

3D Cadastres Best Practices, Chapter 2: Initial Registration of 3D Parcels

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SUMMARY

Registering the rights of a 3D parcel should provide certainty of ownership, protection of rights and unambiguous spatial location. While not all cadastral jurisdictions in the world maintain a digital cadastral database, the concepts of such registration hold true regardless of whether it is a paper-based cadastre or a digital one. Similarly, the motivations and purpose for the creation of a 2D cadastre for individual jurisdictions applies to 3D cadastre as well. It provides security of ownership for 3D parcels, protects the rights of the owners, and provides valuable financial instruments such as mortgage, collateral, valuation and taxation. The current life cycle of the development of a land parcel includes processes start from outside the cadastral registration sphere, such as zoning plans and permits, but has a direct impact on how a certain development application is processed. Thus, in considering the changes required to allow a jurisdiction to register 3D, it is important to note the sphere of influence that could have an impact on 3D registration. These include planners, notaries, surveyors, data managers and registrars; however for the purpose of this paper, the research is focused on the core 3D aspects that are institutional, legal and technical. This paper explores approaches and solutions towards the implementation of initial 3D cadastral registration, as derived by current procedures of registration of 3D parcels in various countries worldwide. To this end, the paper analyses the categorisations and approaches of 3D spatial units and examines the validation requirements (constraints) on a cadastral database, at various levels of maturity. In this view, 3D data storage and visualization issues are examined in relation to the level of complexity of various jurisdictions, as provided by the results of the country inventory combined with a worldwide survey in 2010 and updated in 2014 (Van Oosterom, et al., 2014). It appears that significant progress has been achieved in providing legal provisions for the registration of 3D cadastres in many countries and several have started to show 3D information on cadastral plans such as isometric views, vertical profiles or text environment to facilitate such data capture and registration. Moreover, as jurisdictions progress towards an implementation of 3D cadastre, much

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3D data collected in other areas (BIM, IFC CityGML files, IndoorGML, InfraGML and LandXML) open up the possibility of creating 3D cadastral database and combining with the existing datasets. The usability, compatibility and portability of these datasets is a low cost solution to one of the costliest phases of the implementation of 3D cadastres, which is the initial 3D data capture.

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