Integration of Land Administration Domain Model with CityGML for 3D Cadastre

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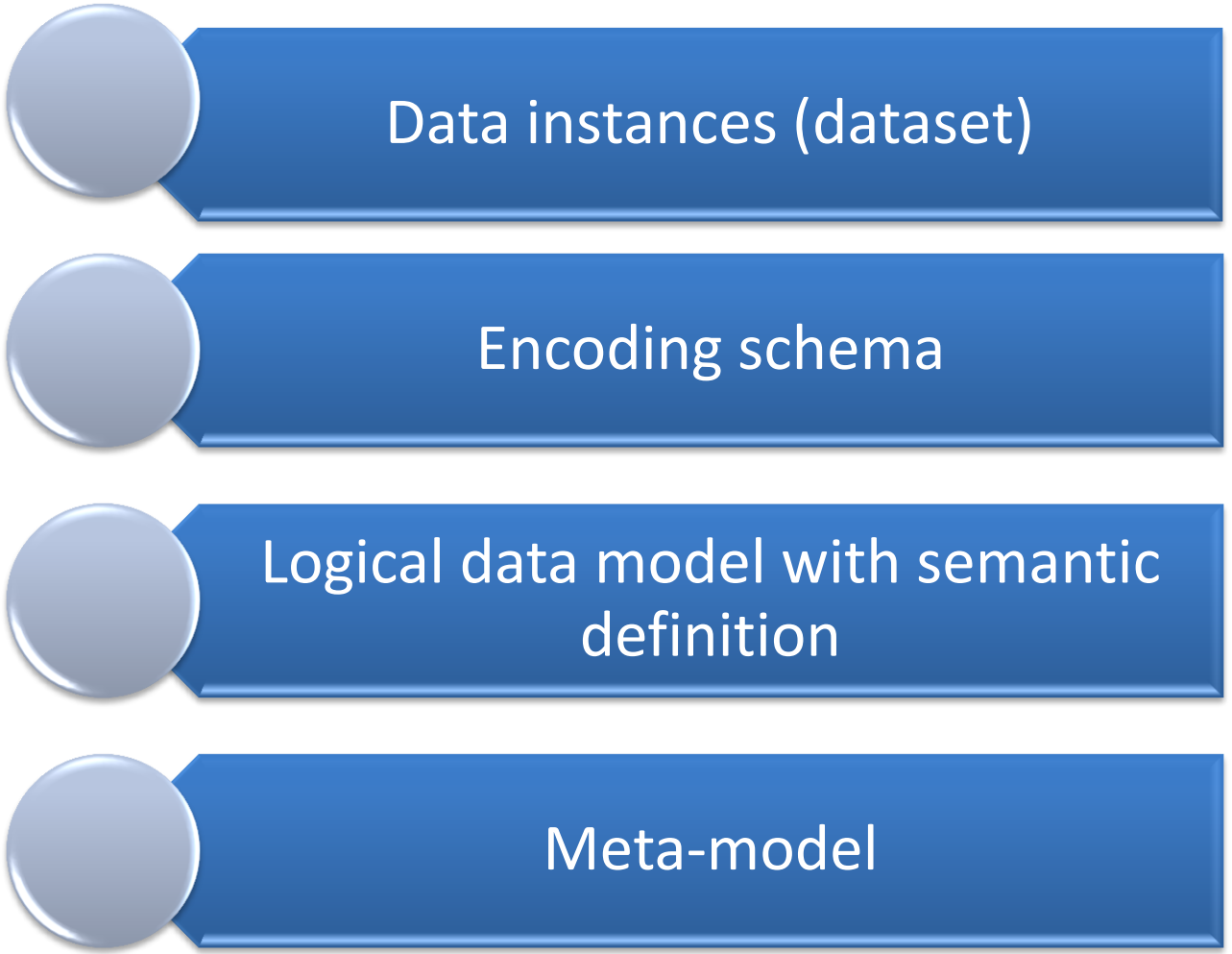
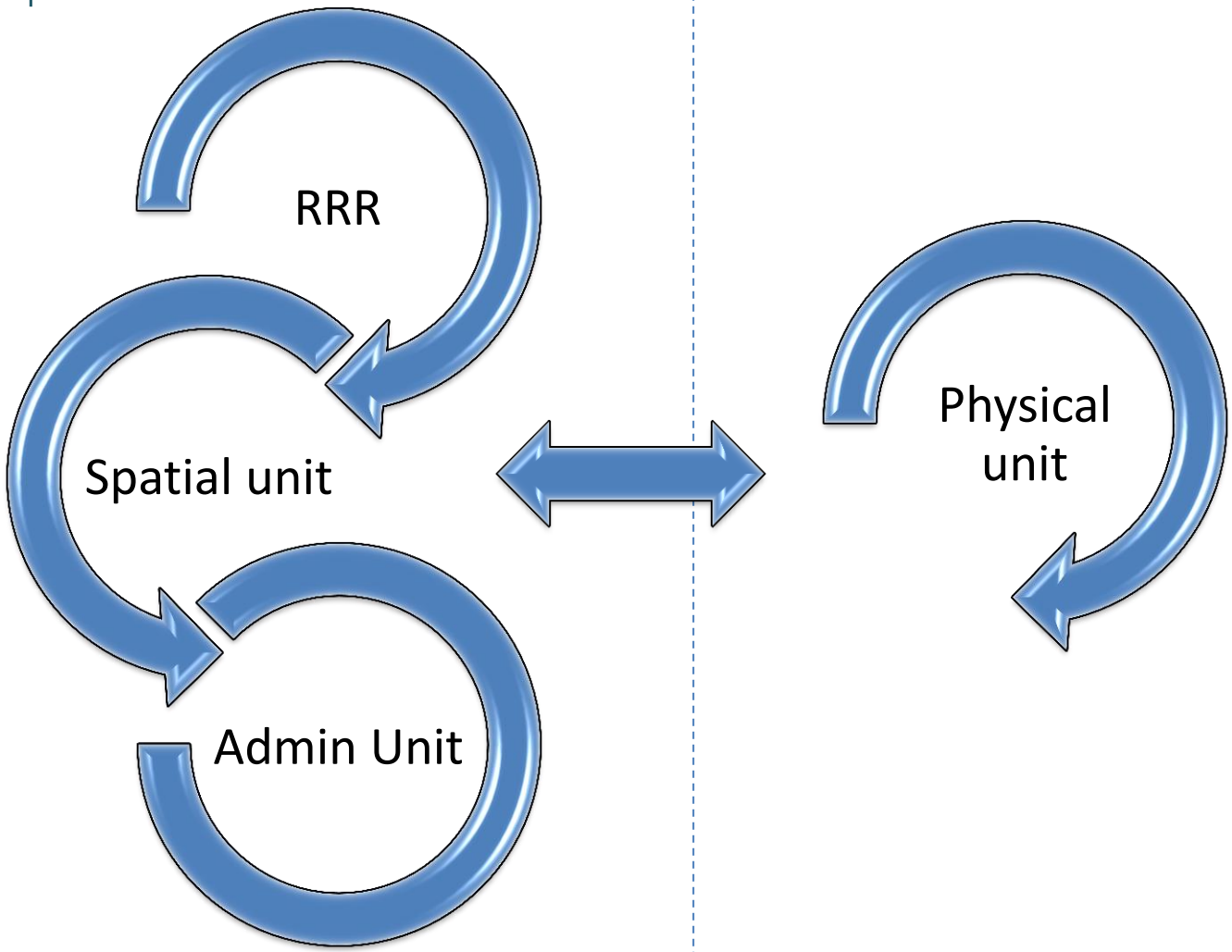
Ordnance Survey

Levels of abstraction



LADM—legal spaces



Metamodel

LADM classes to consider

- **LA_SpatialUnit**: base class for spatial representations. LADM explicitly allows volumetric spatial representations in 3D.
- **LA_LegalSpaceBuildingUnit**: A specialisation of LA_SpatialUnit to link legal spaces to physical ones. This is useful to describe legal spaces within a building which coincide with the physical space of the building or parts of it.
- **LA_SpatialUnitGroup**: grouping of SpatialUnit instances allowing hierarchies (for example parcels into registration areas into parishes into districts into counties).
- **LA_BAUnit**: An administrative unit that can be represented by spatial units.
- **LA_RRR** is used to describe Right, Restriction, Responsibility to give meaning to a BAUnit which is represented by a spatial unit.

CityGML—physical spaces

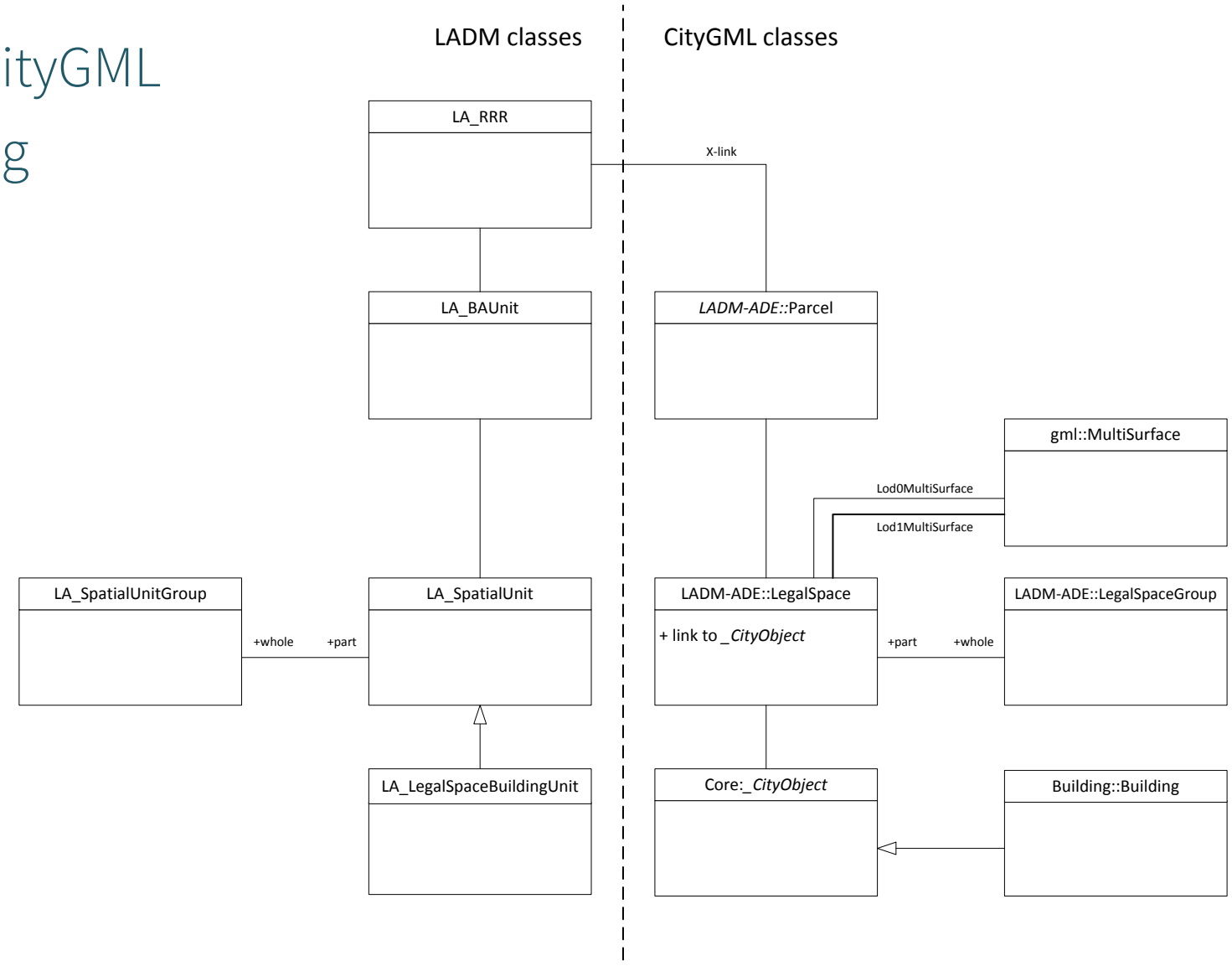
Data model and GML encoding

Graphic by Filip Biljecki, TU Delft

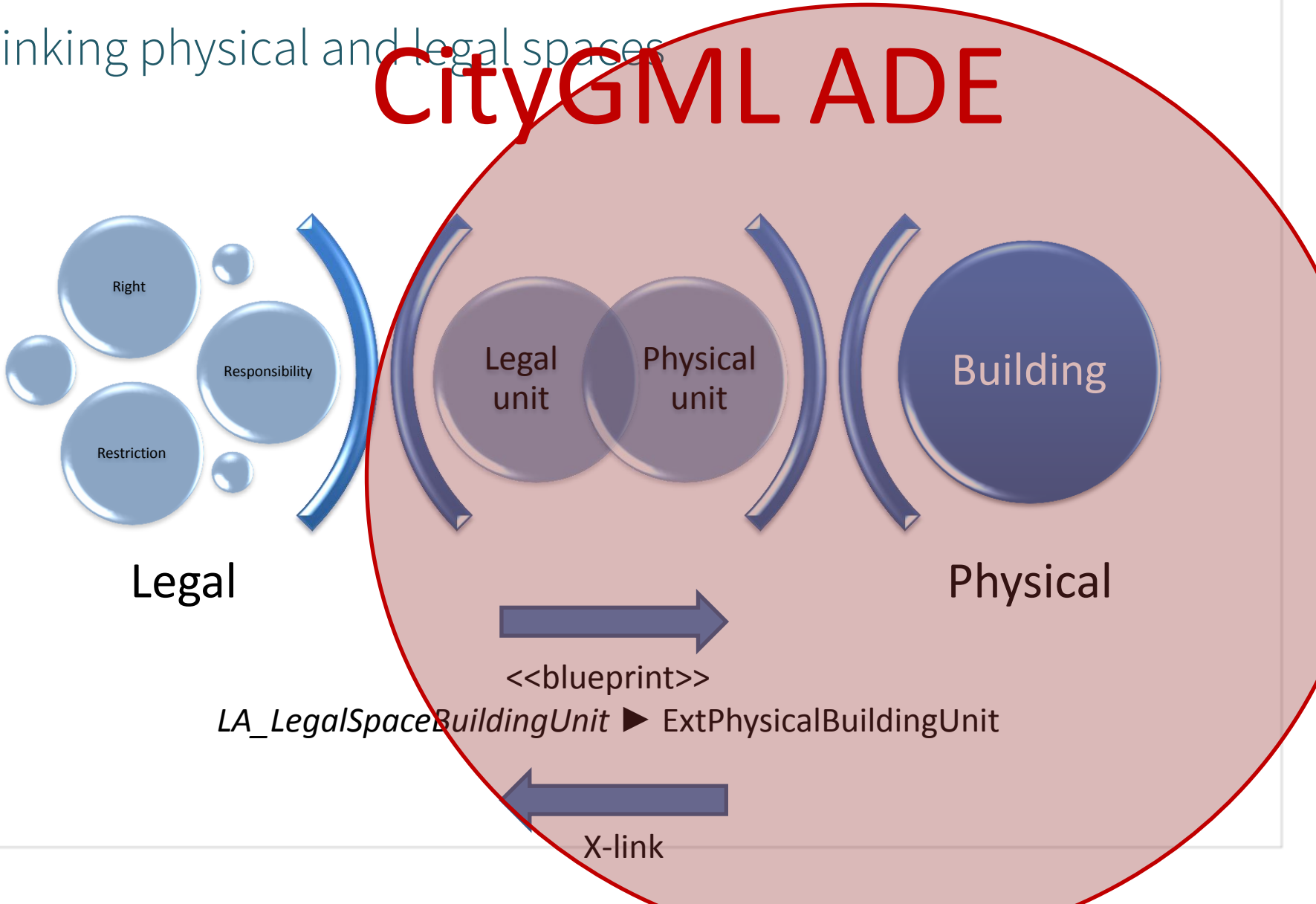
CityGML classes to consider

- Building / BuildingPart: Representation of a physical building in different Levels of Detail.
- _*CityObject*: As the boundary of legal spaces may defined by or mered to any physical feature, all features with a physical representation in CityGML might be of relevance to express this relationship.
- Landuse: defines land areas of a particular use and could be used to represent parcels or ownership extends, though this would stretch the meaning of landuse beyond its general meaning and is not recommended.
- [ADEs -> i.e utilities]

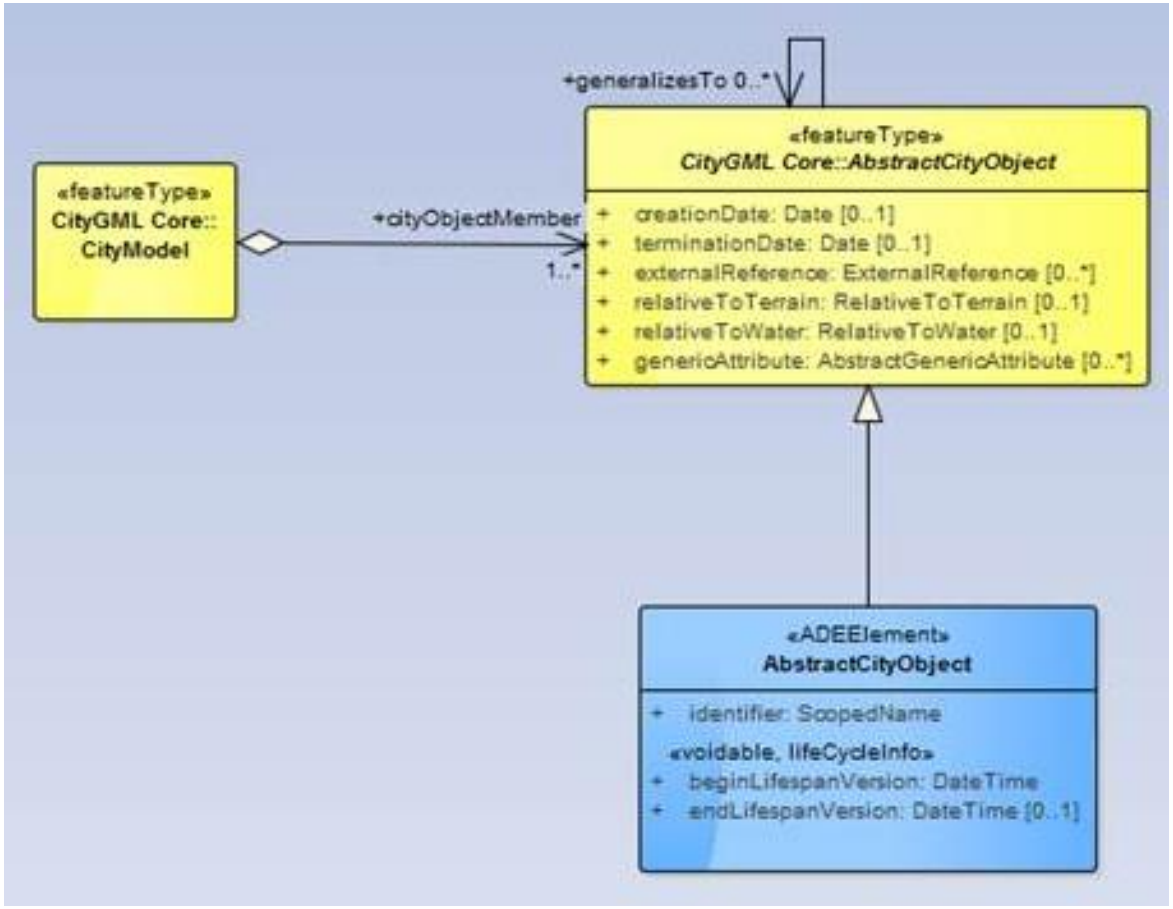
LADM-CityGML mapping



Linking physical and legal spaces



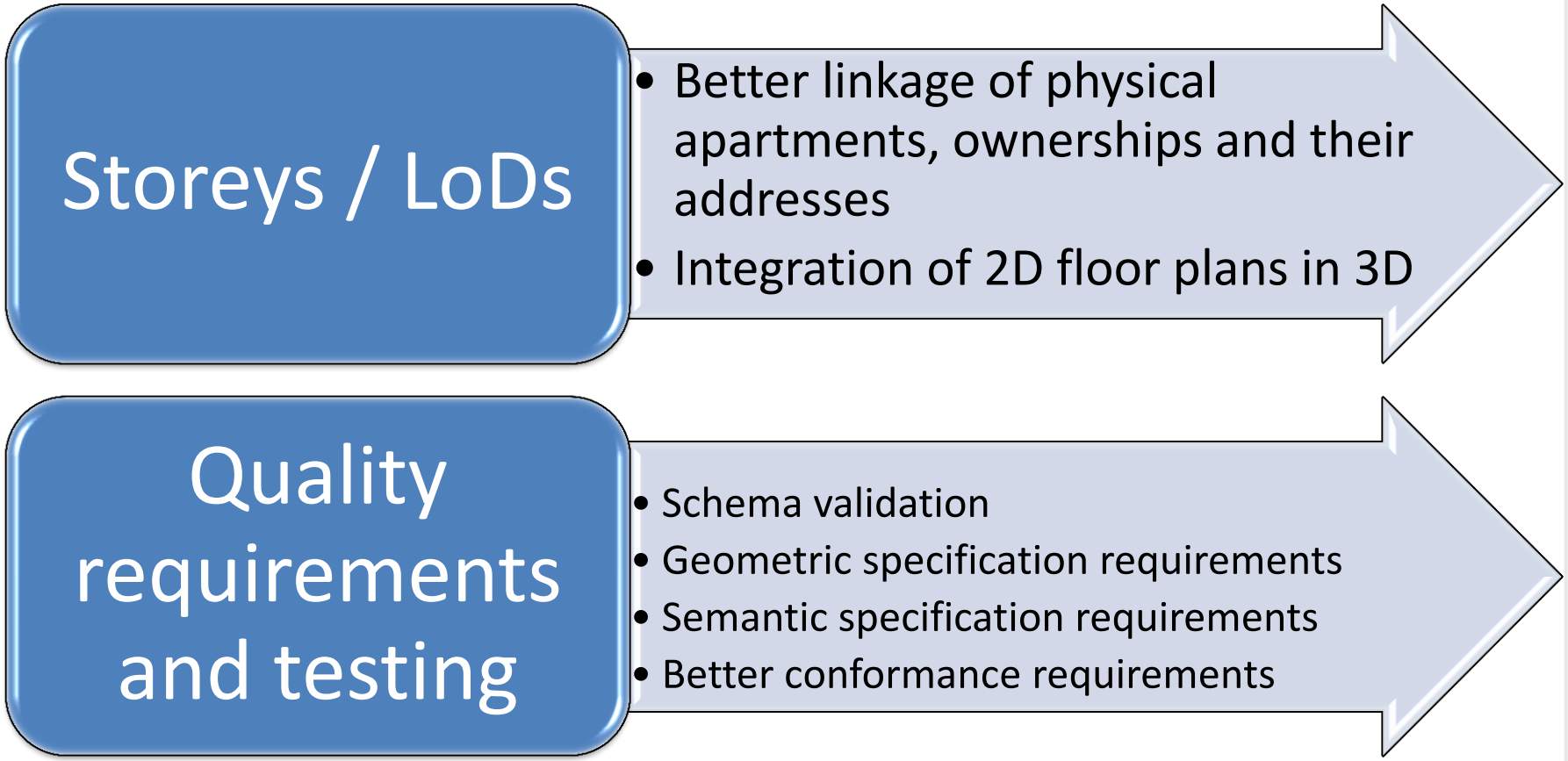
Data modelling: multiple inheritance



What is a smart city?

- Ubiquitous availability
  and exchange of information
- Technology to make life better, safer and more sustainable
- Public, private and voluntary sector together with citizens

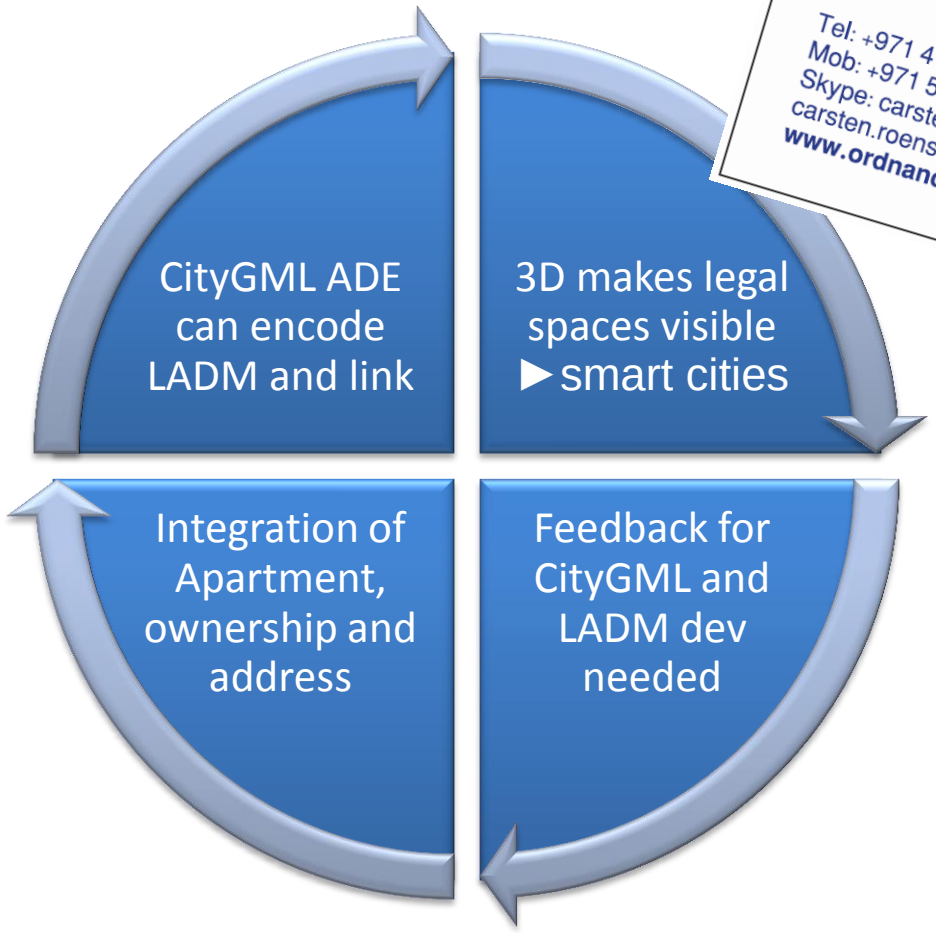
Planned next steps for CityGML



Ideas to integrate LADM and CityGML better

- Is there a need for this in the market?
- Is there a business case for cadastre in its own right?
- Informative annex in LADM:2017 on CityGML ADE encoding of one national/regional profile of LADM
- Informative annex in CityGML 3.0 (2015/16) on the how to create an ADE for LADM-profiles
- Could have a CityGML legal spaces module with abstract classes as hooks for further ADE development of legal spaces
- Experiment more with LoD0 expressions of existing legal spaces and cadastral data)

Conclusion


CityGML ADE can encode LADM and link
3D makes legal spaces visible ►smart cities
Integration of Apartment, ownership and address
Feedback for CityGML and LADM dev needed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