What's the Future of Greek Cities in the Post-COVID-19 Period? New Perspectives on Urban Resilience and Sustainable Mobility

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COVID-19 would be recognized not only as a health crisis but also as a socio-economic emergency situation that brings to mind the concept of “urban resilience.” Social distancing came into the forefront and many countries have been forced to adopt such measures immediately. Such early steps to contain the virus earlier than most European countries have been characterized as the key to Greece’s success. People have been alienated from public space. Even now, during the second phase of the strategy against the COVID-19 pandemic, while the economic impacts are becoming obvious, the influence of public spaces still remains uncertain. However, decision makers have to schedule for the following day: an individualistic context came to the fore. Nevertheless, it is necessary to rebuilt communities’ trust in public spaces in order to reconstitute future cities. To face such a challenge, a strategy combining urban resilience with sustainable mobility is going to be required. To gain this goal, case studies review analysis was implemented and best practices have been concentrated. Considerable emphasis has been placed on the intervention plan carried out by the Municipality of Athens, Greece. By implementing such a plan, there is hope that coronavirus might offer to modern societies an opportunity to radically reassess their values and the way they function.

39.1 Introduction: A Brief Review of the Pandemic

The disease COVID-19 outbreak is an on-going pandemic caused by the coronavirus SARS-CoV-2, first reported in Wuhan, the capital of Hubei Province, China on December 31, 2019 [1]. The novel coronavirus SARS-CoV-2 is now quickly spreading worldwide through a human-to-human transmission [2]. According to the John Hopkins University database [3], more than 10.5 million cases have been recorded in more than 215 countries around the world, by the end of June (30/06/2020). During this 6-month-period more than 512,000 deaths have been attributed to this virus infection.

Focusing on the epidemiological profile of COVID-19 during the early stages of the pandemic, the number of registered cases doubled in size every 7.4 days since the mean incubation period was 5.2 days [4]. It is obvious that the degree of transmission was great enough to maintain this rate of infection: according to Surveillances [5], until February 11, 2020, a total 44,672 cases were reported across China.

On January 30, 2020, the World Health Organization (WHO) declared this outbreak to be a

global public health emergency [6] and declared it a pandemic on March 11, 2020 [7], as the virus spread to other countries like Thailand, Japan, Morocco, South Korea and Taiwan. The outbreak reached Europe, too: as of March 20, 2020, Italy has the second largest number of COVID-19 cases after China. That was the reason why, on March 8, 2020, the Italian Government introduced extraordinary mitigation measures to limit viral transmission by limiting social interactions [7, 8]. Other European countries, like Spain, France and Germany [6], appeared to be in a similar situation, “with a short time-lag of a couple of weeks” [7]. Thus, restrictive measures to limit viral diffusion were adopted. (Sweden and the UK preferred to follow a different strategy, earlier, based on the “heard immunity” model.) Similar measures were adopted in Greece where the first case was reported on February 26, 2020.

The measures put in place in Greece were strict; however, they also were among the most proactive in Europe and have been credited on a worldwide level for limiting the spread of the pandemic and kept the number of deaths among the lowest in Europe [9]. However, when the post-lockdown period was approaching the Greek Authorities faced a major dilemma: which could be the best plan for the gradual lifting of the restrictive measures and restarting of business activity in the post-lockdown period? In response specific guidelines were adopted in order for shopping centers, recreational activities, schools and religious groups to function. Similar hygienic rules have been applied for hotels, cinemas, pools and gyms.

Nevertheless, another important issue had to be addressed: the way in which public space will have to re-open to the public again. Looking to the future, planners, academics and decision makers in Greece started to think about this topic and how this crisis will transform people’s relationship with public space, as many others do, worldwide. The fruits of such discussions were some initial plans and interventions most of which have already started to be implemented. They focused on the Athens Metropolitan Area where the majority of the country’s population is concentrated, with a large number of visiting foreigners. At the same time, the Ministry of Environment and Energy has published technical instructions to promote the creation of temporary pedestrian streets and cycle lanes, as well as the development of temporary traffic-calming zones (speed limit is reduced to 30 km/h).

This chapter focuses on the implementation works took place in Athens. They are presented and examined, taking into account similar decisions that other countries have taken. Finally, although there is a great uncertainty about the way COVID-19 pandemic will impact future urban planning and design approaches, an estimation of the results is considered.

39.2 Initial Ideas About an “Anti-social” Planning Policy: How Easy is to Combine such a Policy to the Sustainable Mobility Paradigm?

Public squares and streets consist of the main components of the public space of a city. They are spaces serving everyday needs [10] and are characterized by a symbolic function [11]. Both of those reasons urge people to concentrate on such spaces that are related to a high degree of psychological health of people [12], sociability [13] and democratic culture [14]. Taking all of the above into consideration, public squares and streets are mainly considered to be social spaces [15, 16].

Researchers whose studies focus on Greek cities [10, 17–20] agree to such an opinion. Nevertheless, after the lockdown period, a growing body of academics bemoans the decline and degradation of public spaces [21–24]. Honey-Rosés, et al. [25] and Scott [26] are interested in such a topic. Although the effects in other sectors seem to be more intense [27], Honey-Rosés, et al. [25] underline that, in some years, extensive changes are also expected in planning practice. According to the same authors [25] some interesting queries may be raised in the near future.

Some of the above questions (i.e. *Will our perceptions of public space change?; Will we experience infringements on civil liberties?; Do we need a new typology for public space?*) seem to be of a future concern. On the other hand, some others (i.e. *Will streets be redesigned?; Will*

green space planning need new designs, uses and practices?; *What will happen to micro-mobility and mobility sharing?*) have already arisen during the lockdown period, not only abroad but also in Greece. Discussion about the principles for resilient cities [28] came again into the forefront. By examining those principles, it could be concluded that, resilient cities have aspects in common with compact cities. Indeed, both city planning models focus on transportation and environmental protection policies by promoting coherence and high-density building [29]. At this point a dispute has risen about whether high-building density is connected to social-distancing enforced by the protocols for the COVID-19 crisis management:

- How the compact city, based on small local residences, will manage to attract the people more to their homes – while until now it urged them to be in public spaces – in order to remain safe (to ensure that, social distancing –especially between individuals of sensitive groups or deceased – is necessary)?
- How the compact city, based on public means of transportation and sharing culture, will contribute to the protection of public health?
- Whether the practice of office workers to stay at home, performing their tasks from a distance from other workers during the crisis, will prove to be a preferred form of “distance employment” when the city returns to normal inter-social activity. If so, what will be the effect on commuting from the suburbs, traffic, parking, public transportation and other city services?

The above questions are being raised by the opponents of the urban density planning model. This oratory refers to the basic arguments against the adoption of the compact city, that namely it does not contribute to the development of adequate microclimate, does not permit the satisfactory solarisation, lighting and airing of buildings and considerably delimits the urban green in the urban fabric. However, those questions have been discussed in the past [17] and the compact city model has been evaluated as the most viable solution. Indeed, the European Union has sought to promote the compact city model since the 1990s [29].

The two new questions posed above have occupied urban planners all around the world. The answer to these refers to the answer of some of the questions posed by Honey-Rosés, et al. [25]. In particular:

- The small size of unattached houses does not seem to raise concerns regarding the virus dispersal in the cities, since it limits the direct association to individuals of the same household. The size of residences does not absolutely guarantee the observance of distances within the household but refers more to the layout of residences and the individuals’ mentality. To the contrary, the small size of houses – usually entailing a narrow front - implies that adjoining residences’ balconies will be close to each other and thus the neighbors will be able to communicate more easily among them. Such a thing is prevented in areas with spare housing. The communication between neighbors – so visibly passive [30, 31], as much as active - is the one that prompts Souvatzidou and Belavilas (in [32]) consideration of the balconies as substitutes for the city square; even future public squares, in case the pandemic persists.
- The compact city model is not based only on public transport; in terms of transportation, a city can be considered as a compact one when an ideal combination of sustainable means of transport (walking, cycling, scooters and public means of transport) is active. That is the reason why WHO [33] declares that there is a strong encouragement in order for cities to improve and upgrade their public space and citizens move on an easier and safer mode.
- Despite this, the establishment of a sharing culture is important for the promotion of the compact city; during a pandemic it can be expressed in different ways, such as sharing of public space while some walk, cycle or talk to others.

These are the key-points in order for public space to be reformed in the post-COVID-19 period; accordingly, an answer can be offered to some of the queries raised. Such directions can be underlined through a brief review of case studies around the world. Indeed, many cities have already completed a series of interventions in order to be quickly transformed into resilient and - at the same time - sustainability, as well. Some case studies are presented on the following section in order to be compared to the actions that have been implemented in Greece.

39.3 Case Studies: Combining resilient city strategy with compact city strategy

In many cities across the world various sorts of temporary measures have been quickly implemented in order to keep citizens as safe as possible by taking precautions to “flatten the curve.” Those measures can be categorized into 2 main groups: (a) Enhance walking and (b) enhance cycling. More specifically:

- (a) Enhance walking: In most of the cities, sidewalks tend to be crowded. Their width - if they exist - is not ideal while most of the time they are occupied by street vendors, trees and street equipment. People need more space on the streets. This need was obvious even before the COVID-19 era; now, it is a necessity, taking into account social distancing measures. In that condition cities must implement low cost and temporary interventions on streets in order to urge people to walk and stay outside. Actions that promote walking (Figure 39.1) include:
 - (a1) Closing streets to private vehicles. Vienna, Austria has created nine temporary meeting zones by reallocating road space from motorized traffic to pedestrian traffic. Such an intervention was chosen to be implemented in neighborhoods where the population density is high enough while sidewalks are narrow and open spaces are limited. Moreover, 20 other streets have been fully pedestrianized [34].
 - (a2) Extending existing sidewalks. The city of Hammersmith, London has temporarily widened the sidewalks in two busy streets providing city dwellers with social distancing. Apart from enabling pedestrians to pass each other while social distancing, through this intervention pedestrians are allowed to queue safely for essential supplies from pharmacies and food stores. The pavements have been widened by locating on the streets barriers, water-filled bollards and weighted cones. At the same time, signage has been put in place to inform not only drivers but also pedestrians of the new street design [35].
 - (a3) removing crosswalk “beg buttons.” The city of Des Moines, Iowa automated pedestrian walk signals at crosswalks so that pedestrians do not need to push the beg buttons. Currently, approximately 45% of the signaled crosswalks are automatic. They are mainly located at the city center and there consideration for expanding this measure to other areas of the city, as well [36].

FIGURE 39.1

Case studies worldwide. Source: a. [39]; b. [40]; c. [41]; d. [42]; e. [43]; f. [44]

- (b) Enhance cycling: In many cities, cycling was not a popular means of transport until the lockdown period. Citizens tended to prefer private cars or public transport for various inner-city travels, although bicycle-friendly policies had already started to be applied (i.e. bike sharing schemes). After the COVID-19 outbreak such policies have been intensified in order to contribute to behavioral changes and the effective adoption of the bicycle, replacing a portion of public transport (and private car) trips with bicycles. The city of Bogota offers one example. Back in 1976, Ciclovía was introduced; it is about a program under which specific streets became car-free on Sundays and holidays for 7 hours per day. In that way a 585 km network of connected streets and bicycle lanes was developed thereby minimizing the construction costs. This initiative was extended to all days of the week, after the lockdown period [37]. Those streets are now the only way for citizens to move around the city while social distancing and exercising themselves. In spite of the fact that the interventions are not permanent, it turns out that such a measure seems to be one of the most resilient.
- (c) A similar approach was applied in Budapest, where the use of public transport has been reduced by approximately 90% after the outbreak. Temporary bicycle lanes have been established on some important streets in order to provide citizens with an alternative and safe way to move around the city. Due to the fact the overall traffic is decreased, no significant traffic congestion is expected. Concerning the phases of the renovation, central locations are the priority [38]. Another action is related to bike sharing systems. Cities like New York and Chicago that have invested in bike sharing schemes and cycling infrastructure during recent years, have seen their systems surge in demand. To face the increased demand, new bicycles have been added. Moreover, the systems have been made entirely free for essential workers that had to move around the city.

Finally, it should be mentioned that another set of measures have been applied. It is related to public transport and contains measures like: (a) extending the timetable for the metro and tram lines, (b) increasing the number of itineraries, (c) promoting all-door bus boarding and (d) keeping stations and vehicles clean. However, we have not focused on such measures because they do not transform the form of urban space although they have a spatial footprint.

39.4 What's Happening in Greece? The Case Study of Athens

The management of public space preoccupied the General Secretariat of Civil Protection but also academics and urban planners in Greece. From the first weeks of lockdown, decisions were taken for the prohibition of access to public spaces. At first, the entrance and stay in the parks of Attica was forbidden. Typical are also the cases of the New Waterfront in Thessaloniki and the Waterfront (Argonauton Str.) in Volos. These prohibitions were the result of intense overcrowding of citizens. Nikiforidis (in [45]), referring to the case of Thessaloniki, underlined that overcrowding is not necessarily a result of citizen insubordination but is an element that designates the absence of public space. Gospodini [46] arrives at the same opinion, characterizing the decision for the closing of the waterfront in Volos as wrong. Since there is no central square, the streets are narrow with narrow sidewalks and pedestrian network is limited.

Although the authorities' intention was not the total prohibition of pedestrian movements but the prevention of congregation, the citizens' reaction was intense because of the deprivation of public space which is of vital importance for the smooth operation of the cities. Such decisions can be justified in periods of pandemics (lockdowns) and especially in any unprecedented situation in which the scientific community was unable to manage an unknown virus. However, their long-term extension is discouraged since, beyond the operating issues of the city, the connection of public space with factional disputes is unavoidable. Typical is the case of Agios Ioannis Sq. in a neighborhood of Athens that constituted the object of discussion for whether the specific square should be open to the public or the access to it should be prohibited.

Beyond the first - possibly unfortunate but effective - decisions for public space, the issue came again in to fore during the planning for the lifting of the restrictive measures. Taking into consideration the resumption of business activity and the normalization of city life, the question was whether measures could be taken quickly and effectively to restrict the spreading of COVID-19 without circumventing the role and operation of public space. In this context, the Transportation Engineers Association (SES) [47] was against the increase of automobiles that, in combination with walking and bicycling, was proposed as an ideal solution for moving around the cities by the infectious disease specialists team [48]. In parallel, it proposed [49] the immediate development of pedestrian and cycle networks in Greek cities, something that can take place with a series of interventions like those in cities abroad. Thus, beyond the temporary transformation of parts of road networks to spaces of exclusive pedestrian and cycle movement, the delimitation of parking, the widening of pavements and the liberation of pavements from obstacles, the SES [49] proposed the decrease of vehicle speed limit from 50 km/h to 30 km/h; the development of small parklets; the movement of pedestrians to be safe and overcrowding to be considerably limited, since the proposed socializing spaces will be of small size and capacity will be limited.

In this context, the Ministry of the Environment and Energy proposed a provision with which procedures have been quickly enacted for the temporary creation of cycle lanes and footpaths [50]. In Athens those directions were integrated in a uniform planning by the municipality of Athens for the city center, called “Great Walk” (Figure 39.2a).

It is an integrated plan of revival of the historic center that creates new paths for pedestrian and bicycle movement. These routes will connect the neighborhoods of the historic center of Athens as well as the archaeological areas, changing the image of the city. Through the interventions of this program, about 50,000 m² will be devoted to pedestrians and cyclists. The total length of the course comes up to 6.8 km, while 1.9km of new bicycle paths are expected to be created in the center of Athens where the infrastructure is considerably limited today [51].

FIGURE 39.2

The interventions proposed in Athens. Source: a. [52]; b. [53]; c. [54]; d. [55]; e. [56]; f. [57]

As Figure 39.2 points out, the regeneration scheme includes 3 types of actions: a) closing streets to private vehicles; (b) extending the existing sidewalks; and (c) developing cycle-lanes. All of the three types of interventions have also been implemented in other cities abroad, as was mentioned in the previous section. More specifically, the regeneration scheme contains the following interventions:

- The redevelopment of Panepistimiou Str. The plan is based on closing three of the six traffic lanes. On that part of the street, a new cycle-lane has been developed. The pavement has also been extended. Concerning motor traffic, 2 car lanes and one bus lane have been preserved. In that way, two main squares of the city (Syntagma Sq. and Omonoia Sq.) have been connected by a green route and the “Trilogy of Buildings” (National Library-Central Building

of the Kappodestrian University of Athens – Academy of Athens) has been vindicated. This intervention is also connected to another street redevelopment: It is about Patision Str. (from Omonoia Sq. to Egypt Sq.). On that part of Patision Str., an extension of the sidewalks and a new cycle-lane have been adopted (Figure 39.2d). The cycle-lane is going to end in Kifisia. According to the Minister of Environment and Energy this cycle-lane is one of the two additional interventions that will take place, apart from the “Great Walk of Athens.” It should be underlined that such interventions are also proposed by the recent Regulatory Plan of Athens (2014) (Act No. 4277/2014). According to that plan, a whole cycling network is proposed to be developed. This provision compensates the absence of planning for cycling in the context of the General Development Plan for the Municipality of Athens which is old enough (1988) and obsolete.

- The redevelopment of Omonoia (Concord) Sq. was scheduled before the COVID-19 outbreak (Figure 39.2f). However, it is considered to be part of the “Great Walk of Athens” because: (a) it is spatially related to the interventions and (b) this scheme is an inspiration from many years ago (see below).
- The redevelopment of V. Olgas Ave. (Figure 39.2c) has been one of the works of great significance. It is about a narrow street that is characterized as an “avenue” due to its great importance; it is the street in front of the Zapeion Megaron. Until the COVID-19 outbreak it was a typical street for car-movement. A tram-line was also located within the street. After the interventions, the Kallimarmaron Stadium is well-connected to other important monuments such as the Parthenon, the Oden of Herodes Atticus, the Areopagus (Mars Hill) and the Museum of Acropolis. The intervention contains widening of the sidewalks and the development of a cycle-lane. The tram-line and one car-line have remained.
- The redevelopment of Herodes Atticus Str., Athenas Str., Ermou Str. and Metropoleos Str. includes the conversion from a road to a pedestrian street. However, specific cars of special purpose (ambulances, fire tracks, food supply tracks, hotel vans, taxis, etc.) and residents’ cars are allowed on those streets.
- The redevelopment of Syntagma Sq. (Figure 39.2e) The plan is based on limiting car movements (in Stadiou Str.) to only three lanes. A bus-lane and a bus-stop-lane have also been developed. On the rest of the road space two elongated parklets have been developed. In that way, the sidewalks of the two blocks facing Stadiou Str. have been widened.

This plan is not a new inspiration. Many years ago (early 2000s), there was a proposal for the unification of archaeological sites of Athens. Through that idea, the previously separate archaeological sites of the historic center could be connected in order to create a large archaeological park enhancing the historic image of the city. A major part of the plan was implemented before the Olympic Games 2004. The most interesting intervention was the redevelopment of Dionysiou Areopagitou Str. which is now considered one of the best pedestrian routes in Europe. However, the regeneration scheme was not totally implemented. One part of a great significance was the one between the Temple of the Olympian Zeus and the Panathinaikon Stadion (V. Olgas Ave.). This part has been included into the “Great Walk” plan. Concerning Athenas Str., there was a prediction in the previous plan about a small scale pedestrianization (close to Omonoia Sq.). Through the “Great Walk” regeneration scheme, the whole length of Athens Str. has now been pedestrianized.

Moreover, the redevelopment of Ermou Str. was also proposed by Vlastos (in [58]), as an extension of the works took part before the Olympic Games 2004 although people - especially store owners - disagreed with that opinion. After a decade, this intervention has also been implemented (even partially due to the reactions of public).

Finally, the idea of pedestrianizing Panepistimiou Str. first appeared in 1983 by the Greek Ministry of Public Works, in the context of the Master Plan of Athens. However, no works were implemented until 2010s when the idea of a partial pedestrianization of Panepistimiou Str. came again to the forefront (Rethink Athens) (Figure 39.2b). In that context the tram line was proposed to be extended from Syntagma to Patissia, through Panepistimiou Str. A strong debate regarding this regeneration reached immense proportions and had a huge political and urban planning impact

[59]. However, the project was not implemented after the European Commission rejected the funding due to the economic crisis. Almost a decade after that, this intervention has now been implemented.

It should be mentioned that, the “Great Walk” is also combined with other small-scale redevelopments that have been scheduled before the COVID-19 outbreak. Such interventions are the pedestrianization of the Historic Triangle of Athens and the redevelopment of some of the squares of the city center. The cost of the interventions (at the time, it is about a pilot implementation) was 2 million euros.

39.5 Brief Discussion

The “Great Walk” scheme manages to materialize interventions that for decades were not achieved. The concession of large areas of the city to pedestrians and cyclists took place with particularly quick procedures. As much the realization speed of the interventions as the turn to the prevailing concept for the city - from a car-centered point of view to a pedestrian-friendly one - are classified to the benefits of the action. To the benefits of the interventions we can factor in the financial benefits that result from the possibility of exploitation of a larger part of the pavements from the roadside establishments, without hindering pedestrians. In parallel, however, the positive effects extend to the social level since socializing is encouraged through the placement of benches. Some may be concerned considering that social contact could not coexist with social distancing. However, the one situation does not contradict the other. The instructions by the infectious disease specialists mention social contact by paying attention; it has not mentioned anything about isolation. Social contact by paying attention can be possibly adopted in large spaces where the benches are placed well apart and permit social distancing. Therefore, such a perspective advocates for the conservation of large open spaces that seem to constitute an advantage for a city, even during a pandemic. Honey-Roses, et al. [25] arrive at this opinion underlining the importance of existence of such spaces in the context of urban resilience.

The above benefits, however, were initially opposed by the opposition of the municipality of Athens. This part of the municipal authority, as well as by groups of citizens and architects, was not in favor of the redevelopment for the following reasons: (a) non-compliance of the provided procedures, since no consultation preceded them, (b) unsatisfactory aesthetic result, (c) insufficient urban planning considering the movement of individuals with restricted mobility, (d) non-viability in terms of environment since it creates congestions, and (e) cost of the project.

Most of these points (b-d) can be easily refuted since the interventions will become permanent in the second phase of the project, after the completion of which, a limited movement of motor vehicles (as a result, the total number of car trips within the city will be reduced; this is something that is considered a public health necessity for most people in America and elsewhere [60] is expected. Easier access by all users (pedestrians, cyclists, disabled, old people, etc.) is also expected.

Finally, it should be underlined that the case of Athens is not a typical one: although the planning policy has been implemented in order for the transmission of COVID-19 to be limited, it seems that the regeneration plan aims to something bigger than that. The ultimate goal is to promote useful interventions that upgrade the city's form and image by establishing permanent solutions to a series of urban and traffic planning problems.

39.6 Conclusions

In this chapter, a brief consideration of the effects derived from the COVID-19 outbreak in the cities and public spaces was attempted. The topic is particularly important as public space constitutes a field of expression of human life in the cities which historically were designed based on health

criteria. Typical are the examples of the Renaissance and the post-industrial revolution period, as well as design practices proposed in the context of utopian idealism and modern movement. Cities evolve and the change of their form is not strange when public health is a major concern of the citizens.

In the post-lockdown era, a large number of cities have decided to change their form by suggesting interventions of great significance. Widening of pavements, closing streets to private vehicles, developing cycle-lanes and removing crosswalk “beg buttons” are only some of the mainstream strategies applied, worldwide. In Greece, discussion of those practices came to the fore when the need for restrictive measures for limiting the virus transmission became obvious.

In fact, the Municipality of Athens has immediately adopted a large-scale action: the “Great Walk of Athens” regeneration scheme.

It is a project that includes the concession of road space to pedestrians and cyclists by limiting motorized traffic in the historic city center. The action was accepted with mixed reactions by the authorities and the citizens. However, as mentioned, the positive effects are more than the negative ones. In support are the results from other countries where respective policies were adopted. Nevertheless, it could be said that the degree of positive feedback by the local public in such measures is related to two parameters: (a) the degree of the virus transmission as well as the number of recorded cases and (b) the mobility culture in each country that reflects its cultural identity. The low number of cases in Greece and the absence of sustainable mobility culture are the reasons why a negative climate was developed during the construction phase. However, the fact that the intervention proposed by the Municipality of Athens is in line with the principles of a sustainable, compact and resilient city, entails long term benefits for the city and its citizens. This is the reason why the permanence of the projects is encouraged despite the fact the implementation of the SUMP has not been completed.

It should be underlined that, although the “Great Walk of Athens” is a scheme of integrated measures of great significance, they are not the only ones that can be applied (i.e. crosswalk beg buttons have not been removed and bike sharing system has not been developed - the acquisition of bikes was subsidized, according to the Ministry of Energy and Environment decision). However, even those measures are superior to the corresponding ones that have been taken in cities of other countries where the outbreak was more intense. That proves that decision-makers in Athens were interested in acting as early as possible. On the other hand, no special interventions have been proposed in order for the cities to be safer in the post-lockdown era. The reason why no special interest have been expressed is probably related to the urban sprawl observed in most of them (e.g., buildings are located at ideal distances; building density is higher only in the center of cities). The good point is that many cities have already implemented SUMPs or have expressed interest in their consideration; some cities where many COVID cases have been reported fall into this category.

Taking all the above into consideration, it could be said that Athens is one of the cities across Europe where brave decisions have been taken. The whole format of the city center has been changed; a large pedestrianized space has now been developed that gives the opportunity for everybody to social distance and stay safe. After the COVID-19 outbreak, Athens has been considered as a resilient city. Nevertheless, this positive outcome could not have been attained had the National Technical University of Athens, other scientific organizations and local authorities not previously supported such studies. Hopefully, the ex-post evaluation will prove that through such actions cities can greatly benefit, not only for citizens to be protected from the pandemic but also for cities to be transformed into economic, compact and resilient urban cores.

References

- [1] Wenjun Du, Shaolei Han, Qiang Li, and Zhongfa Zhang. Epidemic update of COVID-19 in Hubei Province compared with other regions in China. *International Journal of Infectious Diseases*, 95, 321-325, 2020.
- [2] Robert Kruse. Therapeutic strategies in an outbreak scenario to treat the novel coronavirus originating in Wuhan, China. *F1000Research*, 9, 2020.

- [3] John Hopkins University. COVID-19 Dashboard by the center for Systems Science and Engineering. 2020. URL <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>. Accessed on 3 July 2020.
- [4] Qun Li, Xuhua Guan, Peng Wu, Xiaoye Wang, Lei Zhou, Yeqing Tong, Ruiqi Ren, Kathy SM Leung, Eric HY Lau, Jessica Y Wong, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New England Journal of Medicine*, 382, 1199-1207, 2020.
- [5] Vital Surveillances. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. *China CDC Weekly*, 2(8):113-122, 2020.
- [6] Zheng Ye, Yun Zhang, Yi Wang, Zixiang Huang, and Bin Song. Chest CT manifestations of new coronavirus disease 2019 (COVID-19): a pictorial review. *European radiology*, 30(3), 4381-4389, 2020.
- [7] Andrea Saglietto, Fabrizio D’Ascenzo, Giuseppe Biondi Zoccai, and Gaetano Maria De Ferrari. COVID-19 in Europe: the Italian lesson. *Lancet*, 395(10230):1110-1111, 2020.
- [8] Andrea Remuzzi and Giuseppe Remuzzi. Covid-19 and italy: what next? *The Lancet*, 7(5), 365-366, 2020.
- [9] P. Tugwell and S. Nikas. Humbled Greeks show the world how to handle the virus outbreak. 2020. URL <https://www.bloomberg.com/news/articles/2020-04-17/humbled-greeks-show-the-world-how-to-handle-the-virus-outbreak>. Accessed on 7 July 2020.
- [10] C Kyriakidis. The function of urban public space in relation to local parameters: Comparative study between Larisa and Nottingham. *Aeichoros*, 24:67-85, 2016.
- [11] S. Radović. The politics of symbolis in city streets: Patterns of renaming the public space in post-Yugoslav countries. *Narodna Umietnost*, 51(2), 117-132, 2014.
- [12] Angela Curl, Catharine Ward Thompson, and Peter Aspinall. The effectiveness of “shared space” residential street interventions on self-reported activity levels and quality of life for older people. *Landscape and urban planning*, 139:117-125, 2015.
- [13] Leila Mahmoudi Farahani, Mirjana Lozanovska, and Ali Soltani. The social life of commercial streets. In *8th Making Cities Livable Conference, Melbourne (VIC), Australia*, 2015.
- [14] Ward Thompson. Urban open space in the 21st century. *Landscape and Urban Planning*, 60, 59-72, 2002.
- [15] Osias Baptista Neto and Heloisa Maria Barbosa. Impacts of traffic calming interventions on urban vitality. *Urban design and planning*, 169(2):78-90, 2016.
- [16] Maryam Lesan and Morten Gjerde. Management of business activities along streets; an often neglected aspect of urban design. In *Living and Learning: Research for a Better Built Environment: 49th International Conference of the Architectural Science Association 2015, Melbourne, Australia*, 2015.
- [17] E. Bakogiannis, C. Kyriakidis, T. Papagerasimou, M. Siti, and C. Karolemeas. Research on the development potential of greenways for pedestrians and bicycles in medium sized-cities. The case of Drama. *International Conference on “Changing Cities IV”: Spatial, Design, Landscape and Socioeconomic Dimensions, Chania, Greece*, 2019.
- [18] E. Bakogiannis, C. Kyriakidis, M. Siti, and E. Kourmpa. Exploring the accessibility of landmarks in cities. The case study of the Stavros Niarchos Foundation Cultural Center. In: In A.M. Defner, P. Skayannis, P. Rodakinas, & E. Psatha (Eds), *Modern questionings for planning and development. University of Thessaly Press*, pp. 1186-1197, 2018.
- [19] M. Andrakakou, P. Panagopoulos, Y. Paraskevopoulos, and S. Tsigdinos. Investigating the spatiotemporal footprint in central areas. Identification of centralities and human flows in Koukaki area of Athens. In 1th International Conference of the Hellenic Geographical Society: Innovative Geographies: Understanding and connecting our World. (pp. n.r.). *Lavrio, Greece: Hellenic Geographical Society*, 2018.
- [20] Th Vlastos. Creating the “Public City”. Public space in the 21st century digital world. 2016. URL <https://drive.google.com/file/d/OBONkroBRNMD9ekpUUExsakJJVDg/view>. Accessed on 15 July 2020.
- [21] P. Kyprianos. Coronavirus and public space: I Efimerida ton Syntakton. 2020. URL https://www.efsyn.gr/stiles/apopseis/239099_koronoios-kai-dimosios-horos. Accessed on 9 July 2020.
- [22] S. Georgiou. Public space in the post-coronavirus era. *syntagma watch*, 2020. URL <https://www.syntagmawatch.gr/trending-issues/o-dimosios-xoros-stin-meta-koronoio-epoxi/>. Accessed on 6 July 2020.
- [23] A. Karlantidis. What is the public space? *Parallaxi Magazine*, 2020. URL <https://parallaxinag.gr/parallax-view/poios-dimosios-choros>. Accessed on 10 July 2020.
- [24] K. Anesti. Professor Andreas Kourkoulas in Iefimerida: “Athens experiences conditions of amputation, during the coronavirus period”. *iefimerida*, 2020. URL <https://www.iefimerida.gr/ellada/koyrkoylas-athina-koronoios-akrotirismos>. Accessed on 5 July 2020.

- [25] Jordi Honey-Roses, Isabelle Anguelovski, Josep Bohigas, Vincent Chireh, Carolyn Daher, Cecil Konijnendijk, Jill Litt, Vrushti Mawani, Mike McCall, Arturo Orellana, et al. The impact of COVID-19 on public space: a review of the emerging questions. *OSF Preprints (pre-print/to be published)*, 2020. doi: [10.31219/osf.io/rf7xa](https://doi.org/10.31219/osf.io/rf7xa).
- [26] Mark Scott. Covid-19, Place-making and Health. *Planning Theory and Practice*, 1(6), n.r., 2020.
- [27] Esteve Corbera, Isabelle Anguelovski, Jordi Honey-Rosés, and Isabel Ruiz-Mallén. Academia in the Time of COVID-19: Towards an Ethics of Care. *Planning Theory and Practice*, 21(2): 191–199, 2020.
- [28] M. Evans. Resilient city-Definition and urban design principles: Building cities to be more resilient to physical, social and economic challenges. 2016. URL <https://www.thebalance.com/resilient-city-definition-and-urban-design-principles-3157826>. Accessed on 17 February 2017.
- [29] E. Bakogiannis, C. Kyriakidis, M. Siti, T. Milioni, and C. Potsiou. Increasing urban resilience of Athens’ Historic Center. FIG Working Week 2017: Surveying the world of tomorrow-From digitalization to augmented reality, 2017.
- [30] Jan Gehl. Life Between Buildings: Using Public Space. *Washington, DC; London: Island Press*, 2006.
- [31] William Hollingsworth Whyte et al. The social life of small urban spaces. *Conservation Foundation Washington, DC*, 1980.
- [32] Monopoli Team. Does the balcony function as the new public square? 2020. URL <https://www.monopoli.gr/2020/04/02/stin-poli/381192/einai-to-mpalkoni-i-nea-plateia/>. Accessed on 2 April 2020.
- [33] WHO. Moving around during the COVID-19 outbreak. 2020. URL <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/moving-around-during-the-covid-19-outbreak>. Accessed on 7 July 2020.
- [34] Alan Rehfish. Coronavirus (COVID-19): Remaking our streets. 2020. URL <https://spice-spotlight.scot/2020/04/14/coronavirus-covid-19-remaking-our-streets/>. Accessed on 6 July 2020.
- [35] Mark Moran. London shopping street pavements to be widened to help social distancing. 2020. URL <https://www.transportxtra.com/publications/parking-review/news/65206/london-shopping-street-pavements-to-be-widened-to-help-social-distancing/>. Accessed on 9 July 2020.
- [36] Maya Miller. Des Moines automates some crosswalks signals along MLK to reduce high-touch areas during COVID-19 pandemic. 2020. URL <https://eu.desmoinesregister.com/story/news/local/des-moines/2020/05/28/des-moines-expands-automated-crosswalks-reduce-coronavirus-spread/5278406002/>. Accessed on 8 July 2020.
- [37] Olga Chepelianskaia. Urban Resilience: Learnings from COVID-19. 2020. URL <https://www.resilience.org/stories/2020-05-12/urban-resilience-learnings-from-covid-19/>. Accessed on 5 July 2020.
- [38] D. Bencze. Temporary bike lanes will help traffic during the pandemic. 2020. URL <https://koronavirus.budapest.hu/en/2020/04/06/temporary-bike-lanes-will-help-traffic-during-the-pandemic/>. Accessed on 5 July 2020.
- [39] J. Keesmaat. Picture on twitter. 2020. URL https://twitter.com/jen_keesmaat/status/1253664988167888896. Accessed on 16 July 2020.
- [40] K. Johnson. Two more Leeds suburbs see social distancing barriers installed on busy roads. 2020. URL <https://www.leeds-live.co.uk/news/leeds-news/two-more-leeds-suburbs-see-18363770>. Accessed on 15 July 2020.
- [41] A. Vaccaro. Share the road: Should cities close streets to make more room for walkers, runners? 2020. URL <https://www.bostonglobe.com/2020/04/09/metro/share-road-should-cities-close-streets-make-more-room-walkers-runners/>. Accessed on 15 July 2020.
- [42] Vernon Matters Staff. Select no-touch crosswalks during COVID-19 response. 2020. URL <https://vernommatters.ca/2020/04/17/select-no-touch-crosswalks-during-covid-19-response/>. Accessed on 15 July 2020.
- [43] A. Schwedhelm, W. Li, L. Harms, and C. Adriaola-Steil. Biking provides a critical lifeline during the Coronavirus crisis. 2020. URL <https://thecityfix.com/blog/coronavirus-biking-critical-in-cities-alejandra-schwedhelm-wei-li-lucas-harms-claudia-adriaola-steil/>. Accessed on 15 July 2020.
- [44] Associated Press. Covid-19 crisis: Berlin gets “pop-up” bike-lanes to boost cycling in pandemic. 2020. URL <https://www.hindustantimes.com/world-news/covid-19-crisis-berlin-gets-pop-up-bike-lanes-to-boost-cycling-in-pandemic/story-4JXniei8HhyuSynE9rpJpL.html>. Accessed on 5 July 2020.
- [45] S. Ioannidis. The big cities after the pandemic: Kathimerini. 2020. URL <https://www.kathimerini.gr/1071025/gallery/politismos/polh/oi-megales-poleis-meta-thn-epidhmia>. Accessed on 4 July 2020.

- [46] A. Gospodini. It was wrong to “close” the waterfront in Volos: MagnesiaNews. 2020. URL <https://magnesianews.gr/volos/lathos-to-quot-kleisimo-quot-tis-paralias-toy-voloy-symfona-me-tin-kathigitria-poleodomias-toy-p-th-aspa-gospodini.html>. Accessed on 6 July 2020.
- [47] SES. Press release in relation to the gradual lifting of the restrictive measures due to the coronavirus. 2020. URL <http://www.ses.gr/wp-content/uploads/2020/05/SES-212.pdf>. Accessed on 6 July 2020.
- [48] S. Tsiodras. Press conference. 2020. URL https://www.ethnos.gr/ellada/105178_tsiodras-aytes-einai-oi-epta-odigies-gia-na-min-kollisoyme-koronoio. Accessed on 10 July 2020.
- [49] SES. Letter of SES to the Ministers of Infrastructure and Transportation, Interiors, Energy and Environment, Civil Protection and Crisis Management. 2020. URL <https://www.smu.gr/2020/05/08/sygkoinoniologoi-zitoun-diktia-podilaton-pezon-logo-pandimias/>. Accessed on 6 July 2020.
- [50] Anon. Restriction on movements. How check-controls will be done-A detailed guide for the citizens: Newsroom. 2020. URL <https://www.kathimerini.gr/1070385/article/epikairothta/ellada/apagoreysh-kykloforias-pws-8a-ginontai-oi-elegxoi---analytikos-odhgos-gia-toys-polites>. Accessed on 5 July 2020.
- [51] E. Bakogiannis, C. Kyriakidis, and C. Potsiou. The potential of Volunteered Geographic Information (VGI) to contribute in cycling infrastructure planning in Athens, Greece [Paper presentation]. FIG Commission 3 Annual Meeting and Workshop. *Cluj-Napoca, Romania*, 2019.
- [52] Drive. The “Great Walk” of Athens: The center is pedestrianized. 2020. URL <https://www.drive.gr/news/ellada/o-megalos-peripatos-tis-athinas-pezodromeitai-kentro>. Accessed on 15 July 2020.
- [53] G. Lialios and E. Karamanoli. Definite “NO” to the redevelopment of Panepistimiou St.: Kathimerini. 2015. URL <https://www.kathimerini.gr/818146/article/epikairothta/ellada/oristiko-oxi-ste-sthn-anaplash--ths-panepisthmiou>. Accessed on 15 July 2020.
- [54] M. Vaularinos. The “Great Walk” and the great nagging. 2020. URL https://www.athensvoice.gr/politics/656050_o-megalos-peripatos-kai-i-megali-gkrinia. Accessed on 15 July 2020.
- [55] Economy today. The “Great Walk” started to change Athens. 2020. URL https://economytoday.sigmalive.com/oikonomia/ellada/27231_o-megalos-peripatos-arhise-na-allazei-tin-athina-fotografies. Accessed on 15 July 2020.
- [56] Skaitv. The “Great Walk”: New view for the square – What has been changed: SKAI. 2020. URL <https://www.skai.gr/news/environment/megalos-peripatos-nea-opsi-gia-tin-plateia-syntagmatos-ti-allakse>. Accessed on 15 July 2020.
- [57] Anon. The new Omonoia Sq. opens and a spectacular fountain now exists – Impressive timelapse video: Newsroom. 2020. URL <https://www.iefimerida.gr/ellada/anoigei-nea-plateia-omonoi-as-entyposiako-sintribani>. Accessed on 15 July 2020.
- [58] G. Elafros. The whole center of Athens could be a “pedestrian street”. 2009. URL <https://www.kathimerini.gr/370382/article/epikairothta/ellada/olo-to-kentro-ths-a8hnas-enas-pezodromos>.
- [59] D. Kanellopoulou. Pedestrianizing the center of Athens: A brief history and queries: Athens Social Atlas. 2016. URL <https://bit.ly/35kQ7Vo>. Accessed on 10 July 2020.
- [60] K. Wilson, C. MilNeil, and T. Snyder. COVID19 Legacy: The Death of the Avoidable Car Trip? 2020. URL <https://usa.streetsblog.org/2020/03/23/covid19-legacy-the-death-of-the-avoidable-car-trip/>. Accessed on 10 September 2020.