

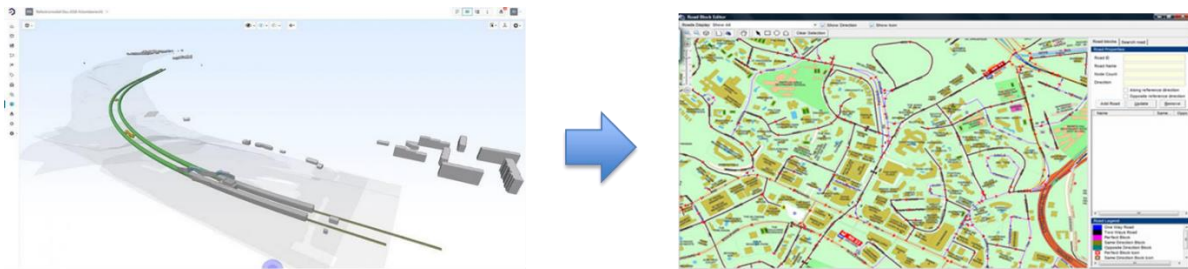
Use Case 19: Handover to GIS

Purpose

After finishing the tunnel construction project, the model information must be handed over to GIS systems that provide the basis for regional/national transportation asset management (network level, programmatic needs analysis), but also provide fundamental services for map generation, navigation applications and mobile services to transportation systems customers.

Location, geometries and semantic information of the tunnel project must be transferred at the proper level of details needed (required-and-sufficient): this can include the tunnel model itself (as-built), the terrain, protection zones, new and existing underground (stations) and aboveground facilities (intermodal transports like busways, railways) as well as surrounding buildings.

This use case is related to Use case 01 (“Initial state modelling”) as data of the completed tunnel projects stored in GIS systems serve as the basis for new tunnel extensions or connected projects.



Exchange Scenario

The underlying exchange scenario that IFC-Tunnel must support is the exchange of models from BIM applications (authoring and coordination tools) to Geographical Information Systems (GIS).

It has to be investigated whether GML-based data formats (CityGML, InfraGML; GeoSciML) provide a suitable basis, even partially, for this use case.

Requirements for IFC-Tunnel:

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

- the tunnel itself (as-built)
- terrain (as-modified)
- geology (as-found)

Coordinate Systems: Particular attention must be paid to the question how geo-referenced coordinate systems are handled. Whereas some BIM solutions (for punctual objects) provide 1:1 modelling, professional GIS systems operate with geoid definition and projected coordinate systems. Thus, a transformation is necessary, and all required parameters must be provided by the IFC format.

Network: A link/hook for integrating the tunnel model with the transportation network level is required.

Geometry: GIS systems are only capable to use explicit geometry descriptions, such as `IfcTriangulatedFaceSets`. It must be investigated how the tunnel axis can be properly described in GIS systems (using `IfcAlignmentCurves` or linear segments).



Semantics: All existing entities must be described with appropriate semantics. The most complex aspect is the appropriate description of the (as-found) geology.