

Greenbelts are effective at slowing urban sprawl, new research shows

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Graphical abstract. Credit: *Landscape and Urban Planning* (2022). DOI: 10.1016/j.landurbplan.2022.104532

Fifteen years ago, the global population was almost evenly divided between urban and rural dwellers. In 2022, according to World Bank figures, almost a billion more people live in cities and towns than in the countryside. This relentless trend of urbanization has led to a rapid, often unchecked growth of cities, with sprawl stretching far out beyond previous limits.

Linking distant suburbs to the urban core is costly, both financially and environmentally, resulting in higher traffic and greenhouse-gas emissions, loss of agricultural soils and the destruction and fragmentation of wildlife habitats.

One tool local and regional governments can use to limit [urban sprawl](#) is the greenbelt: an [open space](#), usually forest or farmland, or a combination of both, that embraces a [city](#) or region and is protected and preserved. This open space, in which development is either strictly limited or prohibited, serves as a barrier to [urban expansion](#).

While many cities worldwide have adopted greenbelts, their usefulness at cutting down sprawl is often debated: critics say they can spur exurban development and increase pressure on developers within the greenbelts.

A new paper in the journal *Landscape and Urban Planning* by two Concordia researchers argues that greenbelts almost always work in curbing sprawl, particularly in larger cities. It looks at 60 cities in Europe, half of them with a greenbelt, half without, and uses open-source data to compare changes in and levels of urban sprawl between 2006 and 2015.

"We noticed decreases in urban sprawl in 27 of the 30 cities that had greenbelts, so we can say that overall, greenbelts are very effective," says the study's lead author, Parnian Pourtaherian, MSc 21. Jochen Jaeger, an associate professor of geography, planning and environment in the

Faculty of Arts and Science, co-authored the paper.

The future is smaller

The researchers separated the 60 cities into four categories according to their 2015 populations: very large (2.5 million or more inhabitants); large (more than one million); medium-large (between 500,000 and one million) and medium (between 96,000 and 500,000), with an equal distribution of cities with and without greenbelts. They quantified urban sprawl using a metric called weighted urban proliferation (WUP). It assigns a value to urban sprawl based on the amount of built-up areas in a landscape, how dispersed those areas are and the average amount of land taken up per inhabitant or job.

They examined the sizes of target cities' built-up areas in 2006 and 2015, the longest time frame possible given the available data. While cities both with and without greenbelts showed increases in built-up areas, says Pourtaherian, "the differences between them were mainly due to land uptake per person, meaning the area that an individual occupies on average. In cities with greenbelts, the decrease in land uptake per person was the most effective measurement that led to a decrease in urban sprawl."

Overall, 90 percent of cities with greenbelts experienced decreases in urban sprawl. In contrast, just over a third—36.7 percent—of cities without them saw their sprawl decrease. Much of that decrease is the result of denser development, with lower uptake per inhabitant.

Transferrable practices

The researchers point out that denser urban development is essential to building greener, more sustainable and more compact cities. They encourage municipal authorities to implement them when possible and to

work together with neighboring towns and cities to advance similar sprawl-mitigating patterns of development. When full greenbelts cannot be implemented due to spatial obstacles, even fragments of them may help, notes Jaeger.

"We have seen recent discussions on having partial greenbelts, such as green corridors or green wedges, as urban boundaries," he says. "There are various modifications available now, but in general, a greenbelt is a very good option to consider to support cities in using land more sparingly. We hope more cities in North America will use them."

More information: Parnian Pourtaherian et al, How effective are greenbelts at mitigating urban sprawl? A comparative study of 60 European cities, *Landscape and Urban Planning* (2022). [DOI: 10.1016/j.landurbplan.2022.104532](https://doi.org/10.1016/j.landurbplan.2022.104532)

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