CityGML and LADM – Some Food for Thoughts

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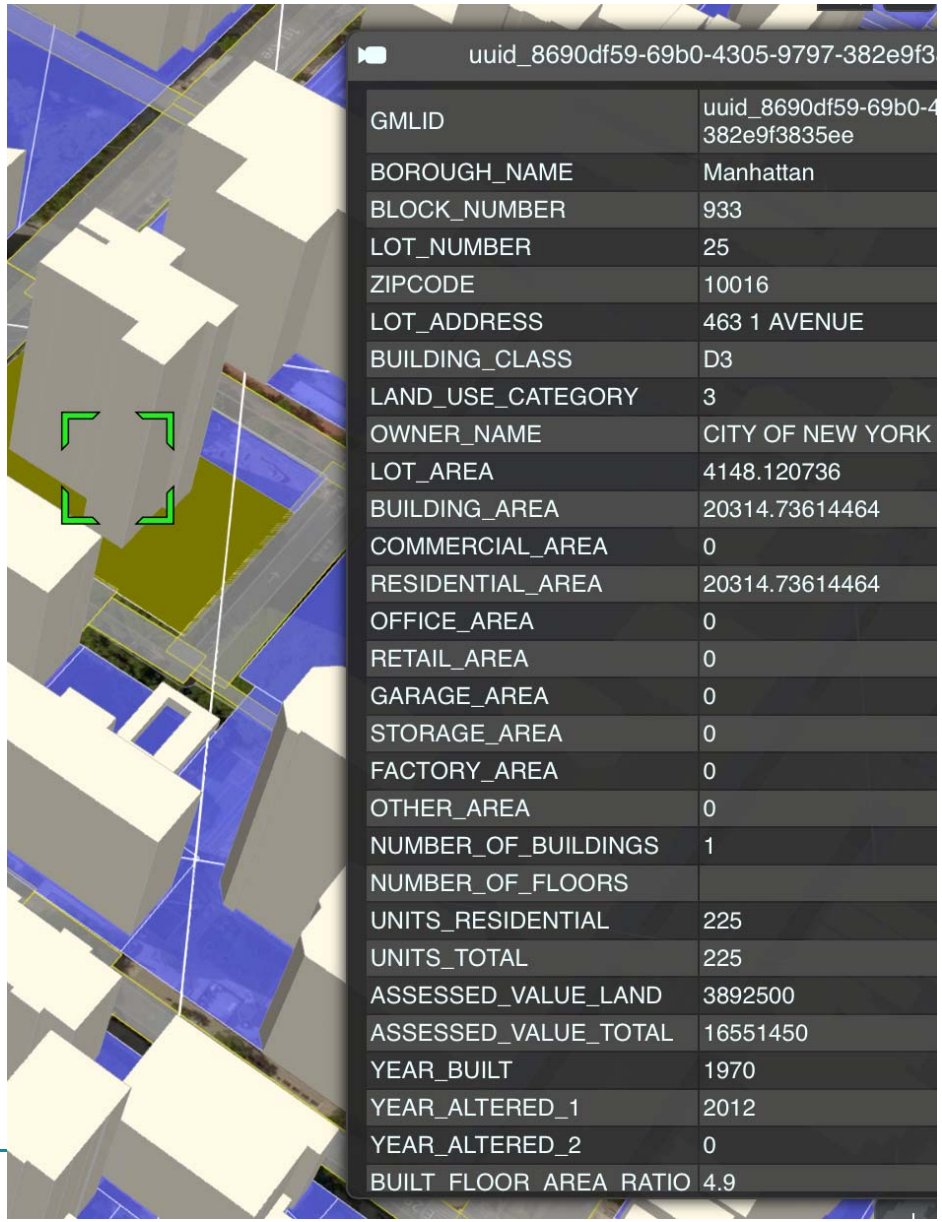


CityGML – 3D City & Landscape Modelling

Application independent Geospatial Information Model

for virtual 3D city and landscape models

- comprises **different thematic areas** (buildings, vegetation, water, terrain, traffic etc.)
- **data model (UML)** acording to **ISO 191xx** standard family
- exchange format results from rule-based mapping of the UML diagrams to a GML3 application schema
- Version 1.0.0 was adopted in 2008 as an international standard of the OGC, version 2.0.0 was adopted in 2012; version 3.0.0 is under development

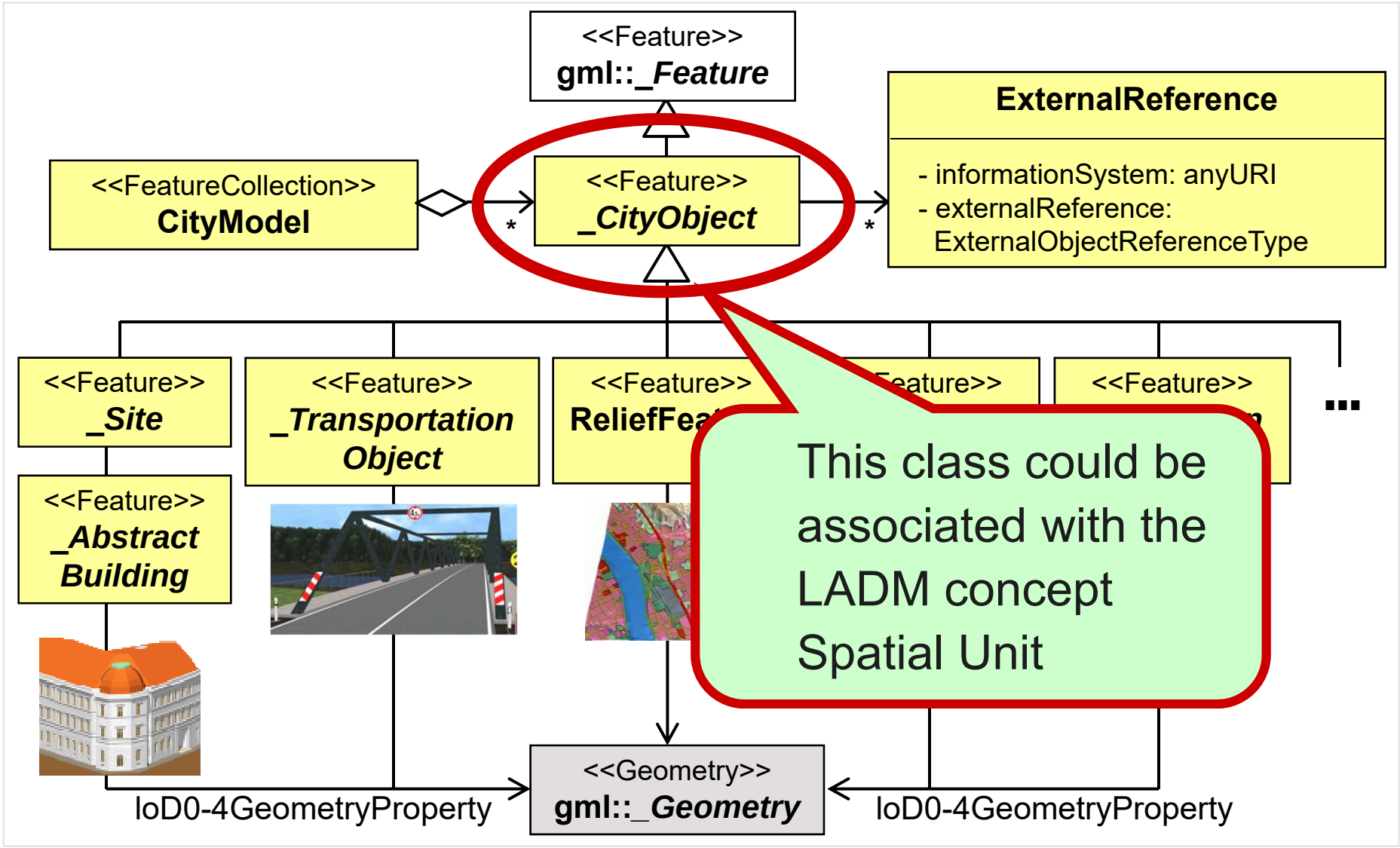
CityGML represents

- 3D geometry, 3D topology, semantics and appearance
- in 5 discrete scales (Levels of Detail, LOD)

CityGML and LADM

- CityGML represents the (most relevant) topographic features **as built / with their actual shape**
  - semantic models in CityGML are decomposed along their thematic boundary surfaces – **these can be directly surveyed / observed**
  - geometry model of CityGML is Boundary Representation (BRep) with absolute world coordinates (which is managed / analysed well within GIS and Spatial DBMS)
- CityGML does not include concepts to express rights, restrictions, and responsibilities (RRR)
- **LADM** provides a strong modeling of RRR, but has a general / abstract model of **Spatial Units**
- hence, **LADM and CityGML are complementary**

Thematic Modelling in CityGML



CityGML and LADM

- One implementation of the (next) **LADM** conceptual model could be **as a CityGML Application Domain Extension**
  - this would allow to have a joint representation and exchange of the 3D topographic objects and the RRR's they are associated with
  - software systems that can handle CityGML ADE could directly handle CityGML together with LADM
  - *SpatialUnit* could become an ADE Extension Class for *CityObject* → all CityGML feature types will inherit the properties of SU
  - of course, a CityGML LADM ADE would not be the only implementation of the (next) LADM conceptual model
- Technical Aspects / useful CityGML concepts
  - Mechanism for Systematic Extensions: CityGML Application Domain Extensions (ADEs)
  - New in (upcoming) CityGML 3.0: Historization and Versioning

Questions

- Is the ISO LADM Standard considered an Abstract Specification or is it a conceptual model with an implementation of an exchange format?
- If it is not considered an Abstract Specification, it should become one
  - then, it can be realized (and become part) of the different international and national geospatial modeling standards
  - the “LADM as a CityGML ADE“ approach would fall into this category