Cartographic Modelling of Cadastral Resurvey Effort and Cost: A Case Study in Cape Town, South Africa

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SUMMARY

South Africa's cadastral system retains many legacy survey records alongside modern grid-connected surveys, resulting in variations in spatial accuracy and completeness. Many parcels, particularly those based on pre-grid surveys, lack coordinate reliability or links to recent survey records, complicating both land administration and resurvey planning.

This study develops a cartographic and spatial model to estimate the relative difficulty and cost of cadastral resurveys, using the City of Cape Town as a case study. A comprehensive PostGIS database was compiled from official Surveyor-General datasets and enriched with environmental and geometric properties derived from high-resolution elevation and vegetation data. The model integrates four principal cost factors of parcel geometry, terrain–vegetation complexity, survey age, and proximity to Town Survey Marks (control points), to compute a unitised resurvey cost surface based on the 2003 gazetted tariff.

Results reveal coherent spatial patterns of survey difficulty, with high-cost clusters in topographically complex or historically irregular suburbs and lower costs across the planned townships of the Cape Flats. At aggregated cadastral block and allotment township levels, the model preserves these trends while smoothing local extremes. By translating surveyor experience and professional judgement into reproducible spatial metrics, the research demonstrates how cadastral modernisation can be guided through data-driven mapping and transparent decision-making. The resulting framework supports future integration of cadastral and survey record databases within spatial infrastructures.
