

## **Nature-inclusive design of public space in cities: *health & well-being during and post covid-19***

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**During covid-19 it became clear that our relation with nature is more important than we had anticipated. Especially in cities, the lack or prohibition to connect with public green and blue networks had negative consequences on our wellbeing. Because today 30% of public urban space is assigned to roads and cars there are lessons to be learned.**

In the past the profession of architecture has always tried to set humans apart and above nature by design. Today this position is untenable as biodiversity is decreasing (Kolbert, 2014) and climate is changing. The Anthropocene (Crutzen, 2000) is the result of human action and characterized by a huge growth of spatial demand. In particular cities grow in Asia but also in Europe, with one million new houses projected in the Netherlands below sea level (PBL, 2021).

The Hypothesis for the Next City as a new initiative inverts the negative impact of humans upon the planet and calls for the potential to react, reconsider and reconcile (Van Stiphout, Lehner, 2019). The basic notion of the Next City's hypothesis is that humans and cities are also nature, alas a somewhat rocky habitat. Its ecosystem services (Geneletti, 2019) can be increased by employing design and social strategies. Based upon the principles of city resilience (Stockholm Centre for Resilient Cities) these are connectivity, modularity, redundancy and porosity in combination with diversity, stewardship and proper communication. In the past 40 years a growing amount of architectural designs bring landscape into the city (Balmori, 2010).

The current pandemic however has changed basic spatial notions. Firstly, human scale itself has increased due to the need for social distancing: today, one single human measures 1,50m in diameter. The second lesson painfully learned is that the well-being of humans depends on the connection with nature. Forcing people in cities to stay in their homes and prohibiting them to use (green) public space results in serious health issues, such as burn-outs (Zilveren Kruis, 2020) and domestic violence (Vienna Police Department, 2021). On the other hand, recent research shows that (re)connection with nature contributes to well-being (Hogeschool van Larenstein, 2021. WUR, 2021).

These changed basic spatial notions result in the need for even more space in urban planning. Space for nature-inclusivity can be created in buildings (facades, roofs), but streets and public space taking up an average 30% of a city (UN Habitat, 2013) represent a huge potential to establish a nature-inclusive network using existing urban structures. Today this network is predominantly occupied by moving or parked cars (World Bank, 2013). Reducing space occupied by cars frees space for human well-being. Stimulating walking, biking and the use of public transport in a model of the 15-minute-city decreases 'car space', as do decreasing speed, centralizing parking, double land use and applying technology for shared and self-driving cars (Degenkamp, 2021).

Various European cities already radically decreased car-space and swapped it for bike lanes (Paris, Milan, Brussels) during covid-19. The effects are more safety (less accidents, easier crossings) and health (due to physical exercise), next to economic revenues (BUF, 2017). Seen from an integral and spatial point of view this somewhat ad hoc development in urban public space improves the 'grey infrastructure'. But it represents an immense opportunity to come to a green-grey infrastructure by adding nature-inclusive elements required for the well-being of urban dwellers.

Recently realisations of public spaces (Utrecht, Maastricht, Paris) deliver ecosystem services such as tempering heat islands, buffering excessive rain and absorbing fine dust – in short a substantial contribution to climate adaptation and quality of life. Strengthening existing green-blue networks and realizing an integral green-blue-grey infrastructure results in even more benefits, as recent architectural projects demonstrate (Amsterdam, Breda): they contribute to resident satisfaction, local recreation, community gardening and improve biodiversity.

Summing up, a crucial lesson from covid-19 is that city dwellers need to connect with nature to stay healthy. Reclaiming parts of the 30% of city space today predominantly used by cars is a huge opportunity to boost quality of life in the city during and post covid-19, while at the same time contributing to climate adaptation and biodiversity, the two largest challenges of our time.