Integration of LiDAR to enhance the digital representation of cadastral parcels in Queensland

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SUMMARY

Being able to analyse the spatial interaction between different objects or datasets enables decision makers to determine the best options for planning and policies that directly affect residents in their day to day lives. Whether that be for large scale urban planning, for new infrastructure such as Olympic stadiums, or for fastest route emergency response initiatives. Historically the 2D digital portrayal of property boundaries in cadastral parcel-based systems formed the basis for these spatial interactions, however these interpretations fail to show the vertical extent of buildings such as high-rise apartments, townhouses, and other properties with multiple buildings. Due to an increase in these multi-storey apartments and complex building structures in urban cities, it is becoming increasingly important to visualise a 3D built environment and illustrate the individual ownership rights, restrictions and responsibilities that exist within these structures.

The paper outlines the modernisation work currently being undertaken by the Queensland Government and how it can better connect the digital cadastre with other foundational datasets, making it easier to support regional planning, development preparations and deliver essential services like waste collection and utilities maintenance. As part of this work, the spatial cadastre in Queensland is being converted from a 2D representation in an isolated database to a 3D enabled feature service in Esri Parcel Fabric. By including an abundance of new attribute fields such as persistent identifiers, there is the capability to integrate endless data from diverse sources to enable more accurate and informed decision making by stakeholders. A key component of the data integration includes the use of LiDAR technology to identify ground and building heights, therefore individual floor and ceiling levels can be inferred, creating a real-world depiction of stratified properties. Specifically, by having a full 3-dimensional representation of strata parcels will prove invaluable for stakeholders such emergency services and council, from locating a patient in an exact house on a large parcel of land to modelling how flood inundation impacts each specific apartment

in a multi-complex property.