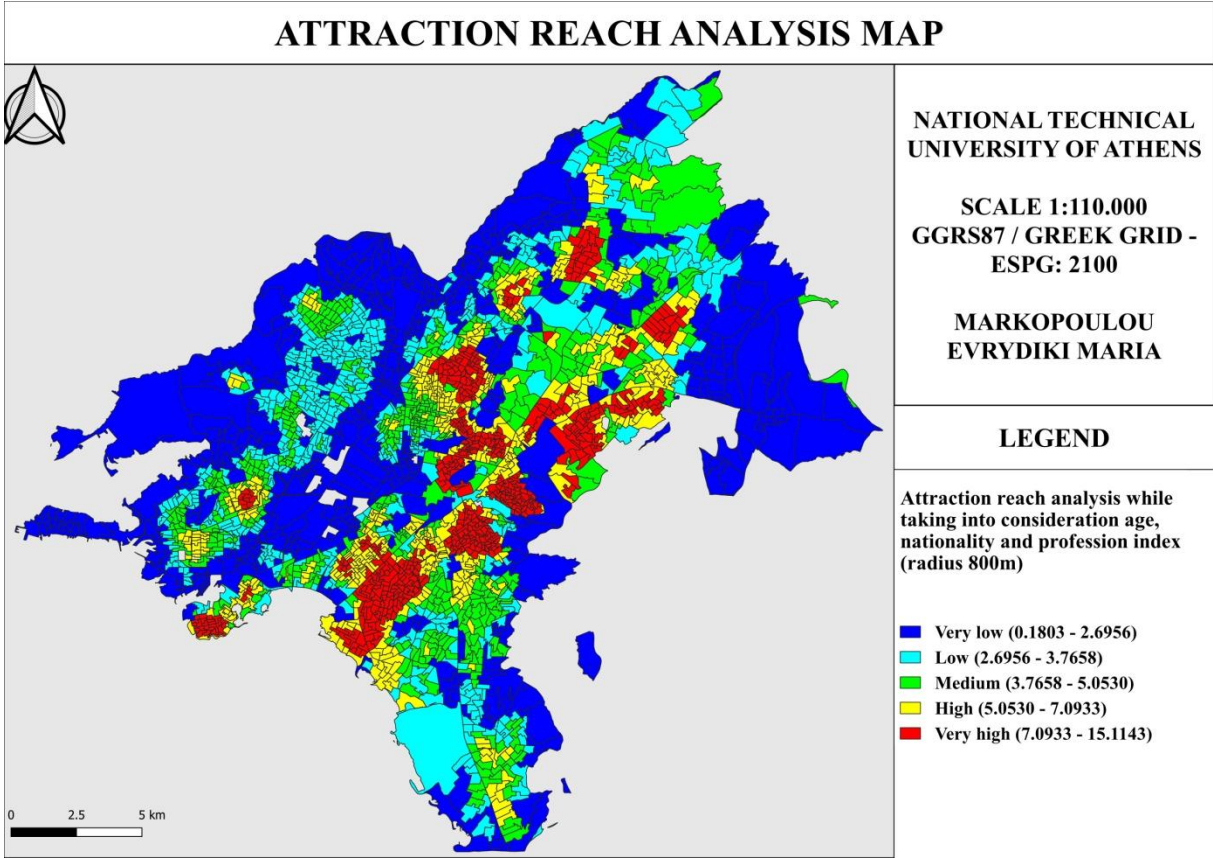
Map 62: Attraction reach analysis (radius 1500m) regarding age, education and tenure index

Maps 63, 64 and 65 show the results from the Attraction Reach analysis with using as weight the combination of age, nationality and profession indices. This combination was selected because age and profession are relevant in order to determine the development any typology of gentrification but mostly super gentrification. The nationality index could be a definitive factor in mainstream and marginal gentrification, but it is unlikely to affect super gentrification. Therefore, it was used to differentiate the first typologies from the latter.

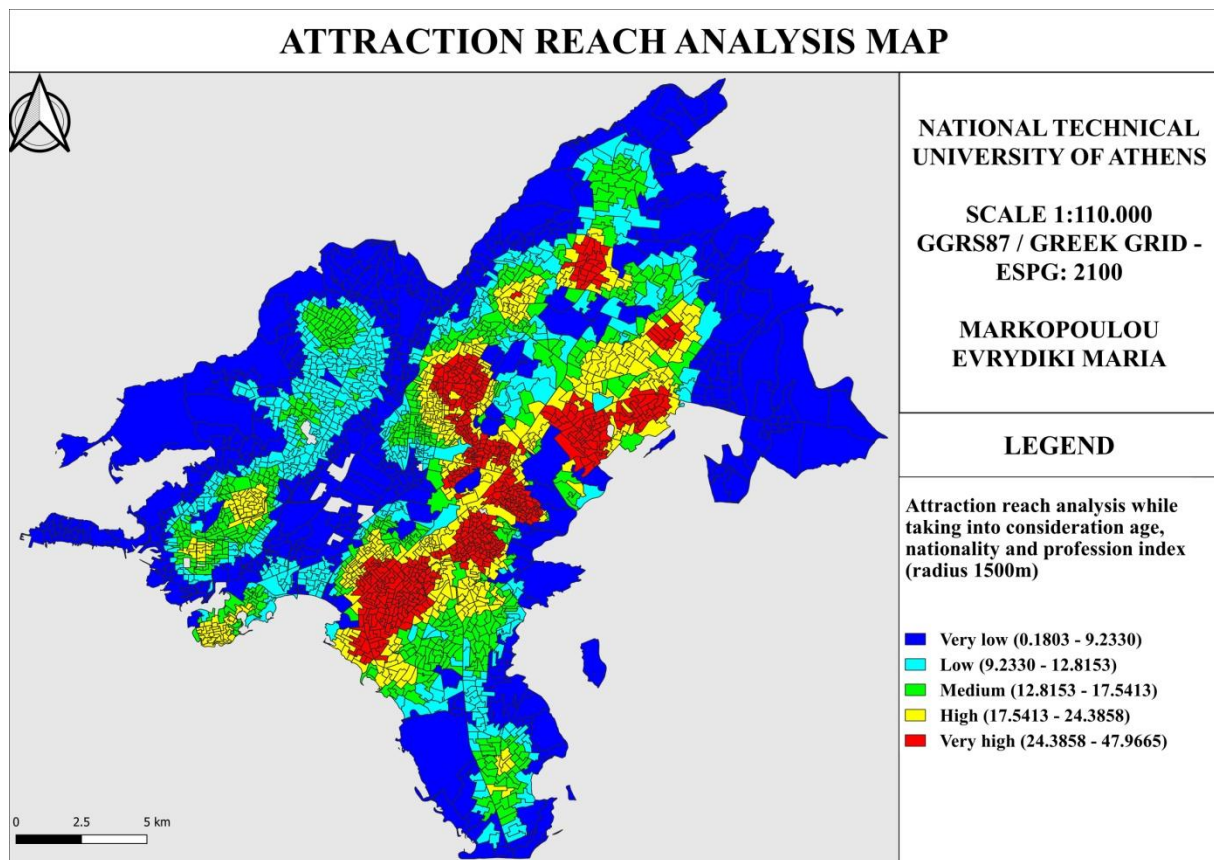
The 400m radius shows that most kernels are concentrated in a north-south axis along the Attiki basin. The areas that stand out are the northern and southern suburbs, areas on the eastern part of the City Center and the southern part of Piraeus.



Map 63: Attraction reach analysis (radius 400m) regarding age, nationality and profession index



Map 64: Attraction reach analysis (radius 800m) regarding age, nationality and profession index



Map 65: Attraction reach analysis (radius 1500m) regarding age, nationality and profession index

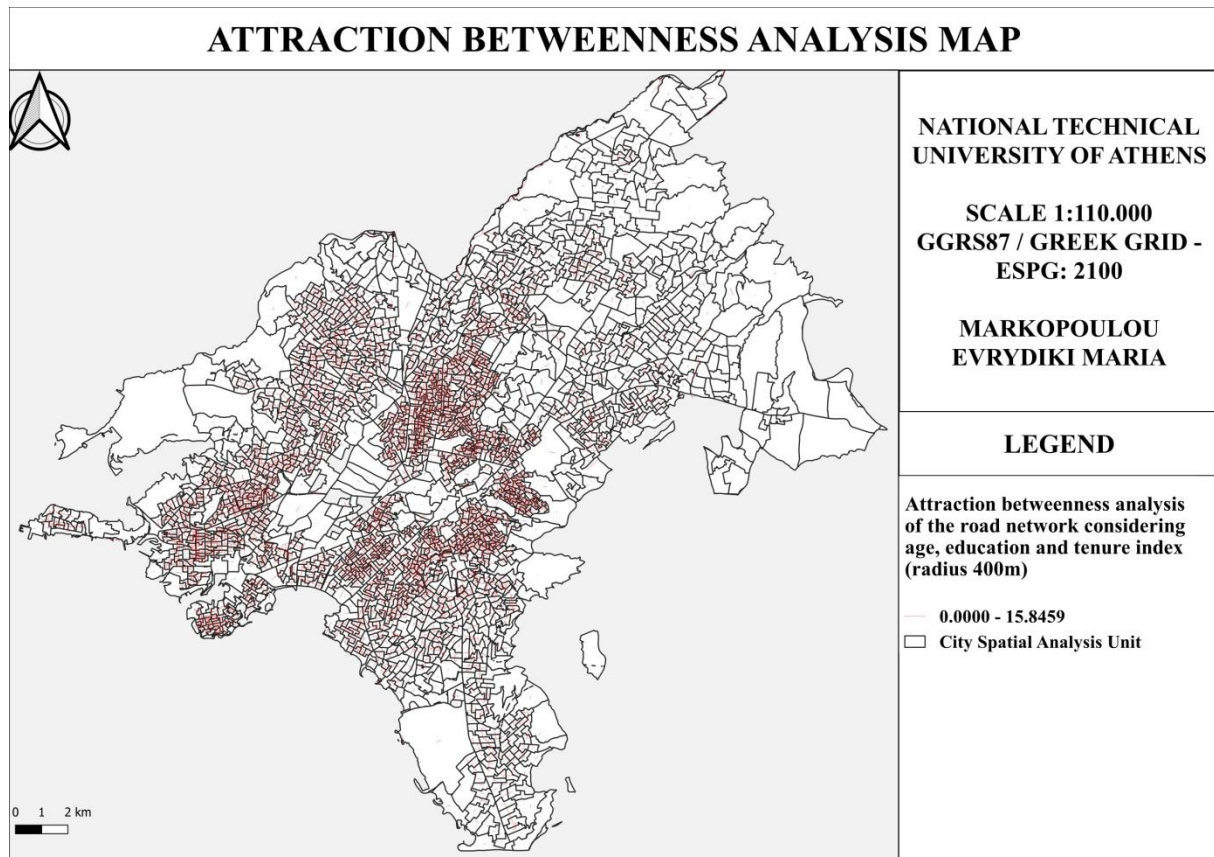
On Map 64, the kernels stand out more. The areas of interest are Irakleio, Kolonaki, Gyzi, Lycabetus and the Municipalities of Filothei, Marousi, Vrilissia, Agia Paraskevi, Neo Psychiko, Nea Smyrni and Palaio Faliro.

Finally, on the 1500 radius (Map 65), kernels can be found on all areas of the 800m radius and also Pefki and Profitis Ilias.

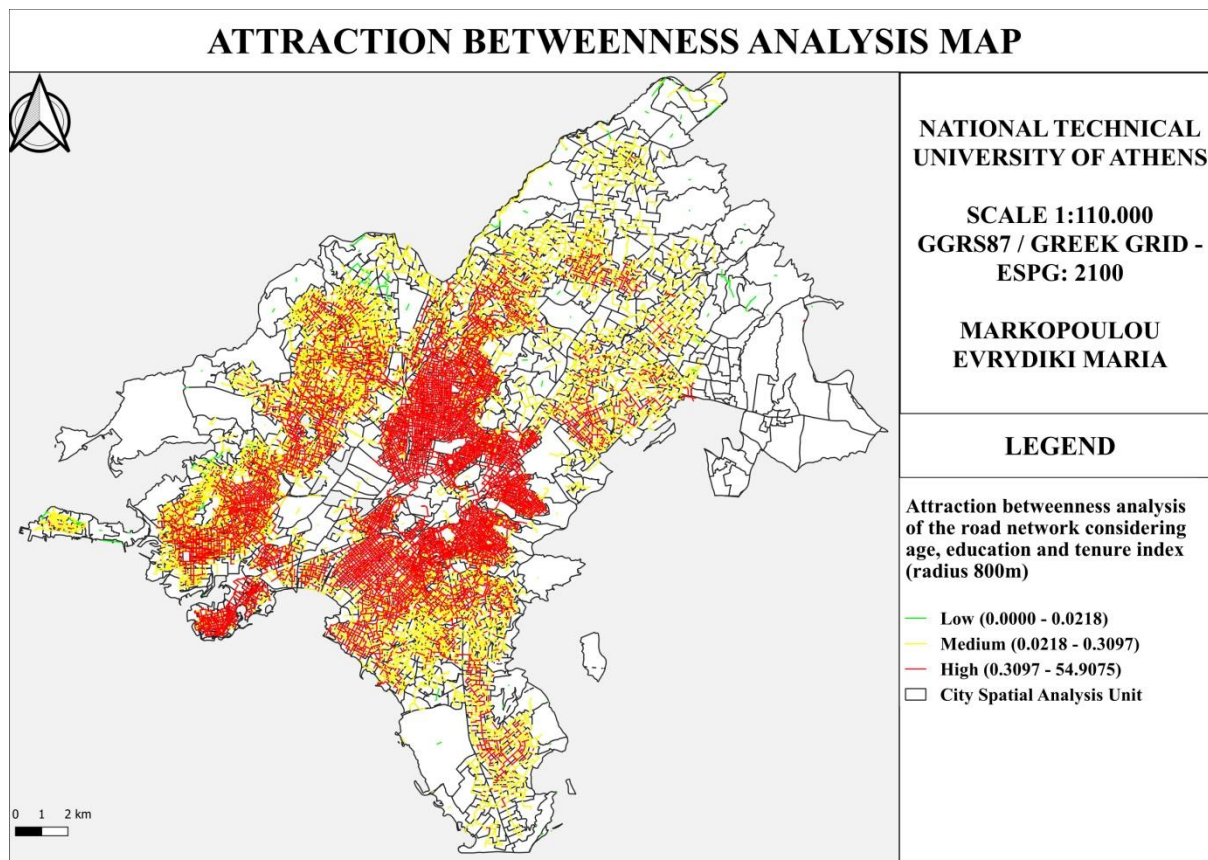
Last but not least, we ran an analysis that will provide insight on the effect of connectivity on gentrification. For this, we used and Attraction Betweenness. This analysis is similar to Network Betweenness, which valuates connectivity by calculating which path is the shortest and best connected to others, but once again takes weights into consideration. We used the same combination of indices and radii as before.

On the following maps, the Attraction Betweenness analysis is displayed with age, education and tenure indices as weights. On Map 66 (400m radius), the kernels are formed in the areas surrounding the City Center, such as Kallithea, Nea Smyrni, Vyronas and Kesariani and the area on both sides of Patision and Alexandras Avenue. Kernels are also to be found in

Piraeus, Keratsini and Korydallos. On Map 67 (800m radius) kernels are formed on the same areas described above, but some of them seem to be more broadly spread.



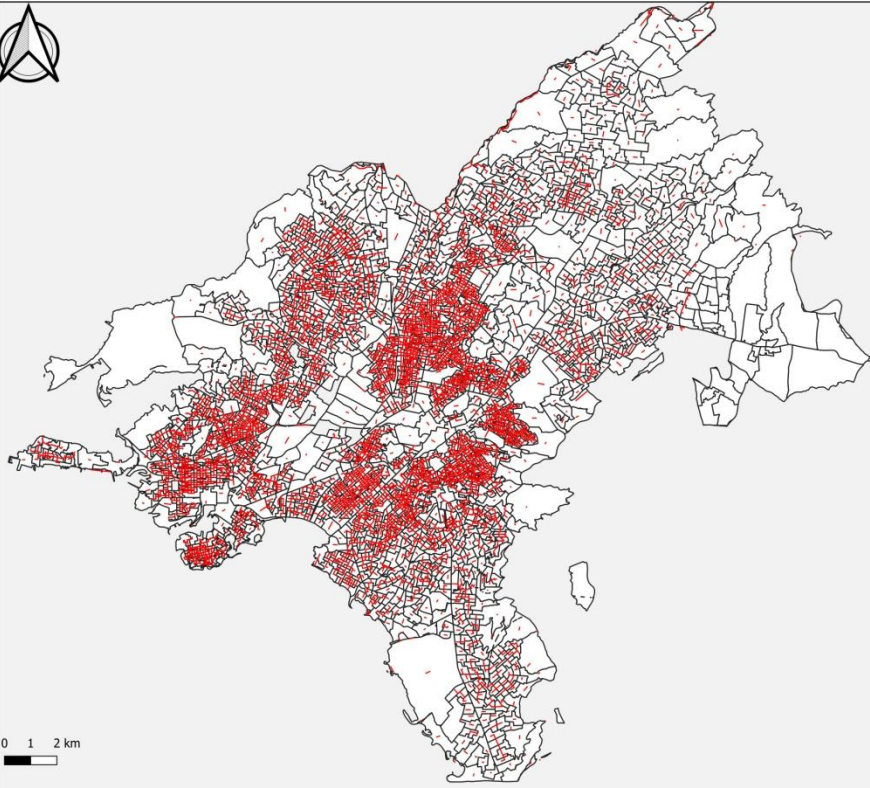
Map 66: Attraction betweenness analysis (radius 400m) regarding age, education and tenure index



Map 67: Attraction betweenness analysis (radius 800m) regarding age, education and tenure index

On the following maps, we present the Attraction Betweenness analysis is displayed with age, nationality and profession indices as weights. Comparing to the previous Attraction Betweenness maps, the result is identical. We suspect that both combinations of weights affect the analysis the same.

ATTRACTION BETWEENNESS ANALYSIS MAP



**NATIONAL TECHNICAL
UNIVERSITY OF ATHENS**

**SCALE 1:110.000
GGRS87 / GREEK GRID -
ESPG: 2100**

**MARKOPOULOU
EVRYDIKI MARIA**

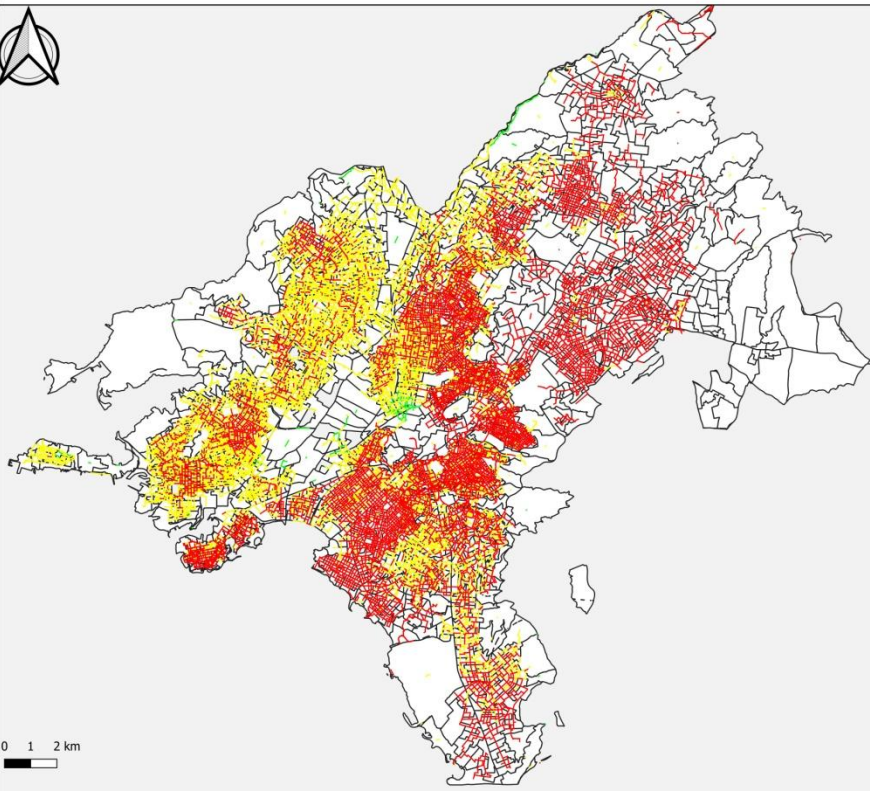
LEGEND

**Attraction betweenness analysis
of the road network considering
age, nationality and profession
index (radius 400m)**

- 0.0000 - 223.3773
- City Spatial Analysis Unit

Map 68: Attraction betweenness analysis (radius 400m) regarding age, nationality and profession index

ATTRACTION BETWEENNESS ANALYSIS MAP



**NATIONAL TECHNICAL
UNIVERSITY OF ATHENS**

**SCALE 1:110.000
GGRS87 / GREEK GRID -
ESPG: 2100**

**MARKOPOULOU
EVRYDIKI MARIA**

LEGEND

**Attraction betweenness analysis
of the road network considering
age, nationality and profession
index (radius 800m)**

- Low (0.0000 - 0.1524)
- Medium (0.1524 - 2.2963)
- High (2.2963 - 286.3622)
- City Spatial Analysis Unit

Map 69: Attraction betweenness analysis (radius 800m) regarding age, nationality and profession index

CONCLUSION

The purpose of this thesis is to recognize the patterns of gentrification in the Attiki basin, while taking into consideration previous experience in urban spaces from all over the world. Then, we attempted to detect which areas of the Attiki basin are likely to be gentrified and determine in which typology they could be classified. We employed spatial analysis techniques including the space syntax analysis and utilized spatial data of the population, the road network, infrastructure and other points of interest.

Regarding the typologies of gentrification, marginal and mainstream are more predominant in the City Center and neighborhoods surrounding it. The same goes for areas in Keratsini, Chaidari, Petroupoli and Egaleio, which are situated at the area known as “West Suburbs”. Super-gentrification can be found in the northern southern suburbs.

As mentioned in previous chapters, the presence of universities in a city affects its social characteristics. Therefore, the areas on both sides of Patision and Alexandras Avenue could be gentrified in the future because of the rising demand of housing, especially for university students. Furthermore, regarding some neighborhoods near Patision Avenue, they are currently habited mainly by refugees and immigrants, which may also influence the spread of gentrification.

Furthermore, marginal and mainstream gentrification is likely to develop further in the West Suburbs. According to the official website of the Municipality of Petroupoli “it has been officially announced by the Development Association of West Athens that the Municipality of Petroupoli is the most developed Municipality in West Athens. The Municipality’s advantages are the excellent street planning (one of the best in Athens) and the proximity to the Mount Pikilo”, which provides green spaces to the area (Dimos Petroupolis, n.d.). According to the official website of the Municipality of Chaidari, plans have been drawn up for making public spaces, such as squares, parks accessible for all, including elderly, people with special needs (Dimos Chaidariou, n.d.). Last but not least, Egaleo has three subway stations, the University of West Attiki, the urban forest “Baroutadiko” above the former Theater and Greek Powder and Cartridge Company and the Municipal Theatre “Alexis Minoitis”. As shown in our analysis, areas with good connectivity may become kernels of gentrification. Additionally, green spaces, cultural points of interest, as well as accessibility and unobstructed movement for all people are amenities create an urban environment, which may attract new residents.

Our estimation is that the Attiki basin presents a different development pattern of gentrification than those described in other countries. Some areas have been described as gentrified by many authors in previous papers. However, due to the significant development of tourism in Athens, further research is required, in order to establish whether it is gentrification or touristification. Certainly, parts of the City Center have been transformed in a “tourist village”. According to our findings, (mainstream) gentrification is not relevant with the touristic areas. Yet, because of the proliferation of the entertainment industry in those areas, we believe that neighborhoods around them are prone to mainstream or marginal gentrification.

However, gentrification is likely to spread to other areas as well and not only due to tourism. The development of infrastructure, such as the expansion of subway lines, the construction of new ones and the pedestrianization of areas is one of the leading causes of gentrification in our area of study. We have observed that primarily, the existence of subway stations in a neighborhood drive the development of gentrification. We believe that the area of Piraeus is an example of it as in the last few years, three subway stations were built. Pedestrian areas and bike lanes affect relatively gentrification, while squares influence far less.

Following the stages of gentrification, the pioneers of gentrification are more likely to drive marginal gentrification. Although demographics reflect the social profile of a neighborhood, which is crucial for the development of gentrification, in the case of the Attiki basin, we suspect that infrastructure is the leading factor. As shown, the existence of subway stations is one of the main elements in the creation of kernels.

Moreover, in other cities, such as London, both mainstream and marginal gentrifications are mostly defined by demographics. If gentrification is mostly defined by infrastructure and spatial relations rather than demographics, further research is required to differentiate between marginal and mainstream gentrification in our area of study. The third typology of gentrification, namely super-gentrification, is defined most clear of all, not only due to the socioeconomic characteristics of residents, but also because the relatively richer neighborhoods are easy to be defined. Any circumstances favoring the development of gentrification there would exclude any of the other gentrification typologies.

Another interesting fact observed is that the Greek terminology regarding gentrification does not encompass all terms necessary.

Finally, we acknowledge the limitations of this thesis. Gentrification can be defined by a variety of other factors, which have already been mentioned in previous chapters. Those factors are mostly socioeconomical and spatial. However, additional factors can provide a better insight in this phenomenon.

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