

Can a Pandemic Change Environmental Consciousness and Responsibility?

Sofoklis Grigoriadis*¹, Konstantinos Serraos ²

National Technical University of Athens, School of Architecture, Urban Planning Research Lab, 106 82, Athens, Greece

1. *Corresponding author: E-mail: sofgrh@mail.ntua.gr, Cel 69455854142

2. E-mail: urbanplanresearchlab@arch.ntua.gr, Tel +30 2107721125, Fax: +30 2107723819

Received: March 02, 2022 / Accepted: April 12, 2022 / Published: Vol. 7, Issue 05, pp. 15-27, 2022

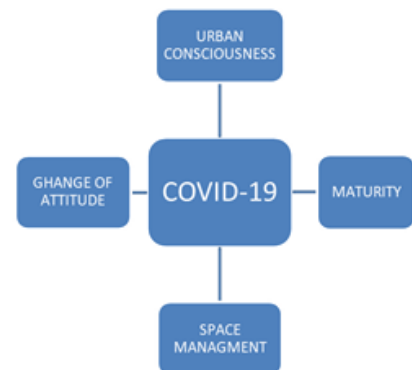
Abstract: The urban transport system, as an essential element of the structure of a city, meets the transportation needs for a variety of activities of everyday life. Its operation significantly burdens the environment, contributing to the phenomenon of climate change. In recent years, efforts have been made to shift in mild forms of transportation, such as trekking, cycling and the use of public transport.

With the advent of Covid 19 and its rapid spread across the globe, counteraction mechanisms have been developed from all countries to confront with the pandemic. Significant restrictions and prohibitions were imposed on daily movements of the population, such as strict distancing between individuals, changes in the working environment, in education, transactions, supply of goods, products and services. Actions that significantly reduce the movements result in the reduction of environmental pollution, noise pollution and in the increase of energy saving.

As a result, since the first days of the lockdown there has been the dramatic reduction of the traffic. At the same time, the previously busy public transport is almost empty now, as well as traffic congestion no longer exists. The quality of the urban space has been improved and an opportunity is given for walking with comfort and safety in the empty streets of the city, which took a more humane form.

The purpose of this paper is to present the situation in cities, in terms of mobility, before and after the Covid 19 pandemic and to propose measures that will contribute to the transition into more humane, clean and 'smart' cities in the context of sustainability.

Key words: Covid 19, pandemic, sustainability, urban sustainable mobility.



1. Introduction

Urban sustainability, as a prerequisite for global sustainability, is now the basis and the determinant of the problems arising from the growing urbanization of populations and the consequent demographic growth and urban sprawl.

Energy requirements for living, production of products and movement of people and goods, leave a strong and negative environmental footprint. This results in the degradation of the urban and suburban environment and the intensity and increase of the phenomenon of climate change.

Energy efficiency and effectiveness, with complete independence from fossil fuels and zero greenhouse gas emissions, is a goal of the European policy, in the context of sustainable cities. Strategies for sustainable urban mobility operating systems are being developed for the prosperity, the improvement of the quality of life and the way urban areas function.

A tool in the implementation of the above is the Sustainable Urban Mobility Plans (SUMP). They began to be widely implemented in the countries of the European Union through the texts of the Green Paper in 2007 on "Developing a new urban mobility education" and "Action Plan for urban mobility" as well as the texts of the White Paper in 2011 which is referred as "Roadmap for a single European transport area towards a competitive and energy efficient transport system".

Although significant progress has been made in the direction of sustainable urban mobility by several European States, the European Court of Auditors States in its Commission in June 2020 reports that no substantial improvement can be achieved without a commitment from Member States. In 2013, the Commission issued a package for urban mobility and increased funding for clean urban transport - which amounted approximately to 13 billion euro for the period 2014-2020 - seeking to enhance their sustainability.

Audit work at Commission level and in eight different cities in Germany, Italy, Poland and Spain found no evidence that European Union cities were radically changing their approaches, nor existed a clear shift to more sustainable modes of transport.

The European Court of Auditors recommends the commission to collect and publish more urban mobility data from the Member States, and also to link the access to financial support.

(<https://op.europa.eu/webpub/eca/special-reports/urban-mobility-6-2020/el/>)

Special Report

06
2020





EUROPEAN
COURT
OF AUDITORS

Special Report

2. The coronavirus pandemic.

The advent of the coronavirus (Covid 19) in the Chinese city of Yuhan and its rapid spread worldwide, on pandemic levels, disrupted balances and structures at social, economic, political and environmental levels. States, in the context of protecting the health of the citizen against the new threat, reacted initially with a total halt of activities and movements (lockdown) and then by taking a package of measures, such as the imposition of "social distance", ie the distance of two (2) meters, the face mask in any activity, etc.

However, the coronavirus pandemic (Covid 19) was also an opportunity for reorganization, reconstruction and renovation of the "faults".

As attention turns to the direct effects of the pandemic on health and mankind in addressing its social and economic impact, governments and societies face unprecedented policies, regulations and fiscal choices.



The 2030 Agenda for Sustainable Development, was adopted by all United Nations Member States in 2015, providing a common plan for peace and prosperity for the people and the planet, now and in the future. At its heart are the seventeen (17) Sustainable Development Goals, as an urgent call for action by all countries - developed and developing - in a global partnership. The agenda recognizes that ending poverty and shortage must go hand in hand with strategies that improve health and education, reduce inequalities and boost economic growth - while tackling climate change and working to preserve our oceans and forests. (<https://sdgs.un.org/goals>)

As the pandemic has revealed fragility and systemic gaps in many key systems, there are many feasible strategies that countries have used, both before and after COVID-19, to accelerate progress on development targets and strengthen durability. Countries have taken steps to expand universal healthcare systems,

strengthen social protection systems, including cash transfer systems and food distribution systems for vulnerable households. Accurate and regular data were crucial to such efforts. Innovation to help the most disadvantaged regarding the access to financial support and SME credits was also vital. Several countries have adopted integrated approaches to various forms of discrimination, in particular with regard to gender and gender-based violence. Collaborations, including the private sector and the financial institutions, have played a crucial role in promoting creative solutions. These experiences provide reasons for optimism.

Responses to the COVID-19 crisis must focus on the well-being of people, empowering them and promoting equality. Promoting change in the relationship between people and environment to protect human health and natural resources is the key to a future that does not repeat the crisis we are in today.

We need a revolution in the mindset and policy practice. Inclusive and reliable governance systems, adaptive institutions with resilience to future shocks, universal social protection and health insurance, and a stronger digital infrastructure are part of the necessary transformations. Everything is driven by low carbon dioxide emissions and environmentally sustainable infrastructure and energy transition.

(www.unescap.org/op-ed/determined-path-sdgs-2030-despite-covid-19-pandemic)

3. How did the coronavirus (COVID-19) pandemic affect the environment?

According to measurements by the Atmospheric Physics and Chemistry Group of the Institute for Environmental Research and Sustainable Development (IEPVA) of the National Observatory of Athens, which are made at the headquarters of the Observatory, in Thessio, the decline of air pollution in Athens was remarkable, after the restrictive measures in transportation and activities due to the pandemic.

The period of March 23-April 12, 2020, when traffic control measures were implemented to prevent the spread of the Covid-19 pandemic, there was a 30-40% reduction in vehicle-related pollutant concentrations compared to the period of 1-22 March 2020 and at least a 10-25% compared to the corresponding period of 2019.

There was a decrease in the concentrations of gaseous pollutants related to combustion processes:
✓ by 45% nitrogen oxides (NO_x), mainly from car emissions.



Athens - April 2020 (photo: Thanasis Stavrakis)

- ✓ by 35% nitrogen dioxide (NO₂), which is an established pollutant.
- ✓ by 30% carbon monoxide (CO), produced by incomplete combustion of fossil fuels and biomass.

Also reduced:

- ✓ by 2% carbon dioxide (CO₂) (greenhouse gas). Decreased locally in Athens by 35% taking into account the regional background.
- ✓ by 20% the concentrations of fine PM_{2.5} particles.
- ✓ by 25-45% the particles that are emitted locally mainly from the traffic, such as carbon black (BC) and characteristic trace elements.

On the contrary, concentrations of sulfur (S) representing the energy production sector as well as cross-border pollution did not change significantly.

Considering that the wind intensity during the period of 2019 was increased by 30% compared to 2020, thus contributing to the natural purification of the atmosphere, it is estimated that the real reduction this year is even greater (<https://m.naftemporiki.gr/story/1590169/simantiki-i-meiosi-tis-atmosfairikis-rupansis-stin-athina>).



(webgiscovid19.beyond-eocenter.eu/pollutants.php)

Photographs from the Sentinel-5P satellite show how levels of air pollution with nitrogen dioxide have dropped dramatically during the lockdown period in France and Italy. "I do not think we can say that this reduction is long-term. However, in the short term, these reductions are useful. Atmospheric pollution affects cardiopulmonary health. So if we have less infection during the pandemic, we can only see it as something positive," said Bensen-Henri Pess, director of the Copernican Atmospheric Monitoring Service.

Can a Pandemic Change Environmental Consciousness and Responsibility?



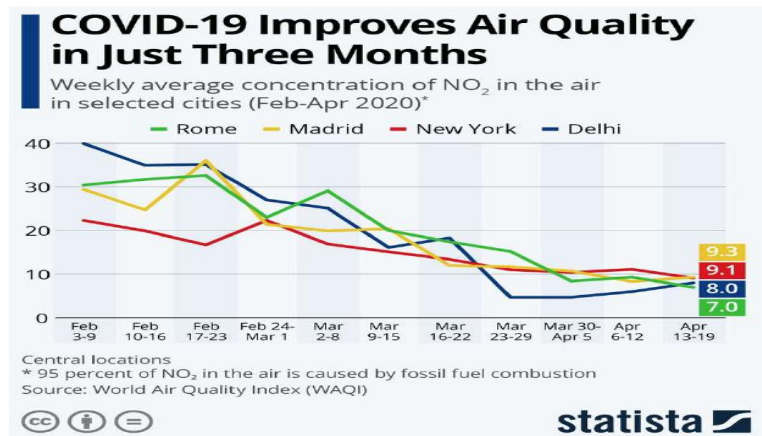
Surface concentrations of nitrogen dioxide over northern Italy, January 31 versus March 15 2020.

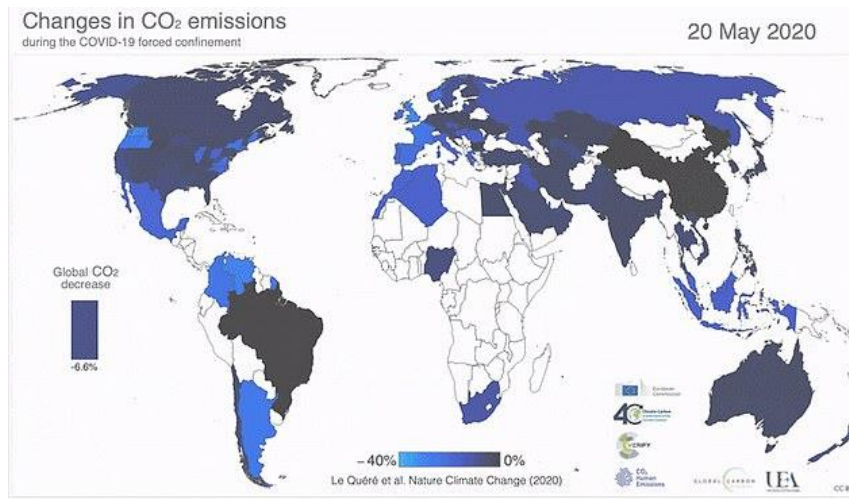
Image: Copernicus Atmosphere Monitoring Service (CAMS); ECMWF

Moreover, a positive element from the low levels of air pollution is the reduction of the possibility of the virus transmission with the infected particles. "There is no scientific consensus, but some experts support it:" These particles, when they have a certain density and there are a lot of clouds or a lot of air pollution, can accelerate the pandemic"said Alessandro Miani, president of the Italian Association of Environmental Medicine.

The pandemic definitely has consequences in our working environment. But what about nature and the environment? "The conclusions will be drawn when we overcome the crisis and they will be very helpful in order to re-evaluate the problem of air pollution. Unfortunately, climate change is here and will continue to be. It will not be affected by the pandemic, "said Bensen-Henri Pess, director of Copernicus' Atmospheric Monitoring Service.

(gr.euronews.com/2020/04/13/o-kairos-ton-martio-kai-pos-epireazei-i-pandimia-tin-atmosfairiki-molinsi)





www.dailymail.co.uk/sciencetech/article-8336325/Coronavirus-lockdown-saw-global-carbon-emissions-plummet-17-cent-April.html

4. How did the coronavirus pandemic (Covid-19) affect urban mobility?

The coronavirus (Covid-19) pandemic has caused sidewalks and bicycle streets to become crowded, revealing the need for the population to move freely, comfortably and safely in neighborhoods free of cars.

The new reality has brought about a change in travel habits and has now highlighted the big problem of the lack of proper infrastructure. Few of the sidewalks can serve the unobstructed, and safe movement and most do not have the appropriate width for two pedestrians. On the roads, the high speeds of motor vehicles and the lack of signage make it almost impossible to travel by bicycle (or by electric scooter), while the public transport system is incomplete, dysfunctional and unreliable.

The state, following the example of other European cities, with amendments passed in the Parliament, made it possible to provide lanes for pedestrians and bicycles, to make sidewalks, to reduce the speed of the urban mast to 30 kilometers per hour and to develop public transport.

It is a common perception, now globally, that restricting the use of private motor vehicles and at the same time encouraging gentle modes of movement like trekking, cycling, etc. and the use of public transport, is the only solution for a healthy, functional and eco-friendly city.

Restricting the private use of the car leading to mild forms of transportation:

- ✓ raises people's health rate

- ✓ reduces air pollution and health costs by 40%
- ✓ drastically reduces accidents
- ✓ reduces traffic congestion
- ✓ reduces noise
- ✓ creates conditions of comfort and safety for citizens
- ✓ reduces the need for parking spaces
- ✓ frees up public space
- ✓ strengthens local markets
- ✓ beautifies cities.



The unfortunate circumstance of the coronavirus pandemic (Covid 19), is a unique opportunity and trigger, in combination with the funding provided, for each city to study the demand for transportation and to manage it by determining the appropriate routes for pedestrians, cyclists and public transport.

5. Suggestions for improving mobility.

The Covid 19 pandemic can and should be an opportunity to move into a new state of urban mobility, the sustainable urban mobility. It is an opportunity to see the urban and suburban space and wonder if we like it as it is and to strive for its landscaping, based on aesthetics and functionality.

We should make smart and innovative changes such as:

- ✓ renovations of common areas (squares, parks, islets), monumental and archeological sites
- ✓ integration of common areas and school units with sidewalk networks, bicycle paths, low traffic roads and improvements such as planting and landscaping along the paths
- ✓ more parking spaces
- ✓ new public parks and recreation areas
- ✓ incentives to buy and use a bicycle
- ✓ setting days or hours during the day without car use
- ✓ construction of comfortable and suitable sidewalks for all (disabled etc.) with descents at the intersections of the streets
- ✓ design and development of infrastructure to promote active mobility
- ✓ adequate "smart" lighting
- ✓ markings, delineations, telematic signs, which provide useful information and facilitate any kind of movement

The public transport system, in order to be attractive, must ensure that transportation is punctual, fast, intermodal, multimodal, safe, comfortable, affordable, accessible, clean, "smart". Therefore, the public transport system should:



- ✓ Replace old buses with anti-pollution technology buses (green).
- ✓ Increase the number of buses (motorized, electric).
- ✓ Permit bicycle entry on public transport
- ✓ Improve telematic services - electronic applications, in order to reduce travel time.

- ✓ Extend the metro and tram lines to significant transport work destinations.
- ✓ Organize the municipal local transport, in order to cover the needs in the boundaries but also intermodality with the metro and tram.
- ✓ Provide and construct public parking near transfer points.
- ✓ Financial support for buying electric bicycles, scooters, etc. as an alternative way of transportation.



At the same time, the release of public space (mainly road) and its efficiency for hiking, cycling, etc. is the most appropriate solution implemented by many European cities and in the current time period, with rapid rates and economic solutions.



In accordance with the European directives, in Greece, with amendments voted by the Greek Parliament, it enables the Municipalities with fast procedures to turn roads or road sections into sidewalks, bicycle paths, light traffic roads (Government Gazette 101/A/24-05 -2020) and approves Technical Instructions for the creation of temporary pedestrian corridors, temporary bicycle corridors and temporary creation of light traffic areas or light traffic roads with a reduction of the speed limit to 30 km/h, set roads or 24 residential areas (Government Gazette 2448/B/19-06-2020). Many Municipalities are implementing the new measures and are slowly moving to the new reality.



*Athens, construction of bicycle paths and sidewalks, Panepistimiou street - image source:
<https://news24world.com/pos-allazoun-londino-nea-yorki-verolino-milano-alla-kai-i-athina/>*

European cities are working every day to implement policies that will make travel more sustainable. With restrictions on the use of public transport European cities are taking steps to enhance cycling and walking, linking workplaces to residential areas and all basic services.

To date, 2,285.47 km of pedestrian and bicycle roads have been announced across Europe. 1,093.36 km have already been implemented with bicycle lanes and shared infrastructure. According to the ECF, a total of 906,402,723 € will be spent on the promotion of the bicycle.

(www.smu.gr/2020/08/05/2285km-dromon-filikoi-pros-to-podilato-stin-evropi)

The Hellenic Institute of Transportation Engineers (H.I.T.E.) opposes the excess use of private motor vehicles and supports public transport by promoting mild forms of mobility and creating new places of entertainment, sports etc.

According to the Sustainable Mobility, Coordinator of the Municipality of Volos & Member of the Board of Directors of H.I.T.E. Mr Konstantinos Karagiannis said that, the coronavirus pandemic (COVID 19) has dramatically affected urban and long-distance transport and has damaged a big part of financial and social activity. The bad impact of the pandemic on the field of transportation, requires scientific study and effective treatment.



Bicycle lanes in Barcelona - image source:

http://citiesforcycling.gr/%CE%B2%CE%B1%CF%81%CE%BA%CE%B5%CE%BB%CF%8E%CE%BD%CE%B7-%CE%B5%CF%80%CE%B9%CF%83%CF%84%CF%81%CE%BF%CF%86%CE%AE-%CF%83%CF%84%CE%BF-%CF%80%CE%BF%CE%B4%CE%AE%CE%BB%CE%B1%CF%84%CE%BF?fbclid=IwAR0Eo7xGnlHbgnwsZ8cEcr2OwzhmS3b_MrdDxGdxCrUJkAr7gXAKo6gjkUM



United Kingdom - Manufacture of bicycle lanes - image source:

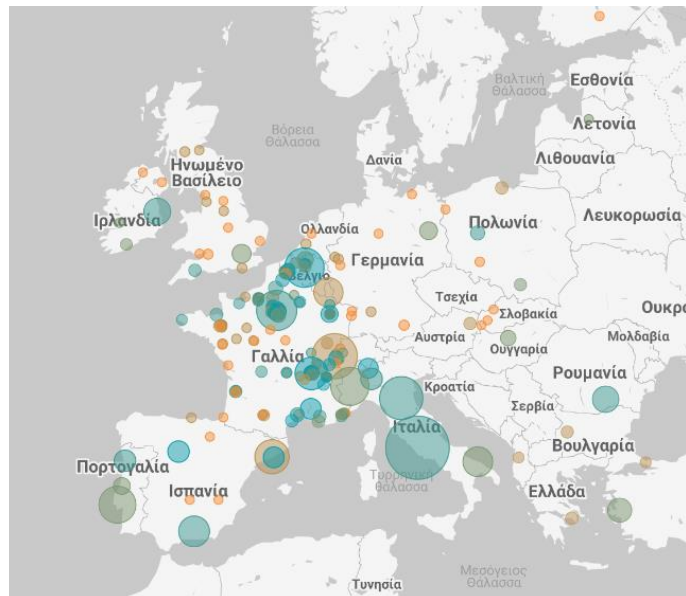
https://cyclonews.gr/2020/05/07/%ce%b7%ce%bd%cf%89%ce%bc%ce%ad%ce%bd%ce%bf-e%b2%ce%b1%cf%83%ce%af%ce%bb%ce%b5%ce%b9%ce%bf-%ce%ba%ce%b1%cf%84%ce%b1%cf%83%ce%ba%ce%b5%cf%85%ce%ae-%cf%80%ce%bf%ce%b4%ce%b7%ce%bb%ce%b1%cf%84%ce%bf/?fbclid=IwAR15hg8PEj7LRfPkGBqMBjNJQYabIaUwFor_FMdTOCzvtu6YUvU7be3gEnM

Mr. Papastergiou, President of KEDE and Mayor of Trikaia, is not only a well-known cyclist (he also travels to Athens by an electric bicycle) but also known for the bold interventions and infrastructure he has implemented for Sustainable Mobility in Trikala, He points out the unique opportunity as a large group of citizens to adopt alternative ways of travelling - that exclude cars. In addition, Central Union of Municipalities of Greece proposed to develop initiatives and to see the promotion of sustainable mobility in an organized way. "It is a unique opportunity," he said, "to keep for the cyclists and the pedestrians the places won during the coronavirus."



Plans for Corso Buenos Aires before and after the Strade Aperte project. Composite: PR

<https://www.theguardian.com/world/2020/apr/21/milan-seeks-to-prevent-post-crisis-return-of-traffic-pollution>



*EU cities implementing bicycle promotion measures:
ECF Dashboard*

In conclusion, I quote an article section by Professor NTUA Mr. Thanos Vlastos: "For 25 years, in the Sustainable Mobility Unit of SATM of NTUA, we have been designing policies for a sustainable, humane and socially cohesive city. This is the image promoted by today's European urban planning. The main issue is to encourage the resident, currently trapped in the apartment, to go outdoors and enjoy the city and its people. It is common truth that we have associated our neighbors or fellow citizens with running the risk



of being infected by the virus or even dying. As a result, the effort to avoid infection has kept us socially back. Anyone can be a threat for everyone. We accept and wish for the success of authoritarian measures, although they are implemented by European governments, and therefore do not suit us. Such measures are not imposed on rebels against an issue, but on superficial and frivolous ones. How belittling, though justified, are all these for the dignity of the citizen? Some saw it coming; in the face of the inability of society to take effective action towards the climate crisis, the 'environmental police' and the 'environmental army' would take action. COVID-19 provided the opportunity for the world's first emergency drill. The political dilemma is obvious. In the face of severe problems of humanity, democracies with "wooden legs" can't be effective. They are forced to borrow

strategies strange to their identity. At least from the tragedy we are experiencing, let us teach our lesson, as a society and as individuals, and this is where lack of maturity and democracy can lead us to".

(www.smu.gr/2020/03/30/covid-19-mathima-politikis-vlastos/)

References

1. Tsetsis Stavros, Tsetsi Voula, 2014 «Green urban mobility, policies for sustainable mobility in urban centers»
2. Athena Vitopoulou, Georgia Gementzi, Grigoris Kafkalas, Anastasia Tasopoulou, 2015, "Sustainable cities, adaptation and resilience in times of crisis"
3. Gavanas, N., Papaioannou P., Pitsiava-Latinopoulou, M. and Politis, 2015, "Urban Transport Networks and Mobility Management", Hellenic Academic Libraries Association, National Technical University of Athens, Athens.
4. Hellenic Institute of Transportation Engineers (H.I.T.E.), 2015, "Positions of the Hellenic Institute of Transportation Engineers for Sustainable Urban Mobility Plans", Athens
5. EC (European Commission). 2007, Towards a New Culture for Urban Mobility. Green Paper from the Office for Official Publications of the European Communities
6. EC (European Commission), 2011, Roadmap to a single European Transport Area, Towards a competitive and resource efficient transport system. White paper from the Office for Official Publications of the European Communities
7. Government Gazette 101/A/24-05-2020 concerning quick procedures to convert roads or road sections into sidewalks, bike paths, light traffic.
8. Government Gazette 2448 /B/19-06-2020 concerning roads Technical Instructions for the creation of temporary corridors for pedestrians and bicycles and temporary creation of areas with light traffic or light roads with a reduction of the speed limit to thirty (30) km / h.

Websites

1. op.europa.eu/webpub/eca/special-reports/urban-mobility-6-2020/el
2. sdgs.un.org/goals
3. unescap.org/op-ed/determined-path-sdgs-2030-despite-covid-19-pandemic
4. webgiscovid19.beyond-eocenter.eu/pollutants.php
5. smu.gr/2020/08/05/2285km-dromon-filikoi-pros-to-podilato-stin-evropi
6. smu.gr/2020/03/30/covid-19-mathima-politikis-vlastos