

GREEN CORRIDORS IN STUTTGART



Addressed SDGs:



> OBJECTIVES

Stuttgart, Germany, lies in a natural depression and like other big cities with manufacturing industries, a high volume of traffic, and a population density, they have to find ways of coping with the heat island effect and poor air quality. To overcome these challenges, Stuttgart is implementing a natural green belt strategy to create pathways for winds to sweep down from the hills to ventilate the city.

> DESCRIPTION

The City of Stuttgart faces air quality problems and its location, in a mild-climate valley basin with low wind speeds, aggravates the situation. This led to the development of a Climate Atlas for the Stuttgart region which provides basic information about wind, solar radiation, precipitation, temperature and cold air flows distribution. With this information at hand, the municipality decided to establish a network of corridors that could also help to ventilate the city.

The city's topographic characteristics guided the designation of four pathways. These, mainly green corridors, distribute the air flows coming from different valleys throughout Stuttgart. They facilitate the air exchange in the city, thereby enhancing the potential for cool air to flow from the hills towards the urban areas at basin level. This, in turn, reduces heat islands from causing thermal stress and diffuses or prevents air pollution.

This network of corridors requires zoning and regulations to limit real estate and other development along or in the green belts. Inside the city, these pathways are connected to existing parks to reach local neighbourhoods. To ensure the air masses stay cold and clean, the already existing buildings in the wind corridors must respect a minimum distance between them as well as offering cool surfaces such as green roofs, green walls or other similar types of nature-based solutions. The width would ideally be several tens of metres (depending on the volume current density), the regulations make sure this distance is respected.

The municipality can analyse the volumes and speeds of the cold air flow in a model, which allows it to estimate the air exchange rate in the valley basin and the reduction of the concentration of pollutants in the city air. A mean wind speed of 4 m/s as in other big cities dilutes the same emissions more than 1.8 m/s or less in the inner city of Stuttgart, yet Stuttgart can use a natural ventilation in the night with lower emissions (fresh air). The data inputs for the modelling come from a number of stations, one of them is located in the city centre and four to five more will be installed in the future.

Green corridors are particularly beneficial for cooling cities and improving air quality. Yet, they also offer other co-benefits: they promote urban biodiversity, connect surrounding rural and peri-urban areas with the city center, and improve citizens' well-being thanks to the availability of more open spaces.

From the beginning, there was a close collaboration between the Office for Environmental Protection, who analysed the information and provided recommendations, and the City Planning and Renewal team, which allowed a successful implementation of the strategy. The estimated cost of the nature-based interventions amounted to 250,000 € and was funded by the municipal and regional budget.

> CHALLENGES

Competing interests were a great obstacle to this project. Realising the green corridors and ensuring they are not built upon, entails zoning and regulations. This limits real estate and other development along the corridor network, which translates into losing out on potential tax revenues from construction. This requires decision-makers to negotiate the city's priorities.

In addition, the political set-up of the local government influenced how susceptible local policy-makers in the city council were towards the goals of the project and ultimately affected the final decision.

Planners play an important role. However, it was necessary for them to understand and plan for the scale of this project. Usually, they only focus on certain neighbourhoods, but here they needed to widen their horizon and scale of planning for this project.

> OPPORTUNITIES

One of the main success factors was that urban climatic concerns were integrated into city planning. Thanks to this, still today each decision is examined and adapted according to the principles and concepts of the green corridors' cold air regime, based on the Climate Atlas.

> LESSONS LEARNED

It is important to focus on the reduction of emissions (e.g. fewer vehicles, low emission cars), but better ventilation through cold air flows can support the dilution of pollutants. Also, high-quality basic data and information is needed to convince the city planners first and subsequently have a basis on which to showcase the necessity towards the city council.

> INSPIRATION FOR OTHERS

Regions with comparable climate and orographic conditions can apply this green corridor strategy. Other cities, such as Erfurt, Germany, have already implemented a similar system to protect cold air flows. There is potential that this case can be transferred to other locations.

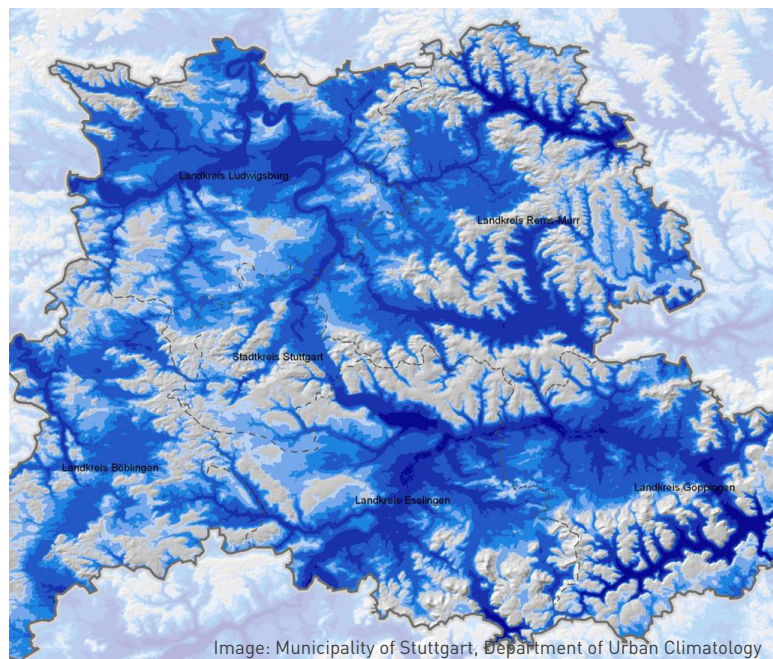


Image: Municipality of Stuttgart, Department of Urban Climatology

FURTHER INFORMATION

All fact sheets were produced from questionnaires and interviews conducted by the ICLEI team. Contact ICLEI Europe for more information or access Oppla: <https://oppla.eu/casestudy/21264>

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 821016.