Title:	Impact of Street Orientation, Street Width and Building Height on Sunlight and Daylight Access in Swedish Urban Blocks
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Popular Science Summary

Sunlight is more than just illumination. It influences our mood, our health, and the amount of energy our homes consume. In Nordic countries such as Sweden, where winter days are short and the sun remains low in the sky, access to natural light is a particularly important part of everyday life. However, in many urban areas, the layout of streets and buildings often limits how much sunlight reaches residential spaces. This raises an important question: can the orientation of a street affect the amount of daylight that residents receive?

This question lies at the core of the present study. As cities continue to grow and buildings are constructed closer together, urban planners face increasing pressure to design neighbourhoods that are both dense and liveable. A key challenge is ensuring that homes receive sufficient natural light, even in compact urban environments. While it is well established that building height and street width influence access to sunlight, the role of street orientation - the direction that streets and buildings face relative to the sun - has received comparatively less attention, particularly in Nordic climates.

To address this, computer-based simulations were conducted for three Swedish cities: Lund in the south, Stockholm in central Sweden, and Luleå in the north. A typical Swedish courtyard-style residential block was modelled and tested under varying conditions of street orientation, building height, and street width. The simulations evaluated how much direct sunlight and diffuse daylight reached indoor residential spaces throughout the year.

The results were somewhat unexpected. Street orientation was found to have only a limited effect on daylight performance. In contrast, building height and street width proved to be far more influential. Taller buildings reduced daylight levels on lower floors while increasing sunlight exposure on upper floors. Narrower streets generally worsened daylight conditions across all floors. Geographic location also played a significant role: homes in Luleå consistently received less daylight than those in Lund, largely due to its higher latitude and lower solar angles.

These findings have important practical implications for urban planners and architects working in Nordic cities. Rather than focusing primarily on street orientation, early-stage planning decisions should prioritise building height and street width as the key factors for improving daylight access in residential areas. This study offers a practical, evidence-based foundation to support better design decisions and ultimately contribute to healthier and more liveable urban environments in Nordic regions.