



## **Gradient Analysis of Urban Structural Change in Time and Space: The Istanbul Case**

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As in many other metropolitan areas throughout the world, urban expansion and the associated conversion of rural land have become an important issue facing Istanbul which is the largest city in Turkey where its population increased from 3.904.588 to 12.573.836 between 1975 and 2007 primarily due to migration. Starting from 1950's, Istanbul has faced rapid growth and its structure is constantly changing. The rapid growth of the city since the 1950s, due to rural migration, has affected urban spatial development and its structure. Initially, the informal residential areas, which were low density and were located at the periphery, accelerated the expansion of Istanbul. As a consequence of expansion, illegal/informal residential areas have started to invade the water basins, forests and high quality agricultural land. In addition, the construction of the bridges on the Bosphorus and the Golden Horn have changed accessibility of various areas measurably and have thus caused a spatial transformation in the pattern of land use. In addition, decentralization of industry, mass housing development at the peripheries and urban expansion has been dominant factors affecting the urban structural change of Istanbul in time and space.

Urban spatial structure is increasingly characterized by decentralization, dispersion, concentration, and multiple centers. In Istanbul, dual development process has been observed in time. The first process is continuous urban expansion with low density development which was triggered mainly by squatter settlements at the periphery and recently occurring high density mass housing development due to low land values. The second process is the intensification and/or renewal process within built-up areas in the central parts of Istanbul.

In this paper, density and land value gradient analysis has been used to analyze urban structural change in terms of core-peripheral relationship in Istanbul. A GIS database is set up to obtain density, land value, distance measures, visualize spatial patterns, and calculate density and land value gradient. In general, standard urban models predict a pattern of negative exponential density gradients within cities, where there is a gradual decline in population density and land value from the centre of the city to its outskirts. In the Istanbul case, negative exponential density and land value gradients is observed even though Istanbul has the changing urban structure from monocentric to polycentric.

**KEY WORDS:** Urban Spatial Structure; change; density gradients; land value gradients.