ASSESSMENT OF GREEN SPACE SPATIAL EQUITY IN SINGAPORE'S URBANITY

Authors: Rosita Samsudin, Puay Yok Tan
Department of Architecture, National University of Singapore
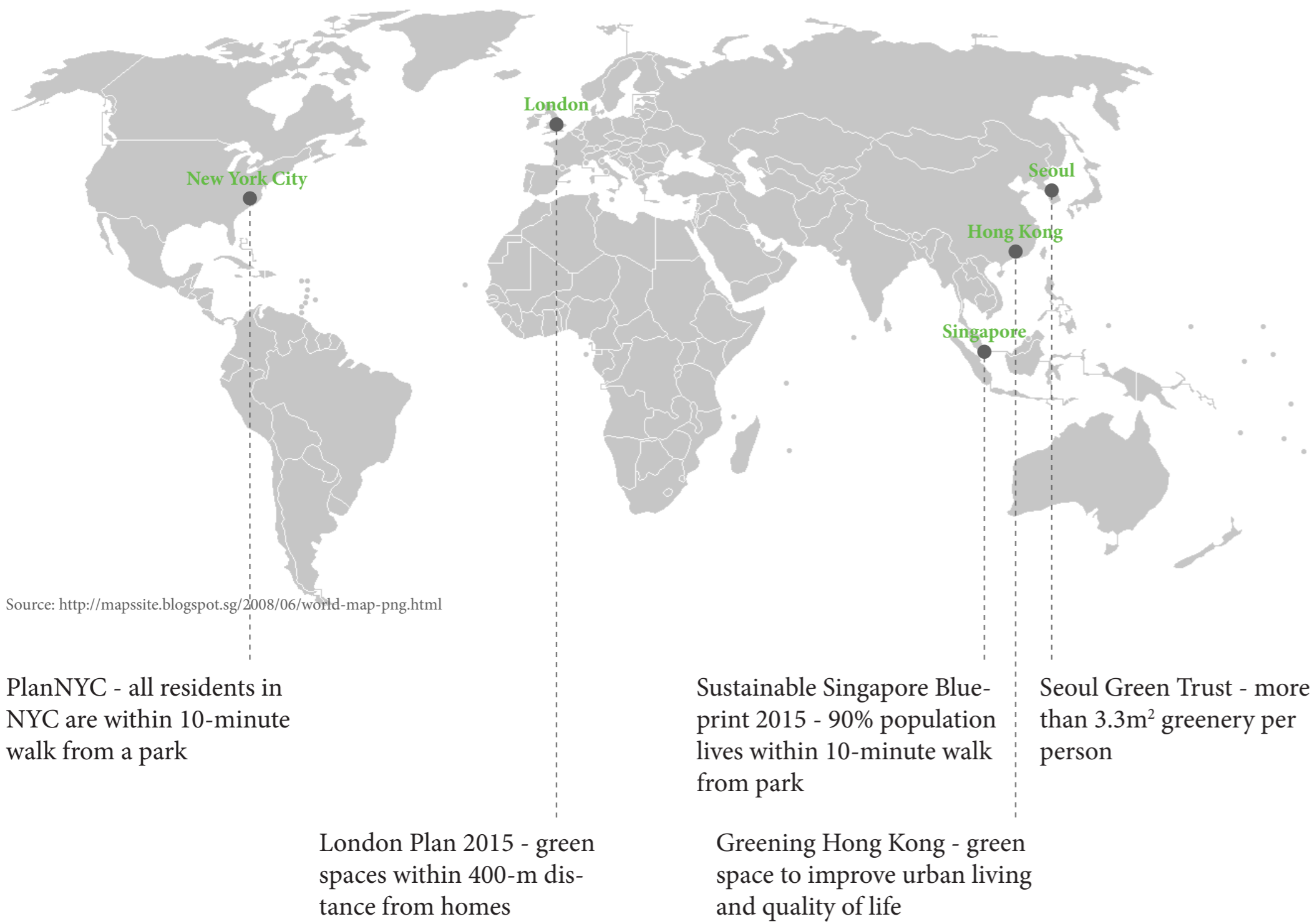
A. Introduction

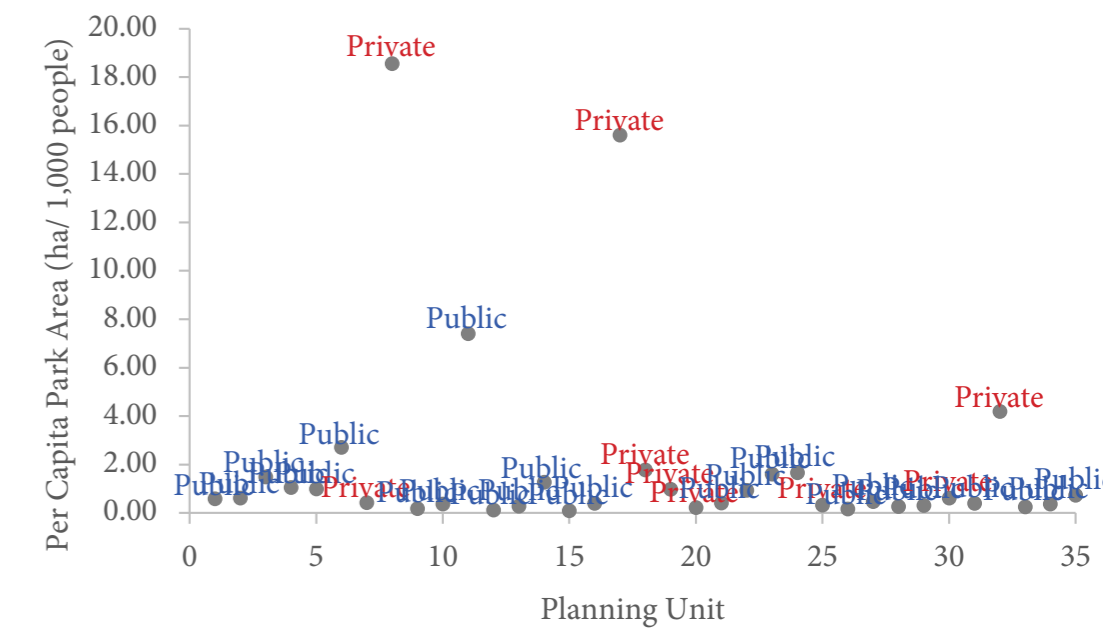Some contributions of parks and open green spaces to the livability of cities:

Source: https://commons.wikimedia.org/wiki/File:Tai_Chi_Bishan_Park.

Source: https://de.wikipedia.org/wiki/Bishan_Park

http://www.australiandesignreview.com/architecture/22700-bishan-park

mitigating urban heat island (Wong & Chen, 2005)

ehancing urban biodiversity (Lian & Sodhi, 2004)

accommodating social interactions and developments of social capital (Arnberger & Eder, 2012; Kearney, 2006)

enhancing physical and psychological health of urban dwellers (Grahn & Stigsdotter, 2003; van den Berg et al. 2010; Ward Thompson & Aspinall, 2011; Ward Thompson et al., 2012)

Some recognitions of the roles of parks in planning policies:

Source: http://mapssite.blogspot.sg/2008/06/world-map-png.html

PlanNYC - all residents in NYC are within 10-minute walk from a park

London Plan 2015 - green spaces within 400-m distance from homes

Sustainable Singapore Blueprint 2015 - 90% population lives within 10-minute walk from park

Greening Hong Kong - green space to improve urban living and quality of life

Seoul Green Trust - more than 3.3m² greenery per person

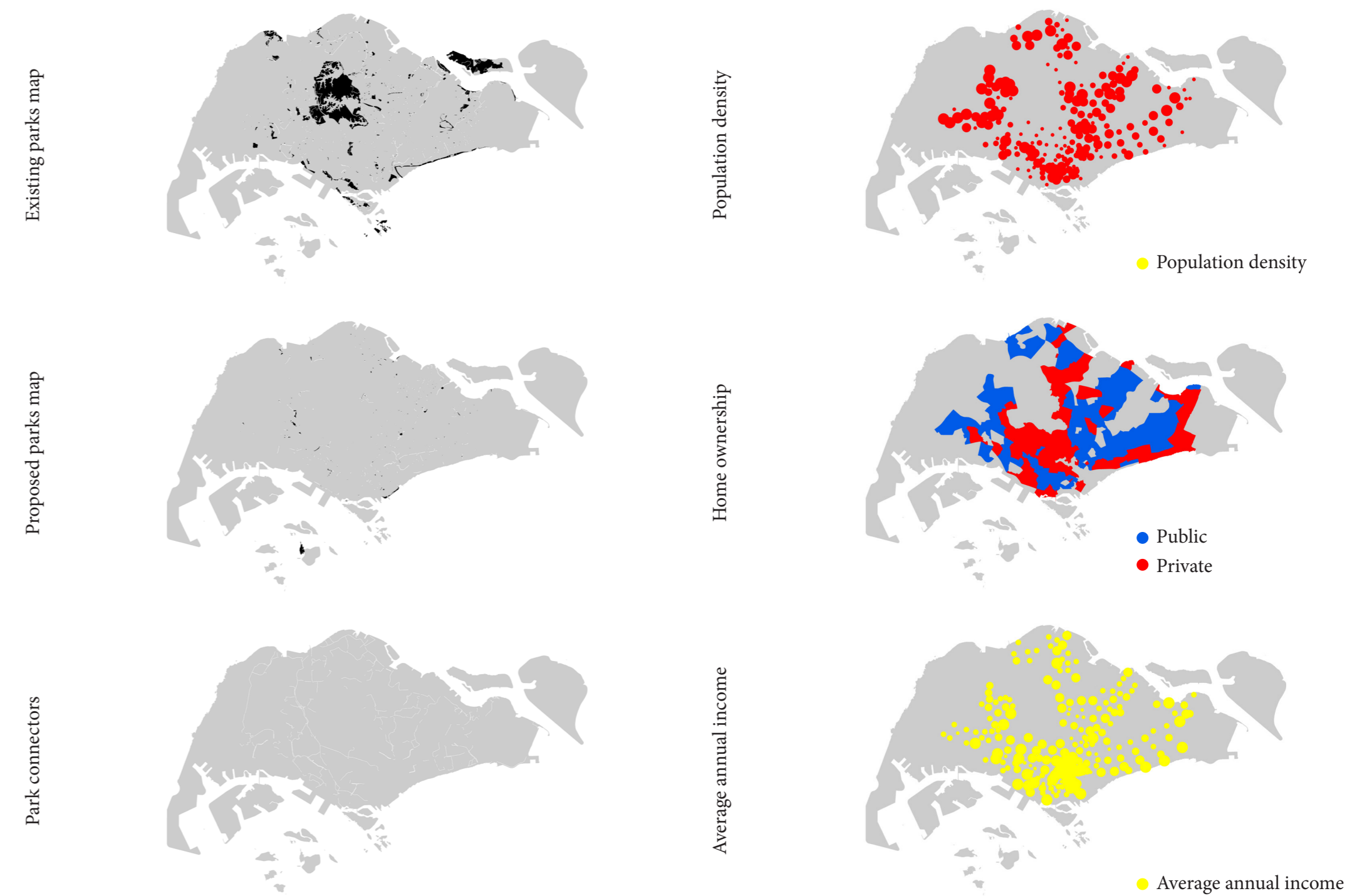## B. Research problems

Parks provision in Singapore:

1. Singapore has not achieved its national target of 0.8 ha/1,000 people for the past decade (Tan et al., 2013)

2. Possible uneven distribution of park spaces in Singapore compared to socio-demographic and socio-economic profiles of residential areas

C. Methodology

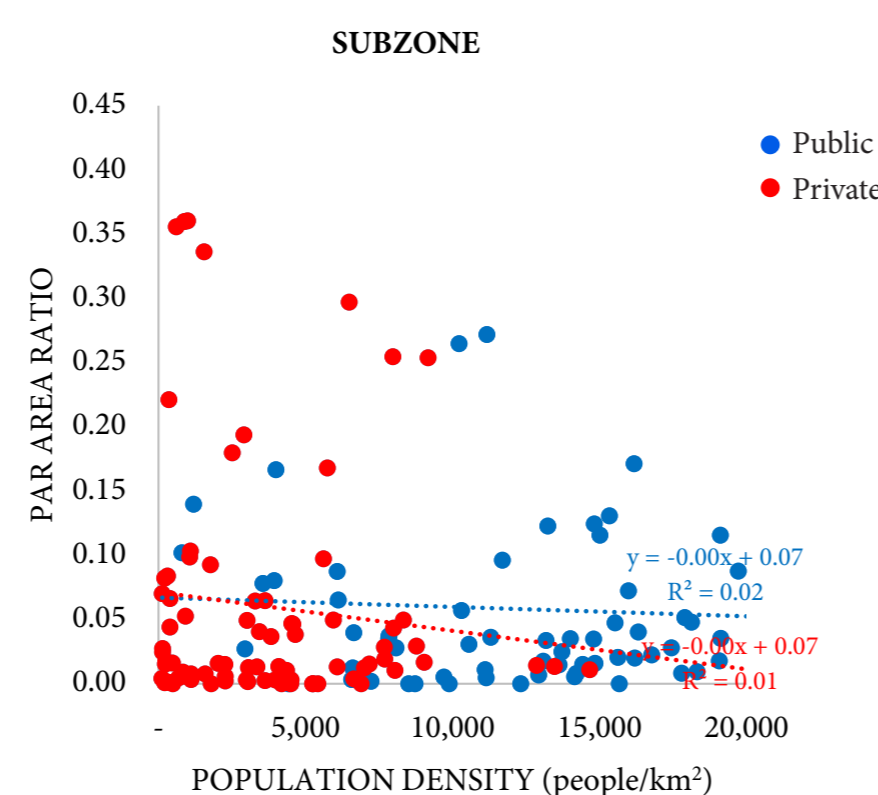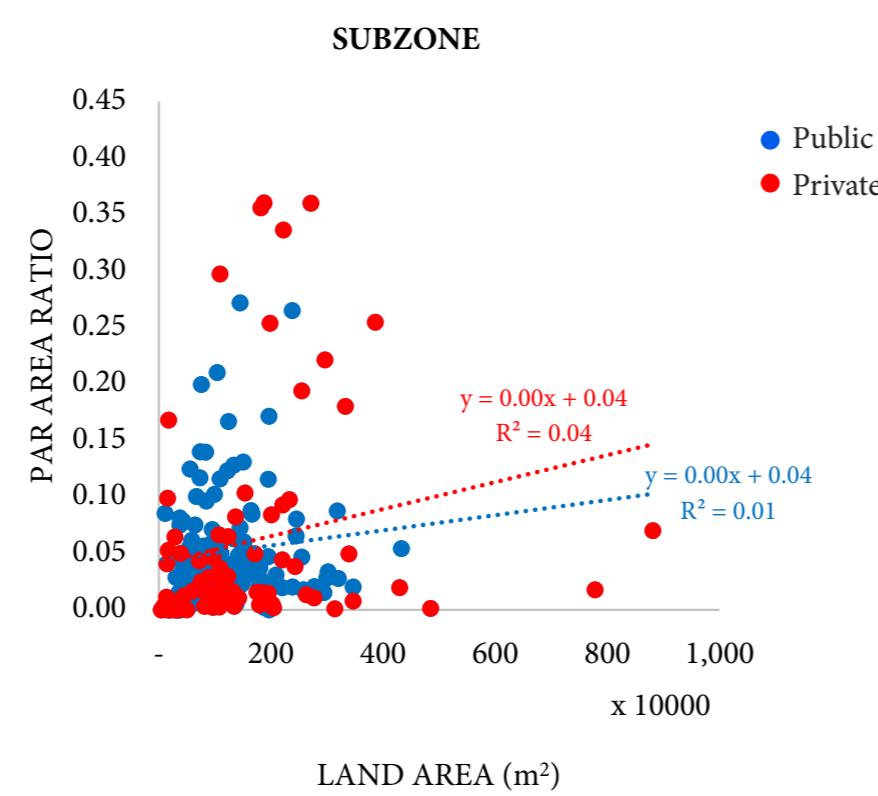1. Mapping parks and population data by using ArcGIS

2. Correlation study of selected 35 planning areas and 220 subzones using linear and logarithmic regressions in IBM SPSS Statistics 22 based on the following indicators:

Park Area Ratio (PAR) = total park area in planning unit/ total land area of planning unit
Per Capita Park Area (PCPA) = total park area in planning unit/ total population in planning
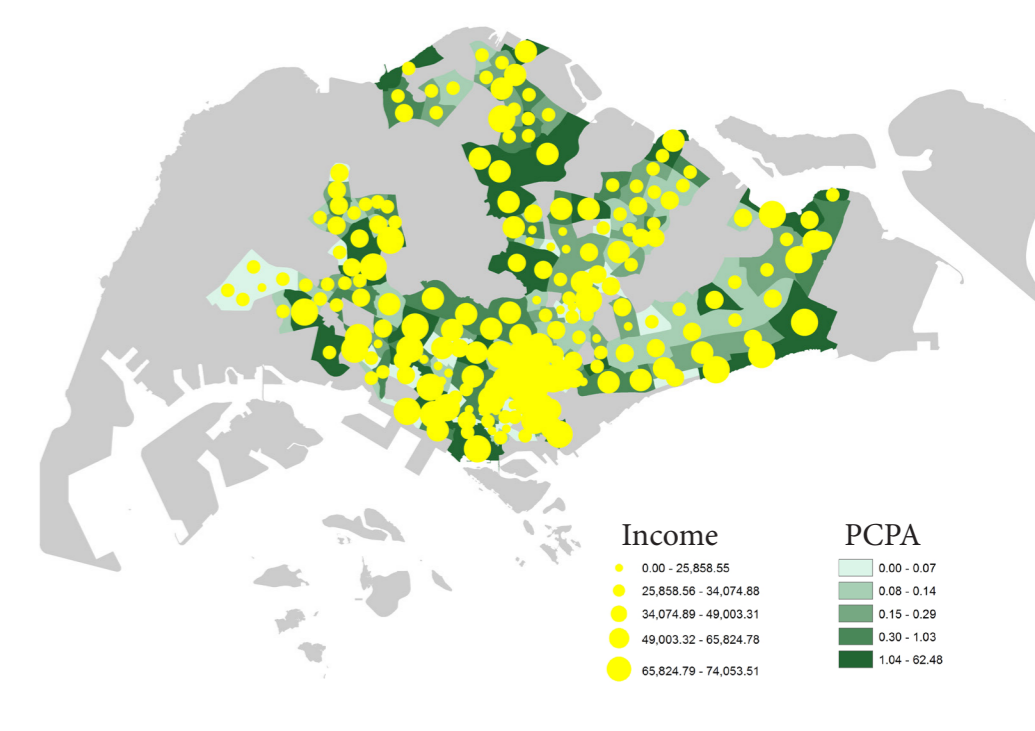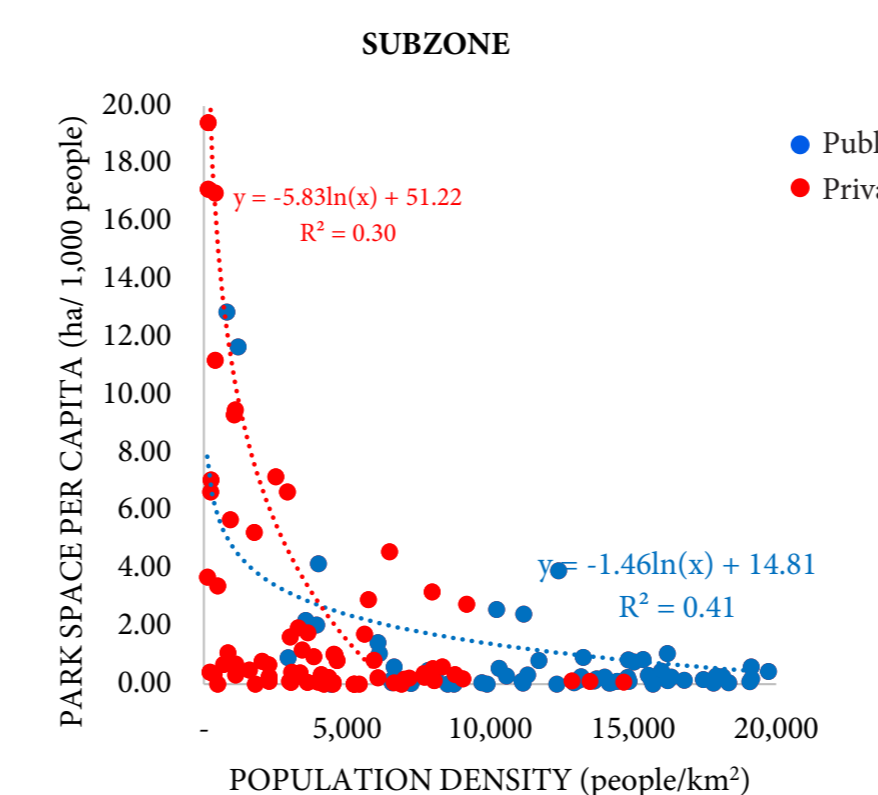
D. Findings

Indicator 1 - PARK AREA RATIO (PAR)

1. No apparent relationship between PAR with planning unit size, population size, and population density.

2. There is uneven distribution of PAR across different planning units. Only 31% planning area and 28% subzone have PAR above the average of 0.069 and 0.054 respectively.

Indicator 2 - PER CAPITA PARK AREA (PCPA)

1. There is significant relationship between PCPA and population density at planning area and subzone levels.

2. Predominantly private residential planning units have higher PCPA than predominantly public residential planning units.

3. While PPR at national level is closed to taregt, but 60% of planning areas and 75% of subzone have not achieved the target with large variations in PCPA across spatial units.

4. There is significant linear relationship between PCPA and annual household income at subzone level.

E. Discussion & Conclusions

1. While park provision at national level is comparatively healthy, this study shows that majority of park provision at planning area and subzone fall beyond the national park target.

2. The wide unevenness of PCPA shows clear relation that high population density drives down PCPA; highlights the implication to future town planning in Singapore as increase in population and population density is expected in next five to fifteen years.

3. Predominantly public housing planning units tend to have lower PCPA than those with predominantly private housing.

4. This study only focused on gazetted parks area and has not considered other forms of green space.

5. Park accessibility and other forms of park provision assessment are included in our larger study that will give a more complete picture of spatial equity of parks in Singapore. They will be shared in future publications.