



Use of Coastal Areas During the Covid-19 Pandemic: A Case Study of the Asian Side of Istanbul

Bengi Korgavuş^{1*}

** Corresponding author: Assist. Prof. Dr., Yeditepe University, Faculty of Architecture, Department of Urban Design and Landscape Architecture.*

bdemirkan@yeditepe.edu.tr

<https://orcid.org/0000-0002-2257-2902>

Ezgi Özkoç²

Res. Assist., Yeditepe University, Faculty of Architecture, Department of Urban Design and Landscape Architecture.

ezgi.ozkoc@yeditepe.edu.tr

<https://orcid.org/0000-0002-4778-8953>

Abstract

Throughout history, pandemics have always shaped cities; many health issues have been reflected in architecture and urban planning. Today, the world faces a public health crisis of the COVID-19 pandemic, which has affected people economically, socially, psychologically, and physically; changed people's daily lives and habits. The pandemic has increased the need for public and open/green spaces where people can spend their time safely and without the risk of contamination. The study aims to examine the use of coastal areas, which is one of the public spaces that people often prefer to use during the COVID-19 pandemic process; at the same time, it offers urban planning and solution suggestions to local and central governments to reorganize, develop and ensure the continuity of coastal areas due to the COVID-19 pandemic. In this context, the Caddebostan - Kartal coastal area, which is an uninterrupted coastal band of the Anatolian side of Istanbul, serves various socio-cultural groups and has intense use, especially during the pandemic process, and has been determined as the study area. To determine user preferences in the study area, a survey was conducted with 952 people. The results of the survey study were evaluated with the SPSS program. Then, on-site observations were made and evaluated together with the survey study, and design criteria and suggestions were presented in response to the ongoing COVID-19 epidemic and different global epidemics that may arise. Emphasizing the importance of green and open spaces for COVID-19 and future pandemics, this study supports the continuity of decisions taken for current and future pandemic situations.

Keywords: COVID-19 Pandemic; Coastal Areas; Public Space; Recreation; Istanbul Coastal Areas

1. INTRODUCTION

SARS-CoV-2, also known as COVID-19, is a viral infectious disease that affects mainly the human respiratory system (Chen et al., 2020) and was first identified in early December 2019 in Wuhan, Hubei province, China. Since then, it has spread rapidly to other countries across the World (Lu et al., 2020). This led the WHO to declare a Public Health Emergency of International Concern on 30 January 2020 and to characterize the outbreak as a pandemic on 11 March 2020 (WHO, 2020).

The coronavirus pandemic has been the biggest challenge for the world since World War Two. As of September 2020, the pandemic has caused over 6.446.438 deaths globally (WHO, 2022) and shut down vast swathes of the global economy, with all the suffering that implies. By any standard, that constitutes a global catastrophe (BBC, 2022).



The first case in Turkey was recorded on 11 March, when a local returned home (Ministry of Health, 2021) from a European trip (Cantekin, 2020). The country's first death due to COVID-19 occurred on 15 March (Cantekin, 2020).

From the first day of the cases to 25 September 2022, 16,896,522 people were caught in the COVID-19 pandemic, and 101,179 people died in our country (Lu et al., 2020). Restrictions and bans have been implemented, such as gradually closing educational institutions and switching to online education, stopping art and sports activities, closing entertainment venues, stopping mass worship, and wedding events, and closing shopping centers and bazaars from the date the cases began to be seen. Later, curfews were imposed on people over the age of 65 and under the age of 20 and a curfew after certain hours. In addition to all these restrictions, a curfew was imposed on public holidays such as national and religious holidays and weekends. In this process, public and private sector institutions mostly switched to the remote working system or flexible working order was applied (Chen et al., 2020).

The pandemic has affected people economically, socially, psychologically, and physically; changed people's daily lives and habits. The pandemic, which has been affecting all over the world, has separated people from the outdoors due to restrictions and made it mandatory for them to be indoors (WHO, 2022). Besides the economic impact of this situation, there are increasing concerns regarding the less obvious effects on mental health. These effects are derived from isolation, disconnection, unemployment, stress, etc., and may result in long-term impacts beyond the time frame of the current pandemic (Grima et al., 2020).

A growing literature has produced an evidence base suggesting that nature exposure helps to deliver mental health benefits (Bratman et al., 2019), reduced stress levels (Bratman et al., 2012), less rumination (i.e., the dwelling on negative aspects of a current situation) (Golding et al., 2018) and increased overall sense of well-being (Bell et al., 2020). Not only do outdoor recreation and exercise have a positive impact on mental health, but physical health as well. Beyond the physical and mental health benefits, the outdoors and green spaces contribute to making people act more positively in social settings, setting a context to improve social relations and overall well-being (Hartig et al., 2014; Kuo et al., 2001).

In this case, urban green areas, with their plant, water, and other ecological elements, are a necessity for public health has come to the fore. The fact that sportive and cultural activities, which were not done outdoors before, are carried out outdoors brings the increasing use of green areas to the agenda. In this context, the protection and sustainability of the urban ecosystem also increase its importance (WHO, 2022).

Based on historical examples and research, this study emphasized that the pandemic will play an active role in future urban design; the essential requirements and solution proposals developed against the pandemic were discussed.

2. PANDEMICS THROUGHOUT HISTORY AND THEIR EFFECTS ON CITIES

Coronavirus is not the world's first pandemic; there have been other pandemics that have hit the world and ended the lives of millions (Figure 1) (LePan; Routley, 2020), which not only affected the health field but also left urban impacts and economic consequences (Eltarabily & Elghezawy, 2020).

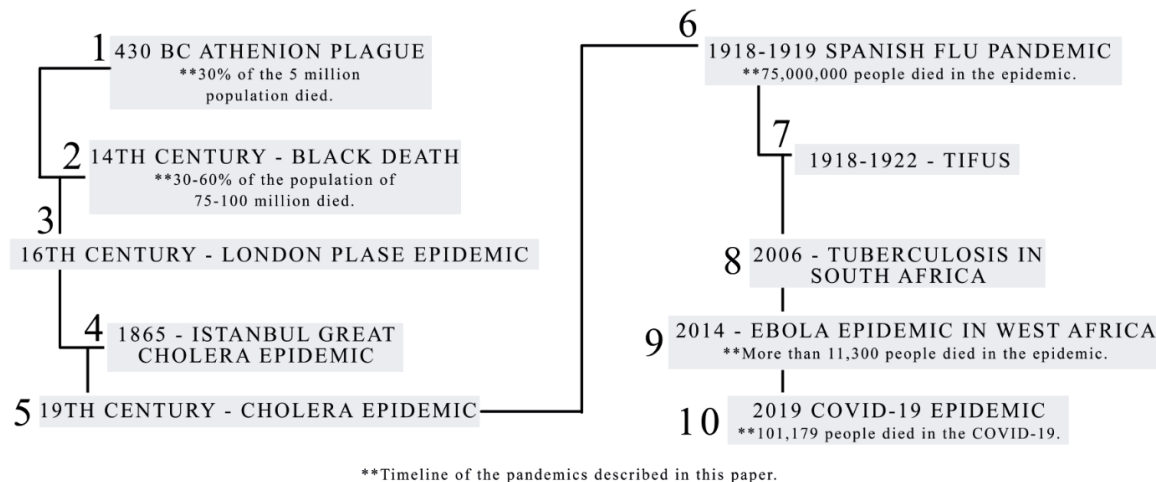


Figure 1: Chart of pandemics in history (Newfield, 2020).

From reviewing the history of pandemics in the past, beginning from the Athenian plague in 430 BC to the Black Death in Europe in the 14th century. We can notice more insights into the effects and consequences of changing the design of cities, the city's zoning laws, and the first concept of quarantine (History, 2021). For example, the black death affected the urban design of European societies by calling for opening more larger public spaces, which provided a more significant opportunity to connect with nature and reduce the feeling of isolation. During the London plague epidemic, urban cemeteries were transformed into green areas such as parks and playgrounds to prevent the spread of the virus and meet the city's public space needs (Bratman et al., 2019). In the early 19th century, when a series of cholera epidemics struck the world, it was a time of deplorable urban living. In London in 1850, one of the main reasons for the cholera outbreak was mixing clean drinking water with wastewater, according to WHO's data (Hays, 2005; WHO, 2020). In terms of improving the urban design field, the disease significantly impacted managing waste in the streets, supporting a strong feeling of wanting ventilation and daylight in open spaces through which people can move.

On the other hand, the infrastructure design field had a great chance to manage the cholera crisis. For this purpose, the central sewer system was built under the Thames River in London to separate the wastewater from the clean water source (Eltarabily & Elgheznawy, 2020; Carr, 2020). Likewise, in the great cholera epidemic of 1865 in Istanbul, people who died from this disease were forbidden to be buried in the city center to prevent the risk of spreading the virus. These areas were transformed into different urban functions (Bratman et al., 2019).

The typhus epidemic was one of the most significant diseases after the First World War (1914-1918). Communal public spaces such as factories, educational institutions, and prisons, where people are gathered together against typhus, which occurs under poor hygiene conditions, have been controlled (Özer, 2015). Between 1918-1919 the deadliest respiratory virus pandemic in history, "The Spanish Flu pandemic," killed more than 50 million people worldwide, slowing urban growth and limiting public life to slow the spread of disease. For example, public transportation had been replaced by walking in uncrowded streets, most of the population was staying at home, and sidewalks at night were unusually clear (Influenza Encyclopedia, 1918; WHYY, 2020).

COVID-19 has been added to a long list of rapidly spreading infectious diseases in the current century, such as tuberculosis in South Africa in 2006 and Ebola in West Africa in 2014, which represents a new challenge for cities to plan effectively and to turn into healthy cities (Duhl & Sanchez, 1999).

3. POST-PANDEMIC CITIES – THE IMPACT OF COVID-19 ON CITIES AND URBAN DESIGN

Pandemics reveal new pursuits in planning and architectural studies. Therefore, it is necessary to accept that epidemics exist and that new plans should be studied that improve healthy life, hygiene conditions, and public health. In addition to the effects of other outbreaks in the historical process, Covid-19; is an excellent opportunity to understand how cities will be affected by epidemics and what actions are necessary in the field of "planning/design in order to minimize their effects and increase urban epidemic resilience. Cities vary in population density, public space, green space, transportation, climate, energy, resource use, etc. It directly affects the public's health, with many criteria determining the quality of urban life (Sharifi & Garmsir, 2020).

AIDS, seen in the USA in 1981, has infected 37.9 million people worldwide, according to the World Health Organization (WHO) 2018 year-end data (Yeditepe University Hospital, 2020). The world has encountered new epidemics, mainly Sars in 2002, Swine Flu in 2009, Mers in 2012, and Ebola in 2014. December of 2020 brings the days requiring quarantine for the entire globe; humanity has faced a pandemic again. As a result of the research carried out on a group of patients in Wuhan, China, on January 13 2020, the whole world has suffered severe losses and continues to live in the face of a virus defined as Covid-19. For centuries, the struggles against epidemics were aimed at improving the health of individuals in the first place; at the same time, it has revealed the necessity of continuing these struggles in urban areas and making many spatial arrangements.

With the increase in the use of open spaces, there has been a need for places that will meet the needs of people to eat and drink outside in a safe, hygienic, and distanced way. Some of the examples of venues organized for this purpose in different parts of the world: social distancing yoga domes in Canada (Figure 2), the conversion of pentagonal greenhouses into dining rooms for two in Amsterdam (Figure 3), USA It is the addition of tables reminiscent of inflatable boats, specially designed for a restaurant to maintain distance in the state of Maryland (Dinc, 2020). The examples that differ according to each country signal that the new lifestyles and understanding of comfort adopted will become even more critical and that qualified and sufficient open spaces can be attained by this means (Seçkin, 2020).



Figure 2: Social distancing yoga domes, Canada (Yetim & Hurst, 2020)



Figure 3: Greenhouse restaurant, Amsterdam (Núñez, 2020)

The pandemic in Turkey has increased both existing urban problems and included new issues in the planning field. Rapidly developing construction, lack of infrastructure, lack of public space, and erosion of local identity have created planning problems, especially for mega-cities. The pandemic life, which has been going on since 2019, has deeply affected the economy and life of the city. In addition to the existing problems, new problems, such as loss of employment, disruption of social life, and economic contraction, have emerged (Gül, 2020). The following basic requirements can be listed in order to minimize the



contagion in the pandemic processes seen from the past to the present and to prevent adverse conditions: (Karagüler & Korgavuş, 2020; Özkoç, 2021)

- Creation of areas that provide both activity opportunities and create a private space,
- Arrangement of public space seating elements in a way to allow social distance,
- The necessity of reconsidering the use of city squares, public open and green spaces due to the interest in the open spaces that people often prefer to use during the pandemic process,
- Ensuring cleanliness and hygiene in all public spaces,
- Improvement of access opportunities to coastal areas,
- The need for particular areas that are not crowded and have sufficient green space,
- The need for an isolated space to reduce contact and create a safe distance,
- Ensuring the diversity of open space activities in public spaces that allow socialization,
- The need for fast and easy access areas for emergency health services,
- Developing pedestrian and bicycle pathways and ensuring their integration into the city,
- The necessity of minimizing contact in communication tools and vehicles,
- The needs of service points focused on daily basic needs such as food, water, medicine,
- Ensuring the coexistence of everyday life and individual life,
- Ensuring the sustainability of coastal areas.

People's needs for public and open/green spaces have increased with the global pandemic processes. In this study, the use of the Caddebostan - Kartal coastal area, which is increasingly used during the pandemic process, was evaluated with the survey evaluation made with the users and on-site determinations.

4. FINDINGS ON EXPERIENCES AND EXPECTATIONS IN THE COVID-19 PROCESS

4.1. Materials

The research aimed to determine the effects of the pandemic on public spaces-coastal areas and the improvement of public spaces to be prepared for future pandemic conditions.

The study is based on evaluating users' views on using coastal areas during the Covid-19 pandemic. The primary materials of the study are given below:

- Studies on the subject and literature review
- On-site observation
- Surveys were used to determine users' views on using coastal areas during the Covid-19 pandemic.
- SPSS 20, Microsoft Word, and Excel software were used in the study's computer environment to evaluate surveys.

In this context, the coastal area between Caddebostan and Kartal, located on the Anatolian side of Istanbul, was chosen as the research area. The Caddebostan-Kartal coastal area, which serves various socio-cultural groups and is an uninterrupted coastal area, was considered as three regions, Caddebostan-Bostancı, Bostancı-Maltepe, and Maltepe-Kartal while conducting survey studies and analyses.

4.2. Method

The research consists of the stages of determining the scope and method, collecting the information about the study subject, determining the sampling size, selecting the inquiry method, preparing the survey, applying the survey, and evaluating the survey results.

4.2.1 Determining sampling size

The survey study's sampling size was calculated using the formula suggested by Andrew Fisher. As demonstrated through Andrew Fisher's Formula below, a sample size of about 385 gives a sufficient sample size to draw assumptions of nearly any population size at the 95% confidence level with a 5% margin of error.



Necessary Sample Size = $(Z\text{-score})^2 * \text{StdDev} * (1 - \text{StdDev}) / (\text{margin of error})^2$

Considering the possibility of incomplete, incorrect, and invalid surveys, it was aimed to reach 450 valid questionnaires to increase the reliability of the survey. However, since the participation rate in online surveys was much higher than expected, more surveys were applied, and as a result, 952 valid surveys were evaluated.

4.2.2 Preparation of the survey

A survey was prepared to consist of two parts: determining the user group's socio-economic structure and users' views about coastal areas during the pandemic. In line with the determined criteria, the survey consisting of multiple choice, open-ended, and 5-point Likert-type questions were prepared with 36 questions. The survey consists of 2 parts; the first part includes questions about socio-economic structure (5 questions), and the second part the questions about the coastal area access and connections (5 questions), use and activities (9 questions), universal design (5 questions), comfort and image (7 questions) and pandemic conditions (5 questions).

4.2.3 Selection of inquiry method

Since inquiries by interviews are safer and faster, an online survey with standard forms was used to determine the opinions of the individuals who constitute the population of the study about the use of coastal areas during Covid 19 pandemic.

4.2.4 Application of the survey

The surveys were conducted in two different ways, online and face-to-face. The online survey study was delivered to users via social platforms and e-mail. Face-to-face survey studies were carried out using two methods: QR code and printed on paper. Due to the pandemic, users' use of the QR code method was the most preferred method to reduce contact.

4.2.5 Evaluation of survey results

The survey study was evaluated with the SPSS program. Each survey question was first examined descriptively in line with the answers given. Then it was checked whether there was a significant difference between them regionally. The answers given for the multiple-choice questions were numerically evaluated and compared. For open-ended questions, content analysis was made, and themes were coded. After these themes were converted into numerical values, differences between regions were analyzed. For Likert-type questions, factor analysis was performed first, and the reliability values of the subtitles on the relevant items were examined. Then, the differences between regions were analyzed. T-test, ANOVA, posthoc analysis, factor analysis, and content analysis were performed in line with the research.

4.3. The Findings

The study findings are presented as a literature review, on-site observation, reliability, demographic, and statistical findings. Among the statistical findings, the accessibility, and connections of the coastal area, use and activities, comfort and image, and socialization environment during the pandemic process are presented with survey data.

4.3.1 Literature review of the study area and on-site studies

The study area starts from the Caddebostan coastal area of Kadıköy district on the Anatolian side of Istanbul and extends to Pendik with a total length of 17.14 km.

Geolocation: The coastal area is geographically located on the Anatolian side of Istanbul, in the northwest-southeast direction of the Marmara and Black Sea coasts and the northeast-southwest direction of the Bosphorus coasts (Figure 4).

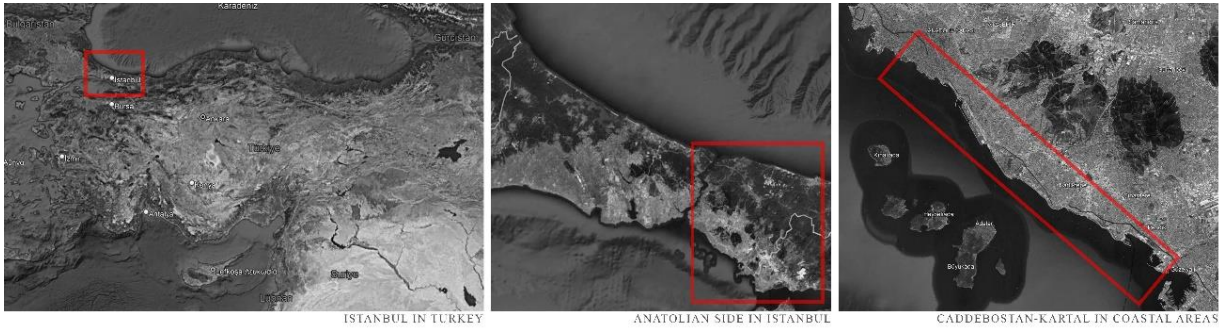


Figure 4: The location of the Caddebostan-Kartal coastal area in Turkey (Created by the authors with Google Earth).

Topography: It starts from sea level and rises slightly towards the north. The study area is primarily flat areas consisting of fill areas and 1.5-2 m above sea level (İBB Deprem ve Zemin İnceleme Şube Müdürlüğü, 2009).

Geology: In the Caddebostan-Bostancı coastline, which was determined as the first region, 50-meter changes were observed over time (Uzun, 2019). On the shores of Bostancı-Maltepe, which is determined as the second region, coastal filling areas were built for coastal road and recreation works. The first filling works caused an average of 100 meters change in the shoreline. Then, with the Maltepe Beach Park project realized after 2011, a 3 km long and 500 m wide coastal filling area covering the Küçükyalı, Feyzullah, and Yalı neighborhoods of Maltepe was formed (Uzun, 2016). It is observed that these fill areas have changed the shoreline by an average of 600 m in total. It was determined that the Maltepe-Kartal coastal zone, which is the last zone of the study area, progressed against the sea for a total of 290-330 meters from the coastline (Uzun, 2019).

Climate: The study area is in the Marmara transition climate, which is a sub-type of the Mediterranean climate, which are Istanbul's climate type. In this temperate climate zone, summers are hot and less rainy, and winters are warm and rainy (Maltepe Belediyesi, 2021).

Natural Disasters: Caddebostan-Kartal coastline remains within the 1st Degree Seismic Zone according to the Turkey Earthquake Zones Map and is affected by earthquakes formed by the fault branches on the North Anatolian Fault Zone (Uzun, 2014). While the coastal and coastal fill areas constitute the riskiest regions in terms of liquefaction potential and shaking effect in possible earthquakes, the fact that the study area is very close to the fault in the Marmara Sea increases the risks in the area. At the same time, shallow-focused and generally dip-slip faulting with magnitudes $M > 6.0$ in the Sea of Marmara can produce tsunamis. (İBB Deprem ve Zemin İnceleme Şube Müdürlüğü, 2020).

Cultural Data: In the study area, which consists of three regions as, Kadıköy, Maltepe, and Kartal, Kadıköy is the area based on the oldest data. Many changes and innovations have occurred in the districts in the historical process.

Population and Demographic Structure: Changes and rapid development in the population of Istanbul have led to different results in different parts of the metropolis. In districts such as Eminönü, Fatih, and Beyoğlu, the population change is low due to the saturation of the settlement and the development of business areas; It has been determined that districts such as Kartal, Maltepe, and Kadıköy are developing rapidly without infrastructure and planning. In addition, with the construction of the Bosphorus Bridge and Fatih Sultan Mehmet Bridge, the population on the Anatolian side has increased rapidly. The population in the districts to which the study areas are connected; Maltepe (513.136), Kadıköy (482.713), and Kartal (470.676). In Maltepe and Kartal districts, unlike Kadıköy, the male-female population is balanced. When the demographic data according to the ages are examined, it is seen that the population over 65 is the highest in Kadıköy and the least in

Kartal. At the same time, it has been observed that the young population in Kadıköy is less than in other districts (TÜİK - Türkiye İstatistik Kurumu, 2022).

Transportation: Access to the Caddebostan–Kartal coastal area is via an uninterrupted coastal road. Access to the coastal road is provided by highway (04 TEM highway, D-100 highway), buses, minibusses, Bağdat Street, rail system (Gebze - Halkalı Marmaray line) and seaway (Bostancı Pier, İDO Pendik Pier). In addition to the existing transportation, the M12 and M8 Metro lines are under construction.

Parking Capacity: There are five open car parks with a total capacity of 886 vehicles in the Caddebostan-Bostancı part of the study area. There are three open car parks with a total capacity of 3135 vehicles in the Bostancı-Maltepe section. There are three open car parks with a total capacity of 639 vehicles in the coastal part of Maltepe-Kartal (Ispark, 2021).

Green Areas: The parks located on the coastal shores of the seaside neighborhoods of the Caddebostan-Kartal region are under the responsibility of the Istanbul Metropolitan Municipality. Other parks are heterogeneously distributed within the districts. There are two parks between Caddebostan and Bostancı coastal areas (Figure 5). There are children's playgrounds, sports complexes, Beltur cafes (a Turkish company that operates cafes in tourist locations, ferry lines within Istanbul, at Metrobus stops) and beach cafes, Isbike stations (Bicycle Rental Services), and toilet cabins in these parks. There are three parks in the Bostancı-Maltepe coastal area.

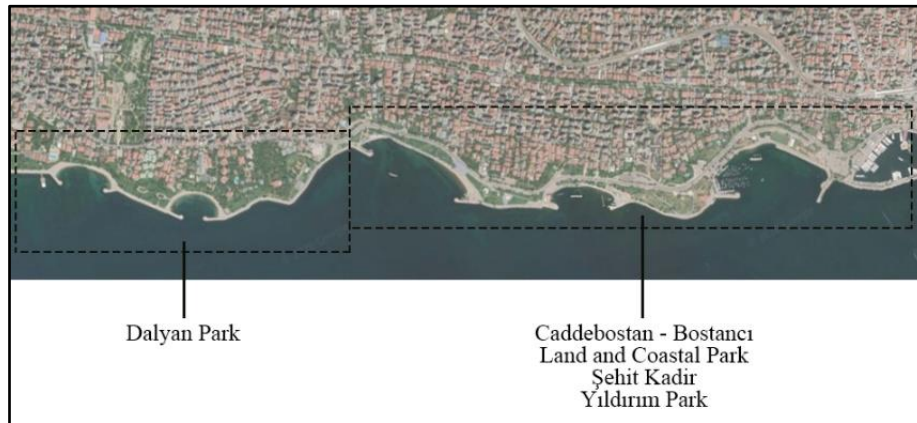


Figure 5: Parks of Caddebostan – Bostancı (Created by the authors with Google Earth).

There are three parks on the coast of Maltepe and Orhangazi City Park (Figure 6 the largest of which is located in the 600-meter coastal filling area; it has been an important green area, coastal road, and recreation work for the region. The tracks, sports fields, playgrounds, picnic areas, and archaeological excavation parks create opportunities for many activities.



Figure 6: Parks of Bostancı – Maltepe (Created by the authors with Google Earth).

There are four parks on the coast of Kartal (Figure 7). There are various urban furniture, İspark stations for bicycles, social facilities, Beltur and other cafes, barbecue areas, sports facilities, and children's playgrounds in these parks (İstanbul Büyükşehir Belediyesi Park ve Bahçeler Müdürlüğü, 2021).

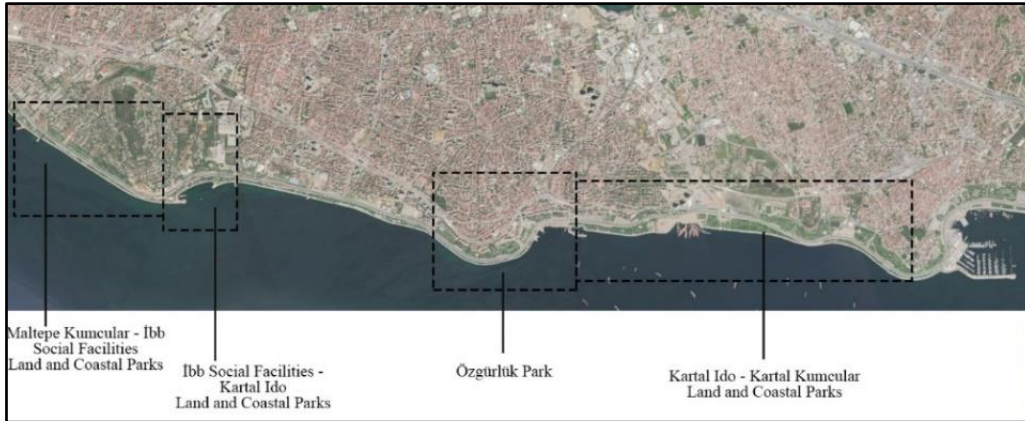


Figure 7: Parks of Maltepe – Kartal (Created by the authors with Google Earth).

As a result of on-site investigations, it is seen that the activities that are thought to be articulated to the Caddebostan-Bostancı coastal area, which is the most preferred among the areas, are not planned according to the social distance rules and the number of people per square meter. It has been determined that a part of the parking area in the Bostancı-Maltepe coastal area is used as a parking lot for caravans. In the pandemic process, where the importance of coastal areas has increased, people looking for alternative accommodation instead of home life have turned to the caravan rental system, which has increased in use with the bans. It has been determined that living and being in the coastal area and easily coming into contact with the open air are attractive to people after the crowded and closed environments that cause the virus to spread rapidly.

4.3.2 Survey results

The data obtained as a result of the surveys and evaluations made with a total of 952 people, online and face-to-face, are as follows:

Preferred Coastal Area: Among the Caddebostan-Bostancı, Bostancı-Maltepe, and Maltepe-Kartal coastal areas, the most preferred coastal area is Caddebostan-Bostancı with a rate of 54% (514 people).

Access and Connections: Accessibility, connectivity, readability, continuity, walkability, and convenience were evaluated for the areas. While Caddebostan-Bostancı coastal area was



found to be successful in terms of access and connections, it was determined that especially the Maltepe-Kartal coastal area was very inadequate.

Comfort and Image: The criteria of the areas such as cleanliness, security, diversity, and impressiveness were discussed. As a result of these evaluations, the coastal area of Maltepe-Kartal remained insufficient. Caddebostan-Bostancı coastal area needs to be improved in terms of diversity and impressiveness, Bostancı-Maltepe coastal area needs to be improved in terms of cleanliness and security.

Usage and Activities: It has been observed that the increase in originality and diversity in the Caddebostan-Bostancı coastal area will lead to the preference for the area. In contrast, the Bostancı-Maltepe coastal area should be developed in terms of usability and sustainability. The Maltepe-Kartal coastal area was insufficient regarding all these entertaining environments, various activities, sustainability, recognition, and activity.

Socialization: The Caddebostan-Bostancı coastal area should be developed in terms of management and diversity, and the Bostancı-Maltepe coastal area should be improved in terms of management and creating a friendly environment. The Maltepe-Kartal coastal area should be reconsidered with all socialization criteria (management, diversity, friendly and comfortable environment and interaction).

Frequency of Use during the Pandemic Process: Users were first asked how often they went to coastal areas. Participants stated that 60% (571 people) did not go to coastal areas during this period. The remaining 16.7% (167 people) went to the coastal areas once a month, and the other 12.8% (122 people) went to the coastal areas once a week.

The Purpose of Use in the Pandemic Process: During this period, the participants could not use the coastal areas due to prohibitions and restrictions. With the removal of restrictions, the reasons for using the fields; sitting on the grass, spending time with friends, having a picnic, riding a bicycle, using the playgrounds, and spending time before boarding the ferry. These reasons did not create a statistically significant difference that could generate a difference between the coasts according to the study areas.

Impact of pandemic regulations: During the pandemic period, a distance seating arrangement was tried to be provided with circles drawn on the ground in the green areas of the coastal area. Users were asked whether this seating arrangement was effective. In line with the answers, it is concluded that they found the social-distancing bench seating in the coastal areas and the social distance period with the circle drawn on the ground effective during the pandemic process.

Users' recommendations for the pandemic process: In line with the open-ended user recommendations asked the users, there are recommendations such as increasing the controls on social distancing and using a medical mask in coastal areas, the necessity of the presence of officials, and restrictions such as days and hours on the use of coastal areas. In general, there is a common belief that people using coastal areas should act more consciously and obey the rules.

When the survey data is analyzed according to the regions, a statistical difference is observed between the coasts. The Caddebostan-Bostancı coastal area was found insufficient due to its crowdedness, and there is a security and crowdedness problem in the Bostancı-Maltepe coastal area. The Maltepe-Kartal coastal area is more problematic area compared to these regions. In line with the criteria, it was observed that only the social distance seating arrangements were positively reflected in the areas.



5. CONCLUSION AND RECOMMENDATIONS

COVID-19 affects the whole world; it has caused changes in urban and architectural designs and public spaces. At the beginning of these changes are public spaces, which are necessary for cities whose essential has increased during the pandemic.

The presented research reviews the impact of the Corona pandemic on cities and urban design and how they can change after their passage from the perspective of planners and designers of cities and public places. In addition to trying to direct the attention of designers and planners toward finding new solutions that achieve a safe and effective environment for individuals.

The following findings have been reached with the results obtained in this field study carried out in the Caddebostan-Kartal region in the example of Istanbul in order to reveal the expectations of the citizens from the public spaces, which are the escape points of the cities during the Covid 19 process, to improve and organize the public spaces, and to ensure their continuity during and after the pandemic period.

In the context of accessibility and connections:

- Access to the area should be fast and hygienic.
- Alternative public transportation facilities that provide easy and fast access to the area
- Additional expeditions and alternative solutions should be found, especially for the Caddebostan region.
- To minimize the use of public transportation, the area should be firmly integrated into the city with bicycle and pedestrian paths.
- Billboards/digital boards, etc., where basic information and warning flows regularly occur. Placing innovative applications at specific points of coastal areas and providing access to municipalities 24/7 via smartphones,
- Public transport usage rules should be determined, and the public should be informed (passenger and personnel information, risk information to local authorities and public transport responsible in case of infected passengers, direct and transparent information about schedule and timetable adjustments to ensure reliability and comfort, public transport of infected persons. Checking people's body temperature before reaching any public transport station to minimize the risk of entering public transport stations, regularly disinfecting vehicles and equipment (such as turnstiles and guardrails) with special anti-microbial cleaners to reduce infection risks, distributing hand disinfectants and masks when necessary should be in the form of measures taken to minimize the risk of infection, such as increasing the distance between passengers (Influenza Encyclopedia, 1918).

In the context of comfort and image:

- Pandemic conditions should be considered in the seating and activity areas arrangements, and distance should be maintained. More understandable borders should be added with plant elements and design elements,
- It should be increased by paying attention to the social distance conditions of the caravan parks located in the Bostancı-Maltepe coastal area and should be made applicable in other regions,
- Adding tools such as mechanic/disinfectant within the coastal areas,
- Making environmentally friendly regulations (environmental pollution prevention, air quality improver, waste bin sorters, sustainable urban furniture preferences, penal actions for those who do not comply with the rules, recycling of plastic waste, establishment of systems that generate energy from garbage, efficient use of solar energy, electricity with kinetic energy on pedestrian paths) production)
- Having a continuous control system at the entry/exit points of the coastal areas.



In the context of use and activities:

- Activity areas to be carried out by maintaining social distance should be added/increased,
- Points that provide food and beverage services (such as takeaway and food trucks) should be added to the area,
- As a variety of activities, theater, cinema, and open-air exhibitions can be realized with distanced layouts and seating areas, and areas that will ensure the continuity of these activities can be created. In this way, support can be provided to artists who are in trouble with the ban on the use of closed spaces during the pandemic process.
- It is also thought that water activities (canoeing, water biking, etc.) for various activities will be applicable during the pandemic period.
- It can also be created in other coastal areas of the pet park, where pets can freely roam and play in the Bostancı-Maltepe coastal area.
- Increasing the number of green areas and ensuring the use of green spaces to maintain social distance will be beneficial. In addition to social distance rings to maintain social distancing, various parks can be planned, such as Parc de la Distance, designed in Australia, which are safe, divided by fences that keep physical distance in a labyrinth order, not intersecting people at the entrance-exit points, arousing curiosity, and maintaining social distance (WHYY, 2020).
- The materials used in urban furniture design, activity areas, and equipment in public spaces are also essential. According to the research, the virus can live up to 72 hours on plastics, 48 hours on stainless steel, 24 hours on cardboard, and up to 4 hours on copper. In this context, using copper alloys on surfaces that are in contact with hands in public spaces may become widespread. In creating reinforcement surfaces, it is essential to develop compact details that are easy to clean, have fewer parts of the surface and joint details, and solve the corner joint details as a whole. In this way, the possibility of adhesion of the virus and/or bacteria can be reduced, and the equipment can be disinfected more efficiently. In this respect, one-piece products produced by three-dimensional printers will provide fast solutions (Duhl; Sanchez, 1999).
- Worldwide regulations, such as a one-person dinner in a meadow in Sweden and the conversion of pentagonal greenhouses into two-person dining rooms in Amsterdam, should be taken as examples in order to create diversity in the eating and drinking spaces in the study area.

In the context of socialization:

- When the criteria and recommendations mentioned in the titles of access and connections, comfort and image, use, and activities are realized, the time spent by people in coastal areas increases. At the same time, with the creation of comfortable usage and activity diversity in all seasons, the rate of preference increases and turns into the preferred ones as a group. The realization of all these contributes to the socialization of the area. When each coastal area fulfills the criteria of being a thriving coastal area, It has been determined that the user distribution of the regions will be homogeneous, the density of the areas will decrease, and the crowding problem will be eliminated.

As a result, it should be noted that more comprehensive design and planning for the continuity of use of coastal areas, which gained importance during the pandemic process, will contribute to providing better quality service to users in future pandemic processes. The epidemic can be seen as an opportunity to rethink the design of cities to better prepare for future crises.

REFERENCES

ArchDaily. (2020). Socially distant outdoor yoga domes invade the open spaces of Toronto. Retrieved from <https://www.archdaily.com/942247/socially-distant-outdoor-yoga-domes-invade-the-open-spaces-of-toronto>



- BBC. (2022). *Coronavirus: Greatest test since World War Two, says UN chief* [Data file]. Retrieved from <https://www.bbc.com/news/world-52114829>
- Bell, S., White, M., Griffiths, A., Darlow, A., Taylor, T., Wheeler, B. (2020). Spending time in the garden is positively associated with health and wellbeing: Results from a national survey in England. *Landscape and Urban Planning*, Aug 1; 200:103836.
- Bratman, G.N., Anderson, C.B., Berman, M.G., Cochran., Vries S., Flanders J. (2019). Nature and mental health: An ecosystem service perspective. *Science Advances*, Jul 1; 5(7): eaax0903. DOI: <https://doi.org/10.1126/sciadv.aax0903>
- Bratman, G.N., Hamilton, J.P., Daily, G.C. (2012). The impacts of nature's experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, 1249(1):118–36. DOI: <https://doi.org/10.1111/j.1749-6632.2011.06400.x>
- Cantekin, K. (2020). *Turkey: Government Takes Extraordinary Administrative Measures for the Coronavirus Pandemic*. Work presented in Library of Congress, Turkey. Abstract Retrieved from <https://www.loc.gov/item/global-legal-monitor/2020-03-24/turkey-government-takes-extraordinary-administrative-measures-for-the-coronavirus-pandemic/>
- Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet*, 395 (10223):507–13. DOI: 10.1016/S0140-6736(20)30211-7
- Dinç, S. (2020). Localařan yeni mekansallıklar. *Spectrum tasarım rehberi 1*, 31-33.
- Duhl, L.J., Sanchez, A.K. (1999). Healthy cities and the city planning process: a background document on links between health and urban planning. *WHO Regional Office for Europe*. Retrieved from <https://apps.who.int/iris/bitstream/handle/10665/108252/E67843.pdf?sequence=1&isAllowed=y>
- Eltarabily, S., Elgheznawy, D. (2020). Post-pandemic cities - The impact of COVID-19 on cities and urban design. *Architecture Research*, 10(3): 75-84. DOI: 10.5923/j.arch.20201003.02
- Golding, S.E., Gatersleben, B., Cropley, M. (2018). An Experimental Exploration of the Effects of Exposure to Images of Nature on Rumination. *International Journal of Environmental Research and Public Health*, 15(2):300. DOI: <https://doi.org/10.3390/ijerph15020300>
- Grima, N., Corcoran W., Corinne H-J., Langton, B., Sommer H., Fisher B. (2020). The importance of urban natural areas and urban ecosystem services during the COVID-19 pandemic. *PLoS ONE Journal*, 15(12): e0243344. DOI: <https://doi.org/10.1371/journal.pone.0243344>
- Gül, M. (2020). Pandemi kořullarında yerel kalkınma ve tasarım rehberleri. *Spectrum tasarım rehberi 1*, 05-06.
- Hartig, T., Mitchell R., De Vries, S., Frumkin H. (2014). Nature and health. *Annual Review of Public Health*, 35(1):207–28. DOI: <https://doi.org/10.1146/annurev-publhealth-032013-182443>
- Hays, J.N. (2005). *Epidemics and pandemics: Their impacts on human history*. Oxford, England: ABC-CLIO.
- History. (2021). *Pandemics that changed history* [Data file]. Retrieved from <https://www.history.com/topics/middle-ages/pandemics-timeline>
- İBB Deprem ve Zemin İnceleme Şube Müdürlüğü. (2009). *Anadolu Yakası mikrobölgeleme rapor ve haritalarının yapılması* [Data file]. Retrieved from <https://depremezemin.ibb.istanbul/calismalarimiz/tamamlanmis-calismalar/istanbul-ili-mikrobolgeleme-projeleri/>
- İBB Deprem ve Zemin İnceleme Şube Müdürlüğü. (2020). *Marmara'da tsunami etkisi* [Data file]. Retrieved from <https://depremezemin.ibb.istanbul/tsunami/marmarada-tsunami-riski/>
- Influenza Encyclopedia. (1918). American influenza. *Deseret Evening News*. Retrieved from



- <https://quod.lib.umich.edu/cache/1/3/3/1330flu.0010.331/00000001.tif.1.pdf#zoom=75>
- İSPARK. (2021). *İspark otoparklarımız* [Data file]. Retrieved from <https://ispark.istanbul/otoparklarimiz/>
- İstanbul Büyükşehir Belediyesi Park ve Bahçeler Müdürlüğü. (2021). *Parklarımız* [Data file]. Retrieved from <http://www.anadoluparkbahceler.com/parklarimiz.php>
- Karagüler, S., Korgavuş, B. (2020). Geleceğin kent tasarımının oluşmasında pandeminin etkileri. In: Demirarslan, S. (Ed.) *Mimarlık, Planlama ve Tasarım Alanında Teori ve Araştırmalar II*, İstanbul, Turkey: Gece Kitaplığı.
- Kuo, F.E., Sullivan W.C. (2001). Environment and crime in the inner city: Does vegetation reduce crime? *Environment and Behavior*, May 1; 33(3):343–67.
- LePan N., Routley M. (2020). *Visualizing the history of pandemics*. [Data file]. Retrieved from <https://www.visualcapitalist.com/history-of-pandemics-deadliest/>
- Lu, H., Stratton, C.W.; Tang, Y. W. (2020). Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. *Journal of Medical Virology*, 92(4):401–2. DOI: <https://doi.org/10.1002/jmv.25678>
- Maltepe Belediyesi. (2021). *Stratejik planlar* [Data file]. Retrieved from <https://www.maltepe.bel.tr/kurumsal/strateji/stratejik-plan>
- Ministry of Health. (2021). *Türkiye Günlük Koronavirüs Tablosu*. [Data file] Retrieved from <https://covid19.saglik.gov.tr/>
- Newfield, T. (2020). Don't compare past pandemics to the COVID-19 crisis. *Georgetown University*. Retrieved from <https://www.georgetown.edu/news/dont-compare-past-pandemics-to-the-covid-19-crisis-professor-says/>
- Núñez, P. (2020). *Amsterdam'daki bir restoran masalarını sera kullanarak ayırdı* [Data file]. Retrieved from <https://www.aa.com.tr/tr/pg/foto-galeri/amsterdamdaki-bir-restoran-masalarini-sera-kullanarak-ayirdi>
- Özer, S. (2015). II. Dünya Savaşı yıllarında İstanbul'da tifüs. *Çağdaş Türkiye Tarihi Araştırmaları Dergisi*, (30), 171-201.
- Özkoç, E. (2021). *Assessment of pedestrian-oriented use of coastal areas: A case study of Asian Side of İstanbul* (master thesis). Yeditepe University, İstanbul.
- Seçkin, P. (2020). Salgın koşullarında peyzaj tasarımında değişen konfor arayışları. *Spectrum tasarım rehberi 1*, 37-39. 2021.
- Sharifi, A., Garmsir A. (2020). The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. NIH: National library of medicine. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0048969720359209?via%3Dihub>
- The Takeaway. (2020). Is the coronavirus changing how we look at public spaces?: COVID-19: Ongoing coverage of the coronavirus pandemic [Data file]. Retrieved from <https://www.wnycstudios.org/podcasts/takeaway/projects/covid-19-ongoing-coverage-coronavirus-outbreak>
- TÜİK. (2022). *Nüfus ve demografi istatistikleri* [Data file]. Retrieved from <https://data.tuik.gov.tr/Kategori/GetKategori?p=nufus-ve-demografi-109&dil=1>
- Uzun, M. (2014). Hersek Deltasında (Yalova) kıyı çizgisi-kıyı alanı değişimleri ve etkileri. *Eastern Geographical Review*, 19(32), 27-48.
- Uzun, M. (2016). Kıyı kullanımı açısından Maltepe Sahil Parkı (İstanbul) örneğinin coğrafi yöntemlerle değerlendirilmesi. *Route Educational And Social Science Journal*, 3(8), 1-17.
- Uzun, M. (2019). İstanbul'un Anadolu Yakasında kıyı dolgu alanları ve kullanımı. In *Proceedings of the 1st International İstanbul Geography Congress* (p. 1002-1021). İstanbul, Turkey: İstanbul University Press. DOI: 10.26650/PB/PS12.2019.002.093
- WHO. (2022). *Coronavirus (COVID-19) Dashboard* [Data file]. Retrieved from: <https://covid19.who.int/>
- WHO. (2020). *Coronavirus disease (COVID-19) pandemic* [Data file]. Retrieved from <https://www.who.int/europe/emergencies/situations/covid-19>



- WHO. (2020). *Health-topics: Cholera* [Data file]. Retrieved from https://www.who.int/health-topics/cholera#tab=tab_1
- WHYY. (2020). How Philly's neighborhoods can help us understand pandemics [Data file]. Retrieved from <https://whyy.org/articles/how-phillys-neighborhoods-can-help-us-understand-pandemics/>.
- Yeditepe Üniversitesi Hospital. (2020). *Koronavirüs COVID-19 Pandemisi İlk Değil* [Data file]. Retrieved from <http://www.yeditepehastanesi.com.tr/koronavirus-pandemisi-ilk-degil>
- Yetim, F., Hurst. L. (2020). *Tek kişilik restoran: İsveç'te çayırın ortasında bir masa ve bir sandalye*. [Data file]. Retrieved from: <https://tr.euronews.com/2020/05/13/video-tek-kisilik-restoran-isvec-te-cay-r-n-ortas-nda-bir-masa-ve-bir-sandalye>

Acknowledgement: This paper is based on Ezgi Özkoç's master's thesis titled "*Assessment of Pedestrian Oriented Use of Coastal Areas: A Case Study of The Asian Side of Istanbul*," which was completed Yeditepe University, Graduate School of Natural and Applied Sciences, Master's Program in Urban Design and Landscape Architecture in 2021. Bengi Korgavuş, the advisor of the Thesis, has revised it critically for important intellectual content.

Conflict of interests: The Authors declares no conflict of interests.