

# Integration of multiple data sources for 3D Land Administration through the lifecycle of 3D objects

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## SUMMARY

Land administration plays an essential role in ensuring secure land tenure, efficient land markets, and can provide support for effective spatial planning, thereby promoting economic development and good governance. For that reason, accurate, semantically rich and up-to-date data is needed to facilitate the determination, recoding and dissemination of information about ownership, value and use of land. In the context of 3D Land Administration (LA), current research explores the reuse of information from diverse sources and phases of the 3D Spatial Development Lifecycle of a (cadastral) object, including data from design processes, surveying methods, participatory crowdsourcing approaches, spatial and architectural planning.

This paper focuses on the significance of data sources from design processes and various data collection approaches, ranging from the use of drones, high-resolution satellite images, sensors and laser scanning to the participatory crowdsourcing methods using smartphones and tablets with GPS for (3D) LA. On the other hand, ownership boundaries also influence the architectural designs and spatial plans. However, the integration of multiple data sources presents challenges in terms of establishment of interoperability, harmonizing standards and licensing. To address this, the ISO 19152 Land Administration Domain Model (LADM) is currently under revision, to provide a standardised framework at a conceptual level, for reusing such data sources in 3D land administration.

The second edition of LADM is being developed as a multipart, with six new parts: (1) Generic Conceptual Model, (2) Land Registration, (3) Marine Space Georegulation, (4) Valuation Information, (5) Spatial Plan Information and (6) Implementation. Notably the approach of reuse info documented in Part 2 (ISO19152-2): Land Registration is of particular interest. Specifically, the survey part of Edition 1 of the standard is refined and enriched, taking into account recent

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advances and trends in the surveying and Architecture, Engineering, Construction, Owner Operator (AECCO) industry, global best practices, and the needs of citizens. This simultaneous consideration ensures that the proposed model remains practical and user-friendly without unnecessary complexity.

In conclusion, reusing information for 3D land administration presents an opportunity to optimise land management processes and enhance decision making, by adopting standardised practices. 3D land administration can evolve into a dynamic, knowledge-driven system for sustainable land use and development. The integration of the LADM ISO 19152 standard and the circular approach, illustrates the ongoing efforts for managing data throughout the entire lifecycle of 3D objects in land administration.

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