Separate the Conceptual Model from the CityGML Encoding

CityGML Workshop, 20-21 June 2013 – Thread: Extension of CityGML by new Objects

Carl Stephen Smyth (Open Site Plan)

Abstract:
Definition of the CityGML conceptual model is shared between a set of XML Schema Language (XSD) files and UML model diagrams. The superiority of one or the other of the XSD and XML definitions is not clear and some adopters of CityGML have picked one as fundamental and some have chosen the other. A strong argument can be made that there should be one fundamental definition, that it should not be XSD, incorporating GML and other external schemata, and that there are significant advantages to a separation of the conceptual model from its realization in specific encodings.

Argument in favor of a separation:

1. There should be a single “root”, “parent”, or “base” conceptual “CityModel” definition because the existence of multiple definitions, even if believed to be equivalent, will always have differences in practice and lead to problems with interoperability and market confusion.
2. The primary problem with XSD as a definition of the CityModel arises when references are made to external schemata, and those schemata have types and relationships that are not essential to CityModel. These non-essential parts contaminate the definition with extraneous information. This extraneous information cannot be ignored because there is no mechanism to prune branches of an external schema. The secondary problem is that reliance on a definition that is not encoding-neutral makes definition and implementation of alternate encodings difficult or impossible.
3. There are many practical advantages for development of additional encodings beyond GML, including the new OGC GeoPackage and JSON/GeoJSON. The former is usable as a runtime format for incident and disaster response, and the latter as a web-friendly delivery format. Opening up these and other possibilities for multiple encodings would enhance both the market appeal and the breadth of use of the CityGML conceptual model.

Argument against a separation:
Beyond tradition, there are some technical issues in structuring the existing CityModel+Encoding specification in a way that enable separation of the conceptual model from details of the encoding.