

The building blocks of user-focused 3D building data

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At Ordnance Survey, GB, we have taken an incremental approach to creating our 3D geospatial database. In 2014 we began to release building height attribution with our 2D topography data. This is the first in a series of enhancements of our 2D data that will ultimately lead to a full 3D product. Research at Ordnance Survey has focussed not only on methods for deriving 3D data, but also on the needs of the user in terms of the type and quality of the data required and how its quality is conveyed.

In 2007, using task analysis and User Centred Design, we derived a set of geometric characteristics of building exteriors that are relevant to one or more use contexts. Whilst this work has required some revision, it has been valuable for guiding which building data to collect and how to further augment our topography data. Current research is focused on providing user-focused confidence measures for the building height data. As well as conveying the accuracy of the heights, our research indicates that it should be possible to automatically label how well an individual building can be represented using an extruded footprint; Put simply, whether someone could recognise the building if it is modelled with vertical walls and a single roofline. We are also developing methods of classifying the roof shape for individual buildings. Both these current projects are using machine learning principles to extract meaning from the height data without recourse to complex, and often unstable, rule-bases.

Ultimately, we plan to develop a fully 3D product. The current developments will support this goal by providing constraints for automatic 3D model-fitting. We have still to initiate research to better understand how to characterise and capture the shape between buildings; As our previous work has shown, getting the right roof shape and extruding its perimeter to the ground will not serve all use-contexts. Therefore, a rich seam of research remains into methods for capturing user-focused, fully 3D building data.