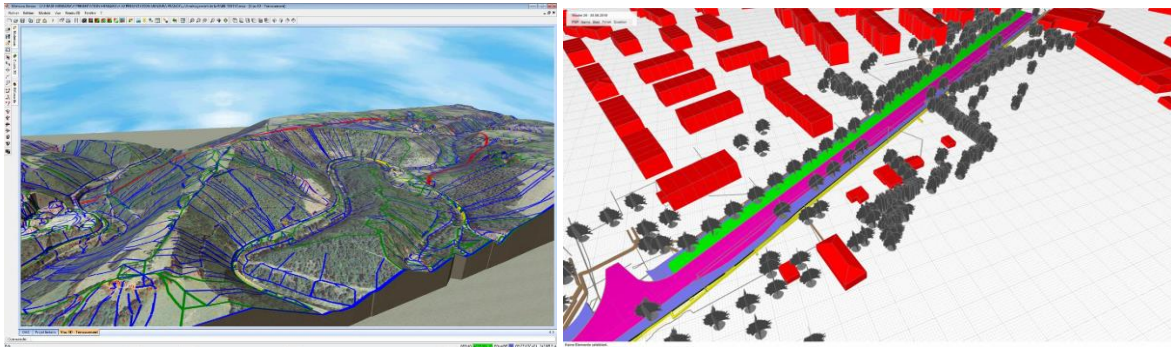


Use Case 01: Initial State Modeling

Purpose

The modelling of the existing natural and human-made environment provides an important background information for the design of tunnels. This includes geometric-semantic information of the terrain, the geology of the ground, existing underground facilities and services as well as any buildings on the surface and land use. Typically, this information is retrieved from various sources involving a multitude of different file formats. It is required that at least parts of initial state information can be transported by the IFC-Tunnel format.



Left: Terrain model (©Geomensura), Right: Existing overground structures and vegetation (© OPB)

Exchange Scenario

The exchange scenario that IFC-Tunnel must support is the exchange of models from GIS as well as BIM-based asset management systems to the tunnel design software.

Requirements for IFC-Tunnel:

The requirements for IFC-Tunnel lie in the geometric-semantic description of

- Terrain
- boundaries
- geology → connected to Use Case 02a
- existing underground facilities and services
- buildings (above and underground)
- land use including restricted areas etc.
- vegetation

Particular attention must be paid to the question how geo-referenced coordinate systems and the distortions resulting from mapping are handled.

Geometry: From a geometry point of view, it can be assumed that the existing geometry descriptions, in particular triangulated face sets, but also sweeps and extrusions are sufficient. It must be investigated how boundaries between soil/rock layers can be appropriately described.

Semantics: All existing entities must be described with appropriate semantics. The most complex aspect is the appropriate description of the geology, which is specifically addressed by Use case 02a.