

# Fit for Purpose Parcel Mapping Methodologies for a Seamless Cadastre Database

Jack McKenna (USA)

**Key words:** Cadastre; Cost management; Digital cadastre; GSDI; Land management; Low cost technology; Property taxes; Security of tenure; Standards; Valuation; Fit for purpose; general boundary survey; fixed boundary survey; seamless cadastre

## SUMMARY

The joint FIG/World Bank Publication states that Fit-for-purpose benefits relate to the opportunity of building appropriate land administration systems within a relatively short time and for relatively low and affordable costs.

The objective of this paper is to demonstrate that general boundary cadastres (versus fixed boundary cadastres) can be created as seamless parcel networks within land administration systems in compliance with the FIG/World Bank fit for-purpose-objective. General boundary cadastres are geo-referenced to real-world coordinates and the feature geometry of GIS data layers is located onto, and coincident with, the cadastral database. The result is a highly functional land administration and GIS database that meets the requirements of registry, cadastre and tax offices.

A map-accurate seamless general boundary cadastre is cheaper, faster to produce and more efficient to manage topologically than an individual parcel, fixed-boundary cadastre. Usually, individual parcels created using fixed boundary survey techniques eventually are reassembled into a contiguous parcel database that frequently involves use of a digital orthophoto or a topographic map database that has been created to internationally recognized map scales of 1:1,250 (30 cm positional accuracy), 1:2,500 (60 cm positional accuracy) or 1:5,000 (1.25 m positional accuracy).

What constitutes a fixed boundary survey? Is it when parcel corners are surveyed to 1 cm, 2 cm or 10 cm accuracy? Does the surveying equipment, for example a total station or GPS receiver, automatically categorize the parcel survey as fixed boundary? Even when, as is the case in many countries, a traverse closure of 1:5,000 or 1:10,000 is acceptable? Not exactly 2 cm accuracy with either of those two traverse closure standards.

If, when transferring a property, a homeowner wants a 1 cm accurate survey, that homeowner, not the other citizens, should pay to have the survey completed at a cost, depending on the country, between \$200 and \$1,500, compared to the less than \$10 per parcel cost for general boundary parcel mapping. The fixed boundary parcel is no more efficient at being the repository for all parcel attributes (scanned survey plans, owner rights, owner name, valuation, etc) than a general boundary parcel.

General boundary cadastres result in cost and time savings of as much as 95%. The question is: “Is the relatively exorbitant cost and huge increase in time required to create a seamless fixed boundary cadastre a technologically, financially and politically prudent direction to take?” This paper demonstrates that seamless general boundary cadastres are created, with fit-for-purpose accuracy, quicker and cheaper per the FIG and World Bank Fit-for-purpose objectives.