# MapLy:AI-Driven Parcel Extraction from Survey Plans.

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**SUMMARY**

Modern land administration depends heavily on the availability of accurate, digitized cadastral records (Survey Plans). Yet across many regions, notably in Africa, North America, and other parts of the world, a substantial portion of land records remains trapped in analog formats such as printed survey plans. Extracting that information has traditionally required manual digitization by trained personnel, which is slow, error-prone, and difficult to scale.

MapLy addresses this gap with an AI-powered pipeline that (i) extracts bearings, distances, labels, and plan metadata from scanned plans; (ii) traces parcel linework and associates text to geometry; and (iii) performs COGO-based reconstruction with datum harmonization to produce georeferenced polygons compatible with cadastral databases. Our objective is to develop a robust model for survey-plan OCR and vector feature extraction; reliably reconstruct parcels from noisy COGO inputs with closure/tolerance checks; harmonize outputs across coordinate reference systems; and deliver production-ready outputs in multiple deployment modes.

MapLy combines a specially trained AI vision model and a reconstruction engine that resolves angular/distance conflicts, flags ambiguities for assisted QA, and applies grid CRS transformations. The system emphasizes modularity (decoupled extraction/reconstruction), auditability (intermediate artifacts, closure error metrics, confidence scores), and deployment flexibility.

Results in pilot use achieved over 85% reduction in time and human effort compared to manual digitization while improving internal consistency (closure checks, duplicate/overlap detection, mislabeled-edge flags). Crucially, all relevant survey-plan data are persisted as parcel attributes aligned to agency schemas, e.g., plan number, parcel/lot ID, per-edge bearings and distances, total area, beacons/monuments, surveyor and survey date, deed/registration references, CRS/datum, and

QA indicators (closure residuals, confidence). Outputs integrate seamlessly with existing parcel fabrics and downstream land/tax systems.

In conclusion, automated parcel extraction from legacy survey plans is both feasible and operationally valuable. Pairing AI extraction with COGO reconstruction and datum harmonization yields reliable, reviewable outputs that strengthen parcel-fabric integrity and reduce backlogs. In practical terms, MapLy advances SDG 1.4, SDG 11, and SDG 16 by improving tenure security, enabling inclusive, data-driven urban management and taxation, and strengthening transparency and accountability in land governance. It is built to scale and, with minor model refinements, can be adapted across regions worldwide. MapLy ships in three production forms: (1) ArcGIS Pro Add-in for Esri users, (2) a browser-based Web application for any organization, and (3) a REST API for direct integration, accelerating adoption, reducing costs, supporting SDG-aligned governance, and improving the reliability of national cadastral infrastructures.