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Urban geology as part of 3D city models - challenges and solutions

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While 3D city models are now available for many large and medium-sized cities and are increasingly being used, the urban subsurface (= urban geology) continues to be neglected in such models in most cases. The reasons for this are both inhomogeneous and complex geological/hydrogeological information, which at the same time is not assembled in a context-specific way, as well as a lack of standards, interfaces and exchange formats.

To overcome these barriers, geological and hydrogeological 2D and 3D content is currently being elaborated for several urban areas in the federal state of Hesse in close cooperation with the municipal cooperation partners using all available input data (in particular, however, boreholes, geological cross sections and groundwater level measurements), which are being assembled with a view to defined "urban geoparameters".

In addition, an attempt will be made to visualize the urban underground infrastructure (man-made objects) in 3D space and thus bring it into a synopsis with the geological and hydrogeological 2D and 3D content.

The synopsis, in turn, should be carried out in the respective working environments as far as possible, i.e. using the software solutions operated by the cooperation partners. To ensure this, both suitable interfaces and a suitable exchange format are required in the 3D data management systems for geological/hydrogeological models. The OGC API 3D GeoVolume and Styles interfaces and the 3D Tiles exchange format are considered to be the solution here.

With this presentation, we would like to present the current state of work with a focus on the parameterisation and packaging of geological and hydrogeological 2D and 3D data for urban areas.