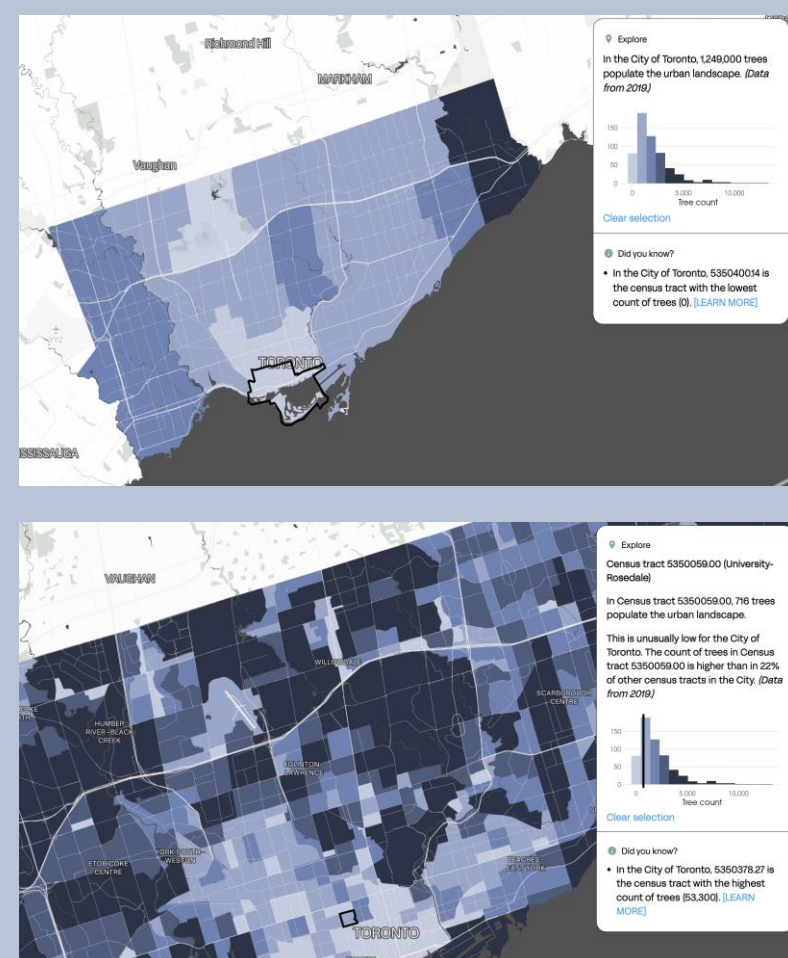


### Introduction

Breaching planetary boundaries such as the climate is fundamentally unfair to those harmed by the effects, and sustainability is long recognized as an issue of justice. The concepts of environmental justice and just sustainabilities center the interlocking concerns of justice and the climate. Climate risk must thus be presented alongside socio-demographic data and a data visualization platform that enables this is needed. **Curbcut** is a tool for urban sustainability data exploration initially developed by the MSSJ, with the Toronto version developed in partnership with the JSD lab. It is a map-based platform designed to translate data into actionable knowledge to support policy and action by presenting multiscalar, temporal, accessible, understandable data for all. Curbcut enables users to visualize data in one dimension, but also connect two dimensions for a correlation analysis. This flexibility for correlating different facets of sustainability can help uncover new insights relevant to policy making and support community activism efforts.

### Features

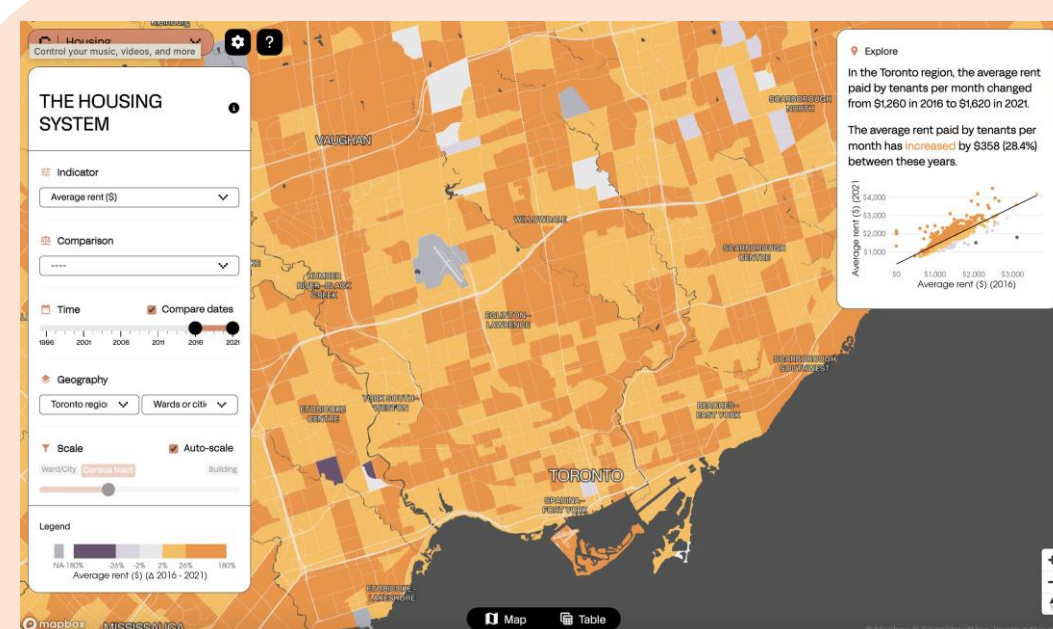
Curbcut Toronto affords various data exploration and visualization capacities, so that urban data can be explored more flexibly with depth and variety. The data is organized into modules, including climate, health, housing, transport, etc. Here we illustrate three main features of the platform: 1) geographic comparison, 2) temporal comparison, and 3) correlation analysis.



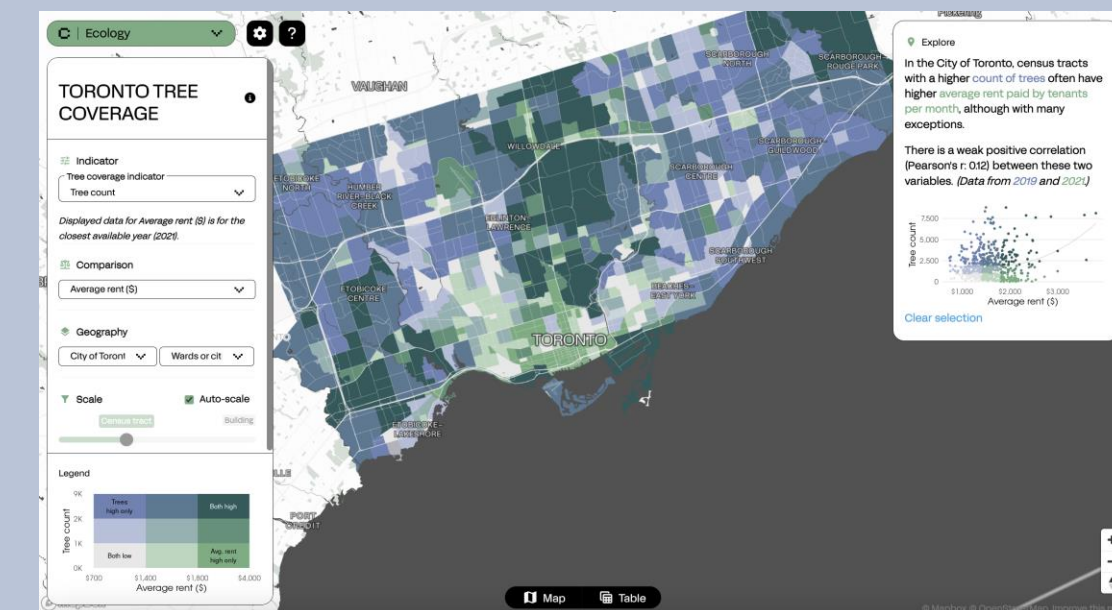
Ward Level

Census Tract Level

Curbcut allows visualization and comparison on different geographical scales. The above image shows numbers of trees aggregated by ward (above), and census tract (below).

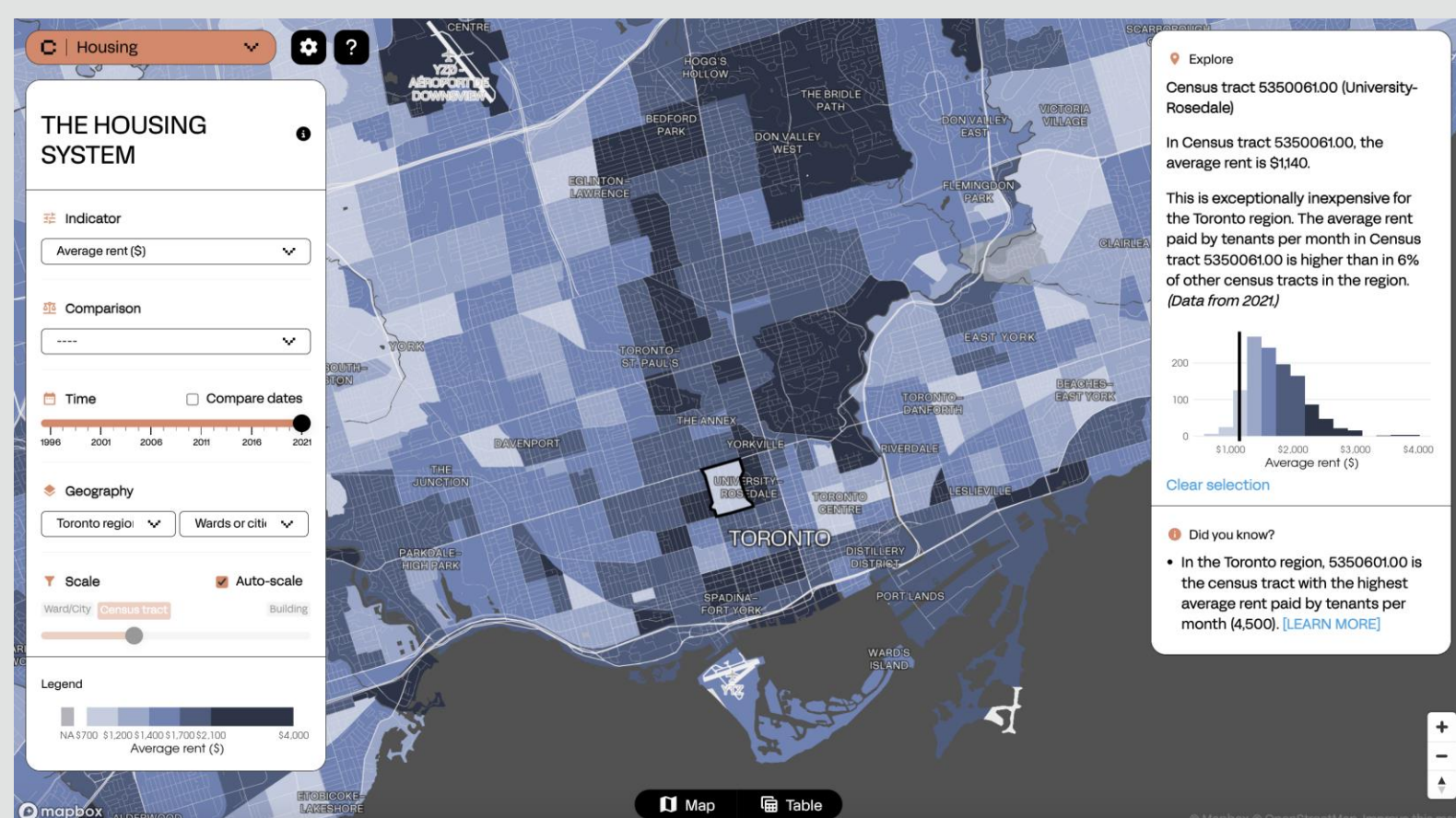


Curbcut enables temporally comparative data visualization. The above image shows how average rent, aggregated by census tracts, changed from 2016 to 2021. We see that most census tracts in Toronto experienced a rent increase.



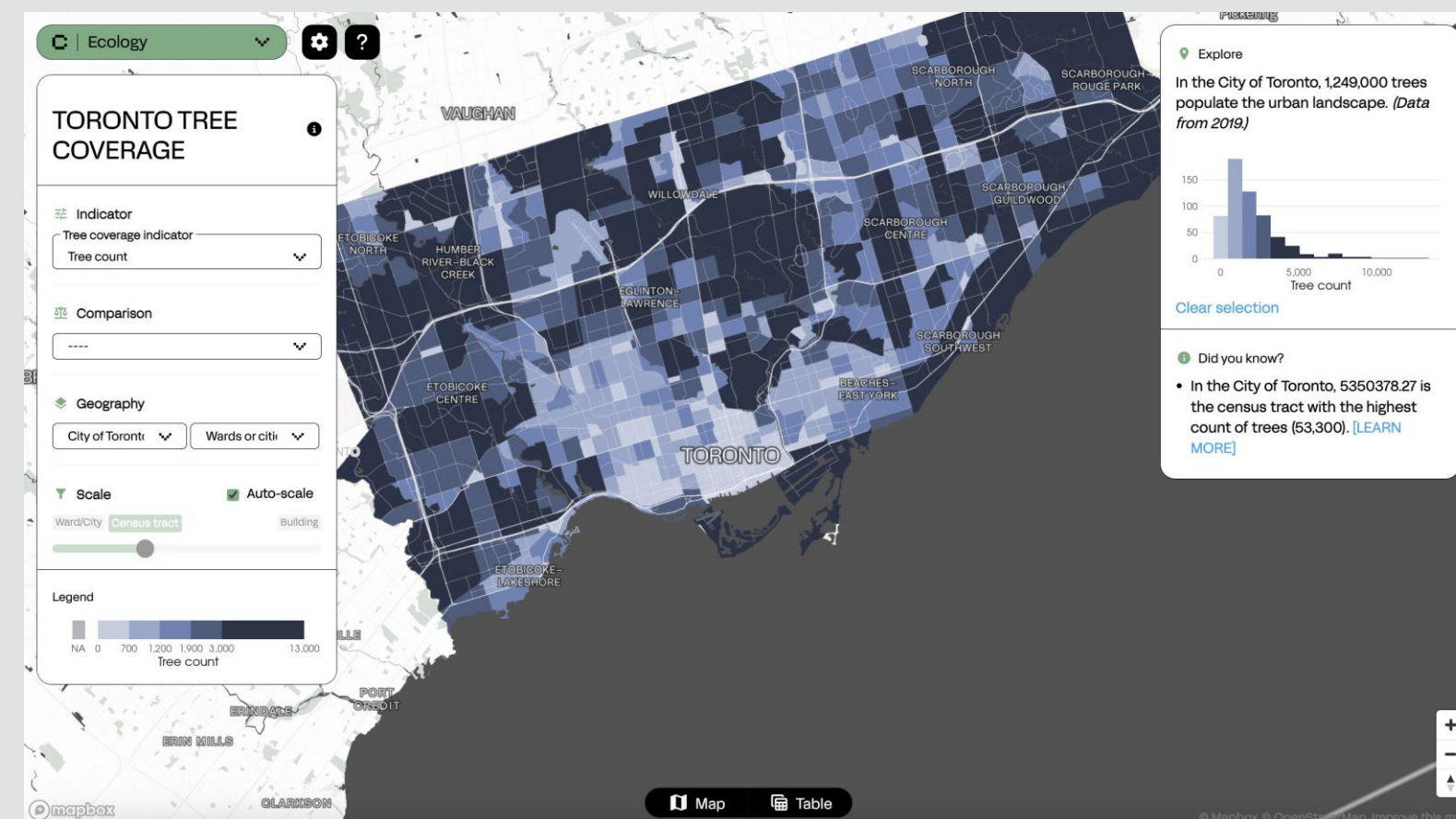
Curbcut also allows correlation analysis across different variables included in the platform. The above image shows a correlation analysis between tree count and average rent across all census tracts. We see that Curbcut assigned different colours to census tracts according to the values of two variables and provided explanation that "in the City of Toronto, census tracts with a higher count of trees often have higher average rent paid by tenants per month, although with many exceptions."

### Housing



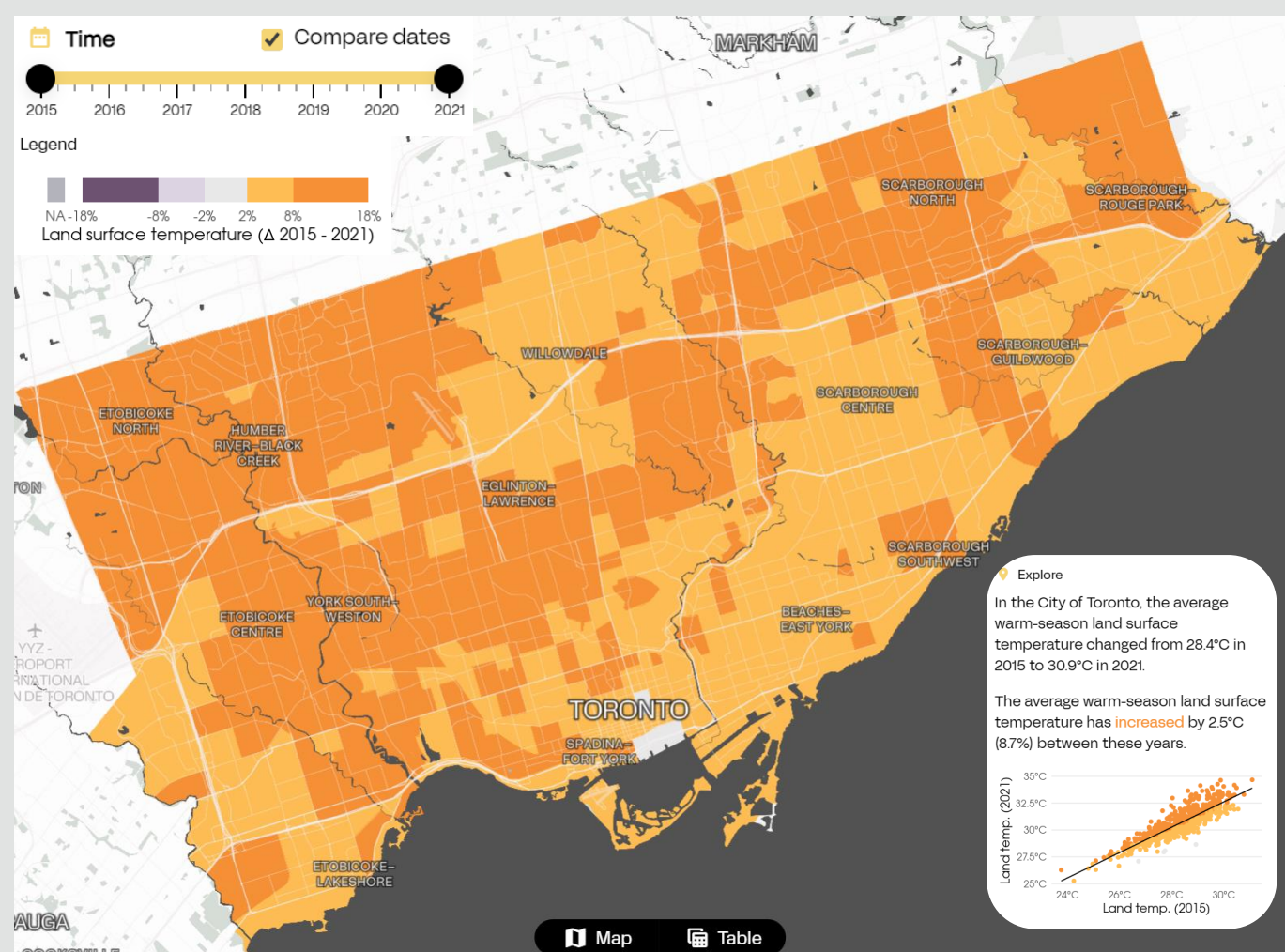
Housing is at the centre of our lives. Our ability to find affordable, adequate, and healthy accommodations profoundly affects our life chances. Closely related to the topic of climate risk and housing is the housing module on Curbcut Toronto. There are a variety of data and indicators involved in the Housing System module, including average rent, renter housing stress, and one-year housing mobility etc.

### Tree Count

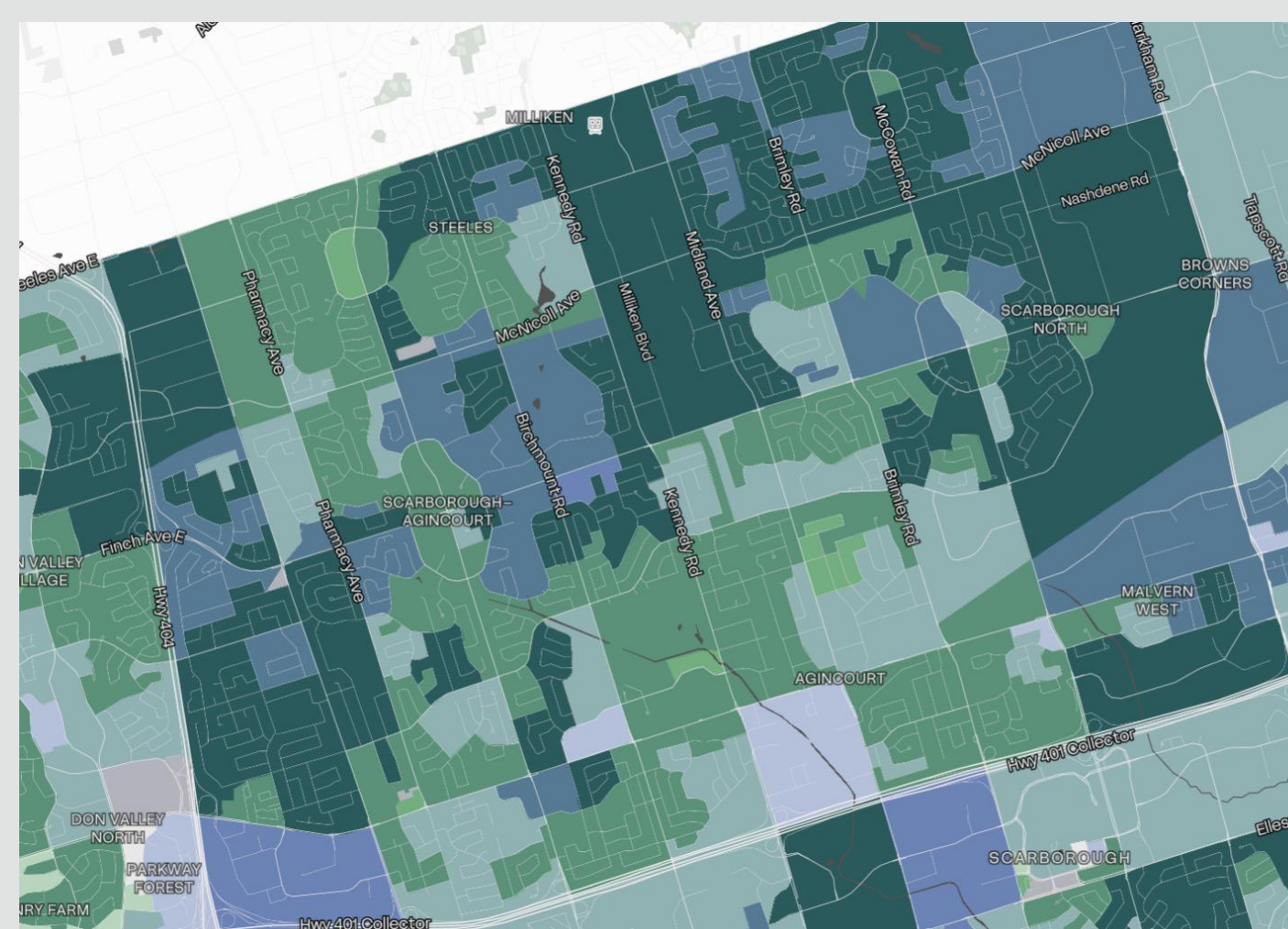


One indicator that Curbcut Toronto include to illustrate and question the topic of ecology and healthy living is tree count. Research has shown that city's tree canopy contributes to environmental benefits as well as to our physical and emotional well-being. However, it is also recognized that trees are unevenly distributed relative to social and economic factors. This module provides an estimation of tree counts, density and distribution in Toronto.

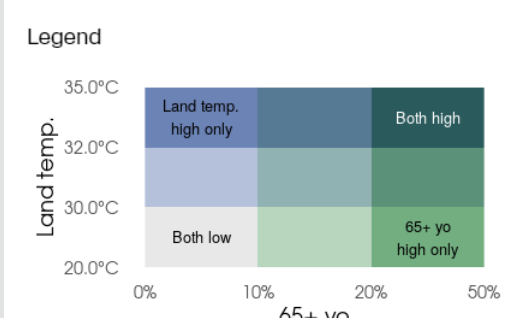
### Land Surface Temperature



The unsustainable rates of consumption and production have caused previously unmatched impacts including warmer temperatures than seen in the last 125,000 years. Toronto experiences an 'urban heat island effect' (due to reduced green spaces and surrounding buildings) and low-income and visible minority groups face greater vulnerabilities to heat risk.



The average warm-season land surface temperature in Markham is higher than in 81% of other wards or cities, which is **exceptionally high** for the Toronto region. Similarly, the percentage of the population aged 65 and above is higher than in 75% of other wards or cities, which is **unusually high** for the Toronto region. (Data from 2021.)



### Conclusion

In a recent paper, we shared our thoughts around how HCI design frameworks could guide us through designing Curbcut aimed to support community effort and inform decision-making for addressing the climate crisis. We are aware of past cases where computing tools become exploitative of community knowledge, and we want to ensure that the process of designing Curbcut does not extract from the local community but helps them. In the paper, we leveraged four design approaches – Speculative Design, Social Design, Design Justice, Data Feminism – and explored how they can help us attend to the coexisting opportunities and challenges that arise from using computational and data tools in addressing the climate crisis.

