Identifying Neighbourhoods that Enable Healthy Child Development through Geospatial Analysis of Built Spaces

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ABSTRACT

Are our built spaces enabling healthy child development? The physical environment around our homes have an impact in the healthy development of children. Research has shown that the built spaces that children (aged 0 to 7) access and interact with daily, can enable their social, emotional and physical competence. As such, an understanding of how well our HDBs enable development will assist policy planners to improve amenity provision and continue enabling the healthy development of children. Thus, this project aims to model the geographic accessibility of built factors and map the developmental enabling index of HDBs in each planning area while providing a proof-of-concept application which utilises open source data

Keywords: Child Development, Built Spaces, Geospatial, Analytics, Policy Planning

1. INTRODUCTION

Children are the future of a nation's well-being. There is therefore an incentive for the nation to ensure the healthy development of a child into adulthood. The critical period for child development is usually between the ages 1 to 7, during which children are developmentally vulnerable. As such, it is important to measure and evaluate child development early to ensure that the child is developing healthily.

One such way to evaluate child development is based on three development domains formulated by the Australian Early Development Census (AEDC) [1]: (1) Physical Health and Wellbeing Domain, (2) Social Competence Domain, and (3) Emotional Maturity Domain. A child should develop healthily in these domains to grow up healthily. The definitions for the developmental domains as provided by AEDC can be found in Table 1.

TABLE 1. DEFINITIONS OF DEVELOPMENTAL DOMAINS

Domain	Definition
Physical Health and Wellbeing	Whether children are healthy, independent, and physically ready for the school day, and their gross and fine motor skills.
Social Competence	Children's overall social development including how they play, share and get along with other children.
Emotional Maturity	Whether children are able to concentrate during the school day, help others, are patient and not aggressive or angry.

There are many factors that affect the healthy development of children, from home environment to genetic make-up, all of which can affect these domains in one way or another.

1.1 Built Spaces and Child Development

One such factor affecting child development is the built environment that children interact with daily. Studies on how built spaces affect the development of children have shown that accessibility and interaction with certain built environment like playgrounds and green spaces [4], has an influence on child development.

However, cities are not always planned with this understanding in mind. This results in unequal opportunities, with some children living in areas where they are more developmentally enabled by the built environment, while others are not as privileged.

1.2 Project Focus and Objective

In Singapore, this is especially relevant for public housing. Public estates are sometimes at a disadvantage, as compared to private housing where developers are already incentivised or expected to provide some of the built environment factors (e.g. green spaces, recreation spaces). As such, understanding how enabling different public housing are for childhood development will be the focus area for this project.

Geospatial analysis of Singapore's neighbourhoods can be conducted to map and understand gaps in spatial planning, pinpointing areas that might require intervention. To do so, based on the developmental domains previously discussed, the related built environment factors that impact the healthy development of children can be further identified [2]. These built factors were selected and filtered based on the Singapore context and grouped into the respective developmental domains as shown in Table 2