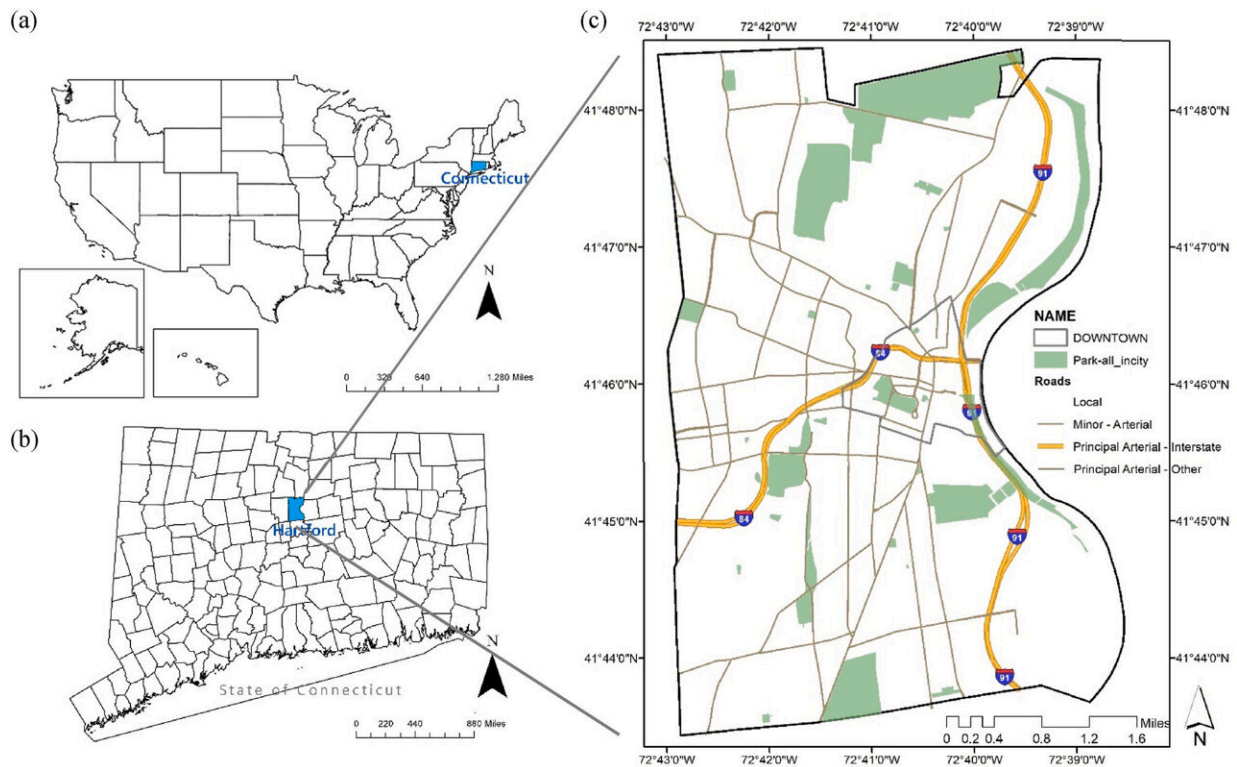


# Researchers take an innovative approach to investigating inequity in parks

May 18 2023, by Elaina Hancock



Study area: (a) Location of the study city in the U.S. (b) Location of the study area in the state of Connecticut. (c) Parks in the study city, Hartford. Credit: *Applied Geography* (2022). DOI: 10.1016/j.apgeog.2022.102857

Urban green spaces provide innumerable benefits for surrounding communities. They are places to enjoy nature, exercise, and gather. Green spaces are also vital for combating urban heat island impacts, they

help clean the air, and can be important for slowing stormwater.

However, not everyone has [equal access](#) to green spaces, and knowing who does is important for making these places accessible and equitable. Though many studies have tried to understand these questions, the results are unclear. College of Agriculture, Health and Natural Resources doctoral researcher Pan Zhang and Assistant Professor Sohyun Park, both in the Department of Plant Science and Landscape Architecture, wanted to take a deeper look at factors contributing to inequity in park access and park quality and fill in the gaps from previous studies. Their research was published in *Applied Geography*.

Zhang's interest in the topic started before her Ph.D. studies when she worked at a nonprofit organization in a neighborhood adjacent to Keney Park, the largest of Hartford's parks. Zhang noticed fewer people visiting the part than she expected, and wanted to understand why:

"Because I spent a lot of time in the area, I realized even though the residents are very close to the largest park in the city, it was very quiet. When I started my Ph.D., under the encouragement of Dr. Park, I wanted to learn more."

Zhang approached the question of park inequity and access by studying its relationship to socio-economic variables.

"Normally, these kinds of studies look at whether people have access or not, but also, I was looking at the acreage, or particularly park congestion—how many people were sharing one acre of the park. The third factor was crime, which could explain the phenomena. I was able to explore the patterns within the city, not just talk about the fact that there is unequal access, but I was able to identify areas that should be improved."

Zhang looked at [spatial data](#) including roads and parks within the city limits to assess accessibility within a 10-minute walk for residents. Zhang also looked at three years of police incident data, and the American Community Survey to assess demographic and socioeconomic data. To assess park access and spatial patterns Zhang used spatial analysis in ArcGIS and Geographically Weighted Regression (GWR).

The results of this multidimensional analysis show that understanding park disparity requires a more rigorous approach to have a more accurate and unbiased assessment of park access since the patterns observed were very location specific and the factors had low correlations to one another.

"The three access factors—proximity, congestion, and crime—have very different patterns and distributions," Zhang says.

For example, areas with higher crime rates have a different equity pattern compared to other areas of the city. Specifically, Zhang explains the southern neighborhood has more severe park inequity despite being close to parks and having high park congestion rates.

"I found that in the city, socio-economic factors were negatively related to the crime rates in some of the northern parts of the city, but it was positively related to a higher crime rate in the southern part of the city. We also saw that housing vacancy rates were associated with higher crime rates in the southern part of the neighborhood. Dr. Park and I work on these issues in Hartford, and usually, it is due to negative aspects like blight and crime, but we always say these spaces could also be an opportunity if they have better maintenance and if we can increase the green space by using those lots, maybe we can change the issue of the neighborhood needing more [green space](#)."

Zhang explains that when she saw the distinct patterns, she could explain

some aspects by considering the post-industrial history of Hartford and surrounding cities in the Northeast. The parks were designed in the last century or earlier, for the white working or upper-class populations living within the city. Gradually, factors like redlining and white flight led to demographic and socioeconomic changes in the city, Zhang says,

"Now other populations inherited those spaces, but because of the post-industrialization, these spaces become less well-preserved and that draws attention to the quality of the space instead of whether it's there or not."

With urban shrinkage, the researchers cite a silver lining with empty lots in that they provide opportunities to build new green spaces.

"The strength of the study is the specific patterns of the park inequity in different locations, even within the same city," says Park. "If you are thinking about taking measures, it should be really geography specific."

Future directions for the research include further exploring the shrinking city theory, says Zhang, who is interested in seeing if other shrinking cities share similar patterns to those seen in Hartford. Zhang is also interested in examining legacy cities and fast-growing cities like Denver, Colorado, to compare patterns.

"I know there are a lot of environmental justice studies, but most of them focus on a growing city because with new investments there are injustice issues in terms of where these resources go," says Zhang.

"Another future direction is to analyze the funding distribution supporting park establishment and maintenance to see equity. An interesting detail is even though Hartford Parks have these issues, a lot of funding from the municipality goes to support parks outside the city boundaries in West Hartford and Wethersfield."

Data from the study suggests that resource availability is a factor for the

lower-income neighborhoods that experienced the highest crime. These methods could be beneficial in addressing social justice issues and funding disparities to help municipalities determine where to allocate funding for the greatest, most socially just, impacts.

"Though this study focuses on the Hartford context, I think the methodology employed can be replicated in other regions as well. The findings can then point where we can try to use discretion about where to spend resources to provide more park spaces, where would need better maintenance, or where you should develop enhanced safety measures," says Park.

**More information:** Pan Zhang et al, Investigating spatial heterogeneity of park inequity using three access measures: A case study in Hartford, Connecticut, *Applied Geography* (2022). [DOI: 10.1016/j.apgeog.2022.102857](https://doi.org/10.1016/j.apgeog.2022.102857)

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