

Representation and Management of Spatial Error in Cadastral Databases

Dr. Panos Lolonis
Ktimatologio S.A. (Hellenic Cadastre)
Mesogion 288
GR- 15562 Holargos – Athens
Greece

E-mail: plolonis@ktimatologio.gr

This paper focuses on the representation and management of error in digital cadastral databases. In particular, emphasis is placed on the error that is associated with the location of land parcel boundaries. In traditional cadastres, that kind of error was not explicitly tagged to the coordinate data that defined land parcels but, instead, it was implicitly inferred from the scale of the cadastral diagrams that depicted those parcels. Cadastral spatial data were used in a clearly deterministic fashion and, consequently, several restrictions and limitations were imposed by such a use into the day-to-day operations of cadastral systems.

Recent developments in statistics and information technologies, however, open new prospects on how error associated with land information can be represented and managed in digital database environments. In particular, nowadays, it is feasible to represent land parcels in a stochastic manner and manage the error associated with them using methods and techniques from the field of Probability Theory. In this paper, we describe how this representation can be accomplished, what are the overheads that are incurred by explicitly embodying error information, how the data updating and maintenance procedures are affected by the presence of such information, and how the cadastral operations are altered to adapt to the new operational environment. The new concepts are illustrated using examples that are encountered in typical functions of cadastral systems. Such examples involve determination and description of land parcels (particularly from the legal standpoint), treatment of land parcel areas, resolution of boundary disputes, and implementation of zoning restrictions and regulations. The data that are used to demonstrate those examples are obtained from the Hellenic Cadastre.