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# Public Space and Public Health Related to Green Space in Urban Landscape Architecture

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## Abstract

In this paper I will investigate relations between public space and public health in the context of the recent pandemic Covid-19 for the urban landscape. Goal of the research is to explore how mitigating and maybe even prevention of pandemics can be achieved through planning and design of urban public space. The main research question is how green space and greenways have been used and can be used in the creation of healthy environments for people in the times after the pandemic. The research methods are mixed, explorative and experimental. Overall the research methods are based on the principles of the case study approach. In the first part, a brief overview of existing publications will be analysed with special attention to the relation between public space and green space. In the second part the issue of public health and public space with special attention to criteria, norms and guidelines will be explored. How can use and spatial aspects of public space create conditions for improving public health? In the last part this information will be integrated into a design approach and elaborated at the scale of the neighbourhood in a case study in the city of Utrecht by explorative research and experimental design. One of the conclusions is that new approaches should be founded on the one hand on evidence-based research on the relations between pandemic and daily living environment, on the other hand on experimental design and explorative research.

**Keywords:** Design experiment, Evidence-based design, Design knowledge, Pandemics, Neighbourhood design.

## Introduction

In the past the relations between public health and urban green space have been analysed and overall the need for green space in the urban landscape is shown by different researchers (Barton et al., 2003; Frumkin, 2002; Maas et al., 2006; Ward Thompson et al., 2010; Honold et al., 2015; Markevych et al., 2017; Urban, 2017; Toorn, 2020). Since the recent pandemic of Covid-19, the question is how urban green space can influence the mitigation and possibly even prevention of spreading of contagious diseases especially in urban landscapes (Hanzl, 2020). The question of public health in urban environments has different aspects; physical, social and mental. In this paper I will focus on the spatial aspects that are related to open space, green space, public space and public health in a European context. Goal of the paper is to investigate how the relations between public space and public health can influence the planning and design of the urban landscape after the pandemic.

### ***Terms and definitions***

*Open space* is used as contrast to built-up space in the juxtaposition of open/closed (mass/space). Note that architects make a distinction between buildings and open space, while landscape architects also distinguish between open/closed green spaces. A forest is a closed space or green mass, while a meadow is an open green space. Lynch (1972) defines *open space* from a design point of view; (...) *In our sense "open space" then is an outdoor area in the metropolitan region which is open to the freely-chosen and spontaneous activity, movement, or visual exploration of a significant number of city people.*

*Public space* comprises all space that is accessible for the public, the opposite is private space. Public space in the urban landscape is basically all space between buildings, although there is also public space inside buildings. Public space in the outdoors comprises open space in the form of green space, blue space (waterways and water bodies), traffic space (roads, paths, slow traffic networks). Note that sometimes only specific users or groups of users have access; think of the motorway which is public space but only accessible by car. In the cities, public space is dominated by space for cars either for driving or parking. This is also the case in European cities.

*Urban green space* is a generic term for spaces that are characterised by vegetation and/or plantation. In landscape architecture a distinction is made between natural green space ('vegetation') and designed green space in the form of gardens, parks, landscapes ('plantation'). This focus on plants, plant materials is part of applied planting design where the relation between plants, soils and climate is studied from the viewpoint of planning, design and management. Taylor & Hochuli (2017) state that there is no consensus about the term 'green space'.

*Civic space* is defined as the set of conditions that determine the extent to which all members of society, both as individuals and in informal or organised groups, are able to freely, effectively and without discrimination exercise their basic civil rights.

*Greenways: systems or networks of interconnected lands (patches and corridors) that are planned, designed and managed for multiple purposes, including: ecological protection, recreation, and cultural/historic landscape value(s)* (Ahern, 2002). Note that according to the Oxford dictionary, the term 'greenway' is specifically used in the US and is defined as: *A strip of undeveloped land near an urban area, set aside for recreational use or environmental protection.*

The definition of *public health* is broad and extends beyond the aspects of physical space as part of the daily living environment. Here we use the definition of the World Health Organisation (WHO) (Health, 1999, p 215): *The science and art of preventing disease, prolonging life and promoting mental and physical health and efficiency through organised community efforts. Public health may be considered as the structures and processes by which the health of populations is understood, safeguarded and promoted through the organised efforts of society.*

### ***Problem analysis***

The terms 'public space', 'green space', 'open space', 'civic space' are sometimes used interchangeably because there are overlaps but there are also important differences. First of all it should be noted that not all public space is green space and not all green space is public, think of private gardens and parks in the city. Core of the problem is the question of density in relation to public health in general and pandemics in particular. From a social viewpoint, the city offers many

possibilities and choices for different groups of people on the other hand densities are a major problem in case of pandemics. Tuts et al. (2021) state that spatial patterns, distribution of population in residential quarters do have relations to spreading, mitigation of pandemics, however, the problem is not density but density without enough urban green space. If there is no empirical evidence that urban density as such is a problem, also from the point of view of the spread of the pandemic, the density/green balance in urban spaces is an important issue for planning and design.

For the relation between density, health and mobility, Berghauser Pont et al. (2020) draw attention to the striking contrast between, on the one hand, the positive effects of density and compact cities on transport and urban economics and, on the other hand, the negative effects for the natural system, social issues and human health. In our culture of mobility, traffic space takes up more space than green space. Traffic space for cars takes up more than 50% of open space in urban landscapes, even in Europe. The average car use per day is only around 5% on the road, for the rest of the time the car is parked. For every car there is a need of roughly 4 parking spaces. Half of all journeys in urban areas are less than 5 km long.

In this paper, two aspects of on the one hand the available green space per inhabitant and on the other hand the relation to its location will be elaborated at the scale of the neighbourhood.

### **Methods and research materials**

From this problem analysis the following research questions can be formulated; 1. What are relations between green space, public space and open space in the context of public health? 2. What are norms and criteria for public health? 3. How can this information be integrated into the planning and design of the urban landscape?

The research methods are mixed, both quantitative and qualitative, and are based on the principles of case study research; they comprise comparative analysis, exploratory research and experimental design (Zeisel, 2006). In the first part — the background — the method is a comparative analysis of publications, projects on public, open & green space and public health in the urban landscape, to search for similarities and differences. In the second part the results of this comparative analysis are related to norms and guidelines from WHO and UN-Habitat on the spatial aspects of pandemics from a global perspective. It is a form of explorative research; that is, in search of unknown solutions instead of collecting data and testing hypothesis. Finally in the results, the comparative analysis and the explorative research are integrated into a design approach by experimental research; applying existing design knowledge and guidelines into a local situation by experimental design.

The research materials are publications on the relation between green space, use and public health, studies on norms and criteria for public health, studies on design projects and existing design knowledge in the form of publications on projects, guidelines, methods and evidence-based research.

## **Results; public space and public health in a new perspective after the pandemic**

### *A comparative analysis of literature*

Public spaces make up between 2-15% of land in city centres in Europe and function and are used in different ways. For the landscape as a socio-economic system both their physical and social functions are essential and can relieve some of the pressures exerted on urban living by a growing population (Redimo-Rung et al., 2005). For different social groups, public space has different functions; for example for different age groups there are children's playgrounds, sports facilities, green spaces for picnic (Frank & Engelke, 2001). For individuals, public space provides spaces for contemplation and reflection, for enjoying the changing of seasons and nature (Honold et al., 2015). Lynch (1972) considers the main function of open space as an extension of the indoor, private space of the dwelling where people can have different activities, meet with other people in a setting that affords different types of use. Thus, open space offers a certain freedom, a choice of activities for each individual (Ward Thompson, 2002). Gehl (2011) focusses on the use of public space by different social groups and distinguishes between three types of outdoor activities: necessary activities, optional activities, social activities. Note that Gehl does not define the term 'public space', what it is and what it stands for! For the landscape as a cultural system and society at large, public space is first of all civic space where people can exercise their human rights and core freedoms (Malena 2015). Moreover, open space gives people a possibility to have contact with the environment and nature for well being, relaxation and leisure.

Morris (2003) published a literature overview in which she made a distinction between the different functions of urban open space; functioning as part of the natural system which she mentions as environmental benefits. For the landscape as a socio-economic system she cites the economic benefits. As third, she mentions the health benefits of urban open space; social, physical, mental health and well-being which are part of the landscape as a cultural system.

All these studies make clear that public space does play an important role in the daily living environment of people from a research point of view but what is also needed is an integrated approach of public space as part of the urban landscape as a whole. Francis (2003) paid special attention to design for users, user needs and puts much emphasis on integrating user needs into the design approach. It is a key issue in functioning and use of the urban landscape in general which also gives the main background for planning and design and could also be used for the integration of health and well-being into urban open space design (Lynch, 1972; 1974; Goossens et al. 1995; Tuts et al., 2021).

So far there are relatively few publications that deal specifically with the relation between greenways and public space. Judit (2011) gives a historical overview of the concept of greenways. The publication of Ward Thompson (2016) does focus on the issue in relation to the creation of healthy environments for people in the context of landscape architecture.

### *Norms, criteria and guidelines for the relation between public space and public health*

Public health is directly related to green space in the urban landscape but relations are multi-faceted and vary at different scales. Before the pandemic the WHO has mentioned the need for urban green space based on comparative data from different cities on the surface in m<sup>2</sup> of green space per inhabitant (Barton et al., 2003). For green space — from a health point of view — Markevych et

al. (2017) distinguish three general functions of green space: reducing harm (e.g. reducing exposure to air pollution, noise and heat), restoring capacities (e.g. attention restoration and physiological stress recovery), building capacities (e.g. encouraging physical activity and facilitating social cohesion). These functions relate to the landscape from a socio-economic and cultural point of view. For the landscape as a natural system the functions are quite different. Maas et al (2006) investigated the strength of the relation between the amount and proximity of green space in people's living environment and their perceived general health among different age groups. The results show that the percentage of green space inside a one kilometre and a three kilometre radius had a significant relation to perceived general health. This evidence-based research shows that the amount of green space in people's living environment has a positive association with the perceived general health of residents. So, green space seems to be more than just a luxury and consequently the development of green space should be allocated a more central position in spatial planning policy (Zhang et al., 2020; Tuts et al., 2021).

The question is how the results of this evidence-based research can be used in planning and design of the urban landscape. Already during the pandemic the issue of the need for more green space in urban landscapes emerged and got a new dimension for planning and design. During the pandemic next to the surface of green space per inhabitant needed, also the dispersion and location of green space became an important issue. The WHO is more precise and combines quantity, location and access; it advises to provide at least one ha per neighbourhood that is accessible from the dwelling by foot or bike and this one ha should not be scattered in small pieces.

One of the basic design approaches is to define guidelines on the basis of norms and criteria. Such an approach is especially suitable in case of results from evidence-based research as mentioned earlier. Norms tend to be socially or people-oriented. In the Netherlands no norm exists for the quantity of public green space. The Spatial Planning Memorandum (2006) refers to a target figure: 75 m<sup>2</sup> per dwelling. In 2003 the amount of public green space was less than this in 19 of the 31 largest municipalities and none of the four major cities achieved the target figure. Note that this indication is not mandatory neither for municipalities nor for developers. Criteria are knowledge-oriented; derived from empirical research. There are different criteria for green space which are also related to location of green space at different levels. Russo & Cirella (2018) refer to the WHO stating that all cities and towns should have a minimum of 9 m<sup>2</sup> of green space per inhabitant, provided that it should be accessible, safe and functional. Guidelines are rules based on norms and criteria that can be used in planning and design. The Accessible Natural Green space Standards (ANGSt) in England specifies guidelines for green space access: *No person should live more than 300 m from their nearest area of a natural green space of at least 2 ha in size; There should be at least one accessible 20-ha site within 2 km from home; There should be one accessible 100-ha site within 5 km; There should be one accessible 500-ha site within 10 km.*

Next to the emphasis on health-care systems and services, we can also distinguish a number of main issues that affect the public health from the viewpoint of landscape architecture and its design process. What is the hierarchy and what are cumulative effects of design interventions on factors that influence the relation between public health and daily living environment for people?

First of all taking into account the basic conditions for urban living; clean drinking water, disease control, sanitation and hygiene, food safety, traffic safety. These conditions result in physical factors in the daily living and working environment, such as sunlight, fresh air, air quality, green

space, access to public services such as sanitation, sewer systems in relation to the natural drainage and traffic systems in the form of slow traffic, public transport and car traffic that can provide access. These conditions are based on the well functioning of the landscape as a natural and as a socio-economic system by means of public policies, planning and design of the daily living environment for people but also on risk management. For the landscape as a natural system, risk management includes prevention by identifying and analysing environments and hazardous agents while limiting exposures to hazardous physical, chemical, and biological agents in elements that may affect health of the population at large, specific social groups and individuals. Environmental health science focusses on identifying the relationships and risks of the physical environment around us on our health (Rooney et al. 2014).

public health & landscape architecture	the landscape as a natural system	the landscape as a socio-economic svstem	the landscape as a cultural system
physical health			
social health (equity)			
mental health			

**Figure 1. The relations between public health and landscape architecture from the viewpoint of the landscape as a system. These basic relations form the foundation for a framework to develop an integrated design approach.**

examples. Honey-Rosés et al. (2020) suppose that the functioning and role of public space might change after Covid-19. Open space design is one of the key domains of work in landscape architecture. There have been several studies specifically on the design of open space and emphasising the need for integration and a comprehensive view on the daily living environment (Lynch, 1972; Cooper-Marcus & Francis, 1998; Barton et al., 2003; Ward Thompson et al., 2010; Sinnett et al., 2015; Urban, 2017; Jennings & Bamkole, 2019). Some of the recent studies do focus on the relation to pandemics such as Grant (2020) and Pouso et al. (2021). The quality of open space is emphasised by Zhang et al. (2020) in a global research study on the relation between public health, well-being and green space. They conclude with a plea for a health-based environmental planning, for better design quality on the basis of evidence-based research.

The integration is achieved in different ways. First of all the concept of health is considered from

Another factor related to design is the cumulative effects of design interventions. For instance more attention for slow traffic in the urban landscape not only improves traffic safety but also decreases the pollution and improves the micro climate.

***Working out a planning and design approach on the scale of a neighbourhood***

In this final section I work out how the integration of pandemics in urban green structure plans could be further developed into a new design approach, in which design principles and methods are further elaborated in the context of pandemics by making use design knowledge from landscape architecture. The relations between public health and landscape architecture can be represented in a matrix, that is used as a research framework for developing a design approach (Figure 1).

Existing research on this issue, from different viewpoints is available; here I give some

three points of view; physical, mental health and social health (equity). Secondly, a distinction is made between the landscape as a natural, a socio-economic and a cultural system. The natural system provides the necessary conditions, the socio-economic system provides conditions for life and living in cities and the cultural system is reflected in history, traditions, which results in a lifestyle.

In the limited space of a paper I will work out a design approach for a neighbourhood, as example; the neighbourhood in the context of the urban landscape. The concept of neighbourhood is first of all a social concept. Neighbourhoods are the 'building blocks' of towns and cities. People live most of their lives in their local neighbourhood and for some, for instance children and older people, the neighbourhood is even more significant. In terms of people's health, it implies that if we are unable to make neighbourhoods healthy places, then we will not have healthy cities. Neighbourhood public open spaces are larger spaces which serve the recreational and social needs of a community. Their areas range from 0.3 and 3 hectares, depending on the density (dwellings per ha.). They should be easily accessible within 400 meters walking distances from households and offering different types of use for different social groups. They can accommodate a variety of activities, such as recreation, sporting, physical exercise and natural features.

In urban landscape architecture we consider the landscape as a natural, socio-economic and cultural system. Even though in some studies the question of urban green space or open space is approached in an integrated way, that is including the social and user aspects, they all lack to pay attention to the function of urban green space for the landscape as a natural system. Urban green space also functions as part of urban metabolism in the functioning of the natural system, enabling and regulating flows of water, the micro-climate, soils, flora and fauna. The same goes for aspects of the landscape as a cultural system such as historic parks, green spaces or sites of remembrance, which is not paid attention to directly.

### ***A planning and design approach in three steps for the scale of the neighbourhood***

Meeus et al. (1992) elaborate such a framework by starting with abstract models of different types of green space at the structural level and add traffic space and blue space in the next two steps. The three networks, green, blue and traffic networks are totally integrated in this approach. Departing from the existing experience in plan making for the urban landscape in urban green structure plans (Meeus et al., 1992), we start with the green space as part of the urban landscape.

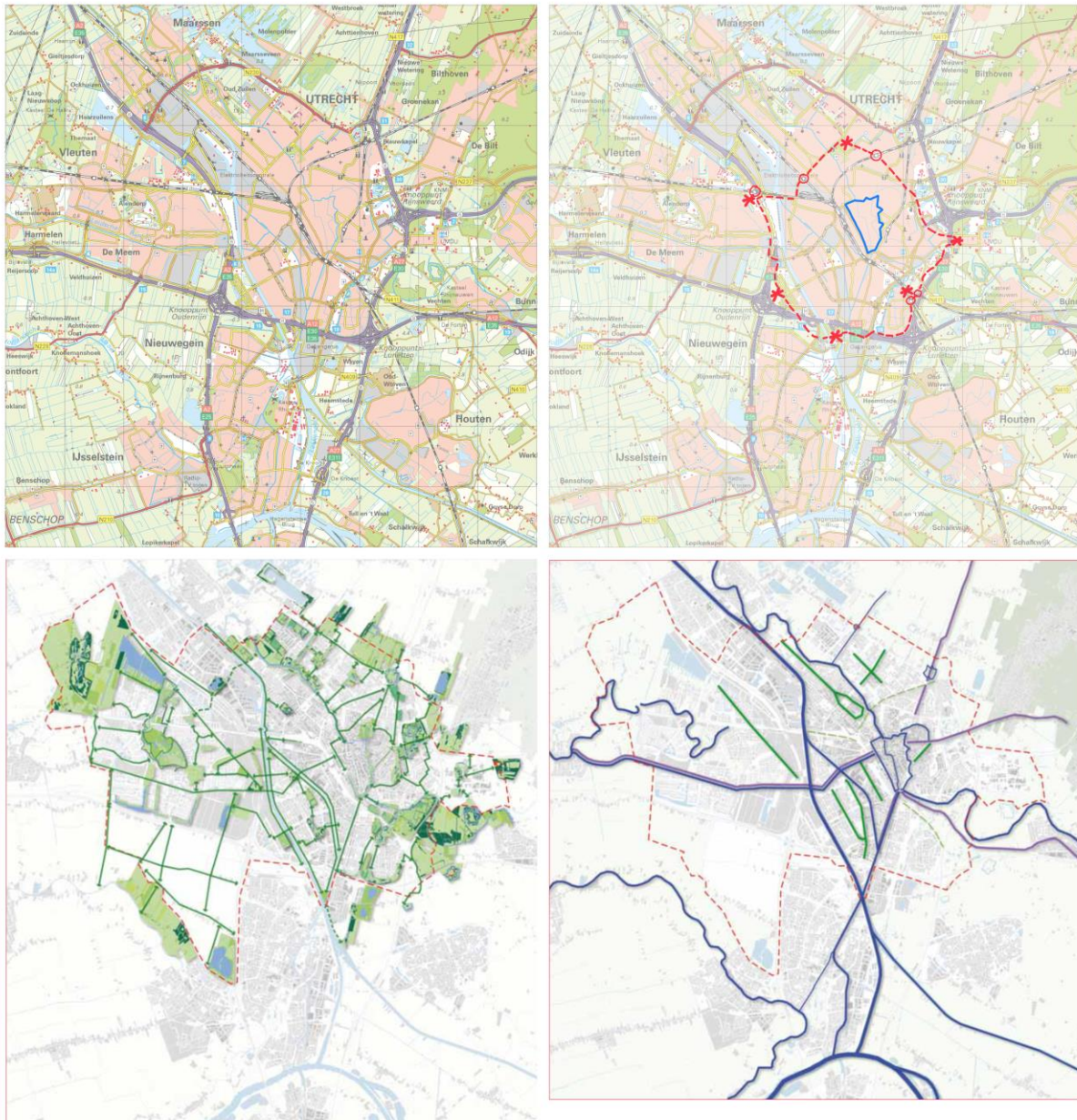
Meeus et al. distinguish four principles of organising urban green space at the structural level; as a network, as isolated spaces in each neighbourhood, as radial structure through neighbourhoods and as common space of more neighbourhoods. The second step is to further integrate the traffic system into the model developed in the first step. For the integration of the traffic system into the urban landscape at large, we have used the overview of Bach et al. (2006). Since traffic space takes up more than half of the public space in cities, the switch to slow traffic for short distances and commuting has both direct and indirect effects on public health. Johnson et al. (2021) show that a reduction in overall mobility may be a good strategy for reducing case rates during pandemic, endorsing the success of lockdown measures. In necessary mobility, outdoor park use may be an excellent activity especially in combination with working from home and other lockdown measures, requiring conditions for slow traffic (walking and cycling) and green space within a 400 meter range from the dwelling. The third step comprises the integration of blue space and the water



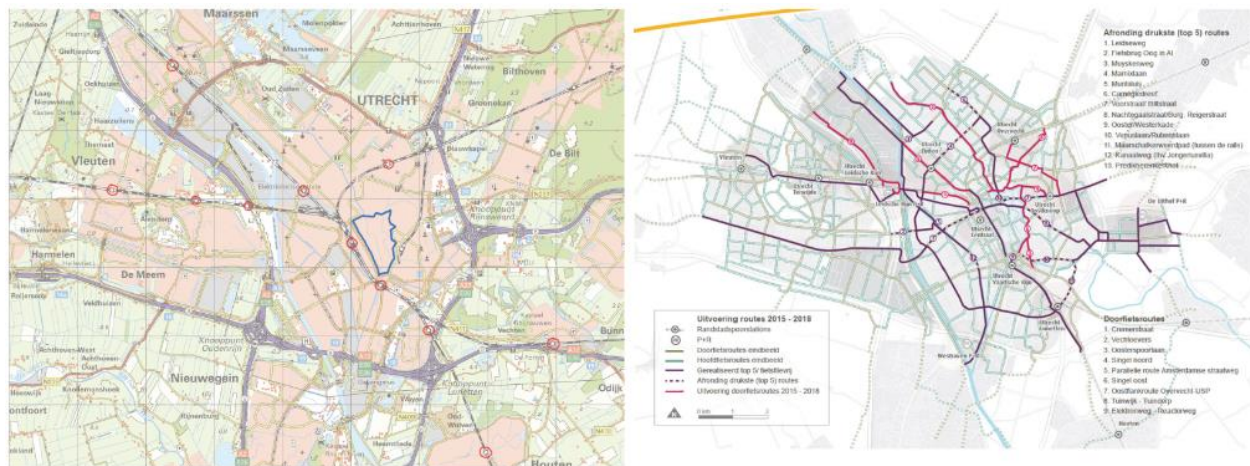
system into the model. In order to understand and gain insight into the water system, we first have to define the river basin or watershed, which is based on the contour lines from the topographic map. Such an analysis is always part of a site analysis. The watershed gives a direct insight into and overview of the natural drainage which is used as a basis for hydraulic measures organising drainage and irrigation on the site of the neighbourhood. The water system for the city should be a closed cycle as much as possible; there should be also space for temporary storage of water, depending on the hydrological cycle. The water system has multiple functions and uses for different groups of users.

Nowadays, planning and design of the urban landscape is dominated by traffic, traffic systems and providing access by car while green and blue networks follow as 'left-overs'. Since the last decades, the city of Utrecht in the Netherlands is developing policies and interventions to limit the use of the car in the city and thus creating more space for slow traffic, green and open space. The city of Utrecht is a Roman city and belongs to the oldest cities in the country. In the Roman times its location was the northern boundary of the Roman Empire which was formed by the river Rhine.

We have selected the plan development for the city of Utrecht to illustrate how such an approach — of integrating the three networks — can be elaborated in a specific situation (Figure 2). The main strategy for the urban development of the city at large is to create new sub-centres around the historical centre that will be connected by public transport in the form of a new tramway / metro system. It will enable to maintain the historic qualities of the historic city. At the moment car use in the historic centre is limited by means of a strictly organised traffic system, parking in the city is very expensive. It means that the urban quality of the centre has already improved.



**Figure 2. Case study on the city of Utrecht. On top left: the topographic map of Utrecht and surroundings 1:100.000 (Maproom TUDelft). Top right: the overall strategy for the urban development of the city till 2040, creating multiple centres around the historic centre inside the Middle Age city walls and moat. These centres will be connected by tramways, this tramway 'ringroad' is connected to all railway stations of outgoing lines on the national level (after: dichtbij, 2021). Below left: the green structure of urban landscape including the water system of canals and lakes (dichtbij, 2021). Below right: green and blue structures both old river systems and contemporary structures (dichtbij, 2021).**



**Figure 3. Case study on the city of Utrecht; part of the traffic system on a structural level. On the left: the topographic map of Utrecht and surroundings 1:100.000 with the Middle Age centre as blue contour of the moat (Maproom TUDelft). The suburban railway stations are also indicated with red circles. On the right: the plan for a system of cycle connections for commuting between the historic centre, the university campus in the east (Actieplan, 2015). This cycle network is also connected to the suburban railway stations and the central station. By now the plan is largely realised and functions well, but is already too limited in capacity.**

At the structural level, the three networks play a dominant and crucial role (Figure 2). In the green structure plan for the city of Utrecht (Groenstructuurplan, 2007), the plans for new slow traffic networks (Actieplan, 2015), the basic viewpoints for the future development of the city towards 2040 have been used (dichtbij, 2021). All three plans emphasise the need for a structural reorganisation of the traffic network that enables the creation of a commuter network for bicycles but the strengthening of the urban green structure as well (Figure 3).



**Figure 4. Case study on the city of Utrecht; the neighbourhood that is used as a cases study, located west of the historic centre with the railway in between.**

On the level of the materialisation of form, we have chosen one neighbourhood close to the historic centre (Figure 4). Here, only two aspects of the three networks have been elaborated; the traffic system and the green structure. Working out this approach on the scale of the neighbourhood shows a further elaboration of structure of the neighbourhood by means of organising the traffic system and the materialisation of form in the green structure of the neighbourhood (Figure 5).

The example shows how relatively small interventions can have a great effect for the quality of the urban life and at the same time diminishes pollution, traffic accidents the character and identity of the neighbourhood. Note that further improvement would be possible by adding the water system to the two networks. Especially in combination with creation of new temporary water storage in the neighbourhood and fountains for the summer, also the urban micro-climate could greatly improve.



**Figure 5.** Case study on the city of Utrecht. The images on the left show the interventions in the traffic system and the spatial organisation into four sections for cars. Cars can only enter the neighbourhood at three places from the through road and not get to another section unless they return to the through road. It limits through traffic in the neighbourhood. Bicycles can enter the neighbourhood at any place but there are five entrances to specific bicycle-friendly roads. Images on the right show the existing green spaces in the neighbourhood and how new green connections create a new urban green structure

he plans for the city of Utrecht are just an example, there are many other cities that are planning for new bicycle infrastructure networks, even in Paris and London there are new initiatives. The city of München did already have bicycle networks but has recently taken a new step in extending, enlarging after the Covid-19 lockdowns (Schwarz et al., 2022).

## Discussion

What is the role of urban green space and greenways in an integrated planning and design approach in the context of health?

After the recent pandemic it is clear that the spatial aspects of green space will need special attention in the design of the urban landscape as a whole. Whether the existing design knowledge in the form of the long experience with green structure plans is a sufficient basis for building forth towards a new design approach, is a matter of further research. We need design knowledge that could meet the demands of the new challenges for the creation of healthy environments for people.

In general the experience and insights in urban landscape architecture over time, have resulted in an extensive body of design experience. The historical development of urban landscape architecture has created a firm foundation for further elaborating and integrating the new challenges of public health in planning and design. The study of Eckbo (1974) was one of the first to focus on urban landscape design. Kostof (1999) traced the origins of urban landscape architecture back to the baroque period, Chadwick (1966) analysed the development of public space from the 18th century on, first in public parks and later on into green structure of the urban landscape as a whole. The Modern movement paid attention to open space and the functional aspects of green space in the form of providing fresh air and sunlight (Boer, 1990; Toorn, 2020). Lynch (1974) still remains a classic study on urban landscape architecture and site planning; how to take into account the local conditions of site, micro-climate in urban development plans. Burns & Kahn (2005) added new dimensions to site, site analysis in relation to urban landscape design. Sinnett et al. (2015) analysed

the relation between neighbourhood design and public space. Gehreis et al., (2016) did a study on the integration of green and blue infrastructure, also in the context of climate change. Ananiadou-Tzimopoulou & Bourlidou (2017) paid attention to the contribution of urban landscape architecture to the contemporary cityscape.

There is nowadays an abundance of publications on the different relations between green space and health. All this research is dealing with specific aspects of site, social context, users and cultural aspects of use of green space. The role of planning and design is to integrate this knowledge in plans for future landscape development, based on existing design knowledge and newly developed design knowledge in design projects. In this process, experimental design needs more attention and demands for an active and conceptual attitude in which sketching, mapping, perception and visual thinking come together in working sessions, in notebooks or other.

Although the role and importance of urban green space is no longer a question in general, there are still studies on the design of public urban space that do not include it. Such as Carmona et al. (2007) in a study on public urban space from an architectural point of view, do not mention green space in the urban landscape at all. On the one hand this is understandable since urban design originates partly from architecture on the other hand the study claims to focus on a 'holistic' approach to urban design.

## Conclusions

In the design of urban green space, the global guidelines for public health need to be translated and accommodated at a local site in space and time. Public space and green space are an integral part of the urban landscape as a whole but their functions and use differ between the two, both for different social groups and individuals. In most research these different functions for different groups are analysed separately. Bringing together these inputs in plan making in general requires an integrated approach which is trans-disciplinary. New approaches should be founded on the one hand on evidence-based research with a focus on the relations between pandemic and daily living environment, on the other hand on experimental design and explorative research. Such an integrated approach comprises the different levels of the urban landscape as a whole in the context of the landscape as a natural, socio-economic and cultural system. Greenways are part of such an approach.

There are only few publications that deal specifically with the relation between greenways and public space. In many studies on open space, green space, public space and public health, the role of greenways is still rather marginal; in most of the studies the term is not even mentioned.

Public space can play a major role in public health and offers many opportunities for planning and design but with the increased privatisation of public space and urbanisation of green open space in Europe, other major challenges will have to be solved as well.

Well-designed public and green spaces can have a multitude of benefits: improving air quality, providing microclimate regulation, and enhancing safety, social integration and public health. The role of design is to conceptualise a plan for future urban development that unifies site, program and conditions for a healthy environment for people in a meaningful order;

Design not only integrates, it can also accumulate different types of use for different groups of people such as combining slow traffic routes and urban green space. The recently published study

by the UN on the goals for nature-based solutions for urban resilience, is an excellent source of inspiration for such an integrative approach (Catalogue, 2021). To further develop design knowledge on the relations between green space and public health, research and design should be part of all plan development. Research on evidence and learning from earlier experiences through precedent analysis are key issues for landscape architecture. From a design point of view, design experiments based on conceptual thinking can offer new viewpoints and solutions.

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