A New Method for Integrating 3D Spatial Information about Vertically Stratified Ownership Properties into the Property Map Base

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SUMMARY

In many jurisdictions, a property map base is typically considered as an underlying basis to support and facilitate making spatial decisions over the development process of buildings and infrastructure facilities. The property map base provides the most accurate and reliable methods for recording, managing and representing legal boundaries of ownership properties. Existing property map bases mainly rely on 2D-based representation schemes to show the legal extent of land parcels and, consequently, failing to communicate spatial arrangements of vertically stratified properties. These include various types of private, communal and public properties such as apartments, office buildings, shopping centers, subway stations, utility systems, and subterranean passages, which are prevalent in urban built areas. In this article, an approach to integrating 3D spatial information about vertically stratified ownership properties into current 2D-based property maps will be presented. The proposed approach mainly comprises creating 3D digital models of ownership properties, validating these models before integration into the current property map base, and analyzing 3D property boundaries. The proposed approach will help implement 3D property ownership map bases which not only can be used to manage legal arrangements in complex urban environments but also have the potential to be leveraged for broader urban applications.