

READINGS IN MALAYSIAN URBAN AND REGIONAL PLANNING

MARIANA MOHAMED OSMAN
MANSOR IBRAHIM
SYAHRIAH BACHOK



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CHAPTER 5

DETERMINATION OF SPATIAL FACTOR IN MEASURING URBAN SPRAWL USING REMOTE SENSING AND GIS APPROACH

Norzailawati Mohd Noor and Alias Abdullah
Urban and Regional Planning Department
Kulliyah Architecture and Environment Design
International Islamic University Malaysia
50278 Kuala Lumpur

INTRODUCTION

Theoretical debates on sprawl have generated a wealth of discussions around the issues. Arguably, there is a sense of urgency attached to the sprawl problem and in many ways, it is time for the theoretical debate to be applied into practice in more useful ways. There has been a range of approaches to the analysis of certain aspects of sprawl, but most have focused on socio economic factors that utilize census and economic data on county or municipal-level (Ewing et al.,2002). Recent work has made progress on identifying the spatial characteristics of sprawl as identified by indicators focusing on urban form. Torrens and Alberty (2000) suggest a number of spatial metrics that could be developed for spatial factors for identifying and quantifying sprawl. Most recently there has been some progress on developing metrics of sprawl at a micro-level of a census block group (Song and Knaap, 2004) and the individual housing unit scale (Hasse and Lathrop, 2003). While many substantial research in academic discourse recently tend to address the spatial factor issues related to sprawl in any level of urban planning administration, this paper attempt to analyze and measure urban land use sprawl aiming at (residential, industrial and commercial) based on determination of spatial factor deriving from remote sensing imagery and GIS to better identify the spatial characteristic and qualities of urban sprawl.

SPATIAL FACTOR IN URBAN SPRAWL

Urban sprawl has become an issue for many rapidly developing areas. The nature of sprawl generated in simulation was analyzed based on its composition and configuration, using landscape metrics and fractal dimensionality (White and Engelen, 1993 and Batty and Longley, 1994). Composition refers to the presence and amount of different patch types (urban, non-urban) within a landscape, without explicitly reference to their spatial features. Configuration refers to the spatial distribution of patches within a landscape (Torrens, 2006). Characterizing urban sprawl using spatial measures requires a concise definition of what exactly constitutes sprawling urban spatial patterns. Burchell and Shad (1998:1999) define sprawl as “ *a low density residential and non-residential intrusion into rural and undeveloped areas, and with less certainty as leapfrog, segregated, ad land consuming in its typical form*”. Ewing (1997) offers a summary of 17 references to sprawl in the literature as