Development of a 3D cadastre over South Africa

Mphuthi Siphiwe, Khumeleni Makungo and Röttcher Lara (South Africa)

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SUMMARY

This paper proposes a framework for implementing an authoritative 3D cadastre in South Africa, anchored to a unified geodetic foundation, ITRF for horizontal control and a vertical position consistent with the IHRF, to enable the registration and management of volumetric rights, restrictions, and responsibilities (RRRs). Drawing on international exemplars (e.g., New Zealand, the Netherlands, Israel), the study outlines the technical, legal, and institutional prerequisites for transitioning from 2D registration to 3D land administration. It positions the 3D cadastre as the legal core within a broader 3D City Model that also comprises physical/BIM–GIS layers for planning, valuation, and infrastructure coordination. A metropolitan pilot concept for Cape Town is advanced to operationalise the approach, clarify roles between the national Land Tenure System (LTS) and municipal Property Management System (PMS), and test end-to-end workflows from survey evidence to authoritative publication. A staged roadmap, datum realisation, legislative and regulatory updates for volumetric parcels and 3D survey plans, CIS upgrades for 3D QA/QC and dissemination, governance separating authoritative legal content from indicative physical layers, and phased pilots with cost–benefit evaluation, is proposed to de-risk national adoption while preserving legal certainty and enabling smart-city and digital-twin use cases.
