

Managing a Cadastral SDI Framework Built from Boundary Dimensions

**Michael ELFICK, Australia, Tim HODSON, South Africa and
Curt WILKINSON, USA**

Key words: cadastral survey, GIS, land records, cadastral fabric, boundary network

SUMMARY

A multi-purpose cadastre is the goal of most countries today. Cadastral information is also a key layer in most multi-purpose geographic information systems (GIS), and these systems, in turn, are included within the broader Spatial Data Infrastructure (SDI). The utility of spatial data is greatly improved if it is accurate and consistent between layers, especially given the advent of inexpensive GPS devices. This paper introduces an approach to improve and maintain spatial accuracy of cadastral boundary geometry, and concurrently improve geometry of other layers constructed with reference to the cadastral boundaries. This approach has been used in Australia for several years, while the full integration with a commercial GIS is currently under development.

In the described system, cadastral geometry provides a network of boundaries defined by their dimensions and connectivity, thus making use of pre-existing survey information. Least squares analysis is applied to the network using survey accuracy as a means to weight the network elements. As many cadastres have used a digitizing process to create their digital maps, the system is designed to begin with such data and incrementally improve accuracy as more survey information is added. Adjustments to the cadastral geometry create a field of displacement vectors that drive adjustment of other spatial data layers. The use of the dimensioned boundary network and least squares analysis yields highly accurate geometry with a minimum of control.