

Health and Hamburg's Grünes Netz (Green Network) Plan

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The Green Network Development Plan (GNDP) of the City of Hamburg is one of the most ambitious of its kind in Europe. Besides making Hamburg a greener city and thus enhancing quality of life, the GNDP is the backbone of an ambitious cycle lane network which plays a key role in the city's aim of increasing the share of cycling from 9% to 18% in the city's modal split. An important related aspect is improving citizens' health by encouraging physical activity. Another key objective of the GNDP is climate change adaptation which, again, has direct health implications. This chapter introduces the GNDP by taking a health point of view. Its important role as a strategic planning paradigm is explained. Furthermore, the key role of the GNDP for effectively delivering ecosystem services is elaborated on.

Introduction

In early 2014, the city of Hamburg, Germany made headlines with a development plan that allegedly aimed to eliminate cars from its streets in 20 years (ArchDaily, 7 Jan 2014; The Independent, 15 January 2014), replacing auto transport with walking and cycling. Addressing whether this was possible, the BBC reported that “city officials obviously feel that the personal motorcar does not fulfill a function that walking, biking and taking public transport cannot” (BBC, 4 February 2014). In health terms, such a bold step would mean a reduction in the 10,000 injured and over 30 human deaths per year caused by pedestrian and bicycle encounters with vehicles in the city (Statistisches Bundesamt, 2013). There would also be other noted positive mental and physical health effects associated with increased levels of physical activity. So, how did Hamburg plan to achieve this? At the heart of the plan that

garnered so much attention was a *Grünes Netz* (green network) of interconnected open areas that would cover approximately 40% of the city. This network complemented sidewalks and bike lanes on roadways with a separate transportation system dedicated to walking and cycling modes.

Rightfully so, legitimate questions were raised as to whether such an ambitious plan was realistic in a port city of trade with nearly two million inhabitants. In the months following the attention-grabbing headlines, corrections and clarifications began to emerge. There had never been any plans to fully eliminate cars in Hamburg. “Germany’s second-largest city does not want to go ‘car-free’ within two decades, as many media reports wrongly stated earlier this year, it is weaving a ‘Grünes Netz’—a green network of parks, playgrounds, sports fields, bike paths and the like which will allow pedestrians or cyclists to more easily navigate through the city. In other words, cars won’t be banned, but get downgraded—a big deal in a country which loves its cars almost as much as America” (Economist, 27 March 2014). While this reality came as a disappointment to some, it was clear that Hamburg still had ambitious plans to substantially increase walking and cycling, and it also spurred enormous interest in the green network at the heart of the plan.

This chapter elaborates on Hamburg’s Green Network Development Plan, health’s explicit place in the plan, and how the *Grünes Netz* is essential to other plans and programs that also affect health. First, Hamburg’s plan is placed in the context of green infrastructure development in Europe and the German landscape planning system where the prominence of health is increasing. For those with a planning inclination, the case of Hamburg reveals how health is an important undercurrent in landscape planning and a potentially powerful motive that, if brought to the fore, can link the environmental and social goals of other plans and

administrative authorities. Likewise, for those with a primary focus in health, this case provides some guidance on how planning is done and how landscape protection and health promotion are inseparable.

Green infrastructure Development and Human Health in Europe

Over the past two decades in Europe, there has been a renewed interest among spatial and development planners in the conservation and reintroduction of green infrastructure in built-up areas. The particular interest on GI in Europe is connected with its perceived ability to deliver a range of benefits, such as the creation of networks of habitats, flood risk reduction, and improvements in human physical and mental health and quality of life. Benefits are frequently explained and operationalized in terms of ecosystem services all of which have numerous, and not mutually exclusive, connections to human health and well-being (World Health Organization, 2005).

Mazza et al (2011) identified approximately 100 European GI initiatives and found recreation and health benefits to be important objectives in most GI initiatives, although they stress that health benefits were difficult to attribute directly to GI (e.g. climate related health issues). The complexities of isolating the human role within ecosystems and the human health benefits derived from ecosystem services is a challenge, but, as we have seen in Chapter 3 with climate change being a stark example, estimates of health impacts are being made. There is ample scientific evidence revealing that GI is indispensable to the provision of the fundamental ecosystem services of water, food, and air, and also GI's role in infectious disease ecology, physical activity, mental restoration, and social capital. We have arrived at a point where it is no longer a matter of *if*, but rather a matter of applying increasingly

sophisticated methods to measure how much. There is ample evidence to proceed with GI development as health promotion strategy, and doing so will allow pre/post impacts to be made. During this process there is solace in the fact that it is highly unlikely there is such a thing as too much GI, GI conservation is always likely a safe bet for health promotion.

It is important to note that in many European countries the issues and associated debates around GI conservation are not entirely new, with many of them having been important policy and planning considerations for some time. Planning for GI has been a part of most planning systems since they were first developed, either in fully integrative ways (e.g. the UK's Town and Country Planning system) or as a distinct planning process (e.g. the Dutch National Ecological Network; the German Landscape Planning system). Associated planning tools have also been in place for some time in many countries such as the Green Belt type designation. These plans fulfill numerous functions not the least of which is their support of human health and well-being (Matsuoka and Kaplan, 2008).

GI development at many scales is continuing to expand in Europe with an EU-wide green infrastructure strategy currently being developed and various EU member states creating trans-border regional plans such as the Latvian, Hungarian, and Czech national ecological networks (ECNC, 2014; Jones-Walters, 2007). Health is coming to the fore in some of these plans. At the country level, following the European Green Paper on Green Infrastructure, the German federal government has announced its intention to prepare a Federal Concept for Green Infrastructure (TASPO, 2013) that includes explicit references to health benefits at various points. In the UK, a number of guidance documents on the health benefits of GI have been prepared (e.g. TCPA, 2012; Natural England, 2009; SPAHG, 2011). The accumulation of evidence documenting the connection between GI and health has led to administrative silos

being broken down. The National Health Service of the UK is playing an important role in folding into GI plans the substantial benefits to physical and mental health, particularly in urban environments (Houses of Parliament, 2013). In urban environments, such as with Hamburg, health and well-being have been an increasingly important goal of green infrastructure conservation (Natural Economy North West, 2008).

Landscape Planning in Germany: The Context for Hamburg's Green Network Plan

The roots of landscape planning in Germany date back to the early 20th century with statutory requirements for the preparation of landscape plans and programmes taking hold under the Federal Nature Conservation Act of 1976. Under the renamed Federal Environmental Protection Act, the protection of the natural landscape is viewed as essential both for its inherent value but also for its recognized role as forming the basis of human life for current and future generations (von Haaren, 2004). In forming the basis of human life, health is at the heart of landscape planning, albeit in an implicit manner. The main aim of landscape plans and programmes is to integrate considerations of the environment, nature, biodiversity, and landscape into decision-making and planning so that human life and health can be sustained.

Landscape plans and programmes in Germany serve as state of the environment reports which proactively set objectives for environmentally sustainable land use (Hanusch and Fischer, 2011). They include information on:

- 1) The existing and anticipated status of nature and landscape.
- 2) The objectives and principles of nature conservation and landscape management, forming an important reference frame for spatial/land use plans (*Flächennutzungsplan*).

- 3) The assessment and evaluation of the existing and anticipated status of nature and landscape on the basis of overall aims and principles, including any possible conflicts.
- 4) The anticipated measures for avoiding, reducing or eliminating adverse effects of planned activities in spatial/land use plans on nature and landscape, and protecting, managing and developing certain parts or components of nature and landscapes, among which the European ecological network Natura 2000 through anticipated development (Federal Ministry for Environment, 2002).

Particularly noteworthy is in points 2 and 4, reference is made to how the landscape plan should work in concert with the spatial/land use plan. To date, Germany is still the only country in the world with a formalized and comprehensive landscape planning system requiring that landscape plans and programmes be prepared in parallel with the statutory spatial/land use planning (Figure 1). Hamburg’s Green Network Development Plan, and *Grünes Netz*, was developed under this landscape planning system and thus landscape planning is also required to consider the social needs in the spatial/land use plan. As we will see shortly, this created the space for Hamburg’s Green Network Development Plan to coalesce with the transport goals of the spatial/land use plan which will bring with them improvements to public health.

<FIGURE 1 HERE>

Figure 1: *The system of landscape planning and spatial/land use planning in Germany*

Planning level	Landscape planning	Spatial/land use planning	Scale of maps
State	Landscape programme	State-wide spatial plan	1:500,000 to 1:200,000
Region	Landscape framework plan	Regional plan	1:50,000 to 1:25,000
Community/	Landscape	Land-use plan	1:10,000 to

Source: Adapted from Federal Ministry for Environment (1998)

Hamburg is somewhat unique in that it is among a small group of German city-states (the other two being Berlin and Bremen). For landscape planning purposes, it is considered as among one of the 16 German states for which a landscape programme (*Landschaftsprogramm*) is prepared. However, as it is directly feeding into Hamburg's city-level spatial/land use plan, it also fulfils the role of a city-level landscape plan. Furthermore, Hamburg's landscape programme also acts as a regional landscape framework plan. The level of detail provided in Hamburg's landscape programme is close to what is normally expected for a city landscape plan, which would be the primary landscape planning document for Hamburg if it were not a city-state. A focal point of Hamburg's landscape programme is the Green Network Development Plan.

Hamburg's Green Network Development Plan

The city of Hamburg's GNDP (Green Network Development Plan) is one of the most comprehensive green infrastructure plans for a city of over one million inhabitants in Europe, on par with a handful of other European cities such as Stockholm, Copenhagen, Berlin, and Vienna with similarly ambitious plans to conserve GI. The GNDP was critical to Hamburg

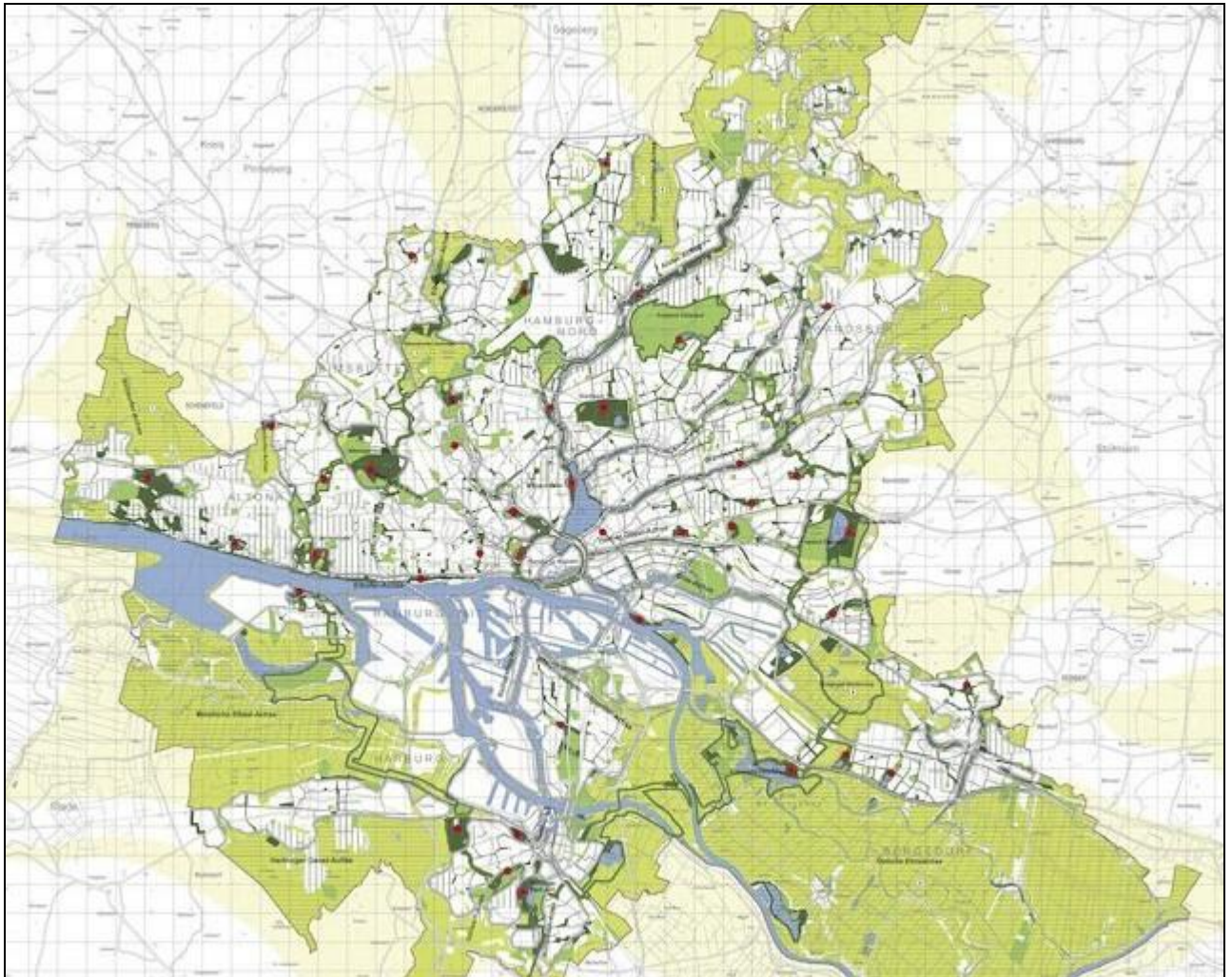
being awarded the European Green Capital Award in 2011. Launched in 2010, this award has also been granted to other cities including Stockholm (2010), Vitoria-Gasteiz, Spain (2012), Nantes, France (2013), Copenhagen (2014), Bristol, UK (2015), and Ljubljana, Slovenia (2016) (European Commission, 2014)¹.

At the heart of the GNDP is the development of several landscape axes (green corridors) that together form a *Grünes Netz* or open space interconnecting system (Figure 2) planned to be fully implemented by 2034. The landscape axes were first laid out in a concept map in 1985 under the landscape programme. There are about 10 axes mostly following waterways that lead to the city centre and also several smaller axes leading to secondary centers of the city. The plan connects existing green, blue, and other open spaces (e.g. parks and city squares) inside the city to those outside the city. Inside the city the green spaces include parks, playgrounds, sports pitches, gardens, and cemeteries. Towards the city edges, axes are extending into forests, and environmental protection and agricultural areas. The GNDP also complements the objectives of the city wide open-space analysis which aims at formulating green and blue infrastructure standards. This is based on calculations for establishing minimum requirements for features such as playgrounds and city squares for every citizen to be located in close proximity to where they live. This network creates the physical green infrastructure necessary to achieve a number of interwoven environmental and social goals including supporting and improving the health of Hamburg residents.

<FIGURE 2 HERE>

¹ NB: Awards are handed out a couple of years ahead of time, so that the cities awarded can increase their related efforts.

Figure 2: *Open space interconnecting system*



Source: Behörde für Stadtentwicklung und Umwelt, 2010.

Health and the GNDP

Landscape planning protects the landscape and its subsequent ability to function and deliver the ecosystem services needed to support human life and health. But the goal of landscape planning is not to promote human health, it is to protect the GI on which health depends. Therefore, there is often no explicit mention of health outcomes in landscape plans even though how well we are planning is evident in the health of the organisms, including humans, that depend on the

landscape. Hamburg's GNDP is an exception. The same interconnected system of GI necessary to maintain a healthy landscape is also recognized as promoting health. One of the explicit goals of the GI system that will create recreational and utilitarian walking and cycling corridors is to promote physical activity with resultant physical and mental health benefits (Bayerisches Landesamt für Umwelt, 2014; Behörde für Stadtentwicklung und Umwelt, 2014). Of particular note is the role that GI will play in addressing the worrying issue of childhood obesity.

This inclusion of the social goal of health in the GNDP is in no small part due to the requirement of the landscape plan to work in unison with the spatial/land use plan (Figure 1) where, within the transport element, the physical and mental health benefits associated with promoting cycling are also noted. In the spatial/land use plan, the interconnected open space system in the GNDP is considered as playing a key role in the development of transportation in the city. Green corridors are not just viewed as landscape features critical for landscape functioning but also as pedestrian and cycling corridors that can complement the existing transportation infrastructure (including bike lanes along roads) and cycling strategy (*Radverkehrsstrategie*) of the spatial/land use plan. In this way, it achieves one of the aims of the spatial/land use plan cycling strategy which is to reduce physical barriers to cycling. Promoting physical activity, particularly in urban environments, begins with providing the physical infrastructure necessary to perform activity. Wisely, and recognizing the limitations of environmental determinism, the cycling plan also aims to reduce mental barriers by improving public perception through education. With reductions in both physical and mental barriers, the city aims to double the cycling modal split from 9% to 18%. While this is nowhere near a complete abandonment of the automobile, as the attention-grabbing headlines cited earlier would have us believe, it does double the number of people who would be achieving some level of physical activity. Improving health by improving cycling safety is also an aim. While a

sceptical view might lead one to believe that more cyclists will simply mean more people putting themselves at risk, cyclists travelling on a system exclusively dedicated to them is very likely to reduce interactions with automobiles. Demonstrating a true commitment, the city of Hamburg aims to invest five million Euros per year to finance the cycling network. Because the *Grünes Netz* is such a prominent part of the cycling network, transportation financing is also GI financing.

Landscape planning performed in concert with the goals of the spatial/land use plan can benefit health, but a hurdle yet to be overcome in Germany is that these plans must remain distinct from health planning. The landscape programme is the responsibility of the Authority for City Development and the Environment, and health is the responsibility of the Authority for Social Matters, Family, Health and Consumer Protection (Fischer et al, 2010). As a statutory duty, the former should not take any responsibility for health planning away from the latter. The GNDP is a case where these two administrative silos coalesce. It addresses an identified need of the health authority to increase levels of physical activity. This need has been identified in various health reports, including one on the exercise habits of children (Behörde für Soziales, Familie, Gesundheit und Verbraucherschutz, 2006) and one on elderly people (Behörde für Soziales, Familie, Gesundheit und Verbraucherschutz, 2010). The GNDP supports health planning by providing the physical infrastructure necessary for physical activity and mentions health as one among many reasons for doing so. With landscape and health authorities working together, there is a consistent message: GI is critical to quality of life and health. It may very well be the inseparable nature of landscape and health in plans such as the GNDP that causes the health authorities to revisit GI's essential role as the basis of human life, and likewise landscape planning to consider health as a fundamental, but often underemphasized, justification for implementing GI plans.

In creating the physical infrastructure necessary to promote walking and cycling, the GNDP also achieves the goals of another development program with subsequent health benefits beyond those achieved through physical activity but very much dependant on people choosing bikes over their automobiles. The city's environment programme (*Umweltprogramm*) outlines the main environmental objectives of the city under three action areas: (1) climate change mitigation and adaptation, (2) sustaining and enhancing quality of life, and (3) developing Hamburg as a green city. The GNDP supports all three of these interdependent action areas. Taking them in reverse order, the GNDP, by definition, contributes to the development of Hamburg as a green city. One among the myriad ways that GI can enhance quality of life is in its ability to address the first action of area to mitigate and help humans adapt to climate change. The interconnected open space system that will promote sustainable transportation options will mitigate climate change primarily by reducing auto emissions, but as outlined in Chapter 3, GI also captures carbon already emitted (dependent on the type of flora), reduces emissions from buildings due to its cooling effect, and can reduce the effects of increases in the frequency and severity of flooding. In Hamburg, a number of developments have been allowed in flood prone areas (Freie und Hansestadt Hamburg, 1997). As an adaptive strategy, the GNDP also functions as a heat amelioration plan (see e.g. Forest Research, 2010) to reduce the heat island effect in Hamburg. Importantly in 2011, a City Climate Analysis and Climate Change Scenario (Behörde für Stadtentwicklung und Umwelt, 2012) were produced, and future scenarios are very much a part of future amendments to the city's landscape programme. The structure of the GI system will be very much influenced by its recognized role in mitigating climate change and adapting to its effects.

At its core, the GNDP, like planning in general, is aimed at improving people's lives. One of the major ways it does this is by promoting health. The GNDP can be viewed as a health plan in that it creates the physical infrastructure necessary to promote active and sustainable transportation. In doing so it meets the environmental and social goals of the landscape programme, the spatial/land use plan, the health authority, and the environment programme. Hamburg has been explicit in connecting active transportation to the health benefits of physical activity and increased safety, but it could truly be a leader if it was to also connect a number of health benefits that the *Grünes Netz* will deliver but that are currently unstated as co-benefits such as those related to improved air quality and heat amelioration.

Summary

Hamburg is an award-winning green city with an ambitious GI plan that can be considered among the best practices in landscape planning. The GNDP is not only a plan, but a planning paradigm for the city that supports the environmental and social goals of a number of plans and spanning the boundaries of administrative authorities. In addition to the environment goals associated with connecting biotopes in the city, an important aim of the GNDP is to ensure a minimum amount of green space for the city's population. Doing both is necessary to deliver the ecosystem services on which health depends. The mere presence of GI can ameliorate the negative health consequences of climate change, but access is necessary to support the behaviors (e.g. physical activity) that can enhance health. The GNDP is the backbone of Hamburg's plan to double the levels of cycling and walking in the city with one of the explicit purposes for doing so to improve human physical and mental health. By explicitly citing health as a product of GI planning, Hamburg makes GI more than a just a luxury; it makes it a recognized necessity for humans to survive and thrive. The GNDP goal of creating an

interconnected system of GI is a case where doing right by the environment and humans is one in the same.

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