

## *Guest Editors' Introduction*

# **Advancing Thought on the Use of Spatial Techniques and Methods for Urban Analysis**

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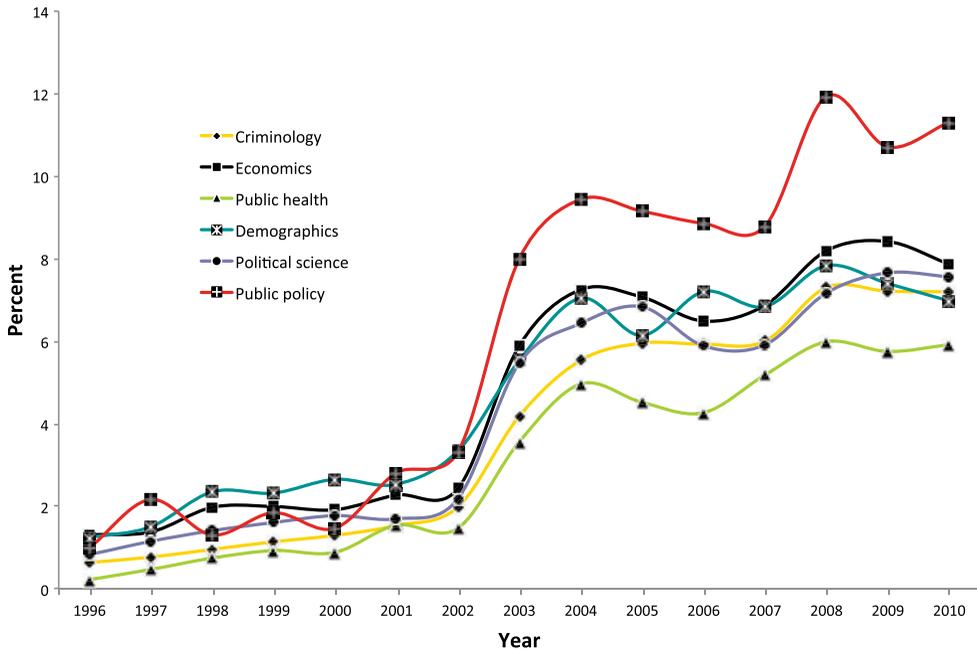
U.S. Department of Housing and Urban Development

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Over the past 20 years, spatial analysis has exploded across a range of uses. Primarily promoted by the rising capacity of Geographic Information Systems (GISs), spatial analysis is now its own scientific field of inquiry, with many journals, conferences, and academic degrees (see Goodchild, 2010, for a recent two-decade review of accomplishments). Analysts have developed spatial analysis tools across many scientific disciplines to measure local variations of social and environmental phenomena. More often than not, the interaction between these phenomena vary across space, suggesting that a spatial approach may be required to fully understand and respond to society's most pressing problems. Spatial tools provide us with a quantitative foundation for understanding these complex interactions and implementing place-based solutions. The symposium in this issue of *Cityscape* is designed to show how spatial techniques and methods can be creatively applied to a wide range of urban issues.

The Spatial Analysis and Methods (SpAM) department of *Cityscape* was created to demonstrate the use of spatial approaches for urban applications so that readers can replicate the methods in their own research. With SpAM, we also hope to combat the notion that spatial analysis is just mapmaking with GIS.

The remarkable growth in use of spatial methods may be expressed quantitatively. Exhibit 1 shows the percentage of journal articles published across several social science disciplines that use some form of spatial analysis. Other surveys demonstrate a similar multidisciplinary growth, such as

**Exhibit 1****Trends in Use of Spatial Analysis Across the Social Sciences**

Notes: Compiled from authors' tabulation from sociological abstracts, applied social sciences index and abstracts, and social service abstracts. Authors conducted a search using the following keywords: spatial, mapping, geographic information systems, GIS, hot spots, and crime mapping. The last two keywords are included to more accurately portray realistic levels in criminology and criminal justice, because those keywords represent spatial analysis that would not have been otherwise detected.

Fearon (2003), who presents a similar trend with spatial analysis growing from 1.3 percent in 1990 to 3.7 percent in 2001.<sup>1</sup> All charted disciplines show a marked upward trend in the use of spatial approaches in understanding the interaction between people and place.

This symposium covers a wide range of practical articles that are representative of the published papers represented in exhibit 1. The problems analyzed include crime, vacant land, residential mobility, urban population distribution, neighborhoods and housing, food deserts, segregation, and place meaning. The U.S. Department of Housing and Urban Development (HUD), like many local governments, is increasingly employing spatial analysis in its work, with the Office of Policy Development and Research (PD&R) playing the key role.

Many of HUD's programs are inherently place based. Program data are regularly geocoded and integrated with other spatially enabled sociodemographic and economic data for analytic purposes. PD&R manages the Enterprise GIS (eGIS) program, which supports and coordinates these activities across the entire agency. An important aspect of PD&R's role in eGIS is the adoption, practice, and promotion of geospatial analytical techniques like the ones presented in this symposium.

<sup>1</sup> The percentage of publications per year is higher in the Fearon paper than in exhibit 1 because Fearon's literature analysis includes a broader scope of disciplines than the authors' analysis in exhibit 1.

For example, the dasymetric approach that Jeremy Mennis addresses in his article has been implemented with block-level data to support the grant application process for a number of HUD's signature grant programs, including the Neighborhood Stabilization Program, Choice Neighborhoods, Rural Innovation Fund, and, most recently, Promise Zones. In another example, Masayoshi Oka and David W.S. Wong demonstrate in their article that "spatializing" common segregation measures improves the representation of social relationships between the races and ethnicities. PD&R staff use program data for monitoring and evaluating expected outcomes. Other examples of HUD spatial analysis appear in earlier SpAM articles, such as evaluating Housing Choice Voucher holder density changes for deconcentration (Wilson, 2012) and the spatial mismatch between the homeless and available resource locations (Mast, 2014). Many PD&R in-house and outside-funded research projects are increasingly using spatial techniques and methods as part of their evaluation strategies.

We hope this symposium spurs more readers to use spatial analysis beyond the typical visualization of data in maps. Many state and local governments are posting geocoded data on line, generating new opportunities for analytic experimentation. New technologies, from social media to sound sensors and smart-phone applications, are capturing geographic data, offering rich, new sources of nongovernmental data.

Spatial analysis is breaking new ground in finding fresh approaches to urban problems. We expect that many more groundbreaking examples will appear in future issues of *Cityscape*.

## **Guest Editors**

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