

# ERG Policy: Green Roofs and Urban Heat 2021-2022

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## GREENSPACE AND HEALTH

- Access to greenspace in urban areas serves as an important determinant of physical and mental health outcomes (Barton and Pretty).
- For instance, parks can facilitate physical exercise, which reduces the risk of cardiovascular disease; mitigate stress and anxiety; and improve air quality, reducing the incidence of respiratory illnesses (Willis).
- Greenspace also contributes to crime reduction efforts and economic growth (Bogar and Beyer).
- Unfortunately, greenspace is unevenly distributed in many urban areas, with racial minorities lacking access to parks, gardens, and fields (Sister et al.).

## GENTRIFICATION CONCERNS

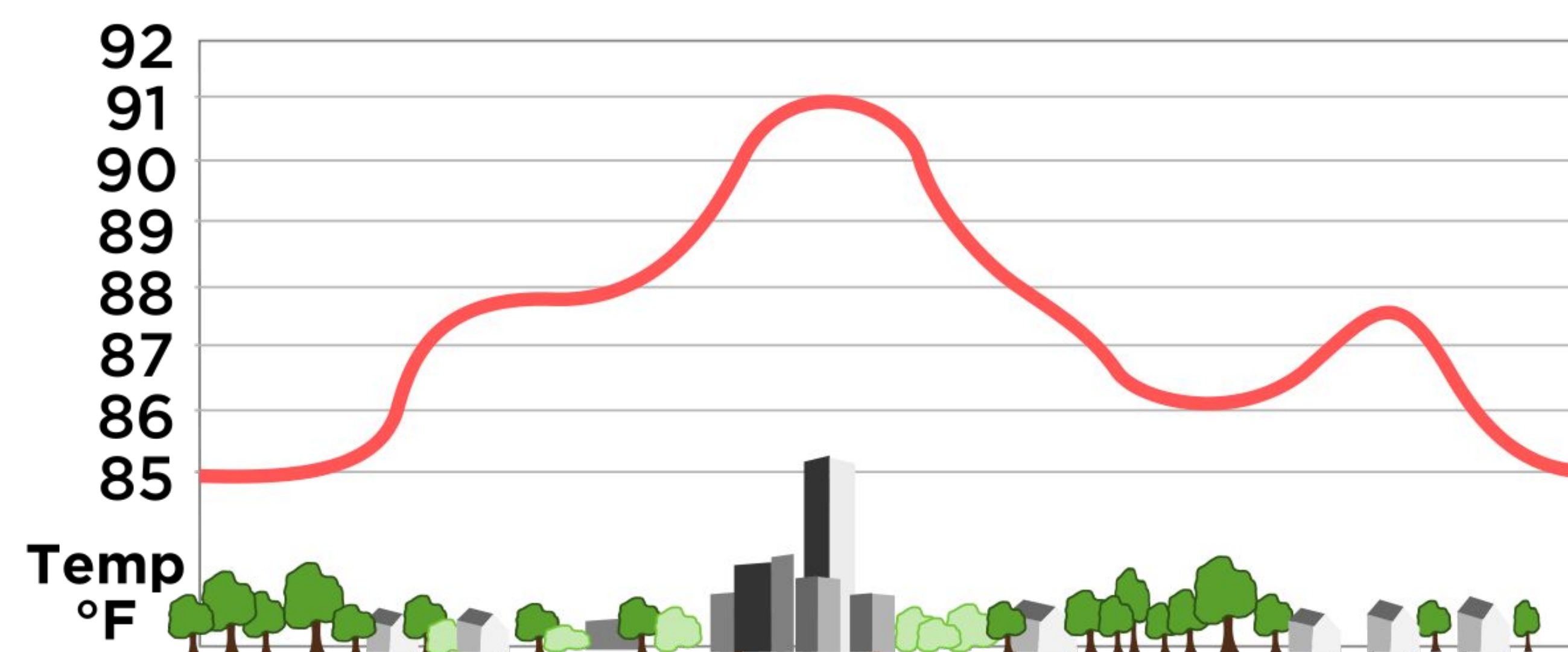
- Some scholars have also raised concerns about possible gentrification and displacement from the introduction of greenspace and corresponding increases in housing prices (Wolch et al.).
- Vitally, “green gentrification” can restrict the health benefits of this greenspace to wealthy individuals who are able to stay in gentrifying neighborhoods, while the supposed beneficiaries of greenspace development are displaced (Cole et al.).



Rooftop Farm at Ryerson University in Toronto

## URBAN HEAT ISLAND

- The urban heat island effect describes the characteristic rise in temperature produced by city infrastructure, in which dark-colored roads and buildings absorb light and heat at high rates (Rizwan).
- The effect is magnified by climate change: Chicago could see 30 more days per year rise above 100 °F under “high” greenhouse gas emissions scenarios (EPA).



Urban Heat Island Effect in Cities

## GREEN ROOFS

- Greenspace prevalence tends to mitigate the urban heat island effect by providing shade, reflecting sunlight, and releasing moisture into the air (Rahman).
- The combination of inequitable greenspace distribution and the urban heat island effect can create severe temperature variations within cities.
- Consequently, Black and brown populations are disproportionately affected by the urban heat island effect and associated health risks (Hoffman, Anderson).

## WATER MANAGEMENT

- Green roofs can also prevent stormwater runoff by absorbing water after periods of heavy rainfall (Stovin).
- Importantly, this reduction in stormwater runoff reduces the probability of flooding events in urban areas, reduces management costs, and improves water quality by neutralizing acid rain (Berghaghe et al.)

## TORONTO'S POLICY

- While Toronto and Chicago are both known for their leadership in implementation of green infrastructure (Loder), the cities diverge in their tactics for encouraging green roof development.
- Toronto's 2009 Green Roof Bylaw requires that new developments with a gross floor area of 2,000 m<sup>2</sup> or greater construct green roofs, ranging from 20-60 percent of available roof space.
- According to Toronto city data, this bylaw has led to the creation of 1.2 million square feet of green roofs.



Green Roof on top of Chicago City Hall

## CHICAGO'S POLICY

- By contrast, Chicago uses a system of monetary incentives: under the Green Elements Permit Process, developments with a green roof are eligible for reduced permit fees and a priority permit review process.
- Although Chicago led North America in green roof development at the start of the 2010s, Toronto outpaced Chicago over the next decade.
- Emulating Toronto's bylaw could restore Chicago as the North American leader in green roof development.