

## Chapter 89

# The Role of GIS in City Competitiveness

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### ABSTRACT

*Virtually every city and region is engaged in activities to improve their relative global competitiveness. The Geographic Information System (GIS) is one of the powerful tools of information storage and information access, providing spatial data to different stakeholders and cities across the world. This chapter will highlight the role of GIS technology in empirical assessment of the competition among cities or regions, using a variety of data assembled by many different individuals, businesses, and institutions. This valuable information can be used in decision-making by stakeholders who are taking part in the competition and can be disseminated, accessed, and updated in a dynamic way. This chapter discusses the origins of urban competitiveness, dynamics and functions of competition, and current and future research possibilities made possible by GIS.*

### INTRODUCTION

While the economic literature has a presumed “objective” – for example some measure of competitiveness or economic product, the “governance” literature, characterized by institutional arrangements, fails to assess the outcome of those changes (Prosperi & Lourenco, 2010). Information technology has brought opportunities both for private, public and individual actors within

the city life. Actors now can easily access the information and become more competent in the global market (Turok, 2004). In the early sixties, cities were competing mostly with industrial and labor inputs within the city territory. The situation has changed because of the globalization and now cities are mostly competing with information, skills of human resources and macro economic aspects. A question remains (Sim et al., 2003), if telecommunications have not made cities obsolete, have they at least altered the economic function of cities in a global economy? For this, the major

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dynamics have been shifted over last twenty years based on some notions as: i) command points in the organization of the world economy, ii) key locations and marketplaces for the leading industries of the current period finance and specialized services for firms and iii) major sites of production for these industries, including the production of innovations in these industries (Sim petal., 2003). Private sectors were predominantly competing among them in the early ages. However, public sectors have come into action from the late 1980s and early 1990s to brand their cities. In the age of internet, telecommunication and digital media world, nature of competitions among cities is changing rapidly. Both private and public sectors are working together to brand their cities in this globalization era so that both the parties can take economic, environmental and social advantages of investments and innovations. Cities have to ensure that their institutional structures cater to the rising demand from business and industrial corporations. There is an increasing need for institutional thickness and free market systems. In the modern world, cities and regions are competing with each other to prove the potentialities they have to offer. For example, they do compete for assembling a skilled and educated labor force, efficient modern infrastructures, a responsive system of local governance, a flexible land and property market, high environmental standards and a high quality of life. Competitiveness in urban regions has emerged from different directions. Some researchers have argued the influential factors as: infrastructure, memberships in networks, institutional and effective policy-networking, quality of living environment, human resources as well as existing number of firms and industries are the major determinants of competition (Lengeyl, 2003; Begg, 1999). Besides, interactions among actors, institutions and municipalities determine the level of competition among cities or urban centers. These competitions have both positive and negative impacts in terms of society, economy and environment. Common descriptions

of the competitive process as ‘displacement’ and ‘zero-sum’ imply on one hand, it is unproductive and to be discouraged, since one area’s success may only come at the expense of others. On the other hand, pressure on local bodies may prevent complacency and encourage timely delivery of suitable economic infrastructure, services and skills. The pyramid model of competitiveness shows sustainability at the top, essential conditions that can bring a positive outcome of the competition among cities, in the middle layer and at the bottom, there are different policy inputs (Lengyel, 2003). Business environment, physical and knowledge infrastructures are some major policy inputs that should be considered to achieve the sustainability of cities. To implement these policy instruments, essential conditions are considered to be business performance, productivity, prices and products, and available labor supply. Geographic Information Systems combine geo-data with other types of information and generate maps for better recognition of local problems and more effective solutions. GIS directly supports a variety of local activities (land-use and urban planning, economic development, infrastructure, transportation and emergency management, educational planning, tax assessment, environmental monitoring, public information services) to know the extent of competition among cities and regions (Pawlowska, 2001). GIS is a set of tools that enables combining digital map with non-spatial characteristics and relationships associated with geographic objects like:

- Automated mapping technology: manipulating map information;
- Database management: managing attribute data;
- Land records information: providing the cartographic and attribute data;
- Topological data structures: Providing definitions of spatial relationships among points, lines and polygons

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