COVID-19: Cartography as a Witness of Change of Spanish Urban Models along History Due to Sanitary Crisis

By Bárbara Polo Martín[*]

During past centuries, pandemics were something very natural to the human race, but as result of industrialisation during the 19th century, they became a larger problem. The arrival of populations to big cities provoked the development of irregular and overpopulated quarters without any measures of safety, and facilitated the expansion of diseases. The problem resided in sanitation problems, as the example of what happened in London and Paris. As a solution, in different cities, and as a starting point, Paris with the Haussman's proposals, issued different reforms and extension plans were made in Spain (Nadal 2017, 357-385). Humanity believed that these extension plans would give us a healthy density and an ordered expansion. We opened big boulevards to believe that we had a wide city to walk, but nothing could be further from reality. At the beginning of 20th century, history repeated itself, and now, a new pandemic crisis has shown that cities have, again, a crisis of congestion.

Keywords: *cartography, cities, COVID-19, urban models*

Introduction

As a result of a health crisis, speculations on the conditions and perspectives of urban historical centres within the aftermath of the worldwide COVID-19 pandemic, supported different European cases. Right now, European cities are being hit by the 'second wave' of the worldwide epidemic, and are subjected to different containment strategies and measures. During last year, a range of plans have strongly impacted the economy, based, overall, on tourism in the city centres, leisure, and cultural consumption. The COVID-19 situation has had major consequences in terms of unemployment and economic depression. More extensively, the very life in city centres was highly affected, in terms of residency, mobility and access to public spaces. The previous, current and potential future use of green areas exposes a scope to rethink the paths of the economy and more-than-economic possible uses of city centres, especially when it involves new ways of connecting economy, lifestyle and citizen-led innovation.

In the unfolding of the pandemic, then, political rhetoric came to the front, building on the thought of learning from the pandemic and prospecting a replacement "urban renaissance." However, the extent to which such discourses can challenge and review pre-existing urban regimes is clearly questionable— they seem to romanticize new urban scenarios and agendas. In such a context, and within the framework of the upcoming renewal of the Leipzig Charter published in

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the end of 2020, it is of particular interest to critically reflect on the areas, domains and potentials of the transformation of the historic centres of European cities post-pandemic. In the last two centuries we can observe in cartography a pattern that is repeated in cities: the change of their structure due to external agents. We can speak of cities of extension during the nineteenth century, to cities of pandemics, in plural.

The latest crisis, COVID-19, has allowed for pedestrianizing centres, to create cycle lanes, to increase the use of public transport, and all this, using few resources. Governments have used unique situations like that in which the city is transforming to achieve sustainable development; in places such as New York's bay after the floods (New York City Regional Heat Island Initiative 2006, United States Environmental Protection Agency 2008), New Orleans after the hurricane, Paris with population increase, or Barcelona with COVID-19.

Crises make tangible changes. They invite governments and citizens to dream, a crisis to evolve, but the citizenship has to be the main defender of these new changes, not government, as in previous occasions. The question that arises in first place is whether the temporary experiment becomes permanent in the centre. To that, we should ask, who is really in charge of this change, the governments or the citizens? Finally, we should ask ourselves as researchers if the COVID-19 crisis has acted as a real trigger for the change of urban configuration, or was it something that has been previously agreed.

Literature Review

"Public health problems were the ones that made the city to be rethought because diseases afflicted both, the rich and the poor," Richard Sennet wrote in *Build and Inhabit*. During past centuries, pandemics were something natural to societies, but as a result of the industrialization during the 19th century, they became a drag (Smith 1979). The arrival of large populations to big cities provoked the creation of irregular and overpopulated quarters without any measures of safety, and facilitated the expansion of diseases. As a consequence, the matter resided within the sanitation's problems. This situation happened, firstly, in London and Paris (Hamlin 1991, Geneviève 2007, Halliday 2013). As a solution, in several cities, and as starter point in Paris with the Haussman's proposals (Figure 1), different inner reforms and extension plans (Nadal 2017, pp. 357–385) were made. Humanity believed that these extension plans would give cities a healthy density and an ordered expansion. Governments opened with scalpel big boulevards to make us believe that we had a good city to walk.

Figure 1. *Haussman's Plan for Paris*

Source: arqui-urba.blogspot.com.

The current urban configuration in many countries is predicated on their many attempts to address health problems during the 19th century (Rodger 1996). At that point, the link between the growth of cities, and therefore the spread of disease, led some countries to adopt a replacement perspective on health risks (Hamlin 1992). For example, within the last third of the 19th century, England became the leader in terms of sanitation. Starting at that point, the mechanisms available to fight classic epidemics were reassessed, new preventive measures against transmissible diseases were adopted, a shift in focus from the environment to the people happened (Rodríguez Ocaña 1994), and different by-laws concerning health were passed in many cities. Those by-laws affected areas such as drains and sewers, street lighting, the regulation of accommodation, slaughter house activity and markets. However, these healthcare worries were taken into account early in most parts of European countries (Wohl 1983), including Spain. By the end of the 19th century, Spain was clearly a backward nation in economic, political and social terms (Capel and Tatjer, 1991). This resulted in a proposal to adopt measures and develop infrastructures already adopted in other European countries (Arnould 1902, Sussman 1997, Poligliano 1984, Hildreth 1987).

The recommended improvements were related to sanitation because of the poor state of health of the Spanish urban population (Real Consejo de Sanidad 1901, Coronas Vida 2008). The conditions in Madrid, for instance, were completely deficient, despite the extensive structure that had been administered since 1856. There have been over 3,000 cesspits within the city, while in outlying

neighbourhoods and parts of the old city, the sewers had no traps to stop the discharge of noxious fumes and nearly 4,000 homes had no direct water supply (Hauser 1913).

Meanwhile, Barcelona City Council undertook a sanitation project between 1885 and 1893. As a part of the project, the authors suggested building tanks from which water was released in order to maintain the circulation within the sewer and drain system. It was necessary because of insufficient connections to dwellings in Spain (Capel and Tatjer 1991). In 1901, a conflict broke out in Seville between the League of Householders, and therefore the council halted the construction of the latest drains within the old city (Pulido Fernández 1902). Specifically, of the seven Spanish cities with more than 100,000 inhabitants, only Zaragoza and Seville had extensive modern systems of drains, although the water system was deficient. In other cities such as Madrid, Valencia and Malaga, the land put aside water that was unusable due to the poor state of the drains. The same circumstances happened in Barcelona and Murcia. The high death rate due to infections was seen as evidence of the importance of hygiene, and the relatively large sanitation gap in Spain regarding urban organization (Hauser 1913, Pulido Fernández 1902): urgent action was required.

Figure 2. *Map of the Surroundings of the City and Project for its Improvement and Extension*

Source: Museu d'Historia de la Ciutat, Barcelona.

The sanitary enhancements were accompanied by the changes in the structure of the cities. Related to the organization problem since the middle of the century, the Spanish government approved a range of acts with the aim of regulating urban growth. As in other countries, inner reforms and extensions were the solution. Thus, in 1864, the first Population Expansion Act was approved, although it was

not applied until three years later. Its preparation was preceded by the Barcelona Expansion Plan (Figure 2). This plan was designed by Ildefons Cerdà, approved by the Central Government in 1859, and by the Minister José Posada Herrera, author of a failed project of the Reform, Sanitation and Expansion Act. All these legal and regulatory measures were inspired by the large urban planning operations carried out in Paris by Haussmann between 1851 and 1869, and in Vienna from 1857, with the Ringstrasse (Martín Ramos 1993, p. 7).

After the first Population Expansion Act, two others were published in 1876 and 1892 respectively. This last one was created specifically for Madrid and Barcelona (Martín Ramos 1993, p. 11). However, the extension model seemed to not be the only solution to enhance the situation, and, in 1895, the Extension Act was accompanied by an Internal Reform Act, which pretended to follow the Haussmann example: the opening of streets in the urban centre and downtown renovation.

In both models, Barcelona and Madrid, a series of avenues or diagonals were devised to allow rapid movement with a geometric urbanism. These neighborhoods were designed for the new capitalist bourgeoisie that saw the historic centre as not a very pleasant place to live because of its narrow streets, few amenities, little representative houses, although they still connected with it. The Cerdá's plan envisaged two large diagonals that would intersect, although the second would never be achieved. In Madrid, the diagonal that was planned would have to serve to cross the entire historic centre and connect the area of the Barrio de Salamanca with that of Argüelles-Moncloa. It was the famous Gran Vía in Madrid, where emblematic buildings such as Telefónica's quickly began to appear.

With the publication of regulatory measures at the beginning of the 20th century, some Spanish cities followed these two examples to have their own expansion projects; as was the case of Gijón (Suárez Muñiz 2018) or San Sebastián (Fernández Cuesta 2012), but these examples have remained hidden until now. This situation changed after 1924, when José Calvo Sotelo, then Director General of Administration of the political regime, implemented by General Miguel Primo de Rivera, approved the Municipal Statute and Regulations for Works, Goods and Services. Because of its approval, the municipalities with more than 10,000 inhabitants, and with a growth rate of more than 20% between 1910 and 1920, had to draw up an Extension Plan within four years. This act also led to a synthesis of the acts made relative to this issue since the end of the 19th century (Terán Troyano 1978, p. 169).

The promulgation of this provision served several purposes: Firstly, it worked as an instrument for the internal reform of the cities. Also, it allowed managing the expansion of the city to the historic centre. Thirdly, it served to plan the land's uses between the expansion and the limit of the traditional nucleus. These facts would allow the city and developers to quantify and regulate what was done in terms of expropriations, management projects, licenses, etc. (Davila Linares 1991, p. 102) According to Bassols Coma, these three perspectives formed the first complete plan on city planning in Spain (Bassols Coma 1973, 1996, pp. 53–90).

This Act, which was promulgated relatively late, supposed the explosion of urban trends that had been carried out in the rest of Europe since the beginning of

the century, characterized by rationalism and forged in international architecture conferences. The culmination of these new urban designs was the Charter of Athens, promulgated by Le Corbusier in 1933, and which contained the elementary bases to understand the reality of the contemporary city (Aymoino 1978, Hilpert 1983, Segre 1985, Le Corbusier 1959, 1996).

With the law in one hand, medium-sized cities took as models Madrid and Barcelona, but overall this last one due to its organization. The expansion of Madrid tripled the city that existed previously. The one from Barcelona multiplied it by nine or ten. In the case of Madrid, there is a clear delimitation of the limit of urban action (Figure 3). In Barcelona, it is much less defined. The one in Madrid is more of the past: it has many baroque things, like streets that do not follow the centre's streets. The one from Barcelona, on the other hand, is a much more rationalist and innovative product. Cerdà is the first to incorporate science into urban planning; for this reason it was taken as the model of Spain. Most parts of Spanish cities chose this solution, that is, the extension of the city, in which corresponds to the urban option known as expansion urbanism.

Nevertheless, in comparison with 19th century, Spanish City Councils have acted very quickly in order to enhance the welfare of their citizens; green and without-cars cities, cities for citizens and not only for the economy. Governments have known how to recover the previous state of the city and to promote spaces of quality. It is proposed that within 10 to 20 years cities are clean, green and car-free. The latest crisis, COVID-19, has allowed to pedestrianize centres, to create cycle lanes, to increase the use of public transport, and all this, only using few resources. Governments have used unique situations like that to achieve sustainable development—in cities such as New York after the floods of Sandy, New Orleans after the hurricane, Paris with population's increase, or Barcelona, Madrid or smaller Spanish cities with the COVID-19. The question that arises is whether the temporary experiment becomes permanent in the centre. Crises make tangible changes, and they invite governments and citizens to dream and evolve. The citizens have to be the main defender of these new changes, and not governments as on previous occasions.

Since COVID-19 appeared, people have begun to discuss the architecture and urban planning of the confinement. Professionals say that confinement will mean a before and after. Some experts agree that perhaps the time has come to modify the way houses are built and designed, and to also think about their interior layout. We have to find solutions so that, within them, we can also be abroad. The key is the transformation of urban structures, which is to modify and whose changes can be seen through cartography. Digital maps, in the case of Spanish cities, provide a complete view of these changes developed during this pandemic: the cease of tourism houses, development of green and pedestrian areas, enlargement of cycle lanes or exclusion of cars. It is the old view of the city, or the so-called "urban corruption" against the new one. Even among these changes, the perception about rural life, reviled by many in the face of the maelstrom of the big city, is more attractive these days.

Figure 3. *Map of the Extension Project (in red) and the Madrid`s Ville (in grey), 1860*
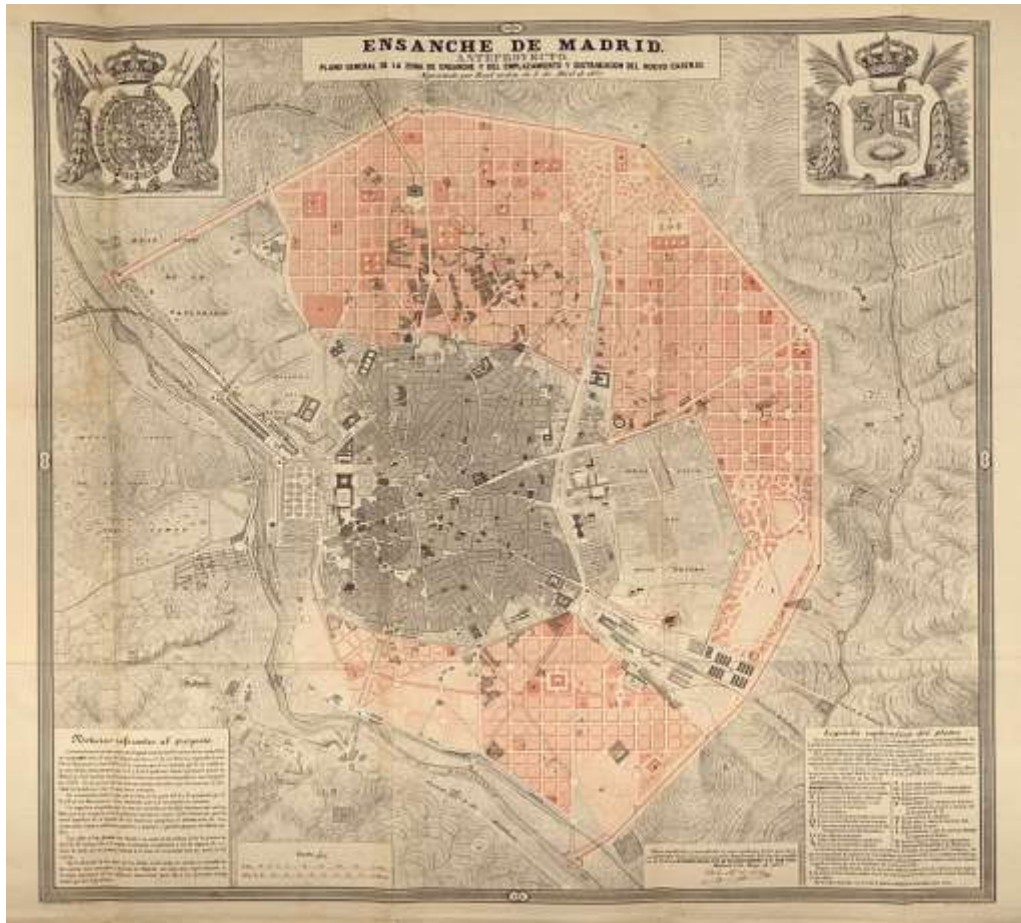
Source: Spanish Digital Library.

Methodology

Urban planners, builders and geographers look at the same information or problem with different perspectives. Each one analyses and joins new information in their urban studies about a problem. Taking into account the relevancy of maps to develop a new urban plan, some of them have been collected and used in this study. Also, in order to achieve the planned goals, it is proposed a thematic analysis through selection and comparison. With these sources of data, the corresponding analytic treatment was administered to get the correlations that would connect variables that ratify, or not, the working hypotheses.

The ongoing research examines the cities in different time periods and poses questions related to changes over time to these places, then put them together to provide multiple viewpoints. Time periods for urban development include 19th and 20th centuries and current conditions; these correspond to periods of growth in cities and mark times when maps or atlases are available. The application of knowledge organization and new visualization techniques provide a method for

analyzing the transformations of an urban development before, during and after COVID-19 pandemics and for posing questions about the urban changes due to a new sanitary crisis.

Discussion and Results

European cities are experiencing a 'second wave' of urban transformations due to another health crisis, COVID-19. This crisis which started in the end of 2019, subjected cities to different containment strategies and measures. Last year, such measures have strongly impacted the economic base of the historic centres of cities such as Paris, New York and Barcelona. Most of them in-part are truly associated with external agents like tourism, leisure, and cultural consumption.[1] More extensively, the very life of and in city centres was highly affected, from the point of view of residency, mobility, access to public spaces, and so on. Being enclosed in a house forces us to think about how we want the places where we live to be, and who we want to be with. Governments must find solutions so that, within them, society can also be abroad.

Searching for the answers to these questions previously exposed, create a range of different proposals in big cities in Spain, such as Barcelona or Madrid. These cities were taken into account as city models for the rest of cities in Spain before, and overall during, the pandemic. The urban proposals made by the different consistories have created an atmosphere considered environmentally-friendly, greener and sustainable, a model which differs highly from the configuration that every Spanish city has in origin.

According to the Barcelona Green Infrastructure and Biodiversity Plan created at the end of the year 2020 as a continuation of EU Biodiversity Strategy to 2020 and the strategies laid out along these lines by the UN by means of the Aichi targets for 2011-2020, some of the purposes of the city's government before the pandemic were addressed to preserve and improve the natural heritage present within the city to enable each and every one among us to profit from and enjoy. To become successful, the city hall has promoted, and currently does, different lines of action.[2]

At this point, the city's government considered this plan a vital point to strive towards a city where nature and urbanity converge and enhance each other, where green infrastructure attains connectivity and where green areas promote continuity within the natural area surrounding it. The aim is not for nature within the city to make a map of isolated spots; rather than seeking to forge a genuine network of green spaces. This greenery has been conceived as a green infrastructure forming part of the city, serving an environmental and social function. Thanks to the period

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[1] https://ajuntament.barcelona.cat/turisme/sites/default/files/barcelona_tourism_for_2020.pdf https://meet.barcelona.cat/en/discover-barcelona/barcelona-today/responsible-and-sustainable-tourism

[2] https://ajuntament.barcelona.cat/ecologiaurbana/sites/default/files/Barcelona%20green%20infrastructure%20and%20biodiversity%20plan%202020.pdf https://ajuntament.barcelona.cat/superilles/es/ https://www.barcelona.cat/urbanismetactic/ca

of pandemic, the success is almost assured. Sustainability continues to be the main goal through its Agenda 21.

Consequently, this plan is another component of the general endeavours that the city is making in altogether areas. It includes air quality as well as protection of specific zones like Collserola Park, the biggest green area of the city. Barcelona City Council, and therefore the metropolitan area, implemented specific policies to enable nature to suit into the town and to reinforce biological diversity supported by the philosophy that a city with greater green infrastructure may be a city where people can benefit from higher levels of health and wellbeing (Figure 4). The city currently has the greatest number of cars per square kilometre in Europe, where pollution causes 3,500 premature deaths a year, and suffers a problem of urban heat island effect. Thanks to the crisis of COVID-19, governments have realized the problem that citizens are going through and are facing the problem regarding some solutions proposed in other cities (Solecki et al. 2005).

The pandemic has made parks event more vital. People who live close to green spaces enjoy better mental health and reduce the risk of death from COVID-19. For this reason, the Barcelona City Council changed its plan, and the current plan is now to turn one in three streets in into parks known as Pocket Parks--because of its size inside the islands (Buckle 2014)--and create 21 new public squares in order to prevent the current problem that cartography reflects: isolated spots with no continuity. Also, the Consistory is trying to promote private greenery and to open private gardens to general public in order to improve health problems.

Figure 4. *Green Areas in Barcelona*

Source: Barcelona Green Infrastructure and Biodiversity Plan. City Council of Barcelona.

Other points taken into account during the pandemic was the economy, fully represented by tourism and, particularly, by the illegal housing. The problems

regarding tourism and elevated prices started after 1990. Until that moment, the city was considered a "regular" city in Spain. However, the Olympic Games boosted the change of urbanism. The multiplication of hotels and the appropriation of part of the sea to build docks and a port made the city one of the most popular in Spain, and even Europe, to visit. For example, Barcelona has the largest port in the Mediterranean, which makes it a prime location for huge cruise ships. In 1990, around 115,000 cruise passengers came to the city. Before COVID-19, there were millions of tourists. The local government had to face mass tourism, which prevented the city to accomplish sustainable purposes.

The City Council took advantage of the COVID-19 situation to stop this, which provoked another problem: the increase in the pricing for regular citizens. Only three years before the pandemic, Airbnb provided a total of 18,817 available rooms in the city and its surroundings. Among all places, the most expensive places to rent were in the centre of the city, where there was also the largest number of tourist places (Figure 5). From that point, a range of measures were proposed in order to avoid illegal practices and normalize the prices. The City Council proposed a city for citizens and not for tourists. The plan consisted of having more inspectors, and the creation of a new municipal body of observers to detect tourists operating under the radar (Ajuntament de Barcelona 2020).

Barcelona put together both plans: the social one and the sustainable one. Following the proposed plan to become a green city, it implemented, during COVID-19, a tourism's normative relative with respect towards environment. The City Council finally got the Biosphere certification for promoting tourism that shares an environmental responsibility between visitors and residents. To have a Biosphere accreditation as a sustainable tourist destination made Barcelona rethink its urbanism.

Figure 5. *Barcelona Airbnb*

Source: IAAC.

For that reason, during the pandemic, the changes implemented in Barcelona

focused on a reform of the city centre's streets. The City Council's methodology was tactical urbanism (Hartley et al. 2014, Lydon and Garcia 2015). The necessity to gain space for the community during the confinement, with the aim of enabling new walking areas to keep safety distance–because of the number of citizens it was necessary to use roads as sidewalks to avoid inner contact— led to performance through tactical urbanism. These actions were soon structured within the framework of the Super Island Barcelona Project. In other words, a plan with four crossings in pedestrian squares, and four streets in green axes, resulted in almost a total pedestrianization of the city centre. Following the example of New York– which transformed Times Square in a walking area-and San Francisco with their park-lets, Barcelona launched its proposal during the pandemic. The interventions, according to the tactical urbanism's idea, were low-cost, with low-impact, designed and executed on a small scale and, with the logic of experimentation, it is possible to ascertain and evaluate their acceptance and leads to a comparatively short time, having the ability to react if necessary by modifying the action accordingly. In this sense, Tactical Urbanism is predicated on the exercise of participatory planning, where the community has to appropriate the proposals in order that they are just materialized.[3]

The first attempts with this new methodology were made in areas not very far from the centre, and that allowed to assess if the changes would serve correctly for the purpose. The selected areas were Poblenou, Horta and Sant Antoni. After the success in these areas, the city government decided to advance the project and modify the scale and the rhythm. In order to know the possibilities of the centre, the Barcelona City Council has carried out a careful analysis of flows and mobility of citizens, neighbourhood facilities, green spaces, constructive and social fabric. A road hierarchy plan has been carried out in order to free some streets from road traffic and to create a network of green axes and squares where pedestrians have priority. One of the examples of the modifications in the city centre that could be taken into account is Carrer de Pelai—one of the main streets of the city centre. There, 1,500 square metres have been given to pedestrians and native shops and businesses. Traffic also has been reduced. The project answers to the stress of local residents and commerce and can help provide an economic boost for the centre. Tactical projects in Barcelona have transformed life through the so-called "superblocks" in Sant Antoni and Poblenou, and have increased safety in areas around schools and have provided wider pavements in Ronda de la Universitat and Via Laietana (Figure 6). Because of tactical urbanism, we have been ready to answer the challenges of the pandemic by gaining pedestrian space, creating new terraces for bars and restaurants and increasing existing ones. Despite the changes that have been made in the city centre or by "example," the City Council has planned to improve these measures in the rest of the neighbourhoods, like Sant Gervasi, Sants-Monjuic, Nous Barris…. This network allows the creation of a new map of the city in which citizens are the protagonists.

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[3]https://dimad.org/di_alogos-sobre-diseno-y-urbanismo-tactico/

Figure 6. *Green Slots and Street Changes in Cerdà's Plan*

Source: Barcelona Green Infrastructure and Biodiversity Plan. City Council of Barcelona.

Nor should it is excluded that, despite being convenient actions for a sector, there's a gaggle of residents who, for various reasons, oppose the project. During this game of the affected population versus the consulted one, lies the demagoguery of power, or that of the loyalty to executive entity, within the organization of the participatory process.

In this sense, the newest interventions administered in the streets of the municipality of Barcelona, despite the looks of how of approaching the transformation following the logic of this urban practice, guided by temporary participation, rather seem to be simple obstacles to the movement of vehicles. And, during this case, the validity of the answer should be assessed, not as an intervention of Tactical Urbanism within the public space, but as a measure to avoid pollution; and, if this is the case, it should be assessed whether the traffic jam caused by poor traffic flow can cause even more pollution. This has long outraged drivers whom are polite enough to not increase pollution, this point acoustic, by honking their horns. One of the hotspots of pedestrianization is the disappearance of places for parking.

As Barcelona and Madrid, capital of Spain, has also experienced similar problems before and during the pandemic, the changes proposed have not been as relevant as the Catalan City. Madrid has a long tradition regarding greenery. To choose Madrid as capital of the reign was a very conscious decision made by King Philip II, the son of Charles V, in 1561. Part of his choice was due to geostrategic purposes, but there were other reasons as well. In addition to its central location in the centre of Spain, the most important thing was due to the passion of the Iberian monarchs for green spaces. Surrounded by oak forests and pastures, the city was an ideal hunting ground (Figure 7). This appreciation has not changed until today (Garcia-Garcia et al. 2020), but it has been affected by humankind's actions. The Community of Madrid has gone from 64,808 anthropized hectares in 1990, to 126,220 hectares in 2018. This represents a growth of 94.76%, as pointed out in different studies. In other words, artificial surfaces have doubled in less than thirty

years. The Metropolitan Region of Madrid therefore needs planning that allows a new territorial configuration. This means establishing new strategies that take into account the current ecological transition scenario (Sgobbo 2017).

Apart from the protection of green spots, other sustainable ideas have started to flourish. The City Council promotes that the beautiful wilderness should be protected at all costs, which is one of the reasons the City has formulated sustainable measures in recent years. With the local government existing before COVID-19, Madrid took its first steps in this domain. In 2018, the City Council imposed new emissions standards, as well as put a limit on travel. At the moment, 44% of the surface of Madrid is a green space.[4] This aims to further reduce the carbon footprint of the city. Currently, the city, apart from being focused on green spots or emissions, tries to improve other measures, such as the street light. Madrid is recognised by having the largest street lighting project in the world, which consists of reduction of consumption to become a smarter, more sustainable and a city for citizens.[5]

Figure 7. *Green Slots in Madrid*

Source: https://urbanmobilityindex.here.com/city/madrid/.

Nevertheless, COVID-19 has made to emerge other kinds of problems in Madrid, and, unlike the Catalan City, had used tactical urbanism in a different way. Whereas the green part is being realized, the social one has been harder to achieve. Different proposals have been made to equalize Madrid to Barcelona. The urban changes in the last years have been focused on the development of a social urbanism. The changes are centred more on unoccupied spaces than in planning policies following the rules of a citizen laboratory (Besson 2016). In other words, when money from governments runs out, citizens take over. The first example of this was La Latina, one of the neighbourhoods of Madrid, who set to figure with a

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[4]https://www.imagina-madrid.es/es
[5]https://ec.europa.eu/environment/europeangreencapital/madrid-street-lighting-project/index.html

plot of land resulting from the demolition of a municipal swimming pool in Campo de Cebada. A space that initially was an empty lot, because there was no public money to try to do anything, it became a spot for citizen activities inside the heart of Madrid. After that, and following also the example of Superislands in Barcelona, Madrid stepped forward with the plan called Imagine Madrid. This project had a goal to explore new forms of intervention in urban spaces through processes of collective creation, particularly between citizens and the artistic fabric.

For this first call, nine spots from the surroundings of Madrid were proposed to be changed. A team of artists and creators worked in each of them. Their projects involved new ways of perceiving, narrating and inhabiting these landscapes of daily life, without forgetting the history and the identity of the neighbourhoods. The difference, in comparison to Barcelona, was that these projects looked for the connection with people's feelings. To start, during the spring and summer of 2017, the program collected the memories and feelings that the neighbours had about the nine places: Plaza Rutilio Gacís; Solar Ana María Matute; Solar de Opañel; Plaza de La Vaguada; Plaza de Valdezarza; Calle Topete; Parque de Pradolongo; Mirador Payaso Fofó and Plaza Brigadas Internacionales. Finally, each project was given to a different company, who worked directly over the place with the permission of the neighbours.

One of the examples of this campaign was the actions that took place in Rutilio García Square. Rutilio Gacía is a square away from the busiest areas of the Chopera neighbourhood. For some years, the square was the focus of neighbourhood's petitions who requested a change of use and a revitalization of the area. Sometimes this petition was crossed with proposals to exclude certain stigmatized or racial communities. In this context, the cultural project called *In tune: Rutilio Gacía*, sought from the beginning to turn the square into a place of intergenerational meetings. The purpose was to change the affections that the neighbours feel towards the square. The childhood and the knowledge of young people were the two catalysts in the programme, and from where the rest of the actions were articulated, using also the tools of mediation and community radio.

Once the experience in the surrounding areas of Madrid was checked to be a success, and COVID-19 impacted the other cities, new changes had to be made, particularly in the city centre. As in Barcelona, important roads in the centre of Madrid have definitively dismissed cars and have become pedestrianized. Streets such as Arenal, Montera or Fuencarral, previously crowded with traffic and noise, are now unimaginable spaces until not long ago, where citizens can walk quietly and forget about the bustle of fumes and engines (Figure 8). However, these pedestrianizations have been specific actions, and on occasion, they have been carried out almost without looking for them, since they arose as a result of COVID-19 that forced to cut traffic for keeping distance. Although they must be valued positively, citizenship misses a global action, as a whole, in which the mobility and coexistence model that the City Council wants for the downtown area is clear. For this reason, different proposals have been made. One of them, following the example of Barcelona, suggests the construction of a Pedestrian Island: an area where we can walk without worrying about the presence of cars

and enjoy a set of streets without their noise and smoke, as well as enjoy a greener and more humane Madrid.

Figure 8. *Pedestrianized Streets in Madrid*
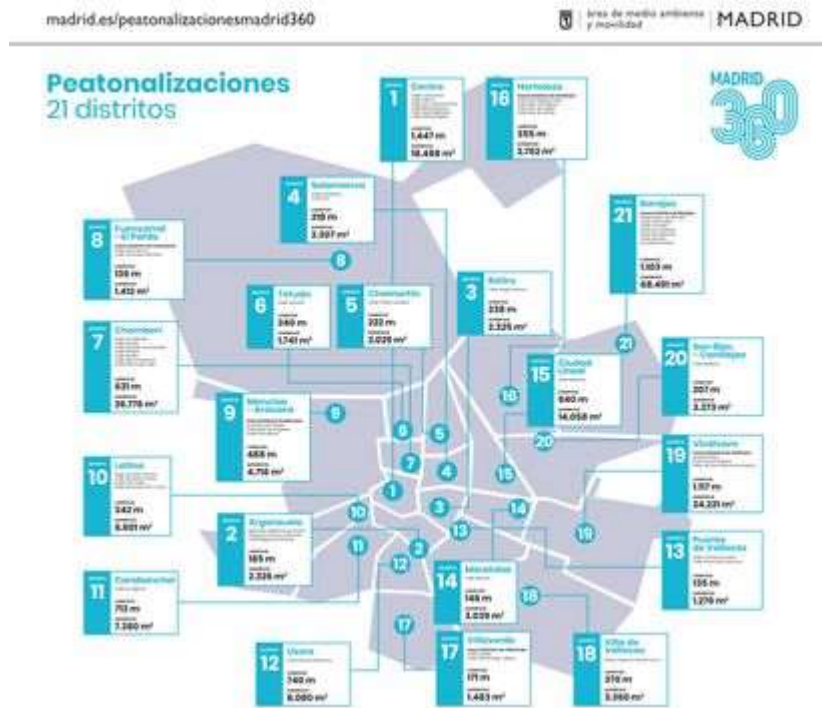
Source: Madrid City Council.

Despite this increase of the presence of pedestrians in the city centres, the most remarkable modification carried out by almost every city is the extension of cycling lanes. Walking or cycling are the only possible options to move in the centre of these big cities due to the "humanization" of them, and the reduction of cars, and, as a consequence, pollution. The commitment to cycling has been happening for years in European cities like Amsterdam, Oslo or Copenhagen, but the pandemic - and therefore the concern of citizens for health and the environment - has driven more and more capitals to follow in their footsteps. During the isolation, Berlin built 27 kilometres of temporary infrastructure (which the far right has taken to court), while London created 30 kilometres of permanent bike lanes. The mayor even promises to multiply this infrastructure by 10 by 2025 throughout the town. Brussels, whose network was 130 kilometres long, has built 40 temporary ones, with which the amount of cyclists has increased by 40%. Lisbon, which had only 105 kilometres in May, wants to double that figure by early 2021.

Figure 9. *Barcelona´s Lanes before (in green) and after the Pandemics (in orange)*
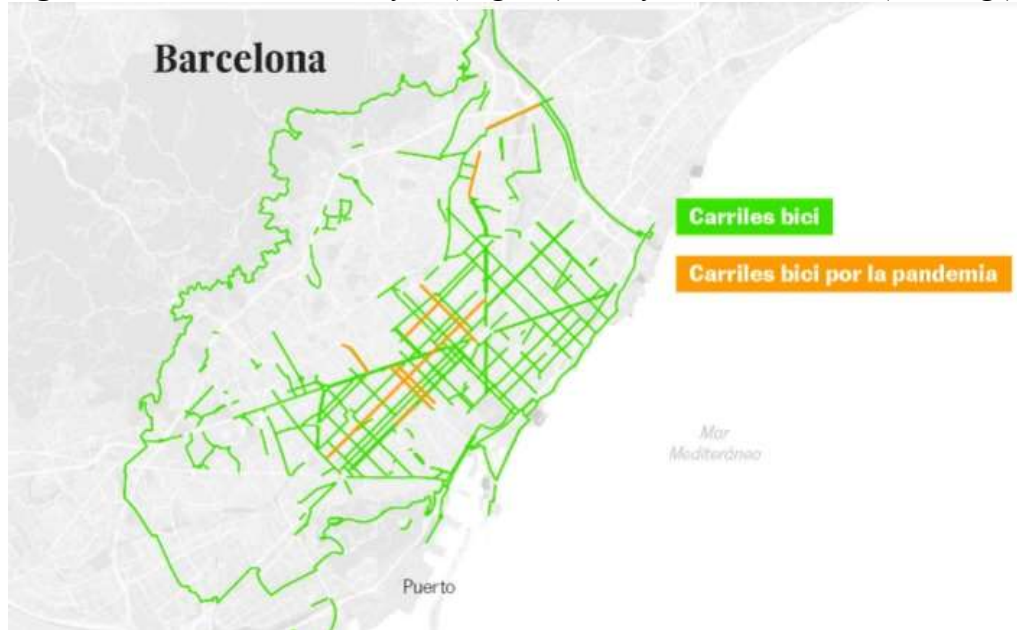
Source: El País.

Figure 10. *Madrid's Lanes before (in green) and after the Pandemics (in orange)*

Source: El País.

However, not all extensions that have been made are an equivalent. The cycling networks of the ten most populated cities in Spain, and three medium-sized cities (Valladolid, Vitoria and San Sebastián), show that in some of them (like Vitoria, Valencia, Zaragoza, San Sebastian or Seville) it is necessary to have a good network to manoeuvre around safely (Figure 11). On the other hand, other cities (like Madrid (Figure 10), Malaga, Bilbao or Las Palmas) have much less

infrastructure to manoeuvre around the urban fabric. Murcia has more bike lanes per capita than Barcelona (Figure 9), but the network of the Catalan capital is of better quality and more useful. Besides, in comparison to other Spanish cities, Barcelona has added more cycling lane kilometres during the pandemic -21 kilometres in total- in order to reach the level of the rest of European cities.

Figure 11. *Different Safety in City's Lanes*

Paris   Madrid   Barcelona   Vitoria

Source: Journal El País.

All these different proposals and plans might count with the support of most of all citizens— that's the main reason to develop ways to assess their opinions about new changes, such as online surveys or an online system to send your requests to some city councils. Examples put in practice by Madrid or Barcelona have been followed by other cities in Spain.

In these cases, citizen participation has been essential to regain lost trust in institutions, politics and politicians, a true drama today in most of the countries of the world. If the eminent social character of politics is not recovered, if technocratic elitism is not overcome for the benefit of citizens, their interests and their points of view, the gap between the results of public management and social expectations about it will grow unstoppably.

Conclusion

Since the crisis of COVID-19, people have begun to discuss the architecture and urban planning of a pandemic. Professionals say that confinement will mean a strike point for societies. Some experts agree that perhaps the time has come to modify the way houses are built and designed, and to also think about their interior layout. We have to find solutions so that, within them, we can also be abroad. The transformations of urban structure in a slow way are the key to improving cities and whose changes can be seen through cartography. Digital maps, in the case of Spanish cities, provide a complete view of these changes developed during this pandemic: the cease of tourism houses, development of green and pedestrian areas, enlargement of cycle lanes or exclusion of cars. It is the old view of the city, or the so-called "urban corruption" against the new one. Even among these changes, the perception of rural life, reviled by many in the face of the maelstrom of the big city, is more attractive these days.

Experts are already beginning to consider the answers to these questions, and some cities have even begun to work on their transformation. In almost all of

them, there is a constant that we already knew: the transformation that COVID-19 will bring us will consist of accelerating the journey of cities towards sustainability, which is directly related to health.

This article has tried to provide new models of urban environments that facilitate the population's access to the healthiest options in cities. For example, policies that promote sustainable and active transportation —that is, walking or cycling— favor physical activity and reduce sedentary lifestyle, as well as enjoy lower levels of pollution. In addition, the current environment in this type of movement helps prevent the spread of the pandemic because it allows maintaining social distance.

However, despite the clear solution of sustainability, the main problem of urbanism is how to make it possible and durable for a long time. For that, Spanish experts in different fields like cartography, geography, urbanism and architecture, look for the ideal model city, in which an autonomous city and not the smart city, as it was thought lately, has a relevant role. It will be necessary to divide large cities into more-or-less autonomous pieces that are capable of responding individually to the new requirements of an overpopulated and globalized planet. All of this could only be possible together with citizens' agreement, something that consistories are taking into account through different strategies such as surveys.

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