Supralocal Role of Medium to Large Scale Urban Parks, in Greater Athens Region in Greece. Issues of Meso Car Dependence During the Covid-19 Pandemic

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https://doi.org/10.5755/j01.sace.35.2.34661

JSACE 2/35

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Received 2023/07/28

Accepted after revision 2023/11/23

Abstract

This paper investigates the supralocal role of medium to large-scale urban parks in Attica, Greece, during the COVID-19 pandemic. The research includes literature review and fieldwork. A statistical sample of 783 individuals was designed to investigate the community's outlook towards urban parks in Attica. The study establishes a theoretical framework based on the available literature that focuses on factors influencing individuals' willingness to commute so as to reach urban parks. These factors may include household characteristics, green space characteristics, and local accessibility. The paper also examines engaging factors for distant park use, such as relaxation, physical exercise, and social contact. The study adds to existing knowledge on the role of medium to large scale urban parks in Attica, by providing findings on visitation patterns during the pandemic. One of the study's most important finding is the car dependent travel mode which should be taken into consideration so as to promote sustainable urban mobility.

Keywords: urban parks; Athens; covid-19; supralocal; meso car dependency.

Introduction

The COVID-19 pandemic has had a huge impact on people's lives and cities all across the world. During this era of constrained mobility and social distance, urban green spaces have taken on new significance and are now acknowledged as an important determinant factor in people's well-being and psychological equilibrium (Dzhambov et al. 2021; Lin et al. 2023; Astell-Burt et al. 2022; Vatavali et al. 2020). These new circumstances necessitated a thorough examination of the role of medium and large-scale urban parks. In light of this, the current study focuses on the function of medium- to large-scale urban parks during the COVID-19 pandemic in the Attica Prefecture, the capital of Greece, that is home to half of the country's population.

Numerous global studies have emphasized the relevance of urban parks in boosting people's well-being and quality of life. According to research, the presence of natural green spaces is re-

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Journal of Sustainable Architecture and Civil Engineering
Vol. 2 / No. 35 / 2024
pp. 201-215
DOI 10.5755/j01.sace.35.2.34661

lated to lower stress levels, higher psychological well-being, increased physical activity, and improved social cohesiveness (Shanahan et al. 2016; Grima et al. 2020; Ridenour 2015; Biernacka and Kronenberg 2019; Lovasi et al. 2008; Twohig-Bennett and Jones 2018).

In Greece, the role of urban parks during the COVID-19 pandemic has yet to be thoroughly investigated. Efforts have been made to investigate the shift in population views about public space throughout the pandemic era (e.g. Apostolopoulou et.al., 2021; Mela and Varelidis, 2022). However, published relevant studies focus mostly on specific regions and neighborhoods of Attica (e.g. Mitoula, 2020; Kyriakidis, et.al, 2022). For an overall assessment, data gathering from diverse places would be necessary in order to facilitate a comparative evaluation within the Attica Region (Mela and Varelidis 2022). Given this, the current study attempts to examine an issue not previously studied, providing valuable knowledge on the function of urban parks in the Attica region during the COVID-19 pandemic. The combination of literature review and quantitative data analysis would disclose valuable information on community's outlook towards the role of urban parks during the pandemic. From this point of view, the aim of this paper is to put in the forefront community's perspective, offering useful data for future urban planning policy making.

Methods

The research focuses on the role of medium to large-scale urban parks during the COVID-19 pandemic in the Attica Region, the capital of Greece. The research includes literature review and fieldwork. The literature review focuses on international publications relevant to the general role of urban parks, the influencing factors of residential leisure travel to urban parks, and crucial factors for visitation and re-visitation of urban parks. Moreover, the authors have delved into studies relevant to the selected case study and its socio-spatial specificities. As for fieldwork, a statistical sample has been designed to explore the community's perspective on the role of medium to large-scale urban parks.

The statistical sample was designed by using as a focal point an urban park in Drapetsona, an area of 640,000 m^2, in the Regional Administrative Area of Piraeus. This park is a former brownfield site, partially redeveloped, that attracts many visitors from other municipalities, according to previous studies1. Based on the published results of the "Gonimo Edafos Program" from the 2026 respondents of the survey (2021-2022), 764 visitors of the park reside in other municipalities. This means that 38% of the visitors do not reside in the nearby area. This fact was considered an indication that large-scale urban parks may attract visitors from other municipalities, especially during the COVID-19 pandemic. From this point of view, the authors tried to explore the supralocal potential of medium to large-scale urban parks of Attica, highlighting as well their special characteristics for attracting visitors.

The questionary was divided into two distinct parts; the first part included questions relevant to the function and role of the Drapetsona Multifunctional Park, while the second includes questions regarding other medium to large-scale urban parks within the Attica Region. This paper presents the findings of the second part of the above-mentioned survey, the one that focuses on medium to large-scale urban parks of Attica.

The questionary included suitable questions to reveal the willingness of citizens to travel certain distances to reach specific urban parks, making the appropriate connections with parks' characteristics as derived from literature (size, vegetation, and equipment-infrastructures). The online survey took place from March 2022 to May 2022.

With the view to estimate the sample size, the target population has been organized into two main categories. Given the fact that research has used as a focal point a specific large-scale urban park in Drapetsona, one category included citizens of the Regional Administrative Area

[1] Based on previous research conducted during the years 2021-2022, as presented on the official website of the program "Gonimo Edafos" https://www.gonimoedafos.gr/

of Piraeus where Drapetsona Park is located. The first category has 448.997 residents according to the Census data of the 2011, Hellenic Statistical Authority. The second category included the rest of the population of the Attica Region, to assure equal potential for participation. The second category included 3027063 residents according to the Census data of 2011, Hellenic Statistical Authority.

Based on literature, the sample should include 384 observations for Category 1 and 384 observations for Category 2 (Shaunders et.al., 2009), a total of 768 participants in order to offer statistical significance. The statistical method used was random sampling, which is a typical probability method. Finally, 783 participants answered the survey. To be more specific, 394 resided in the Regional Administrative Area of Piraeus and 389 in the rest of the Attica Region. The questionary was forwarded online, via mailing lists and social media to the municipalities of the Regional Administrative Area of Piraeus, to public schools, to universities located in the area of study, to local athletic associations, to centers for elderly people, to local commercial chambers, to large retail stores with more than 10 employees, and local cultural associations.

The statistical data analysis was made with the help of the SPSS software, descriptive statistics, and a cross-tabulation process to reveal interrelations among different qualitative factors. After gathering the answers to the survey, authors have conducted multiple visits to the urban parks that participants proposed as more frequently visited to make direct observations. The research also includes cartographic depictions of the above-mentioned urban parks, commenting on their location within the city's fabric and their possible future potential.

Theoretical Framework

In the era of COVID-19, urban parks have become major catalysts for supporting and promoting physical and mental health (Baek et.al., 2021). However, even before the outburst of the pandemic, urban parks have been described as important modes of "cultural fix" (Loughram, 2018). According to the International Federation of Parks and the Recreation Report, (Ifpra Report, 2013), parks may be defined as delineated open space areas, covered mostly by vegetation and water, open for public use. The term refers to large-scale spaces but contemporary approaches list urban pocket parks as well. In most of the cases, local authorities have officially defined an area as a park, shaping a special regulatory framework on park's use.

Finding analogies with the concept of "spatial fix" introduced by David Harvey (2001), urban parks have been used to resolve social crises (ibid). Building upon Harvey's approach, studies promote the idea that since the 19th century, planners have deployed green spaces as remedies to cultural, political, and economic crises, the evident side-effects of rapid urbanization processes (ibid). In addition, park planning and design follows the socio-spatial changes that occur in cities, expressing different eras of landscape design and architecture (Young, 1995). Given this, there is a variety of planning standards and principles when it comes to park design; recent advances in the field underscore the necessity for outdoor athletic facilities (ibid). Moreover, literature provides evidence that urban parks may offer a suitable venue for community engagement, able to promote participation and social exchange (Francis, 2006).

Nonetheless, during the COVID-19 pandemic, empirical evidence shows that citizens spontaneously have increased the frequency of visiting urban parks and other outdoor urban spaces. Research from around the world shows that visitation in open public spaces changed incrementally during the pandemic in cases where urban mobility restrictions allowed it. After retracting official mobility restrains, park visitation returned to higher levels than before the pandemic (Matasov et al. 2023; Mela and Varelidis 2022).

Based on literature, three main parameters determine how far people are willing to travel to reach an open green space (Schindler et.al., 2022); the first factor includes household characteristics such as demographic, cultural, etc., the second green space's attributes-mainly size, vegetation,

and equipment, and the third the local accessibility of urban green spaces. These parameters have been taken into account while designing the survey for this research as described in the previous chapter.

Moreover, other researchers as Wang et al. and Liu et al., have identified four main factors that influence the use of urban parks. In particular, the determinant factors include socio-demographic attributes, residential space characteristics, personal factors, and park characteristics. Relaxation, physical exercise, socializing, and playing with children have also been identified as important motivating factors for park use. Encouraging factors for further use of a park may include safety, aesthetics, and maintenance (McCormak et.al., 2010).

In addition, facilities and resources within a park may influence the target population (Baek, et.al., 2021). To be more specific, studies associate attractiveness with facilities as the convenient use of restaurants and cafes and/or places for children (ibid). Further research in the field has identified new key factors for users' satisfaction while visiting parks, among which are the sign system, the air quality, the traffic to the park, car parking facilities, and the presence of water bodies within the park (Liu et.al., 2021). Studies also indicate that both natural and man-made elements may serve as drivers to attract and engage visitors (Razak et.al., 2016). Regardless of the motivating factors, it is commonly accepted that urban parks may be considered common travel destinations (Xuyichen Yan et.al., 2022).

Specific studies emphasize destination attributes such as natural resources, amenities, activities, and accessibility. As for natural resources, studies focus on the contribution of urban parks to biodiversity, as well as on the interaction of urban dwellers with nature (Lin et.al., 2014). As research evidence shows, nature orientation may be perceived as the primary effect (ibid). Moreover, park users with stronger nature orientation, seem willing to travel longer distances to reach urban parks. Delving into the aspect of parks' natural resources, studies indicate that the presence of exotic flora may be significant, oftentimes as an intentional landscape approach, enhancing visitors' natural experience (Nielsen et.al., 2013). From this point of view, park destinations may be clustered as culture- versus nature-based. Literature on culture-based dimensions of urban parks reveals that visitors may be attracted by organizing open-air events such as screenings, concerts, engaging even residents of distant neighborhoods (Szafranko, 2017). Thus, the visitation and revisitation patterns are highly dependent on the experiences that visitors seek (Baek et.al., 2021).

Furthermore, urban parks may include high-intensity recreation, low-intensity recreation, and conservation zones. There is a clear distinction between "high-intensity recreation" and "low-intensity recreation". High-intensity recreation requires special design and planning as well as amenities and equipment e.g. skate parks, while low-intensity recreation needs minimal or no interventions having a low impact on the natural ecosystem (e.g. pic-nick areas, hiking, etc.). It is also important to mention that, there are differences between community sports and high-intensity outdoor spaces, in terms of design and function (Jayawardhana,2019). Nonetheless, the main body of evidence shows that recreational trends within urban parks follow the changes in societal trends, revealing the new contemporary dynamics in park design (Zanon et.al., 2018).

Pertinent literature provides a direct connection between park design and assessment of the quality of life; studies using Lawton's Quality of Life Model, embrace intangible aspects of the quality of life affected by the presence of urban parks as good health and recreation opportunities (Hamdan et.al., 2017). Building upon this idea, other studies claim that visiting urban parks may improve human senses and emotions (Hajmirsadeghi, 2012). Other researchers employ the concept of "vitality" to evaluate the intangible benefits of urban parks to human well-being, using as categories the visiting intensity and the recreational satisfaction rate (Zhu, et.al., 2020). Researchers also link urban park visits to short leisure travels at weekends, indicating as a basic traveling motive, the

need to visit natural landscapes (ibid). Previous studies have also underscored the differences in travel time, travel mode, and duration of visits in urban parks during weekends and weekdays. Usually, during weekends, there is high concentration of visitors, longer distances to cover, and longer duration of visit (ibid).

An engendered outlook on the matter, reveals that women are less likely to visit remote urban parks (Xuyichen Yan et.al., 2022). Moreover, travel distance is affected by residents' characteristics such as age, gender, and family size (ibid). Particularly, older citizens, visit and revisit urban parks during weekends, seeming willing to cover longer distances (Zhan et.al, 2021). Some studies claim that park design features have no significant impact on revisitation (ibid), while European studies propose as main drivers for revisitation, relaxation, and natural experience (Fischer et.al, 2018 Vierrikko, 2019). Most of the studies, diversify visitors as regular visitors and first-time visitors, so as to evaluate re-visitation patterns (Zhan et.al, 2021). It is also important to mention that according to recent literature, there are a few studies on visiting frequency, stressing that there is room for further research on the topic.

As for the main factors for revisitation, most of the studies converge to the idea that mental and physical health benefits seem to be the higher priority for visitors, followed by positive experiences from previous visits (ibid). On the other hand, weather conditions and time limitations set barriers to park visitation for some of the citizens (ibid). Commenting on travel mode, all of the studies conclude to the fact that alternative ways, other than car-dependent traveling, should be established to promote sustainable urban development, especially in megacities (Liang,2018). There are numerous studies that identify forms of meso car dependence connected to park visits (ibid). As meso car dependency, researchers describe certain car dependent trips (Mattioli et al. 2016) as in the case of park visits. Based on Mattioli et.al. (2016) most of the existing studies put emphasis on other scales of car dependence; the macro and micro. The main body of evidence indicates that citizens of different cities show different levels of car dependence (Von Behren, et.al, 2018). Moreover, car dependent mobility is divided into subjective and objective. The one case is related to driving a car by choice while the other by necessity. To understand car dependent individuals, characterized by a subjective car dependent profile, it is important to study how different markets function (ibid). In addition, studies associate traveling patterns to social class; there is a clear distinction between the transport rich and the transport poor (Wickham, et.al., 1999).

Putting in the forefront the urban park visitation patterns, the combination of public transport routes to major urban parks may offer better accessibility, increasing the visiting frequency. There are also studies promoting the idea of using low-carbon transportation as nonmotor vehicles as a step towards sustainable urban development and mobility (Xuyichen Yan et.al., 2022).

Focusing on the Case of Greece

During the pandemic, a study in Attica revealed that citizens increased their visits to urban public spaces for exercise, socializing, and contact with nature, with the majority of the participants responding that they preferably choose places that are 15 minutes on foot from their house; visits take place several times a week, and primarily in the afternoon (Mela and Varelidis 2022). The distribution and closeness of urban spaces to residential areas provide a fruitful field for researching visitation patterns during times of crisis.

Residents prefer open spaces close to their residences, but what happens in locations where the distribution does not suit the "15-minute city" pattern (Pozoukidou and Angelidou 2022; Glavan et al. 2022)? Taking into account this argument, it is important to mention that Athens shows evident ramifications of urban sprawl (Kiousopoulos and Tousi, 2017). From this point of view, there are large residential areas that lack the principles of a well designed compact city. Previous studies (Wickham et.al., 1999) have identified a general car dependent mobility pattern in Athens since 1990.

Another important parameter is the quality of urban public spaces. Previous studies have revealed its significance in determining visitation; people who reside in neighborhoods with abundant and well-maintained public spaces were more likely to return in the future (Mela and Varelidis 2022; Zhang and Zhou 2018). The interrelation between the amount and quality of public spaces and their attractiveness indicated the need of promoting high quality design and maintencance. Given this, of notice are the findings of a study, where citizens viewed urban green spaces as an important mode of improving public health. This notion was expressed through their willingness to accept an increase in municipal taxes to improve urban park services (Kolimenakis et al. 2022).

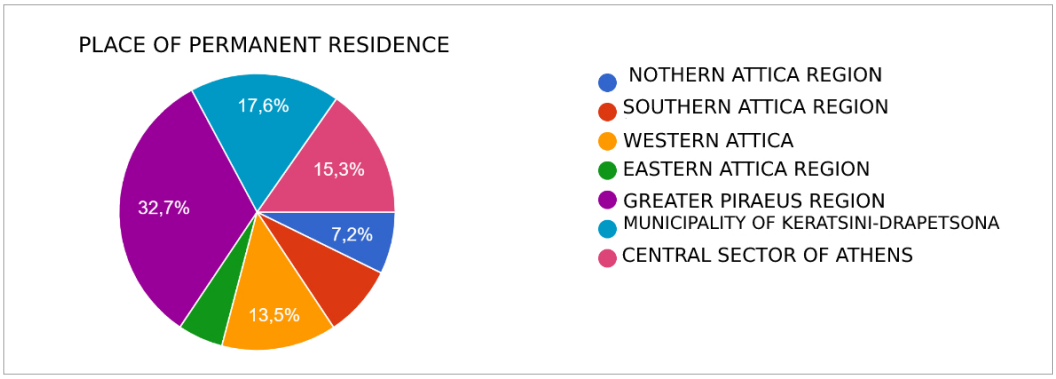
All the above-mentioned show that urban parks in Greece play a significant role, especially during the pandemic, however public spaces are not evenly distributed throughout the urban fabric. This fact opens dialog on how to improve and enhance green networks within the Greek metropolis with the view to promote sustainable urban development and mobility.

Results and Discussion

The survey's questionary has been answered by 783 participants. In particular, 394 residents of the Regional Administrative Area of Piraeus and 389 residents of the rest of the Attica Region. The table below (Fig. 1) depicts in detail the place of permanent residence of the participants. 50,3% of the participants lived in the Greater Piraeus Region and 49,7% in the rest of the Attica Region. As for the sample's demographics, 39,7% of the participants were 19 to 35 years old, 42,5% were 36-55 years old, 15,6% were 56 to 65 plus and a small percentage of 2,1% included high school students 15 to 18 years old. The sample included 45,9% males, 53.7% females and 0,4% defined themselves as non-binary. The educational level of the participants varied from high school graduates to university graduates, with the majority of the participants having a tertiary degree (71,7%). The majority of the participants belonged to the economically active population at a percentage of 59%, while the sample included also pensioners (7,7%), high school students (2,1%) university students (28,2%), and unemployed participants (3,3%).

Fig. 1

Place of Permanent Residence, authors' SPSS statistical analysis



Commenting on the supralocal role of the Drapetsona Multifunctional Park (Lipasmata Park), the focal point of this research, 60,3% of the participants have visited the Park and 74,9% of the participants were familiar with the site. According to the participants' opinion, positive attributes of the Lipasmata Drapetsona park may be the proximity to the sea, the propinquity to Piraeus port and the size of the park. On the other hand, barriers to future regeneration may be associated with the presence of industrial uses, the complex ownership status, and the lack of funding (Tousi et.al., 2022).

Expanding the discussion to other medium to large-scale parks in Attica, the majority of the participants stated that they do visit urban parks far from their neighborhood, at a percentage of 91,60%. They identified 8 popular urban parks within the Attica Region, as presented below in Fig. 2 and Fig. 2a. The most popular of all is the Stavros Niarchos Park (562 responses), a high aesthetics contemporary urban park located in Athens Riviera.

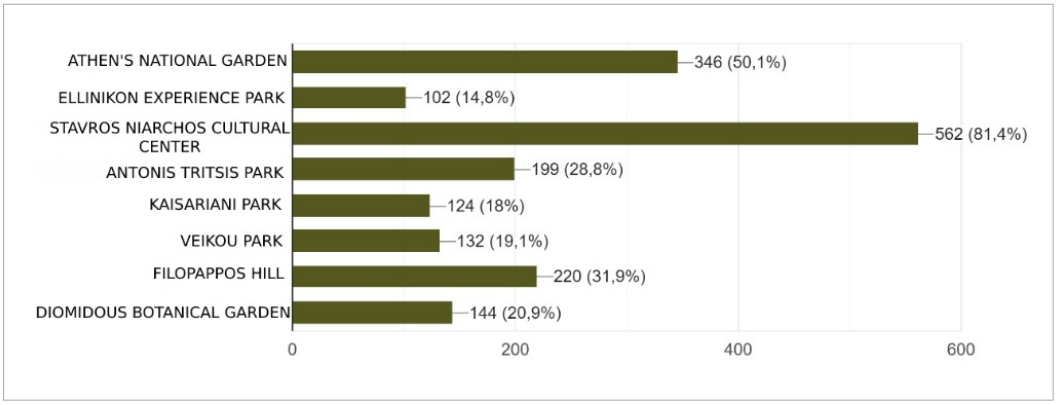


Fig. 2

Frequently visited medium to large-scale urban parks within the Attica Region, authors' SPSS analysis

The parks presented in Fig. 2, have different physiognomy and different features. They are also designed during different chronological eras, representing design principles of different epochs. Some of them may be described as nature-based while others as culture-based or both, as presented in Fig. 3. Common characteristic of all 8 parks, is the opportunity for recreation and relaxation, which, according to literature, is one of the strongest motives for traveling, especially during weekends. These frequently visited urban parks, offer different forms of recreation; some of them may be clustered into the high-intensity recreational areas and community sports areas while others to low-intensity, as presented in the table below (Fig. 3). Some of the parks include water body elements as the Stavros Niarchos Park, the Antonis Tritsis Park, and the National Garden. Details regarding the size, vegetation, and equipment of the parks are depicted below (Fig. 3).

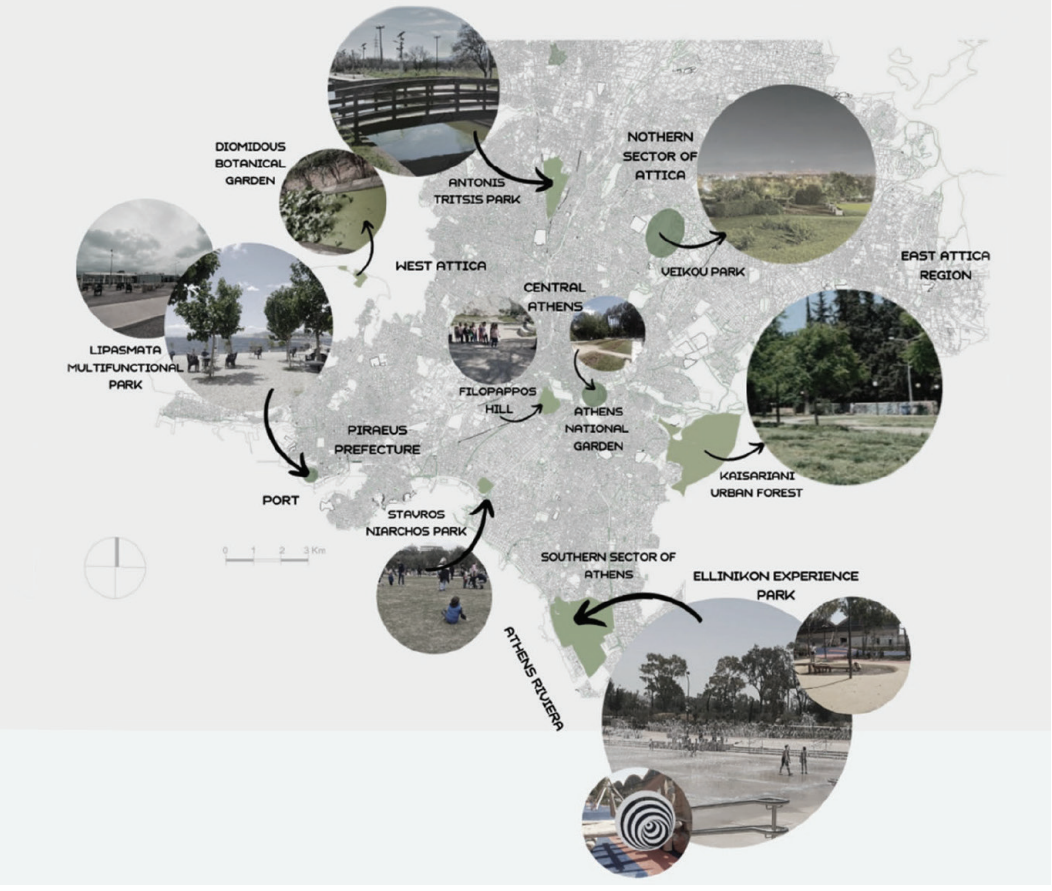


Fig. 3

Map showing the location of the 8 parks and representative photos, authors' field work, source of background map, google maps

Table 3

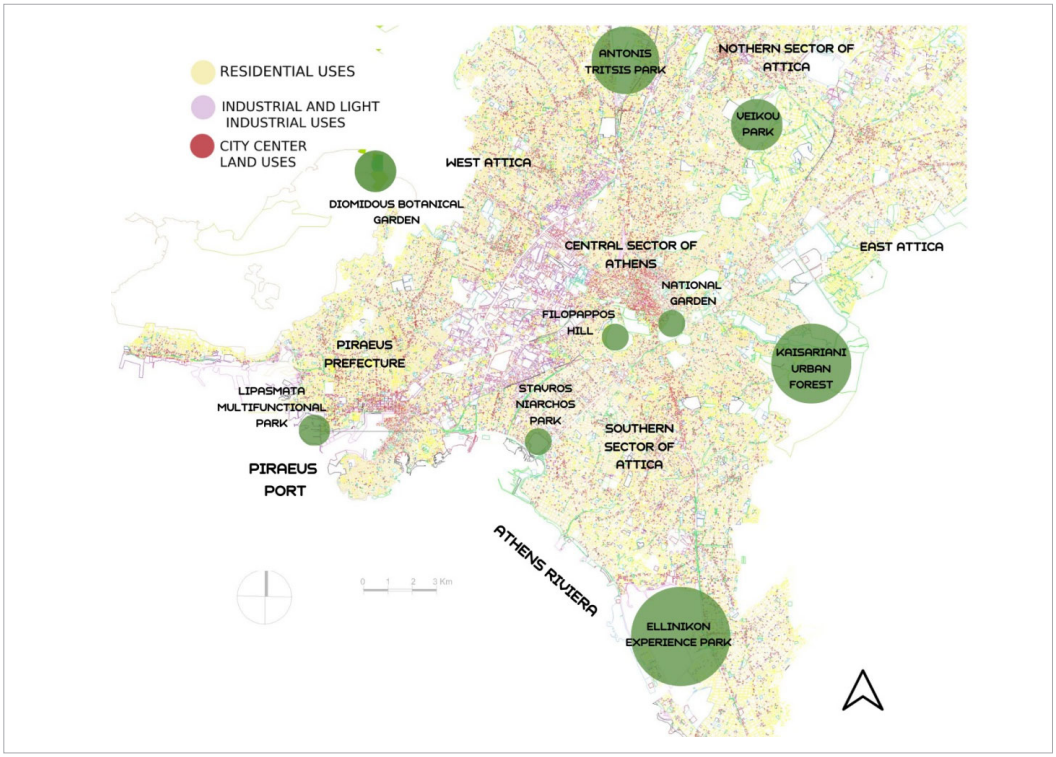
Size, vegetation and equipment, type of recreation, nature or culture based on the 8 parks, authors' fieldwork

Park	Size	Brief Description/ History	Vegetation	Equipment/ urban furniture and infrastructures	Low-intensity recreation vs high-intensity recreation	Type of park Nature-based or culture based	Availability of public transportation
Athen's national garden	285 Acres	Designed as a royal garden in 1838, by the german agronomist friedrich schmidt. The garden included more than 500 imported flora and fauna species. In 1878, the neoclassical zappeion hall was constructed and designed by theophil hansen. During the 1920s the park was opened to the public and renamed "national garden".	Dense vegetation, shrubs, and medium to high trees. Indigenous and exotic flora species.	Few sitting areas, fauna species, water body elements, zappeion	Low-intensity recreation	Nature-based	Next to syntagma metro station 3 Minutes on foot Nodal point of athens
Filopappos hill	700 Acres	Green area to the southwest of the ancient acropolis of athens. It offers panoramic views of the acropolis, the city of athens, and the saronic gulf. On its top is a 115 ad monument dedicated to the exiled roman prince gaius julius antichus philopappos. It includes a paved path that leads to pnyx hill, where the orators of greek antiquity used to discuss political issues.	Dense vegetation, shrubs, and medium to high trees	Few sitting areas, walking paths, sites of cultural, architectural, and archaeological interest	Low-intensity recreation	Mostly nature-based	17 Minutes on foot from thision train station (the closest one)
Stavros niarchos park (Snfcc)	210 Acres	Designed by the architectural firm renzo piano building workshop, the snfcc is a donation of the stavros niarchos foundation (snf). It was completed in 2017. Contemporary sustainable architecture and landscape design, redefining the connection between the city and the waterfront. Environmental design (leed) certification.	Well-landscaped area indigenous flora species shrubs, and trees of different heights	Well-designed, eco-friendly contemporary urban furniture and playground equipment, water body elements	Both	Culture-based	Stavros niarchos shuttle bus departs from syntagma Far from all the existing metro stations
Kaisariani urban forest	4.460 Acres	The aesthetic forest (presidential decree (pd) 71/94) is located on the west side of mt. Hymettus. The area belongs to the natura network (sci/sac) Gr3000006	Urban mediter-ranean Forest/foothills of hymettus mountain Variety of species, esp. Pinus mugo, and pinus leucodermis	Mostly paths for walking,	Low-intensity recreation	Nature-based	15 Minutes on foot from the closest bus stop Bus line 224, connects kaisariani to nea philothei (a northern suburb of athens)

Park	Size	Brief Description/ History	Vegetation	Equipment/ urban furniture and infrastructures	Low-intensity recreation vs high-intensity recreation	Type of park Nature-based or culture based	Availability of public transportation
Veikou park	256 Acres	The green area in the northwest suburbs of athens. It was named after lampros veikos, a hero of the greek revolution of 1821. The area includes green spaces, basketball and football courts, a swimming pool, tennis courts, open-air cinema and theatre, a cafeteria, playgrounds, and outdoor body training equipment.	Dense vegetation, shrubs, and medium to high trees	Sitting areas, walking paths, playgrounds, and various athletic facilities (it includes a type of community sports area)	Both	Both	Bus stop Bus line 444 (Circular route from train station eirini, northern sector of athens to patisia, central athens)
Botanical diomidous garden haidari	1.860 Acres	(1952-1975) Significant botanical garden in the east mediterranean region. Alexander diomedes entailed part of his fortune to the university of athens in order to keep and operate the botanical garden.	High aesthetic quality botanical garden, variety of flora and fauna species Hosting more than 2500 plant taxa.	Sitting areas, walking paths, cafeteria	Low-intensity recreation	Nature-based	Bus stop nearby Bus line 811, from metro station agia marina (line airport to port) to haidari, west attica
Ellinikon experience park	70 Acres	Designed by the architectural firm doxiadis+, is part of a greater regeneration project in the former brownfield site of the old airport of athens. The general project is undertaken by the famous architectural firm foster + partners and will be completed in the following years.	Mostly hard-landscape design with few flora species	Well-designed contemporary urban furniture and playground equipment, cafeteria	Both	Culture-based	600 M from ellinikon metro station, up to 10 minutes on foot Red metro line From northwest attica (peristeri) to eastern suburbs (ellinikon)
Antonis Tritsis Park	1.200 Acres	Metropolitan Park on the outskirts of the Western Sector of Athens, is open 24h a day, and hosts 15.000-16.000 visitors during weekends. Its history dates back to 1833, it includes historical buildings and various amenities. In 1993 the site was declared a supralocal recreational area and has functions as such since (Law 6/11.03.1993/Δ 29).	Various flora and fauna species, Mediterranean species.	cafeterias, walking paths, sitting areas, large water body elements, 6 artificial lakes, a canal, continuous flow of water within the park	Mostly low-intensity recreation	Mainly nature-based	18 minutes on foot from Pyrgos Vasilissis Suburban Railway station 15 minutes on foot from the closest bus stop (Lines 735, 892, A10, B10) The lines accommodate only routes from Western Attica to central Athens

Fig. 4

Location of the 8 parks within the Metropolitan Region of Athens and neighboring land uses, authors' work, source of background map Laboratory of Urban Planning and GIS, School of Architecture National Technical University of Athens (2013)



Some of the parks are centrally located as the Filopappos Hill and the National Garden, while others are found in suburban areas, near peri-urban green spaces as the Botanical Diomidous Garden and the Kaisariani forest (Fig. 4). The majority of participants use a private car to reach the above-mentioned parks, at a percentage of 70,83%. Delving into the car-dependent mobility pattern, research revealed that not all of the 8 supralocal parks are well connected to the public transportation network (Fig. 5 and 6). Besides the Ellinikon Experience Park and the Athens National Garden, all other parks are far from metro stations requiring more than two, three or even four transfers. Local bus lines are oftentimes far from the park, requiring more than 15 minutes walking. Field work indicated that especially the parks that are located far from the city center as Diomidus Botanical Garden and Tritsis Park have the less efficient connection to the rest of the city. Thus, the extensive use of private cars could be linked to how the public transport network is planned and designed. This might be considered as an objective car dependent traveling mode. Moreover, this is a clear case of meso car dependence, where private cars are extensively used for certain activities and trips. To put this situation into a broader context, there might be linkages between meso car dependence and COVID-19. Given the fact that the survey took place during the pandemic, there is a high possibility that participants chose to use their private car so as to avoid

Fig. 5

Reasons for visiting parks far from the participants' neighborhoods, authors' SPSS analysis

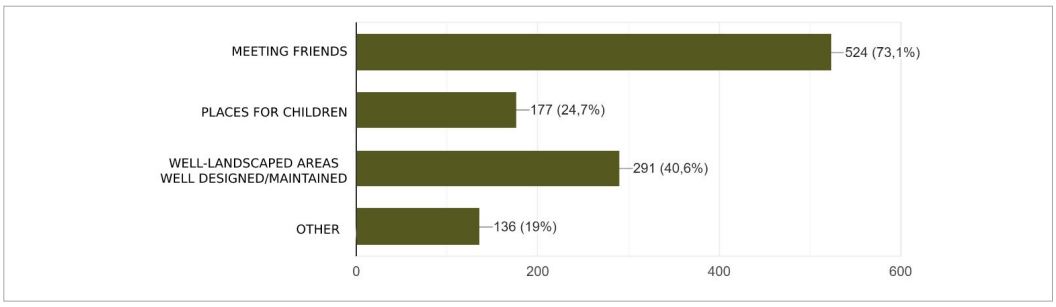


Fig. 6

Location of the 8 supralocal parks compared to the lines of public transportation. Electric rail metro, suburban rail, and tram. The thin blue lines on the map represent bus routes, authors' work, background map available at https://el.athensmap360.com/

densely populated public transportation. It is important to mention though, that Athens has a long history of car dependent mobility (Wickham, et.al., 1999), owed to its urban expansion and development. Thus, meso car dependence may be associated with a general macro car dependence pattern that excacerbated in the era of COVID-19.

To outline visitation and re-visitation patterns, the majority of participants (524 answers) stated that the main reason for visiting and re-visiting the above-mentioned parks, during the COVID-19 pandemic, is meeting with friends, while the second most important factor is the quality of design

and maintenance (291 answers) (Fig. 5). In addition, specially designed areas for children and relevant facilities are considered to be engaging factors, enhancing parks' attractiveness towards certain population groups. (Fig. 5).

As for the profile of the parks' visitors, mostly young people (19-45 years old) are the frequent visitors of these parks, at a percentage of 44,95%, mainly residing in central Piraeus and the central sector of Athens. These are areas with dense urban cores and few public green spaces. Regardless of residential areas, senior citizens especially those over 65 years old, stated that they occasionally visit urban parks located far from their neighborhood.

Furthermore, residential leisure travel seems to be associated with the availability of outdoor green spaces; the 35% of those who answered that their neighborhood has only a few outdoor green spaces, stated also that they visit the supralocal urban parks often or very often, meaning a couple of times within a month. At this point, it is important to mention that, there were no significant differences among male and female respondents on the above-mentioned issues.

Summarizing the main findings of the survey, almost all participants seemed willing to travel long distances to visit an urban park. However, special features of the park itself are important drivers for ascribing supralocal significance to certain parks within the metropolitan area of Attica. From this point of view, of the 407 participants who stated that their neighborhood has adequate public spaces, 47,2% seemed also willing to visit distant urban parks, on condition that these parks offer intriguing natural and/or cultural experiences.

Conclusions

The study focuses on the supralocal role of medium to large-scale urban parks during the COVID-19 pandemic in the Attica Region, the capital of Greece. Quantitative research results underscored the significance of certain parks within the city's fabric. National Garden, Filopappos Hill, Stavros Niarchos Park, Ellinikon Experience Park, Diomidous Botanical Garden, Veikou Park, Antonis Tritsis Park, and Kaisariani Urban Forest are the 8 parks that participants described as the most frequently visited. Either nature-based or culture-based, these parks offer low-intensity to high-intensity recreational opportunities, attracting visitors from all the neighborhoods of Attica.

Frequent visitors are citizens from the most populated municipalities of Attica; central Piraeus and the central sector of Athens, mostly young people (19 to 45 years old). Special features owed to landscape design, function as major drivers for inducing residential leisure travel during weekends. However, in the COVID-19 era, social interaction was the main reason for residential leisure travel. Moreover, specially designed places for children may serve as an engaging factor for visiting and revisiting distant urban parks. As for the travel mode, the study's findings comply with empirical evidence from other studies; there is a clearly meso car-dependent traveling pattern in Attica.

To conclude, the research's most important finding is the willingness of the population to drive long distances to reach certain medium to large-scale urban parks in Attica. As evidence showed, the majority of young citizens is not limited to their neighborhood's outdoor spaces but prefer to commute to reach distant urban parks, especially during weekends. This finding expands the discussion of the role of urban parks beyond the 15-minutes city. It is also associated with parks' special features either natural or cultural. From this point of view, urban planning should accommodate citizens' needs; It should efficiently include large urban parks into public transportation networks, in order to avoid car-dependent mobility that only exacerbates urban microclimate. Being designated as supralocal, certain parks within the Greater Athens Region, require efficient connection to public transportation networks as a step towards sustainable urban development, avoiding fragmented routes with more than two transfers. Future research on this issue, should also focus on public transportation features as accessibility, urban environment safety, frequency of public transport, first and last mile travel, in order to provide an overall assessment of the contemporary situation. Incorporating supralocal parks in the urban transportation network would undoubdedly promote sustainable mobility in metropolitan Athens, improving citizen's quality of life.

Acknowledgments

Authors would like to thank Abigail Chernila, Giatra Pantochara, Georgopoulou Christina, Gania Maria, Mpalta Eleni, Kapranou Konstantina, Kotsianou Nataly and Tsimpidi Stavroula for supporting the survey's distribution.

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