EXECUTIVE SUMMARY

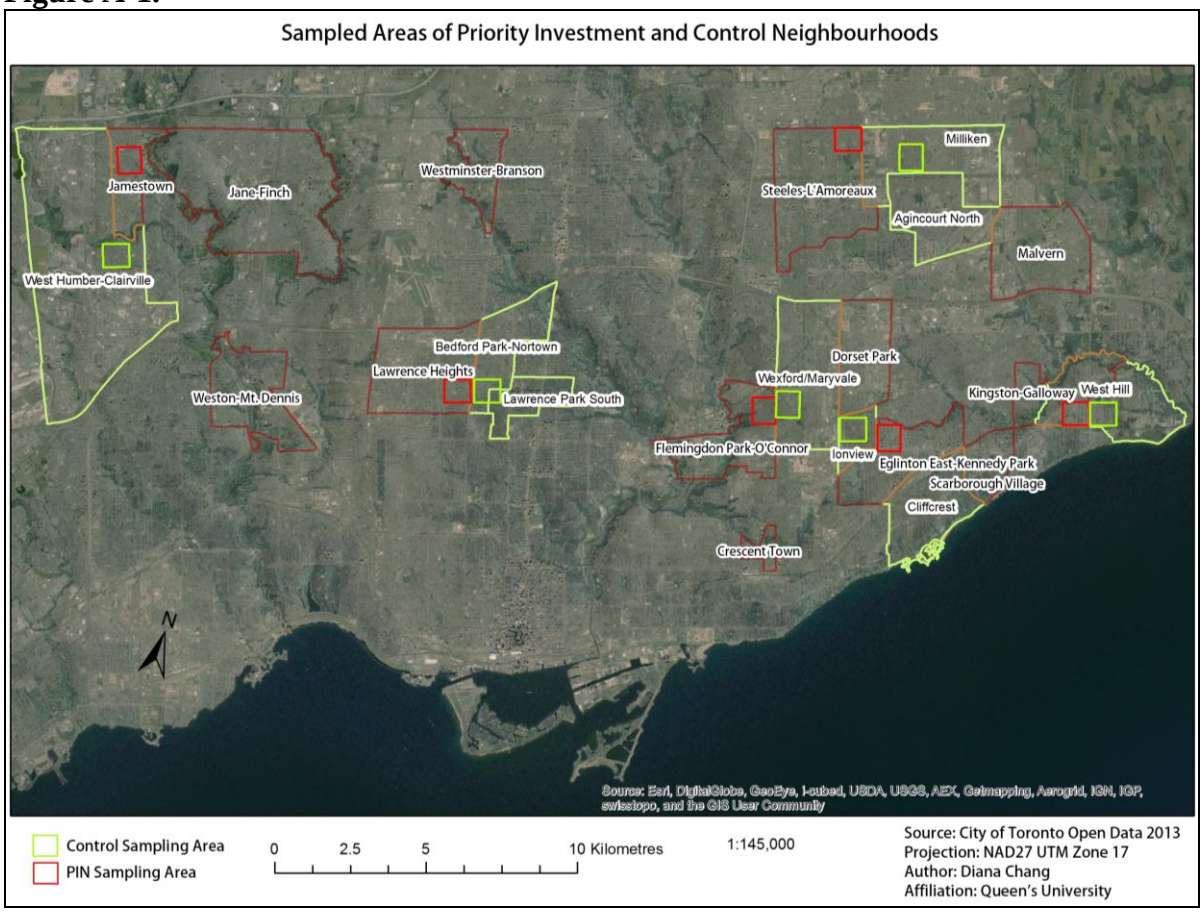
This report supports the growing body of research that demonstrates the link between socioeconomic indicators and tree cover. A matched pairs design controlling for urban form showed a stratified spatial sample of single-detached housing areas in Toronto's Priority Investment Neighbourhoods (PINs) featured significantly less tree cover than nearby residential areas not designated as a PIN. Paired sampled areas were selected based on the homogeneity of their built form and were near adjacent to control for development age. The PIN status served as a treatment group because they have been established based on collective socioeconomic and demographic traits similar to those cited in the literature as predictive of, or correlated, with urban tree cover. Such findings align with the environmental inequity hypothesis that environmental benefits are disproportionately distributed among different socioeconomic groups in urban areas. At the same time, much of the focus in previous studies has been on tree cover with less emphasis on the structural attributes of trees. The structural attributes of a tree community is important in ensuring its longevity and increasing the canopy, from where environmental benefits derive. Increasing the canopy cover is a chief objective for many cities, including Toronto, and relies on large tree growth. A diverse and healthy tree population contributes to the long term presence of large trees and their canopy, so genus and size class distribution were also examined for street trees in the right-of-way (ROW). With this, the planning implications and approaches towards a more equitable distribution were discussed.

A. Research Questions & Answers

1. Is tree cover significantly less in Priority Investment Neighborhoods (PINs) than non-PINs?

Yes. Six matched pairs of a sample area of 0.67 km2 each were selected based on their similar land use (suburban residential) and built form, including the road network, with the pairs selected near each other to control for development age. It was found that there was significantly less tree cover in PIN neighbourhoods than their non-PIN counterparts (**Figure A-1.**).

Figure A-1.

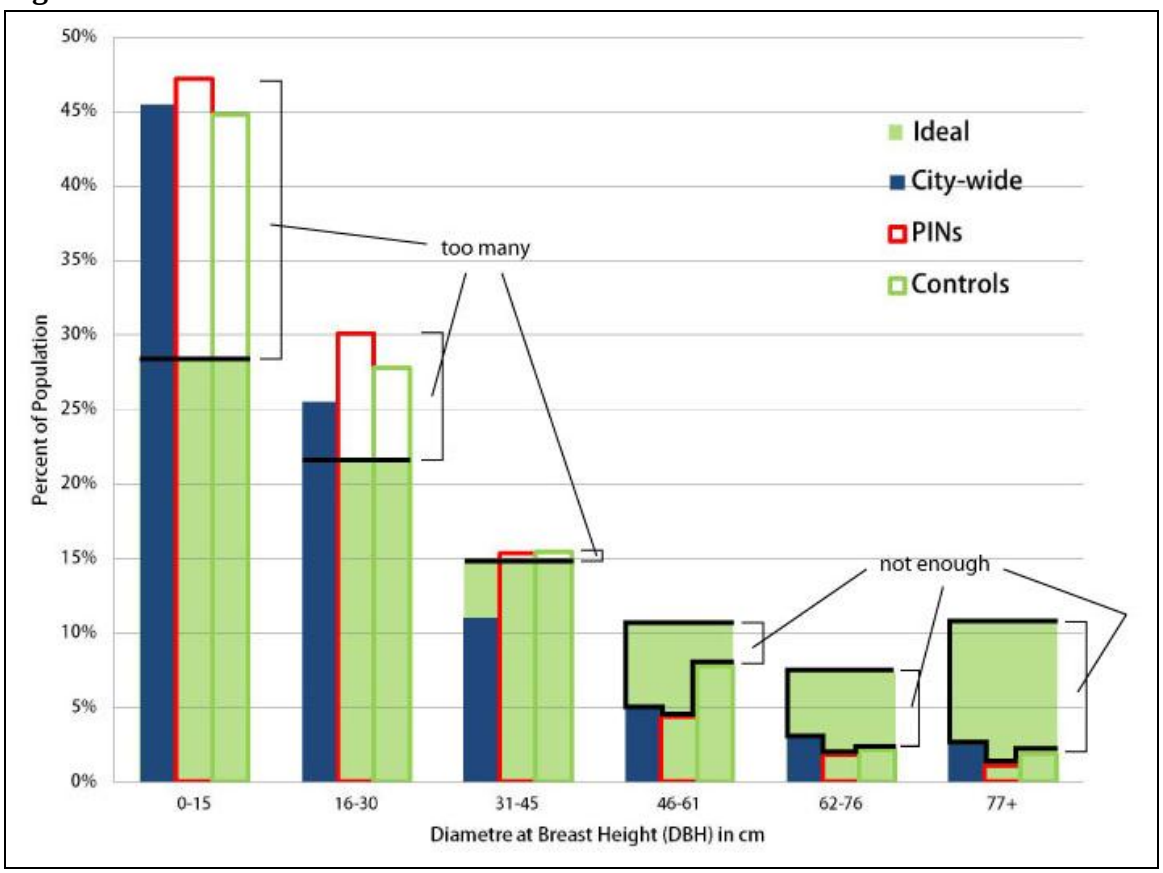


2. How do the genus distribution (diversity) and size class distribution (relative age) of sampled areas fare against standard benchmarks used for tree master planning?

Diversity. Benchmarks for a single genus state that no one should represent over 10% or 20% in a given community. All samples had a proportion of maples (*Acer*) that exceeded the 20% mark regardless of neighbourhood status with some other common genera exceeding the 10% mark. Given the modifiable areal unit problem (MAUP), such benchmarks should be used more as a rule of thumb with emphasis on avoiding a homogenous stand or row of trees than meeting a proportion requirement.

Relative Age. The ideal size class distribution of a group of trees is based on their trunk diameter at breast height (DBH), which indicates the relative age of a tree stand. The DBH ranges from 0 cm to as large as the tree will grow. The distribution for Toronto and the ideal is seen in **Figure A-2**, showing how far the City and samples exceed or fall short of the ideal proportion.

Figure A-2.



Source: City and Ideal values from City of Toronto, *Every Tree Counts Report*, 2010

3. What planning directions / recommendations arise from implications of the first two questions?

Protect existing trees to ensure they reach their potential growth. Section B provides recommendations in achieving greater environmental equity in neighbourhood tree cover and local management strategies.

B. Recommendations

1. Equitable Distribution: Use socioeconomic data to further prioritize urban forest investments in addition to 'least treed' neighbourhoods.

The second of 6 strategic goals in *Toronto's Strategic Forest Management Plan* (2013) is to "Achieve an equitable distribution of the urban forest, increasing canopy where it is most needed" (p. 4). There is a major opportunity to further refine the definition of 'equitable' and 'most needed'. The City can prioritize less affluent neighbourhoods that are

least treed, i.e. approach the urban forest similar to how social planning is approached – based on comprehensive social data and indicators at a smaller scale or neighbourhood-level. As both land use and socioeconomic variables determine the spatial distribution of the urban forest, planning should incorporate a greater understanding on this relationship specific to the City of Toronto in order to move towards a more equitable distribution.

2. **Smaller-scale approaches to forest management are encouraged as a source of local, fine-level data and as a way of addressing the specific needs of a tree community.**

Since the quality or condition of trees will differ at different places, smaller-scaled (few blocks or less) plans may make for a more manageable approach. Use both established boundaries (such as the neighbourhoods, streets, natural features) as well as boundaries that are meaningful and perceivable to the specific group or community. While municipal level tree plans are good for high level strategy and monitoring the overall state of the city, more specific plans at a smaller-scale would offer a unique layer of information that could support higher level efforts.

3. **Community stewardship: transfer emphasis from planting to protection and maximizing tree growth. On-going engagement and education can be achieved simultaneously in community-based inventorying, which includes monitoring.**

The City's stewardship programs could be extended by incorporating community-based inventories, which calls for some level of recognizing key conditions and structural attributes of trees. Given that community efforts are necessary to manage the urban forest throughout the entire city, public awareness and education need to emphasize the optimal conditions for growth and survival. Citizen-based inventory such as Neighbour*woods* can be a formative component of community partnership with the City. The community level is a critical scale of assessment for long-term management and through which to address environmental inequity. An informed and engaged citizenry can be fostered through the community inventory process.

C. Significance

The existing link between urban trees with various socioeconomic factors provides a substantial impetus to better understand the processes which dictate its distribution and apply this information to ensure environmental equity in the urban forest. That the amount of tree cover can be somewhat predicted by socioeconomic indicators means the urban forest is also a matter of social equity. While increasing the tree canopy is an important goal, attaining it depends on our ability to protect existing trees in a harsh urban environment and ensuring their growth. Street trees and other vegetation in the ROW are critical as they are the most accessible, particularly for those who have limited exposure to nature otherwise. Although this study was limited to single detached residential land use areas, recommendations for a more comprehensive inventory at different scales and ensuring small tree growth are not. There is need for future research to explore ways in which other land use types: multi-dwelling residential, commercial and institutional can be designed to incorporate more trees and other vegetation.