6

Mobility & COVID-19: How Should We Redesign Transport for a New Future?

Series | COVID-19 & strategy response

ISGlobal Barcelona Institute for Global Health

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[This document is part of a series of discussion notes addressing fundamental questions about the COVID-19 crisis and response strategies. The works are based on the best scientific information available and may be updated as new information comes in.]

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Urban mobility during and after the COVID-19 pandemic has a significant impact on health. Cities and people must take urgent actions now that are linked to longer-term change. **Active transport** and providing sufficient public space for **people to get around, while maintaining physical distancing**, should be the highest priority.

Better use of **technology to organise mobility** and clear communication about the available transport network options will alleviate fear and encourage rational transport use.

Transport choices should be based on: the risk of transmission, health and environmental impacts, access and use of space. We recommend:

1. Walking, cycling or PMVs (Personal Mobility Vehicles) for journeys up to 5 km
2. Cycling for journeys up 10 km (and electric cycling for longer)
3. Low occupancy public transport for longer journeys
4. Cars and motorcycles for vulnerable populations and those who cannot use the other transport modes

1. Overview

"How can we keep motorcycle and car use low, restore confidence in the use of public transport and promote walking and cycling for a sustainable, equitable, liveable and healthy society after the pandemic?."

The relationship between health and mobility has multiple dimensions[1]. Especially in urban areas, motorised traffic, and particularly private vehicles, causes most air and noise pollution, the two main environmental health threats. **Car-focused urban planning** that gives the majority of public space to roads and parking also contributes to the heat island effect, sedentary lifestyles and lack of green spaces.

Mobility has been drastically altered by the COVID-19 crisis. Confinement, teleworking and travel restrictions have had multiple, sometimes paradoxical, impacts on daily mobility. Single occupancy car and motorcycle use in cities has fallen, and thereby also air pollution and noise, but is encouraged in order to maintain physical distancing and a low risk of transmission. Cycling and walking have also risen partly because of the low transmission risk and local shopping has made the trips shorter. The use of public transport has collapsed for fear of the high risk of transmission.

Physical distancing measures (1.5 metres) will stay in place for the foreseeable future. How can we keep motorcycle and car use low, restore confidence in public transport use and promote walking and cycling for a sustainable, equitable, habitable and healthy society after the pandemic?

2. What are the Main Impacts On Mobility-Related Health Risks Related to COVID-19?

"The current crisis shows that major reductions in air pollution levels are possible in cities, and offers a critical opportunity to make lasting positive changes on health through more active and sustainable urban mobility solutions"

Air Pollution

Motorised traffic in cities is the main contributor to air pollution levels, and especially particulate matter ≤ 2.5 mm ($PM_{2.5}$) and nitrogen dioxide (NO_2). Worldwide, outdoor air causes over 4 million deaths each year. **Air pollution is also starting to be linked with the COVID-19 disease**. Preliminary evidence suggests higher viral spread and increased COVID-19 related mortality in more polluted areas[2,3,4].

Air pollution levels **have dropped in many cities worldwide** due to the confinement measures, lower economic activity and decreases in mobility. Long-term reductions are needed to achieve significant health benefits[5]. The current crisis shows that major reductions in air pollution levels are possible in cities, and offers a **critical opportunity to make lasting positive changes on health** through more active and sustainable urban mobility solutions.

Noise

Regular exposure to environmental noise contributes to persistent stress and annoyance, sleep disturbance, and in the

[1] Nieuwenhuijsen, M. J. (2020). Urban and transport planning pathways to carbon neutral, liveable and healthy cities; A review of the current evidence. *Environment International*, 105661. https://doi.org/10.1016/j.envint.2020.105661.

[2] Ogen, Y. (2020). Assessing nitrogen dioxide (NO2) levels as a contributing factor to coronavirus (COVID-19) fatality. *Science of the Total Environment, 726*, 138605. https://doi.org/10.1016/j.scitotenv.2020.138605.

[3] Setti, L., Passarini, F., de Gennaro, G., Di Gilio, A., Palmisani, J., Buono, P., Fornari, F., Grazia Perrone, M., Piazzalunga, A., Pierluigi, B., Rizzo, E., & Miani, A. (2020). Evaluation of the potential relationship between Particulate Matter (PM) pollution and COVID-19 infection spread in Italy. *SIMA Position Paper*. http://www.simaonlus.it/wpsima/wp-content/uploads/2020/03/COVID_19_position-paper_ENG.pdf.

[4] Wu, X., Nethery, R. C., Sabath, B. M., Braun, D., & Dominici, F. (2020). Exposure to air pollution and COVID-19 mortality in the United States. *MedRxiv*, 2020.04.05.20054502. https://doi.org/10.1101/2020.04.05.20054502.

[5] Barcelona Institute for Global Health. (2020). *Are the Reductions in Air Pollution Triggered by the COVID-19 Epidemic Having Health Effects?* https://www.isglobal.org/en/healthisglobal/-/custom-blog-portlet/-sera-relevante-para-nuestra-salud-la-disminucion-de-la-contaminacion-atmosferica-durante-la-epidemia-de-la-covid-19-/5083982/11101.

"Urban and mobility planners need to protect public health by facilitating mobility that allows people to meet their basic needs in the safest possible way"

long-term leads to chronic conditions such as cardiovascular disease and diabetes[6]. **Road traffic is usually the main source of noise** in Spanish cities.

COVID-19 confinement has led to **an enormous decrease in noise in cities throughout the world**: Paris has recorded a 90% reduction in some streets; in Madrid and Barcelona, levels dropped massively by 13 and 11 decibels, respectively, compared with the 2019 average.

Quieter cities are possible; however, short-term reductions are not sufficient to improve health. Cities need to reinforce plans for changes in mobility patterns to maintain longer-term lower noise levels.

Physical Activity

The planning of urban development and transport influences citizens' levels of physical activity. A sedentary lifestyle is the fourth risk factor for global mortality, and is associated with 6% of deaths worldwide.(WHO, 2018)[7]. Enabling physical activity is an even more urgent health need during the pandemic to minimise negative health impacts.

Physical activity is minimised at times of confinement. Physical activity related to recreation and park visits in Spain has fallen by 92% and 85%, respectively. During the crisis it is even more important to have **options for physical activity** through active mobility. Our policy briefs on COVID-19 and physical activity [8] and going outside[9] detail this topic further.

How can Mobility Contribute to COVID-19 Management?

Urban and mobility planners **need to protect public health by facilitating mobility** that allows people to meet their basic needs in the safest possible way. Cities can lead the way in developing and testing strategies through social, tactical and technological policies and interventions. This requires efficient and effective collaboration across sectors and in conjunction with society. Measures should be implemented rapidly, but with the intent to create more long-term positive changes

3. What is Needed for Mobility during COVID-19 and Beyond?

"Walking or cycling are the two healthiest, most sustainable and equitable options which guarantee social distancing."

Reallocate public space to prioritise active mobility whenever possible

We should take advantage of the 60% to 90% fewer motorised trips that have **freed up a lot of public space** to prioritise **active mobility** and devote large areas for bicycles and pedestrians that would allow new users to be safely brought in and a larger number of trips among current users.

Walking or cycling are the two healthiest, most sustainable and equitable options which guarantee social distancing. Scooters and other PMVs will also become more important. These offer the possibility of decongesting transport, thus facilitating compliance with the minimum interpersonal distance. Many cities **have already begun to enable road infrastructure to promote active transport**[10].

Make public transport as safe as possible

For many, including essential workers, **public transport is the only viable option for daily mobility**. However, the very benefits of public transport under usual conditions are those that pose health threats during the pandemic. Local gov-

[6] van Kempen, E., Casas, M., Pershagen, G., & Foraster, M. (2018). WHO environmental noise guidelines for the European region: A systematic review on environmental noise and cardiovascular and metabolic effects: A summary. *International Journal of Environmental Research and Public Health, 15*(2), 1–59. https://doi.org/10.3390/ijerph15020379.

[7] World Health Organization. (2018). *Physical activity. Fact sheet.* https://www.who.int/news-room/fact-sheets/detail/physical-activity. https://doi.org/10.1101/2020.04.05.20054502.

[8] ¿Debería permitirse la actividad física durante la pandemia causada por el coronavirus? https://www.isglobal.org/es/-/-deberia-permitirse-la-actividad-fisica-durante-la-pandemia-causada-por-el-coronavirus-.

[9] ¿Deberíamos salir durante y después del confinamiento por la COVID-19? https://www.isglobal.org/es/-/-deberiamos-salir-durante-y-despues-del-confinamiento-por-la-covid-19-.

[10] Polis Network. (2020). COVID-19: *Keeping Things Moving - Polis Network.* https://www.polisnetwork.eu/document/covid-19-keeping-things-moving/.

"Technology is a key asset for mobility management that is underused."

ernments and traffic authorities must work together to provide a sufficient level of service while maintaining safe conditions.

Encouraging shared transport use, in other words combining bicycles or PMVs with public transport, can help decrease their use at the beginning and end of longer trips. **Reducing overcrowding by increasing public transport** and/or controlling the number of people getting on, improving the ventilation, disinfecting public transport each day and encouraging the use of masks are important measures to reduce the risk of transmission.

Promotion of the rational use of private transport, taxis and shared vehicle services

Single occupancy in the use of private vehicles offers mobility while maintaining a physical distance and so reducing the risk of transmission, but comes at the cost of high emissions, noise and urban space occupancy. What's more, cities with high traffic volumes before the pandemic will struggle to manage an increase in circulating vehicles, and this will limit the space for active transport.

Taxis and shared vehicle services such as Uber and Cabify offer a more flexible option for people who may need to use cars, and especially for more vulnerable populations, such as the elderly. Cities in Germany and the United States, for example, are working to provide access to such services and to make them more affordable. If implemented in conjunction with city transport management, they are a viable option that can minimise the need for individual car ownership.

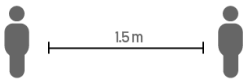
Use technology to manage and programme mobility

Technology is a key asset for mobility management that is underused. **Smartphone applications** can help people find optimal routes and suggest alternatives to avoid crowding. For instance, apps can alert people to congested streets in real-time and can be used to plan trips on public transport in advance, to limit occupancy. They can also be used for payments to avoid having to touch ticket machines in stations and on buses.

Change working and shopping habits

Providing more flexible **options for teleworking and managing work-time hours** will help decongest travel routes. Encouraging local shopping that can be accessed by active transport will also help. On-line shopping can also reduce individual trips; however, distribution, especially in the last km, should be done through active transport ●

Mobility options



1.5 metres distance

Impact on use of public space

	CR	Space	Health benefits	Environ. impacts
Cars	L	H	L	H
Motorbikes	L	M	L	H
Public transport	H	M	M	M
Walking	L	L	H	L
Cycling	L	L	H	L
Other, incl. PMV	?	?	?	?

Impact:
positive
intermediate
negative
unknown

CR = contagion risk
PMV = Personal Mobility Vehicle
L = low; M = medium; H = high

4. What are the Immediate Actions?

"In the short term, the application of measures to extend the area used for active transport (...) which guarantee distancing and combat the spread of COVID-19"

In the short term, the application of **measures to extend the area used for active transport**, in combination with the management of public space, which guarantee distancing and combat the spread of COVID-19. These strategies promote a healthier lifestyle while reducing the impacts on health and the environment. These changes can be consolidated in the long term. The following measures are being implemented in different cities worldwide, although they are not exhaustive.

Public Space and Active Transport

- Promote active transport as the principal means of transport for short trips
- Close or reduce car lanes on streets with two lanes (or more) each way to accommodate cycle paths and wider pavements for pedestrians
- Set up lanes for cycling and/or walking parallel to vehicle lanes, marking these areas with beacons
- Close off streets to motor vehicles in more residential areas to open them up to pedestrians and cyclists
- Implement traffic light priority for bicycles and pedestrians in order to reduce crowding
- Eliminate pedestrian traffic lights on request
- Support the bicycle and PMV trade at the level of the community, with low-cost or low-interest credits negotiated with banks, to encourage their purchase and use
- Open the shared bicycle public services, reducing their cost and applying systematic measures of hygiene
- Accelerate urban transformations that recover public space like the Barcelona Superblocks

Public Transport: Bus, Underground and Railway

- Expand the frequencies, especially the maximum frequencies in the rush hours
- Use fences and signs to limit the capacity in carriages and at stations, in halls and entrances
- Install fences and signs on the ground, especially at interconnection stops
- Continuous cleaning and disinfection and distribution of masks in the facilities
- Increase the number of staff attending travellers, and set up signs on prevention methods in the facilities
- Organise the underground service with booking systems to control capacity
- Offer demand management services to low-density areas with shared taxis and linked to public transport operators
- Implement traffic light priority for buses and segregated lanes to increase commercial speed and passing times
- Getting on and off buses and ticket stamping machines via the rear doors
- Expand the public space occupied by bus stops: shelters

Private Transport

- Reduce the speed of the street traffic
- Reduce car parking space and remove motorcycles from pavements
- Run low emission areas
- Link taxi and shared vehicle transportation with the organisation of public transport

To ensure the durability of the positive impacts, other policy and structural changes can help mobility remain active and sustainable. For example, relevant and necessary actions such as promoting a **state bicycle plan**; carrying out studies on the use of and external factors associated with active and sustainable transport; and strengthening the active transport to work programme. Better linkage of health and mobility at this time of transformation can bring large gains and move towards achieving the Sustainable Development Goals.

TO LEARN MORE

- WHO Moving around during the COVID-19 outbreak 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
- POLIS- Cities and Regions for Transport Innovation

https://www.polisnetwork.eu/document/covid-19-keeping-things-moving/

https://www.polisnetwork.eu/document/resources-covid-19-mobility/

- Catalogue of the European Cyclists' Federation https://ecf.com/cycling-beyond-crisis
- Emergency Mobility Network: Action Plan for Post COVID-19 Mobility https://www.bikeitalia.it/wp-content/uploads/2020/04/RME-Piano-di-azione-mobilit%C3%A0-urbana-post-covid.pdf
- CityLab Transportation https://www.citylab.com/transportation/
- City of Bogota https://bogota.gov.co/mi-ciudad/movilidad/distrito-estudia-hacer-permanentes-ciclovias-de-cuarentena-en-bogota

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