OGC IndoorGML
ISO LADM

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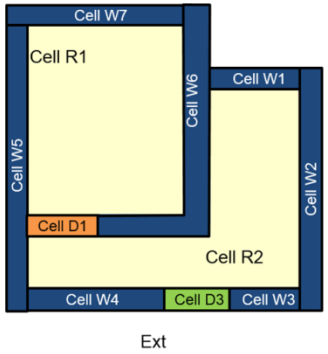
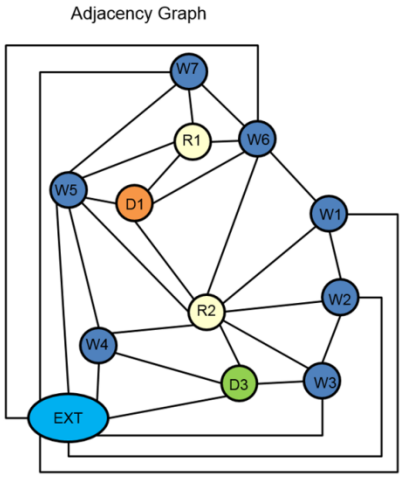
IndoorGML concept

- Cell is the most important unit
- Complete space subdivision
- Poincaré duality

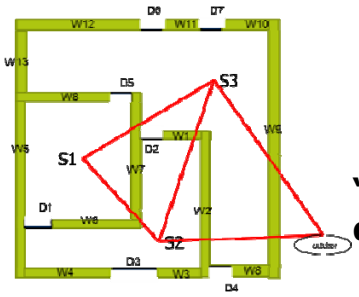


Primal Space

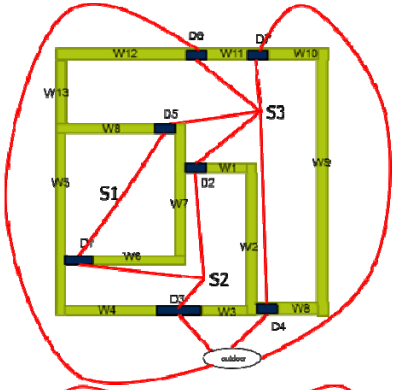


Dual Space

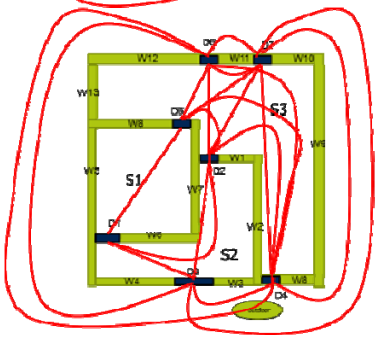
Green: primal space
Red: dual space



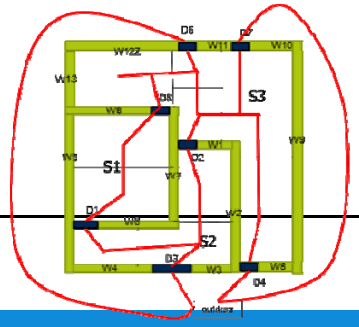
'Thin' door

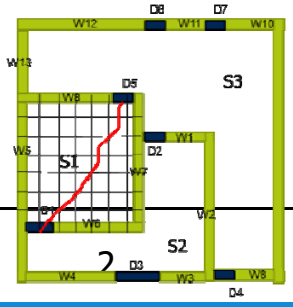


'Thick' door



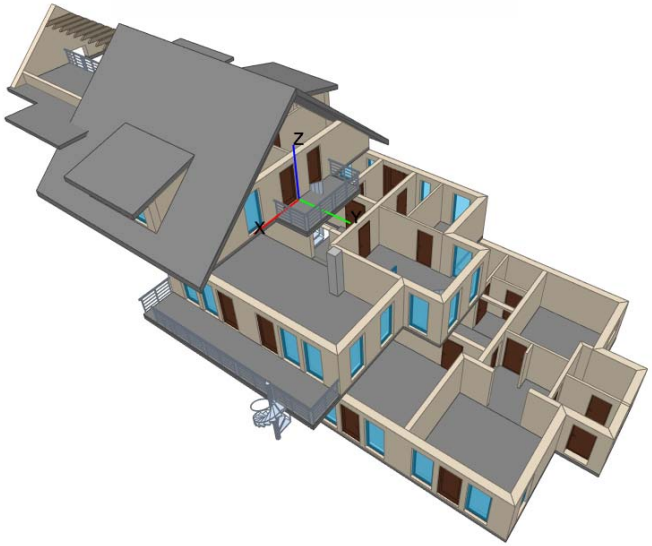
'Thin' room (visibility graph)



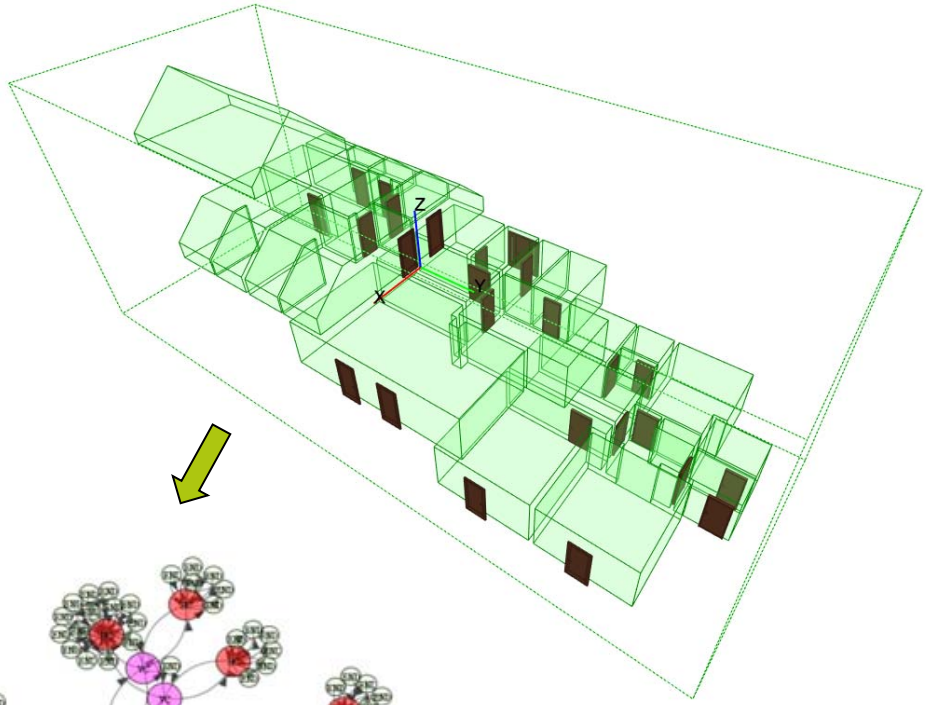


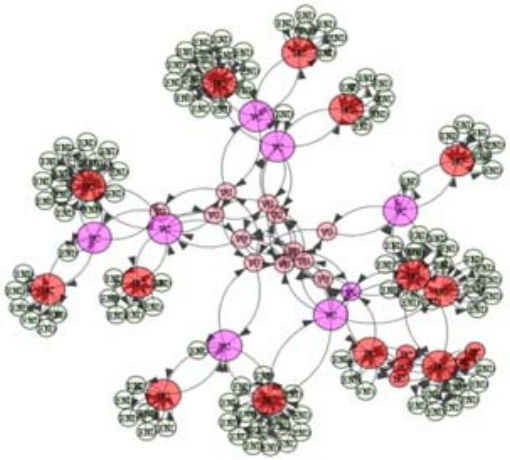
Space subdivisions

IndoorGML spaces



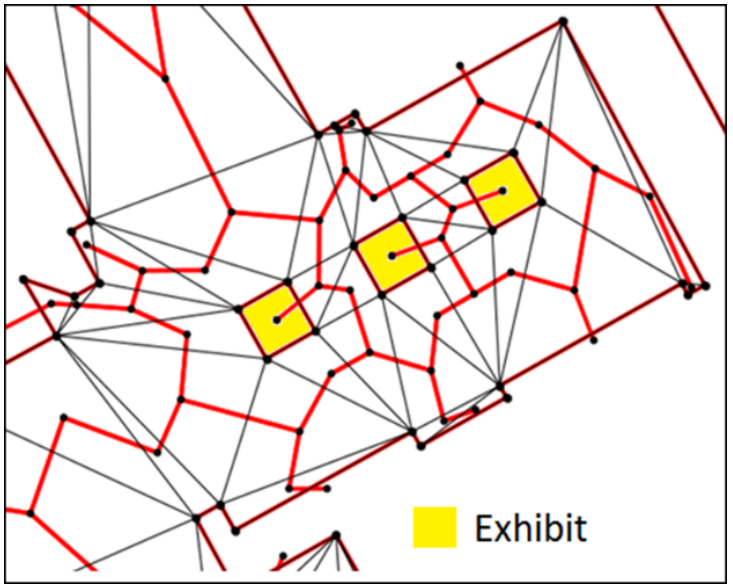
Primal space

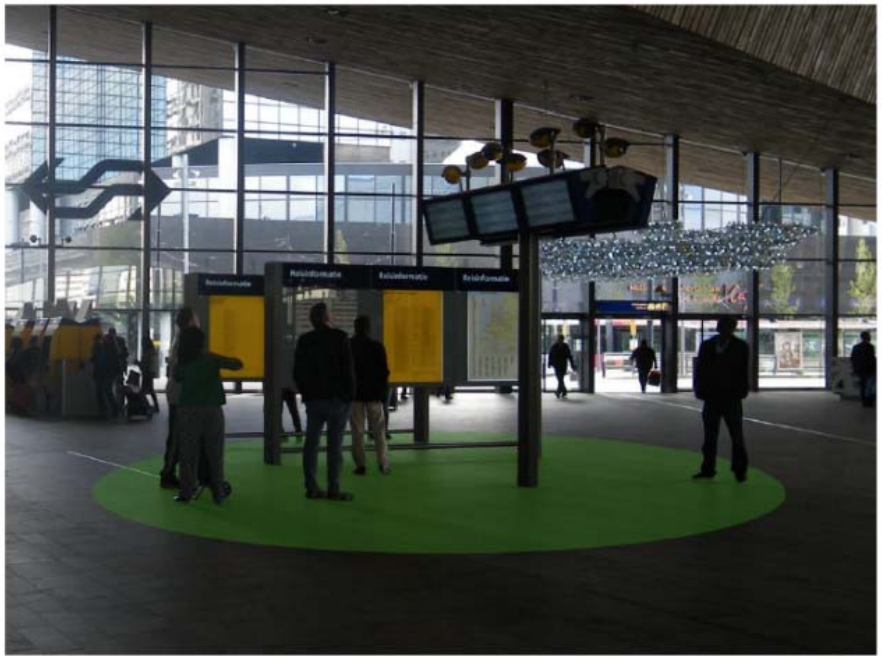


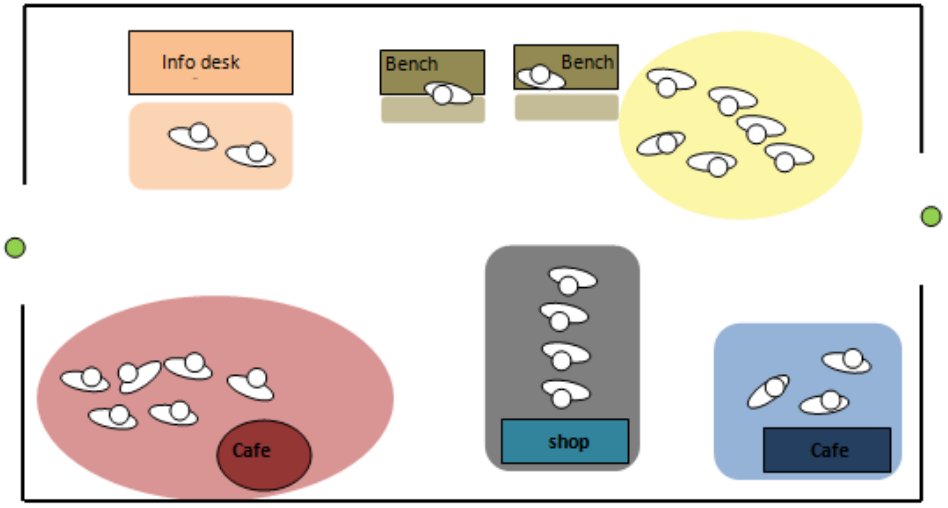


Dual Space

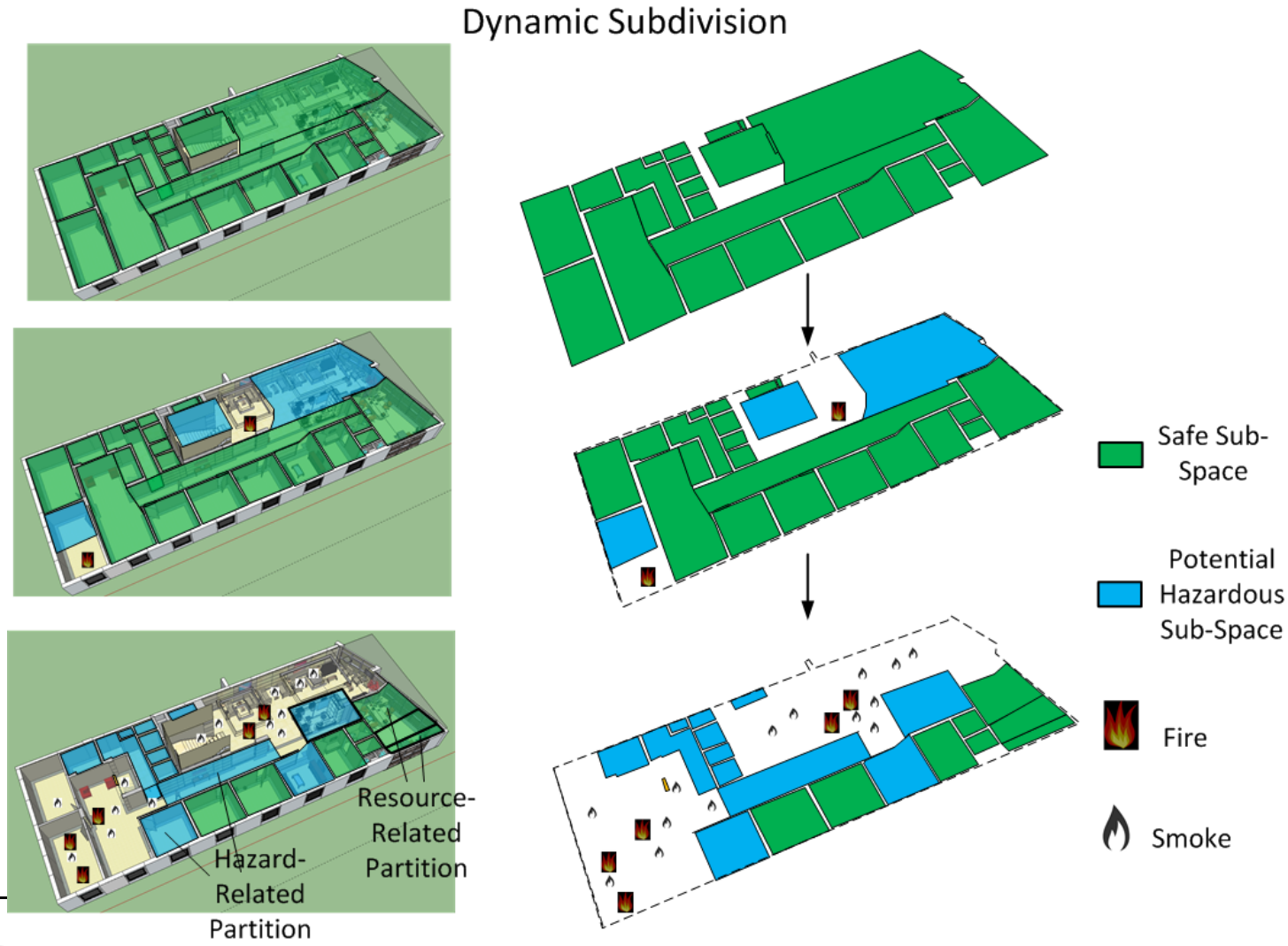
Subdivisions (1/2)







Subdivisions (2/2)



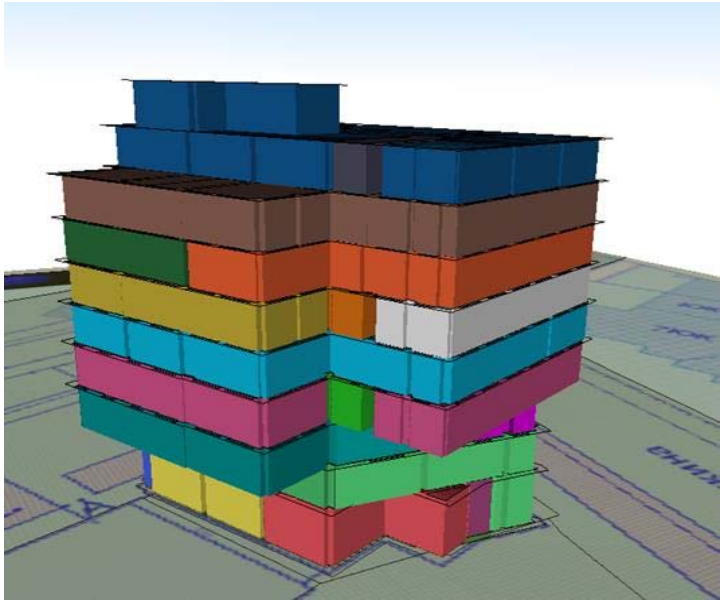
IndoorGML & LADM

Common concepts:

- It is possible to have virtual spaces
- Full subdivision of space (no gaps or overlaps)
- Physical space can be subdivided or united
- Spatial component (polygon, solid)

Differences

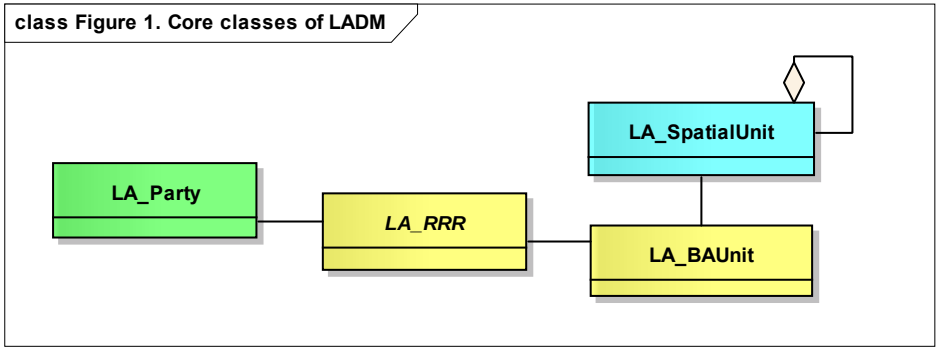
- LADM
  - indoor/outdoor
  - Space can be unbounded
  - Line and point spatial units can exist
  - Classes very elaborated
- IndoorGML
  - (Currently) Indoor
  - Spaces are intended to create network
  - Limited set of classes for the topographic model



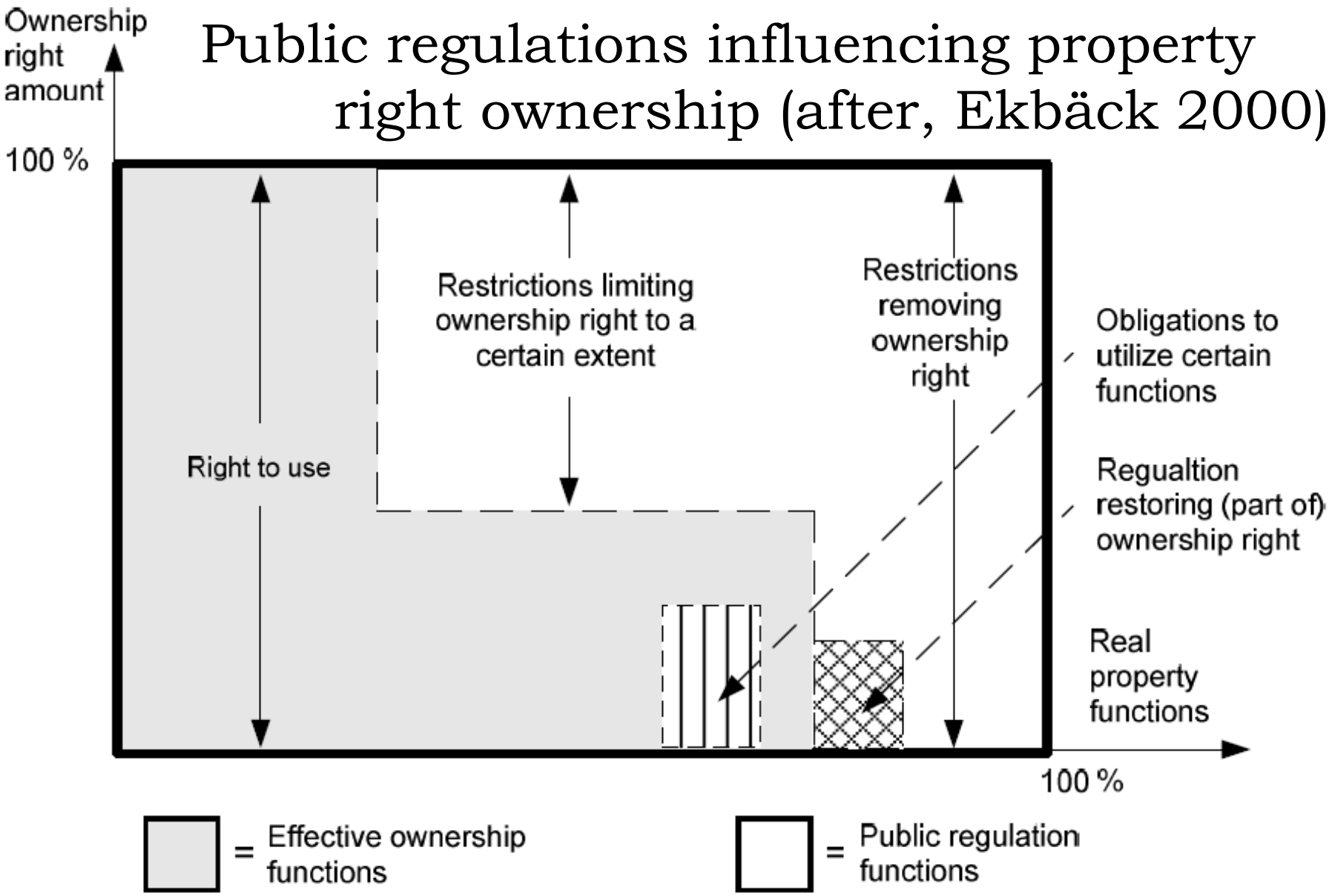
LADM

- LA_Party Peter has LA_RRR ownership on LA_BAUnit Peter's estate consisting of 2 LA_SpatialUnit parcels (with same LA_RRR)

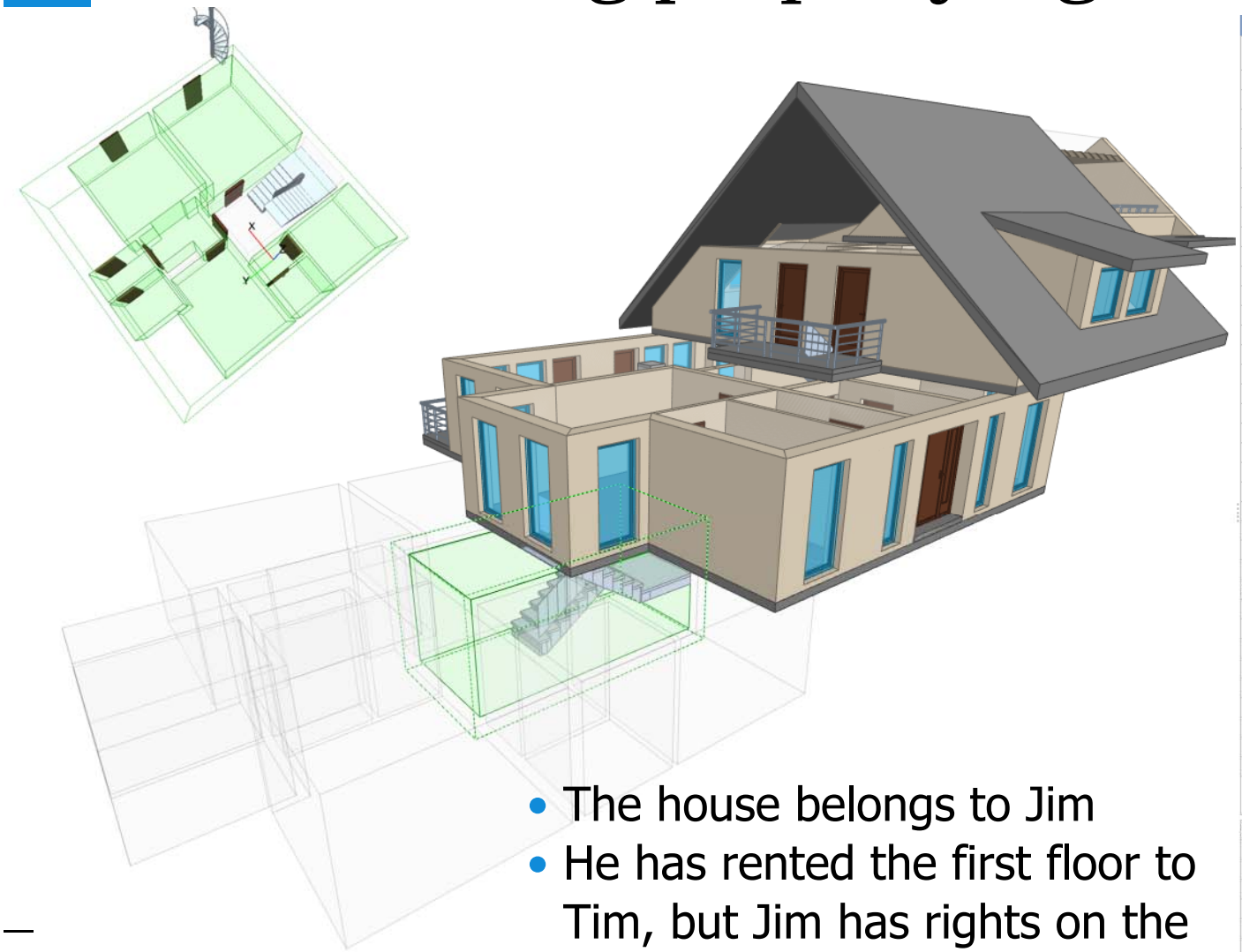
- LA_Party is a person or institution with rights
- LA_BAUnit stands for Basic Administrative Unit
- LA_RRR stands for Right Restriction Responsibility
- LA_SpatialUnit stand for the physical (spatial) representation



Public regulations influencing property right ownership (after, Ekbäck 2000)



Considering property rights



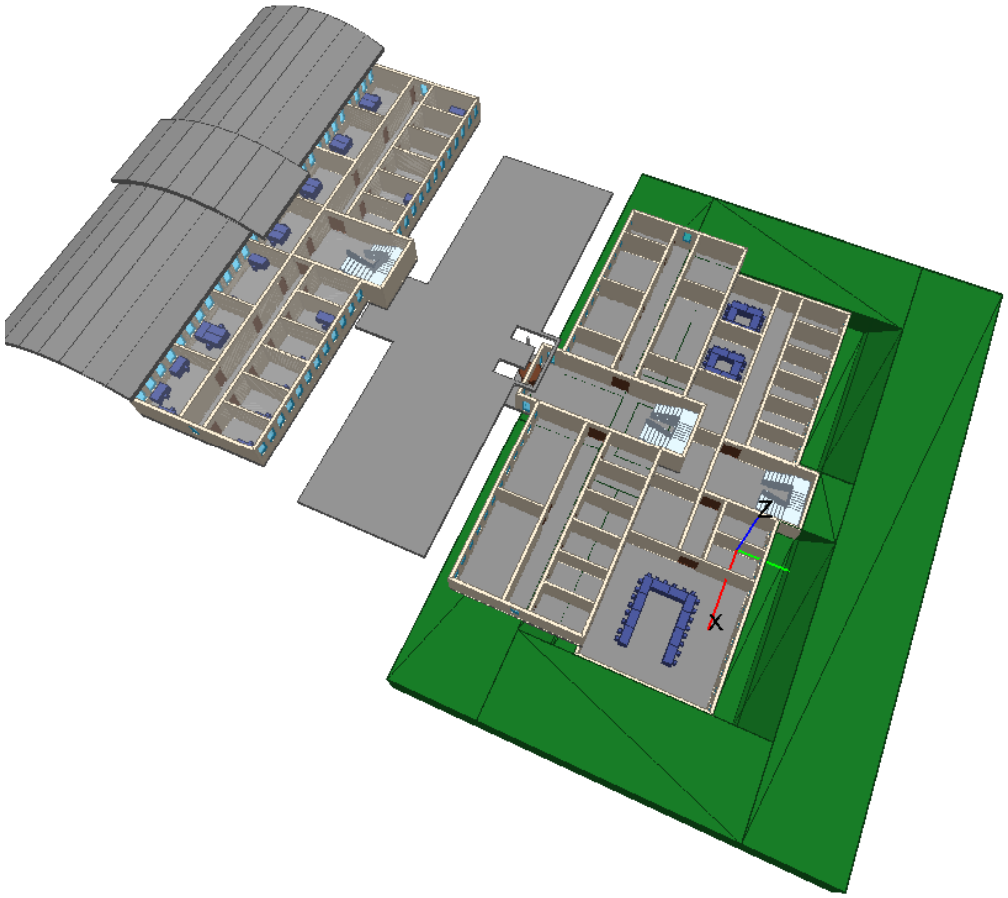
IFC Structure

Active	Type	Name	Description
☑	Project	Default Project	
☑	Building	Default Building	
☐	Building Storey	Keller	
☐	Walls		
☐	Windows		
☐	Doors		
☑	Stairs		
☑	Stair		
☑	Stair		
☐	Slabs		
☐	Slab	Kellerboden	
☐	Slab	Estrich K-10	
☐	Slab	Estrich K-9	
☐	Slab	Estrich K-8	
☐	Slab	Estrich K-3	
☐	Slab	Estrich K-2	
☐	Slab	Estrich K-1	
☐	Slab	Estrich K-11	
☐	Slab	Estrich K-6	
☐	Slab	Estrich K-7	
☐	Slab	Estrich K-4	
☑	Spaces		
☑	Space	K-3	Schlafen
☑	Space	K-9	Dusche
☑	Space	K-8	Flur-3
☑	Space	K-10	Heizung
√ ☑	Space	K-7	Flur-2
☑	Space	K-6	Keller
☑	Space	K-5	Flur-1
☑	Space	K-2	Bad
☑	Space	K-1	Windfang
☑	Space	K-4	Wohnen
☑	Space	K-11	Abstell
☑	Building Storey	Erdgeschoss	
☑	Building Storey	Obergeschoss	
☑	Building Storey	Dachgeschoss	

Name	Value
horizontal area	14.209
volume	35.877759
DC_ElementSpecific	
InteriorOrExteriorSpace	INTERNAL
LongName	Flur-2
PSet_Draughting	
Layername	Keller-Raeume

- The house belongs to Jim
- He has rented the first floor to Tim, but Jim has rights on the stairs

Considering property resprictions



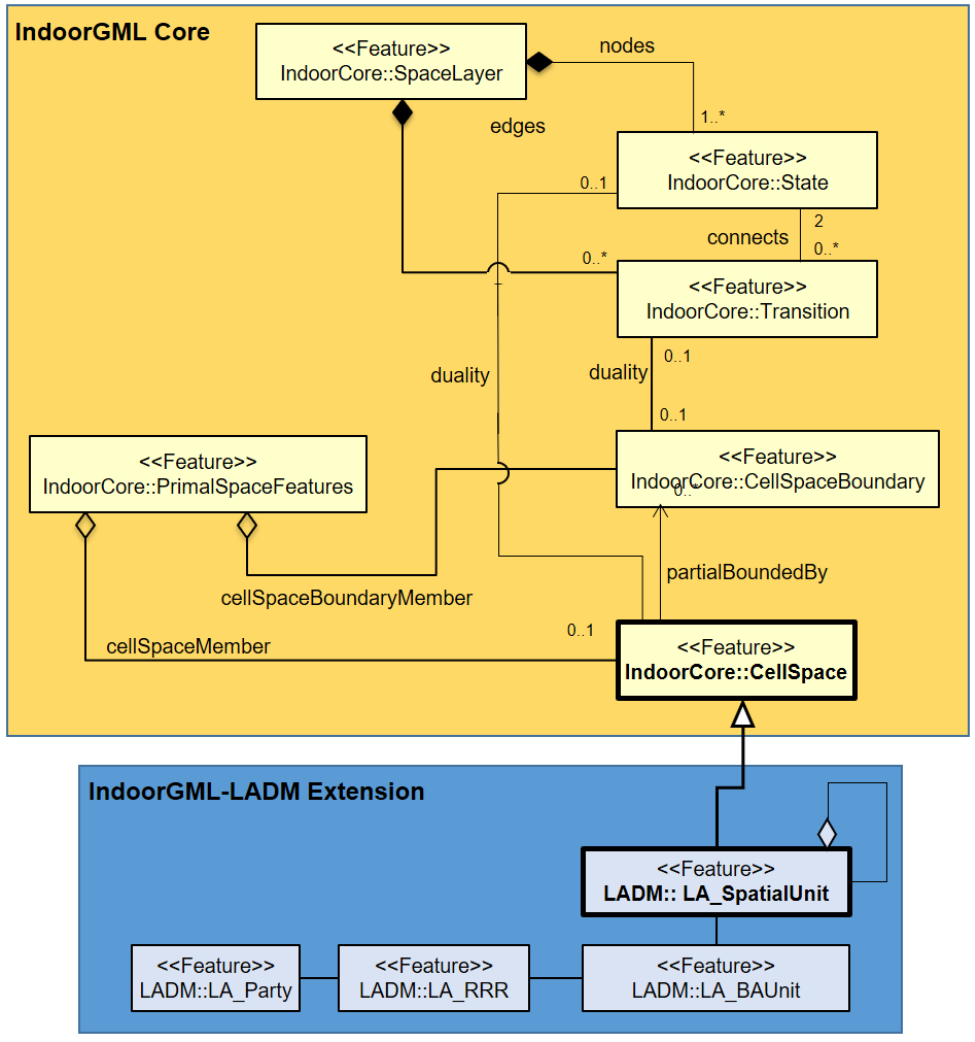
☑	Site		
☑	Building	Buerogebaeude	No real Building
☑	Building Storey	Keller	Basement
☑	Building Storey	Erdgeschoss	Ground Level
☑	Building Storey	1. Obergeschoss	1. Level
☐	Walls		
☐	Windows		
☐	Doors		
☐	Stairs		
☑	Slabs		
☐	Spaces		
☐	Furniture		
☑	Building Storey	2. Obergeschoss	2. Level
☑	Building Storey	Dachgeschoss	Roof Level
☑	Subsoil	Gelaende 0815	No real site

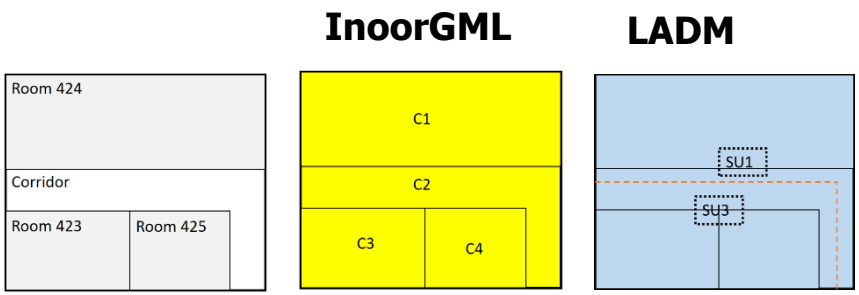
Name	Value
No properties	

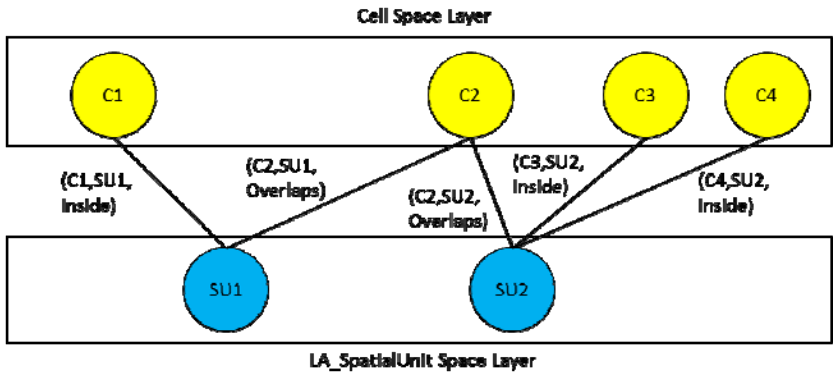
Cases

- Shopping malls: visitors, employees of the specific shop, maintenance/cleaning services only.
- Railway and metro stations: all users, platforms avaible only for passengers, metro tunnels avaible only for train personnel, ticket service area avaible only for clerks selling the tickets, etc.
- Museums: visitors, storage halls used only by exhibitors, administration areas, restauration areas, available only for experts.
- Airports: visitors, check-in area for travelers, passport control accessible for checked-in travelers, waiting/shopping areas, boarding gates, transit areas, 'international space' ('no men's land'), and so on.
- Hospitals: common access areas, sections for examination patients, areas for hospitalized patients, surgery, laboratories, storage of medical equipment, etc.

IndoorGML & LADM







Next steps

- What property and rights influence the navigation?
  - Restrictions and responsibilities for users of indoor environment
  - Restrictions and responsibilities for maintenance of indoor environment
- Where the indoor stops? What happens with space above terraces for example?
- Define geometrically Rights and Responsibilities and derive networks
- Maintenance of datasets for administration purposes. Link to external databases with party data, address data, taxation data, land use data, valuation data, physical utility network data, and archive data. LADM provides stereotype classes for these data sets.

Thank you for listening