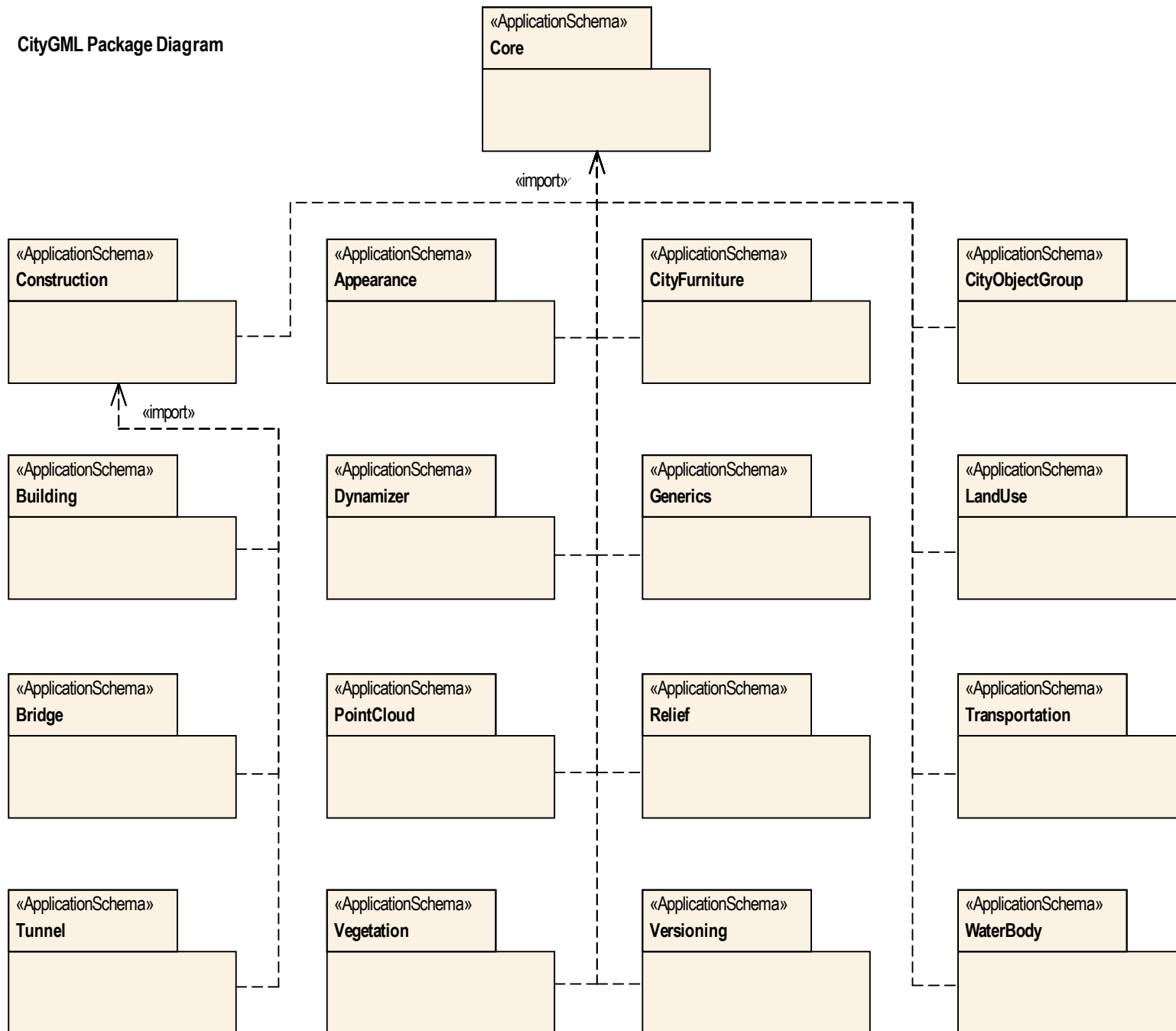
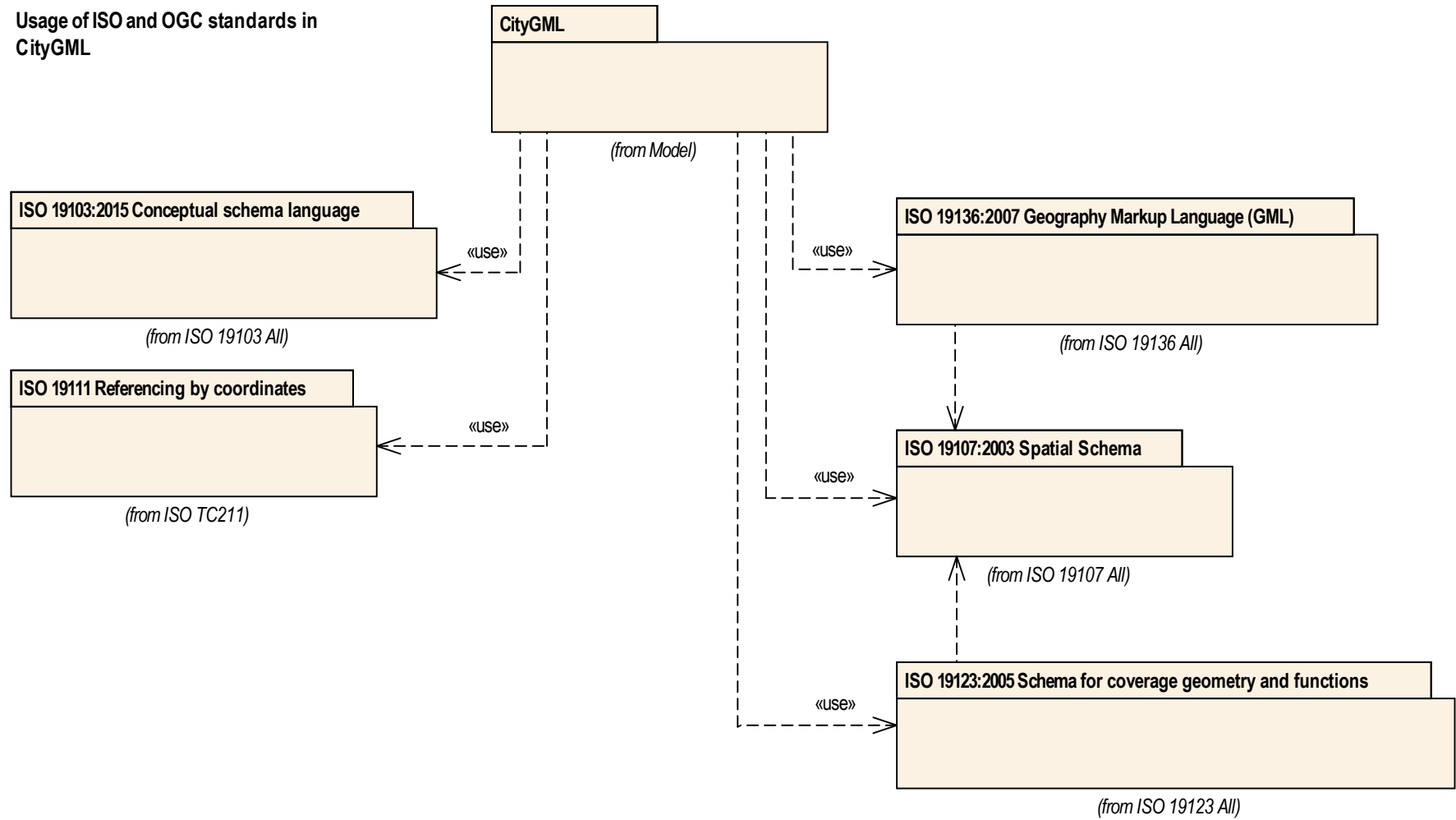


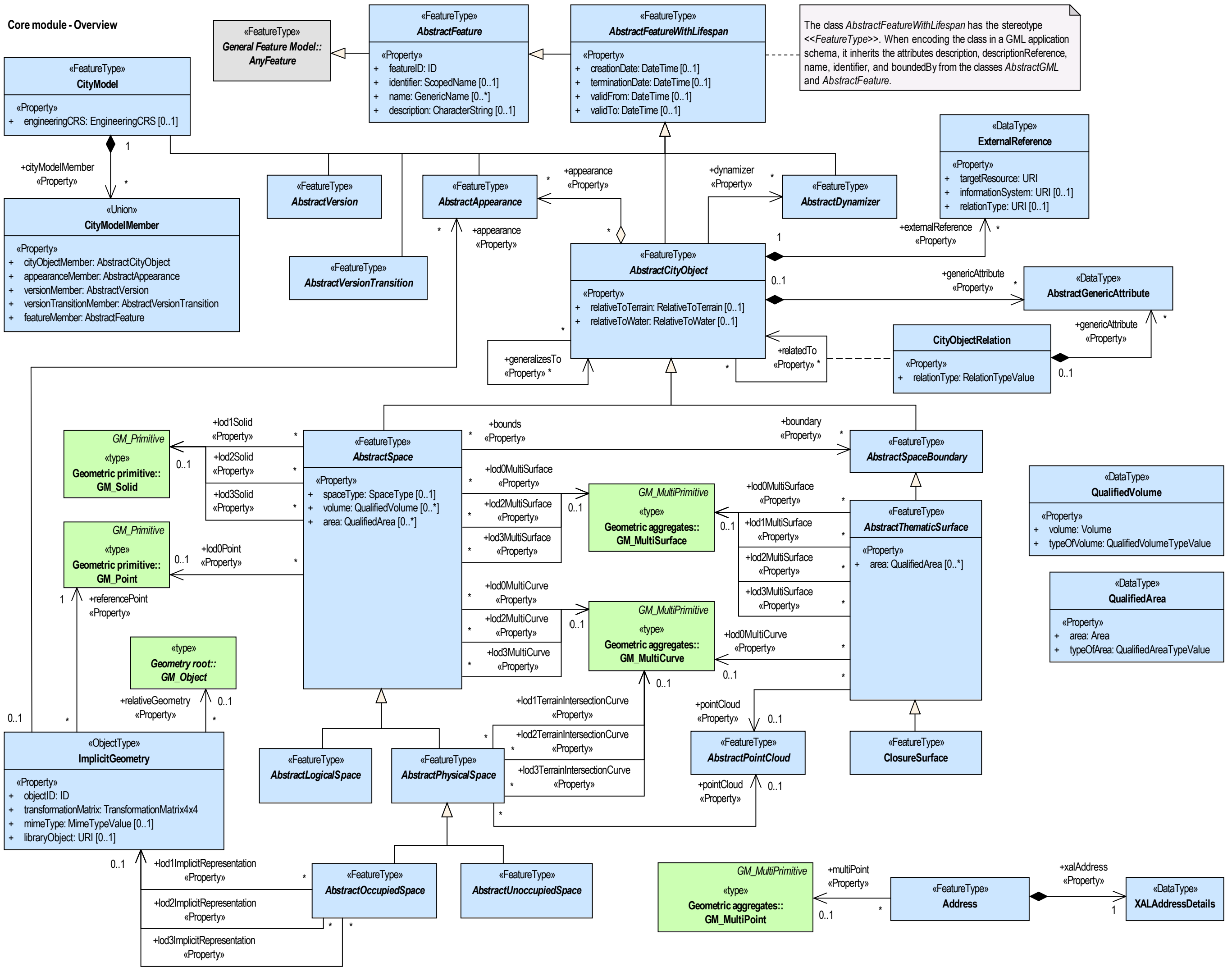
CityGML Package Diagram



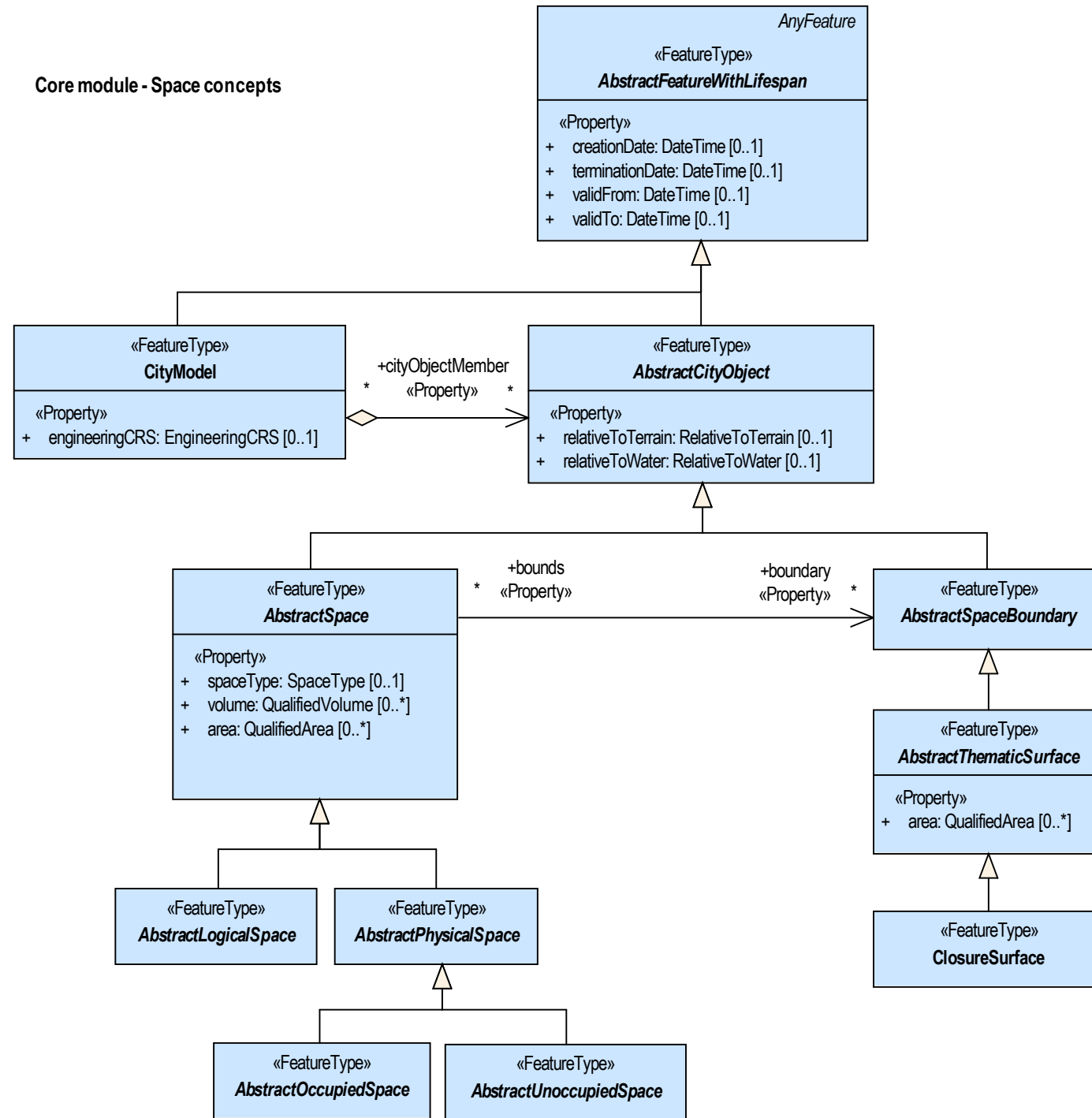
Usage of ISO and OGC standards in CityGML



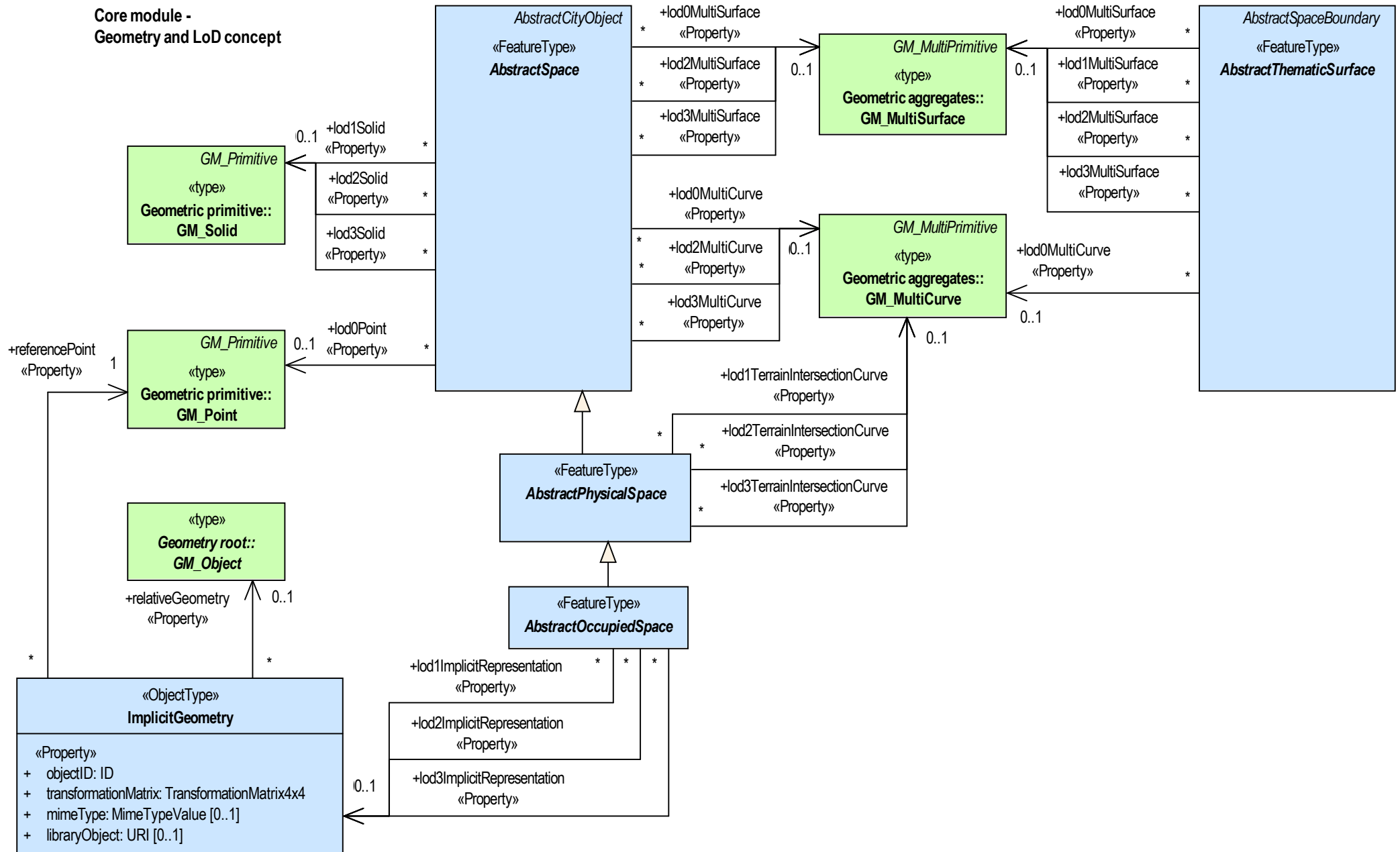
Core module - Overview



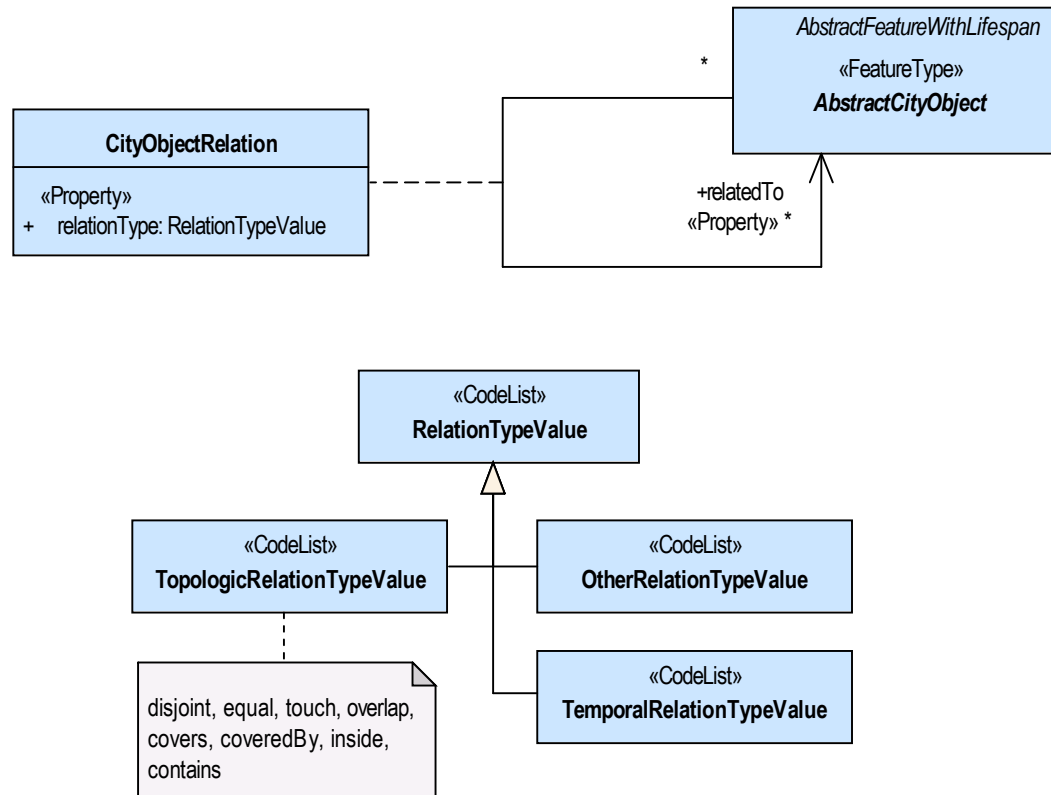
Core module - Space concepts



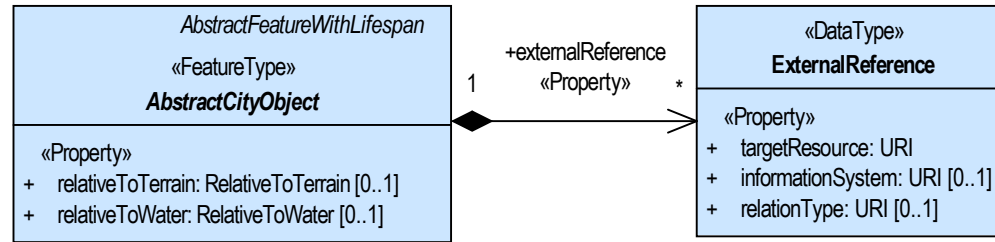
**Core module -
Geometry and LoD concept**



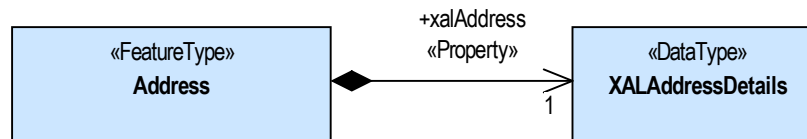
Core module - City object relations



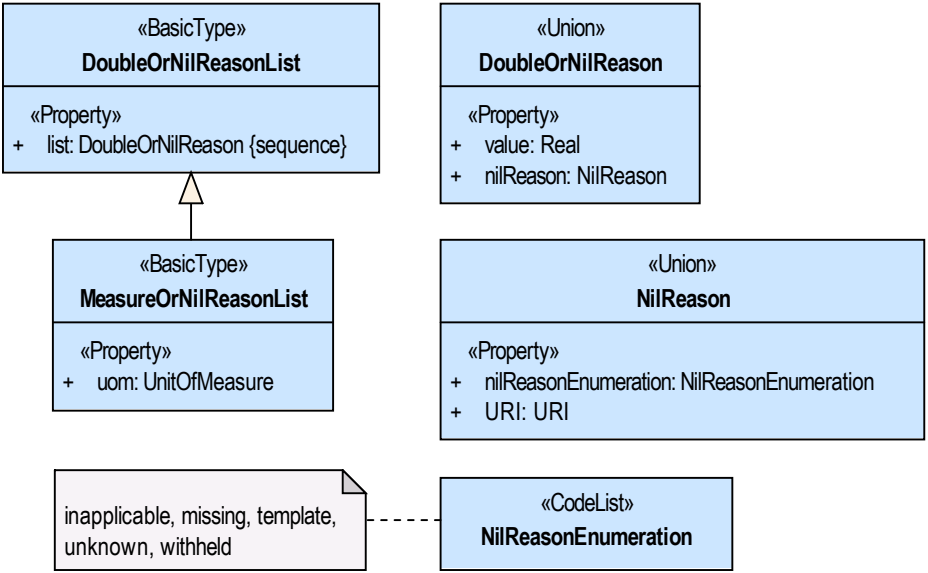
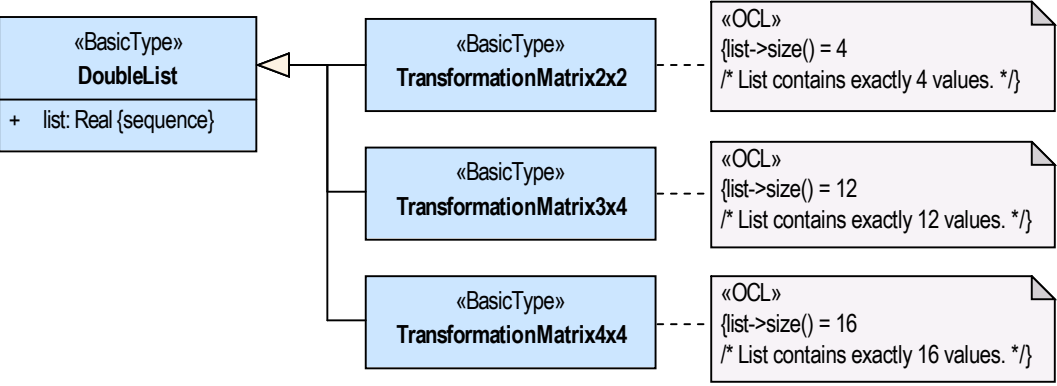
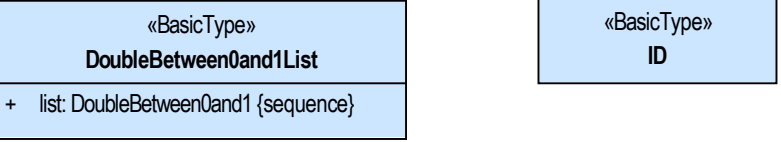
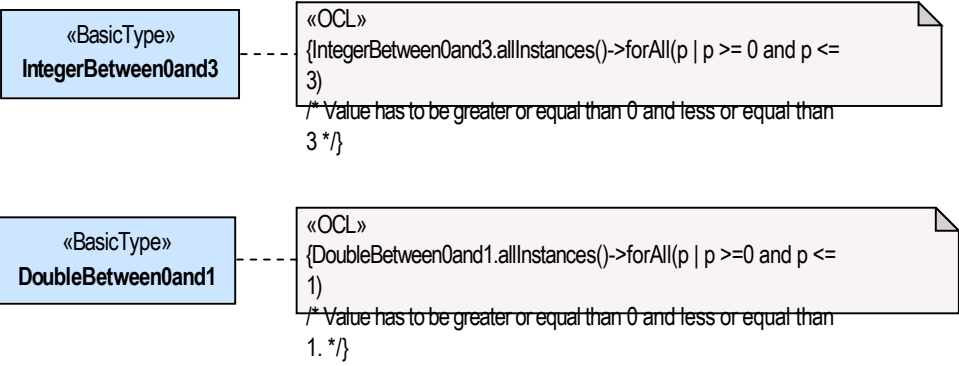
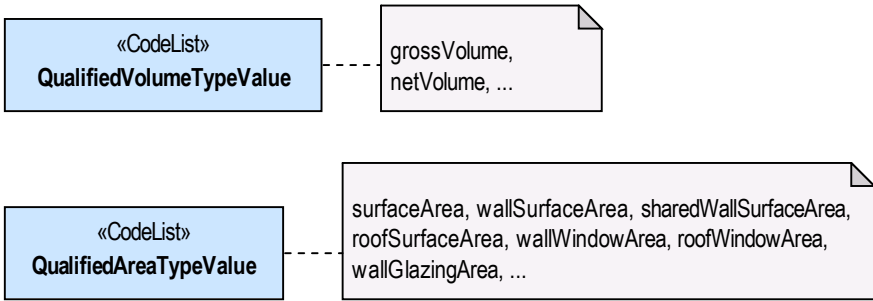
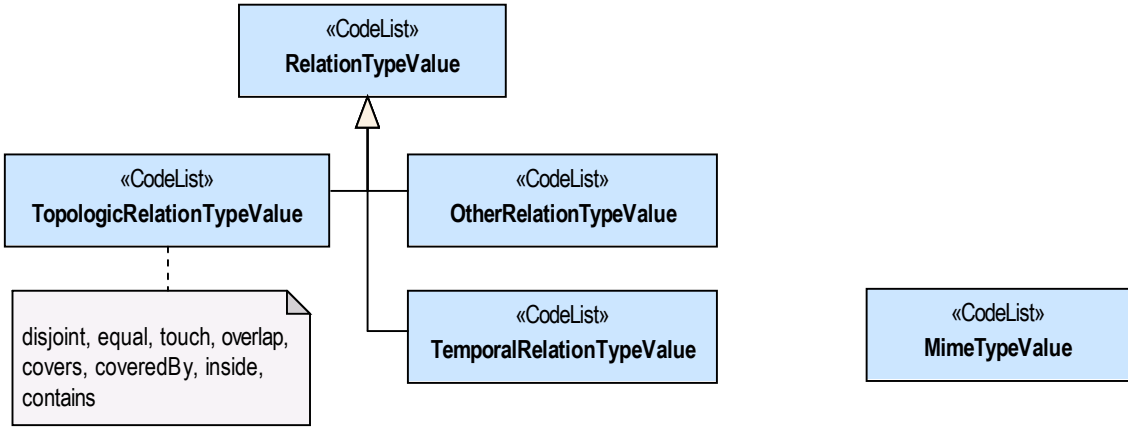
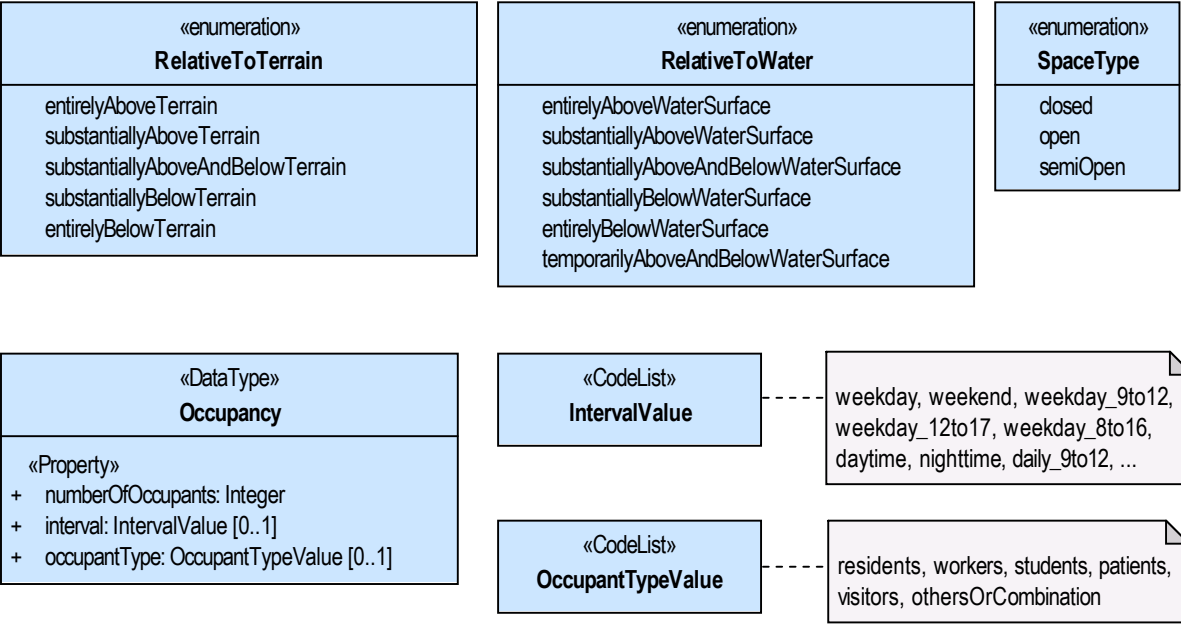
Core module - Miscellaneous

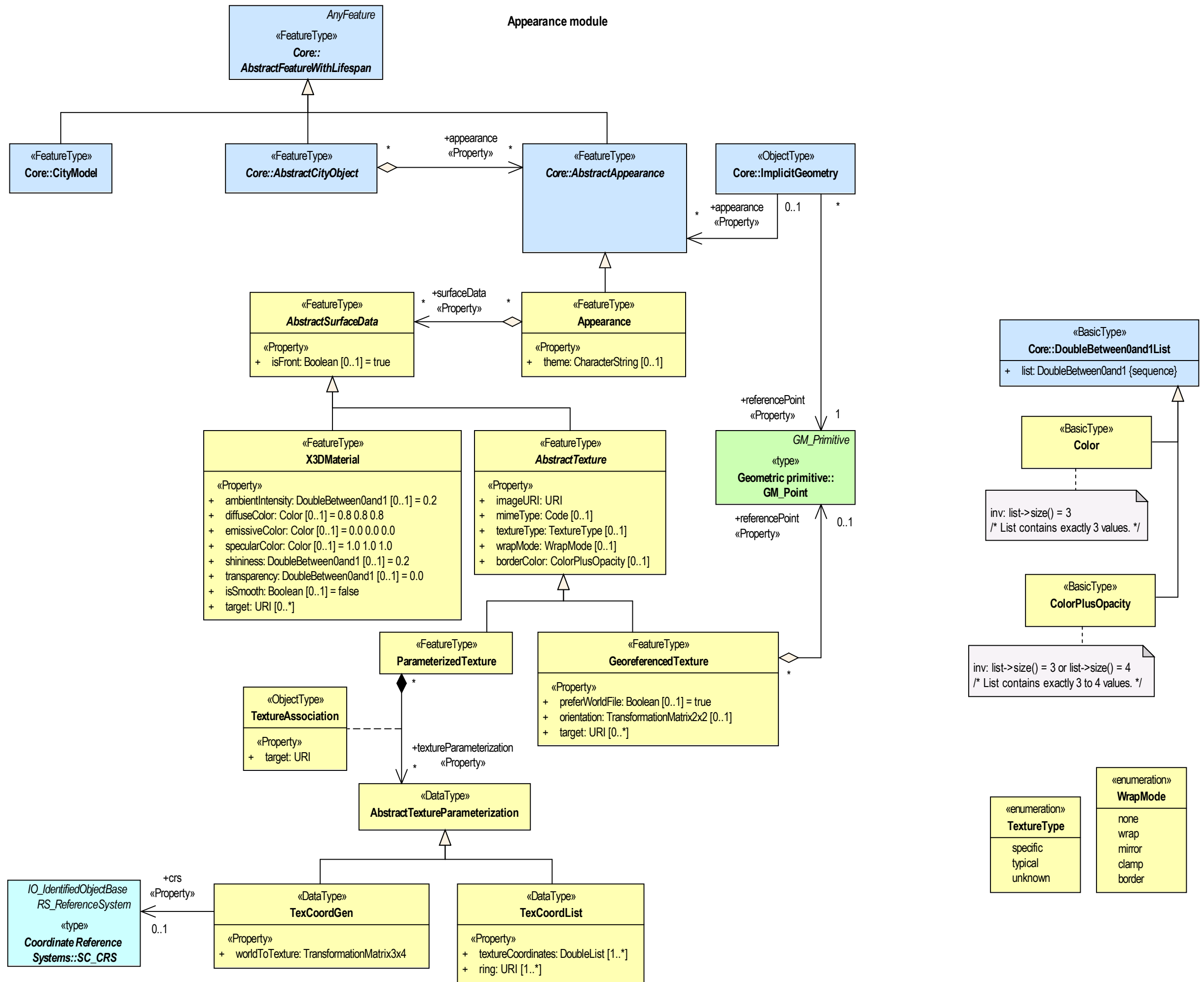


ExternalReference is now extended by an optional **relation Type** which can link to some external definition of the type of relation (e.g. the *sameAs* relation from OWL). Hence, **ExternalReferences** can now be used to express relations similar to RDF.

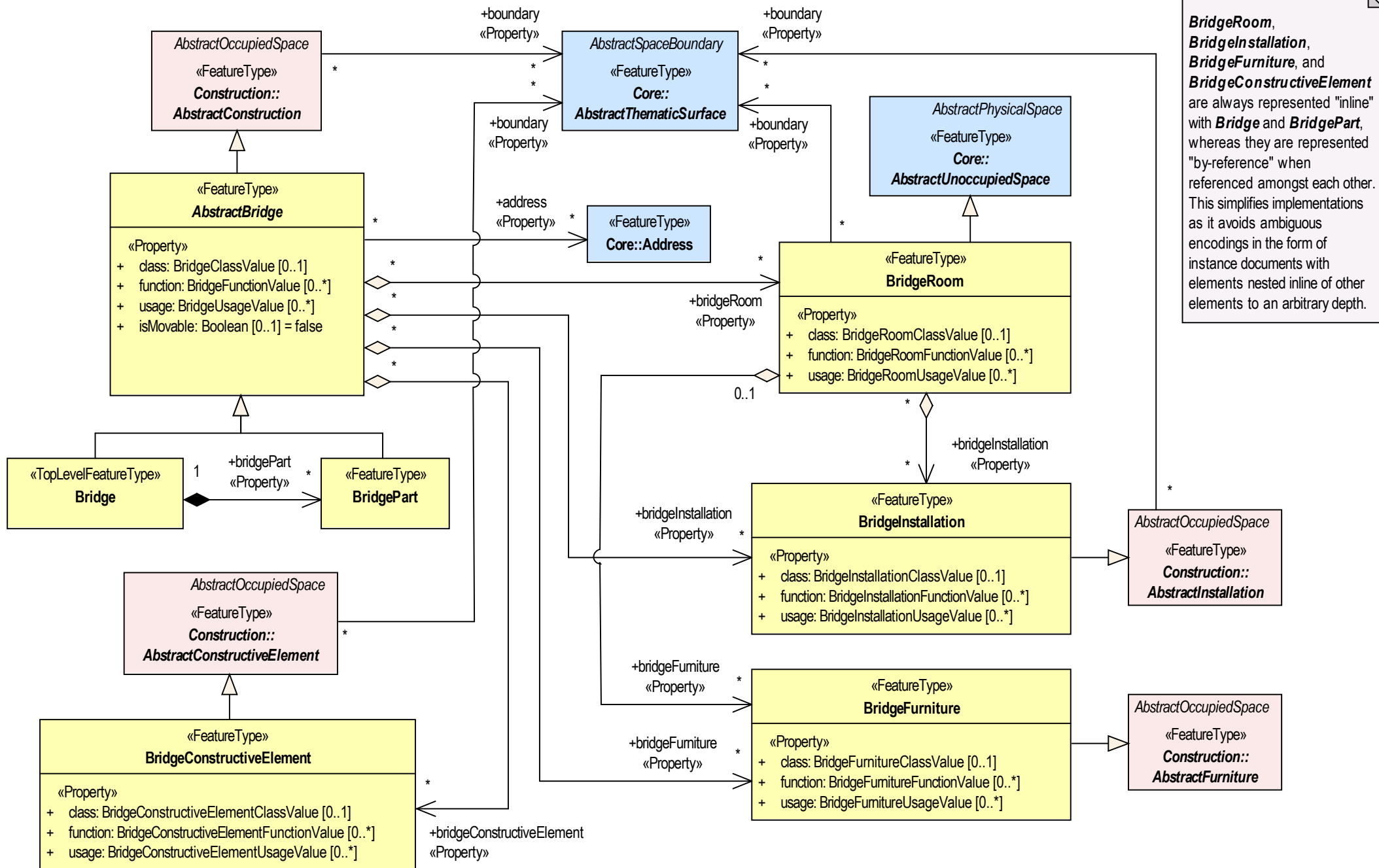


Core module - Basic Types, Enumerations, and Code lists

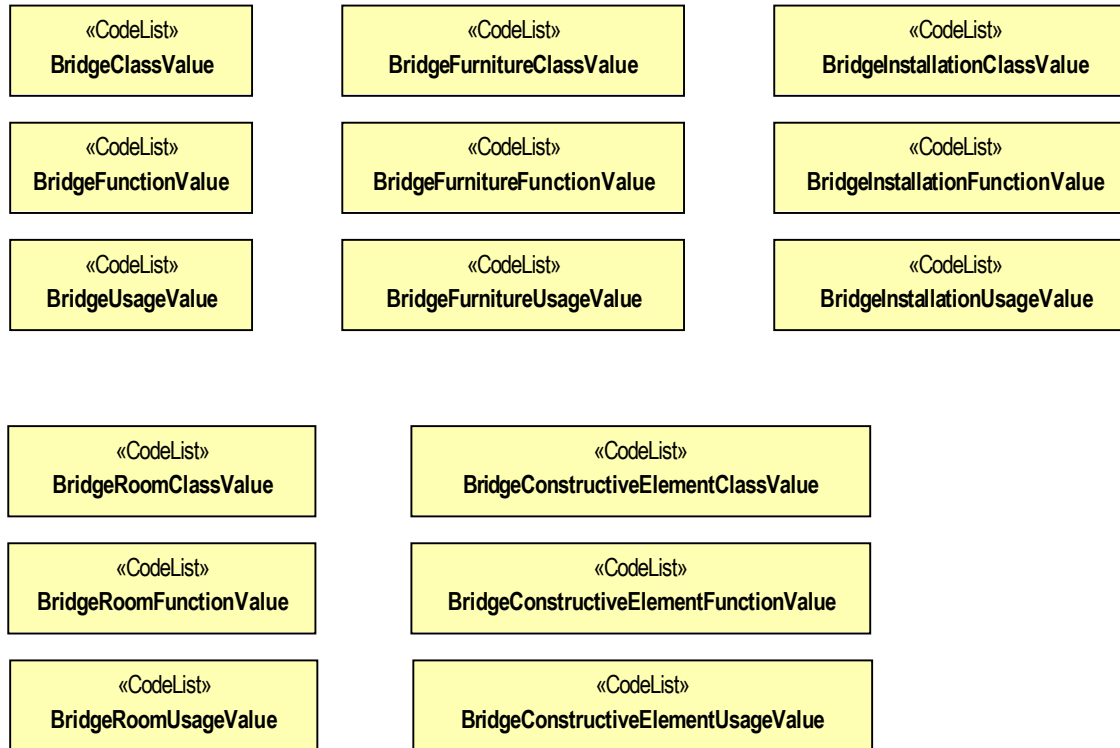




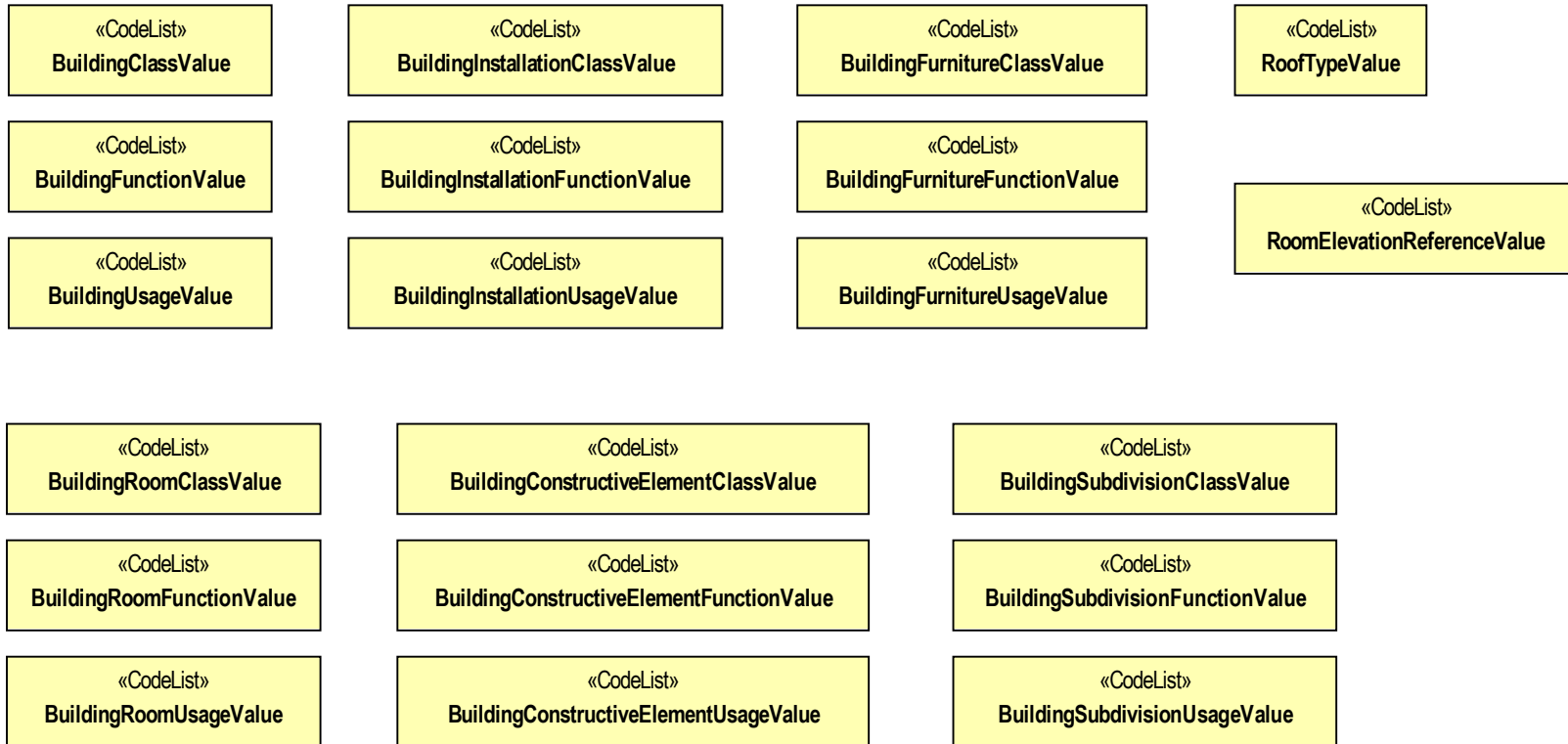
Bridge module



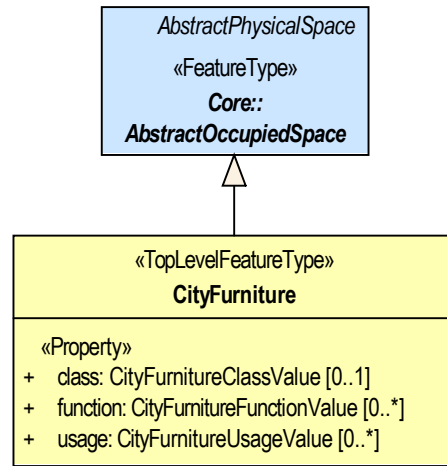
Bridge module - Code lists



Building module - Code lists



CityFurniture module



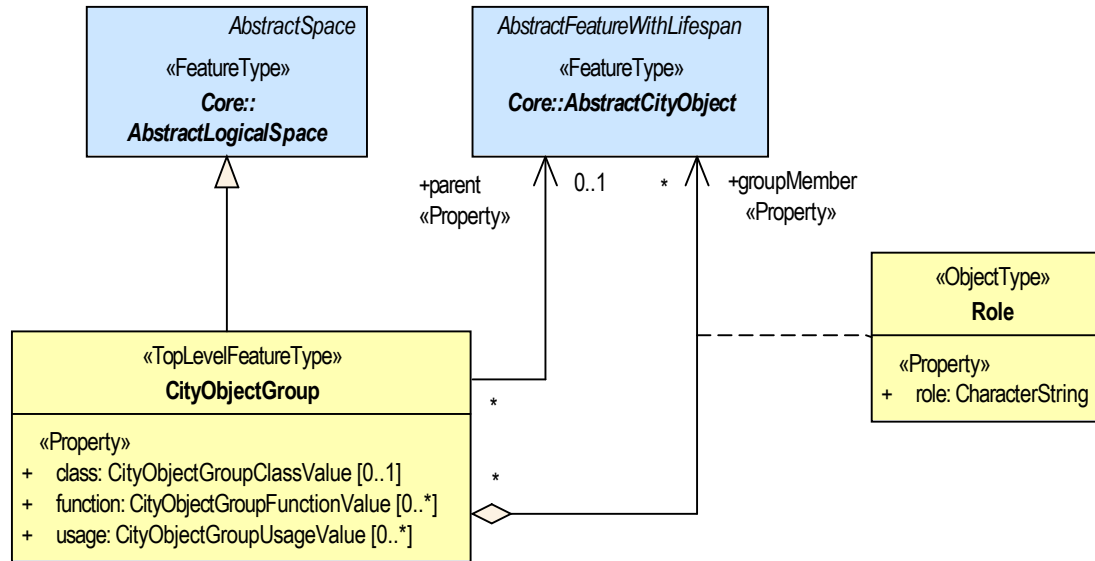
CityFurniture module - Code lists

«CodeList»
CityFurnitureClassValue

«CodeList»
CityFurnitureFunctionValue

«CodeList»
CityFurnitureUsageValue

CityObjectGroup module



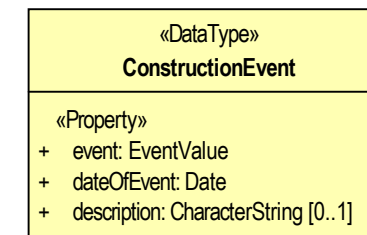
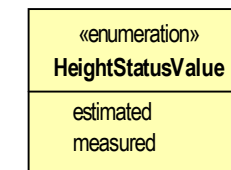
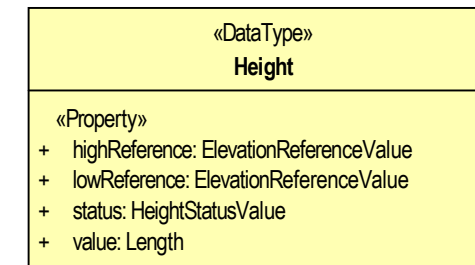
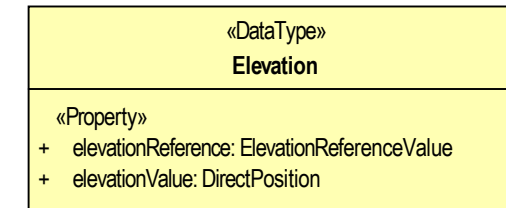
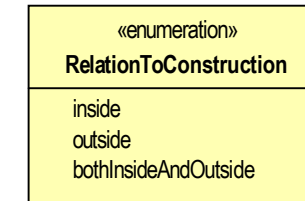
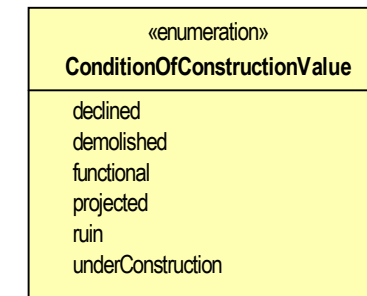
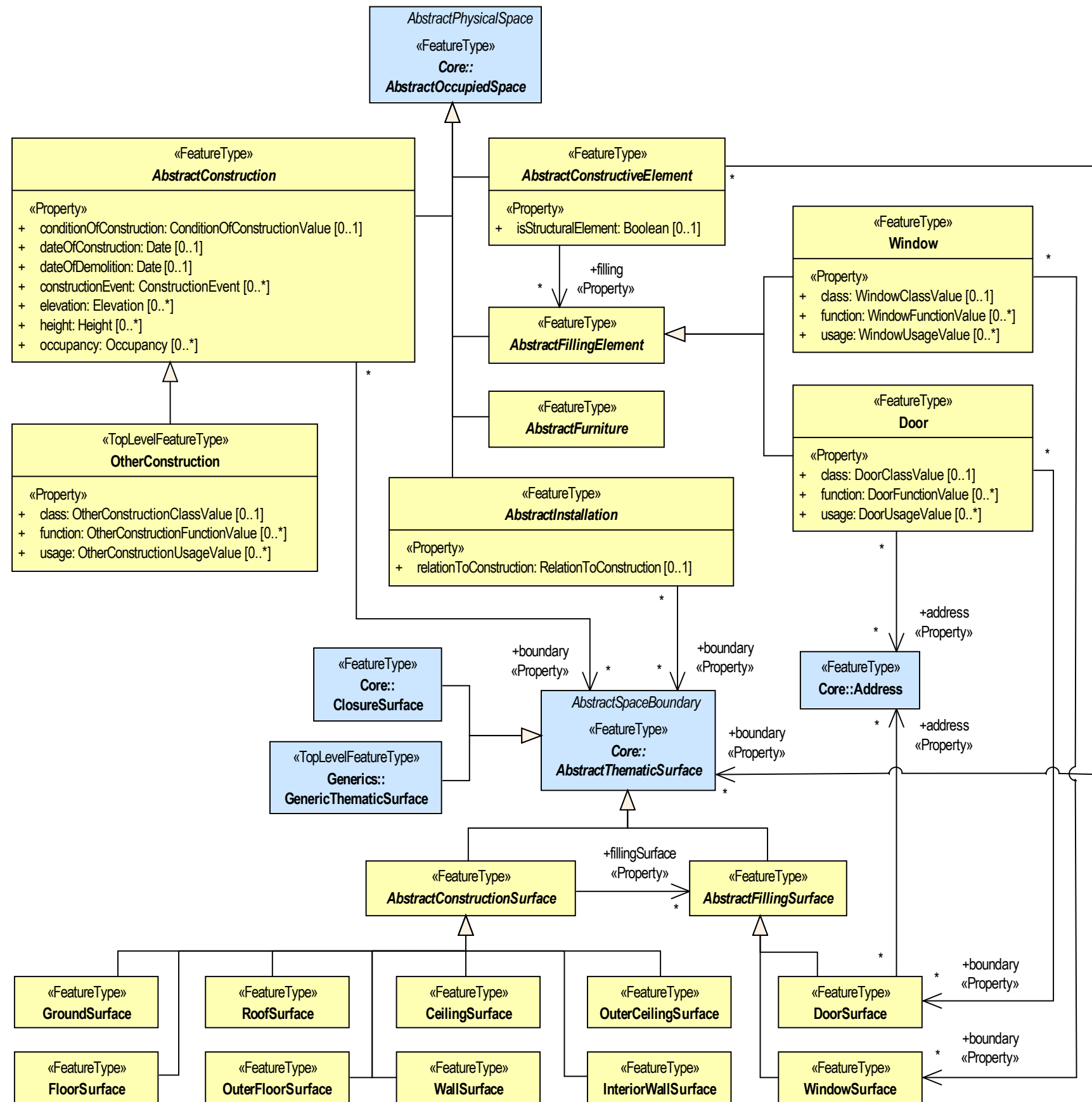
CityObjectGroup module - Code lists

«CodeList»
CityObjectGroupClassValue

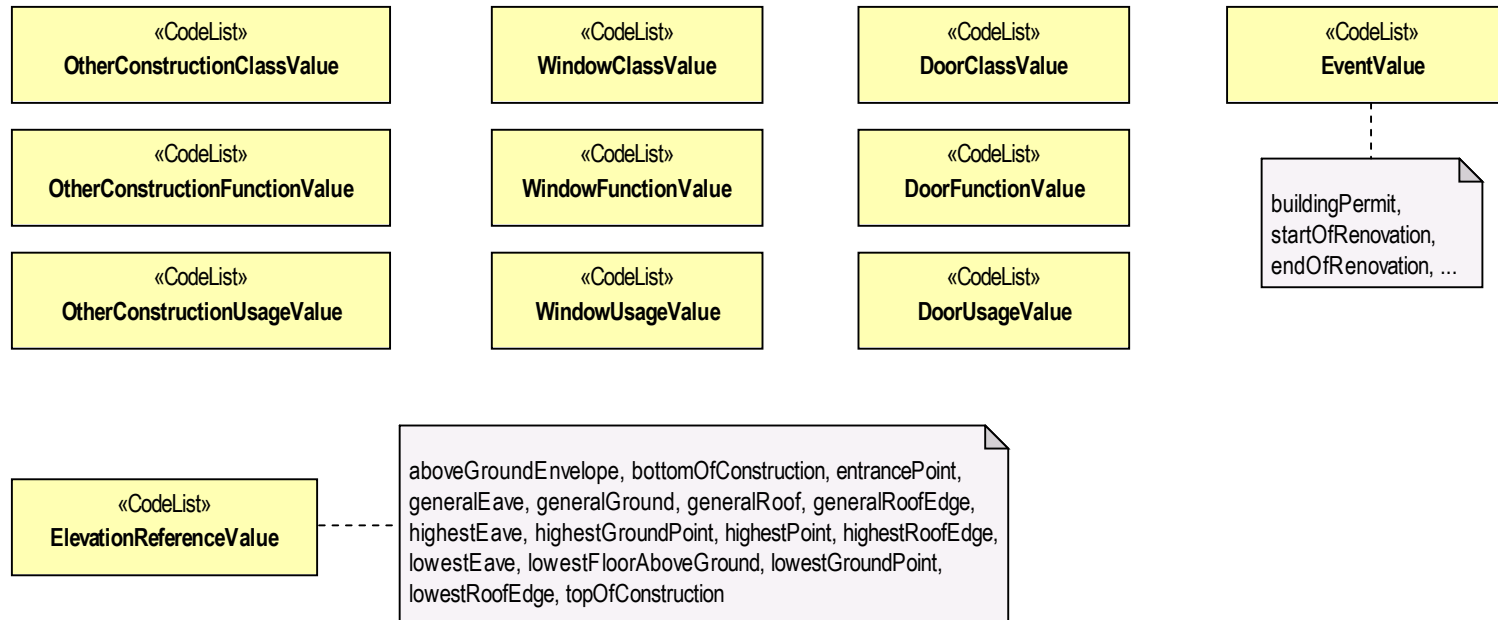
«CodeList»
CityObjectGroupFunctionValue

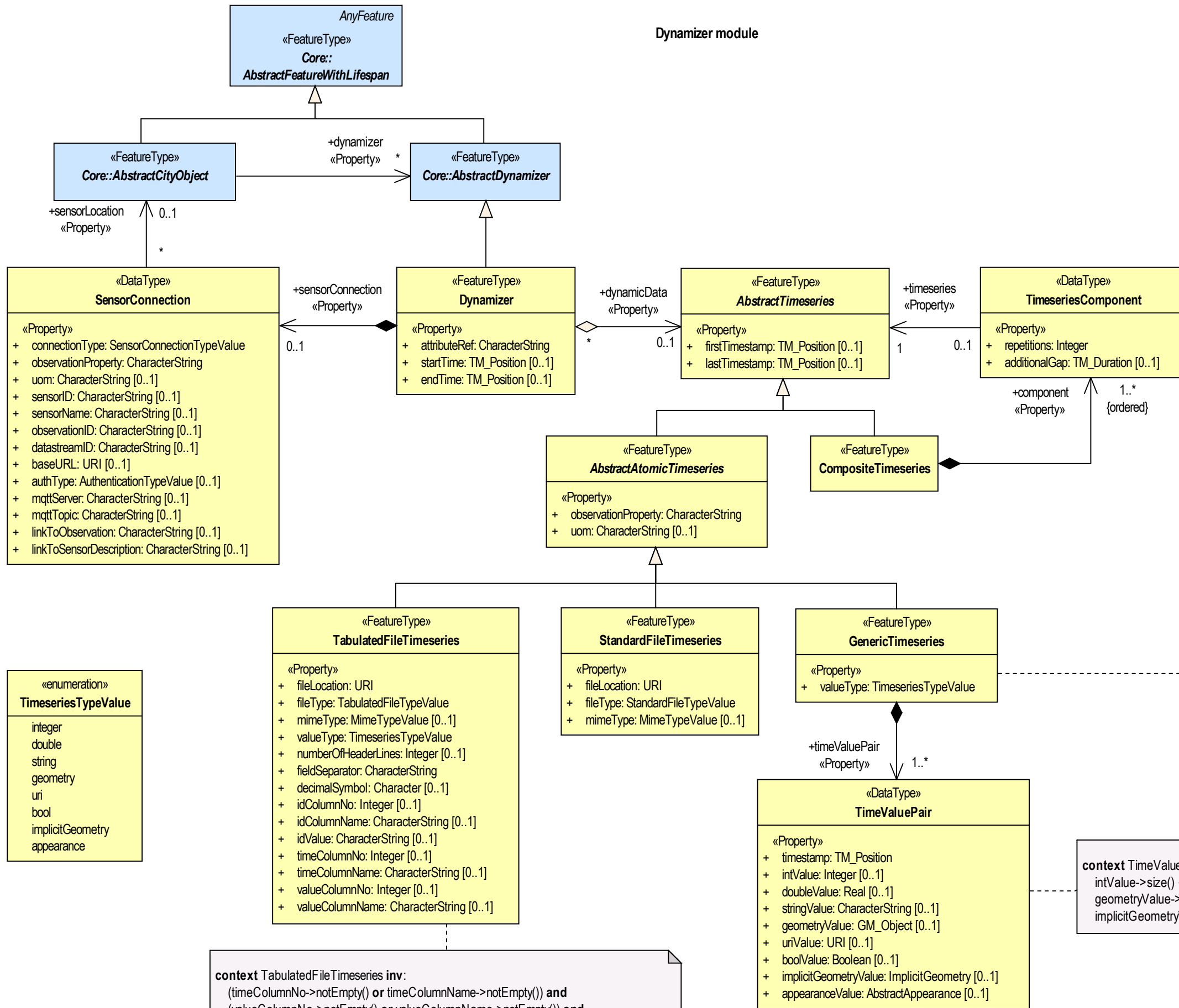
«CodeList»
CityObjectGroupUsageValue

Construction module



Construction module - Code lists





```

context GenericTimeseries inv:
if valueType = TimeseriesTypeValue::integer then
    TimeValuePair->forAll(c|c.intValue->size()=1)
else
if valueType = TimeseriesTypeValue::double then
    TimeValuePair->forAll(c|c.doubleValue->size()=1)
else
if valueType = TimeseriesTypeValue::string then
    TimeValuePair->forAll(c|c.stringValue->size()=1)
else
if valueType = TimeseriesTypeValue::geometry then
    TimeValuePair->forAll(c|c.geometryValue->size()=1)
else
if valueType = TimeseriesTypeValue::uri then
    TimeValuePair->forAll(c|c.uriValue->size()=1)
else
if valueType = TimeseriesTypeValue::bool then
    TimeValuePair->forAll(c|c.boolValue->size()=1)
else
if valueType = TimeseriesTypeValue::implicitGeometry then
    TimeValuePair->forAll(c|c.implicitGeometryValue->size()=1)
else
    TimeValuePair->forAll(c|c.appearanceValue->size()=1)
endif
endif
endif
endif
endif
endif
    
```

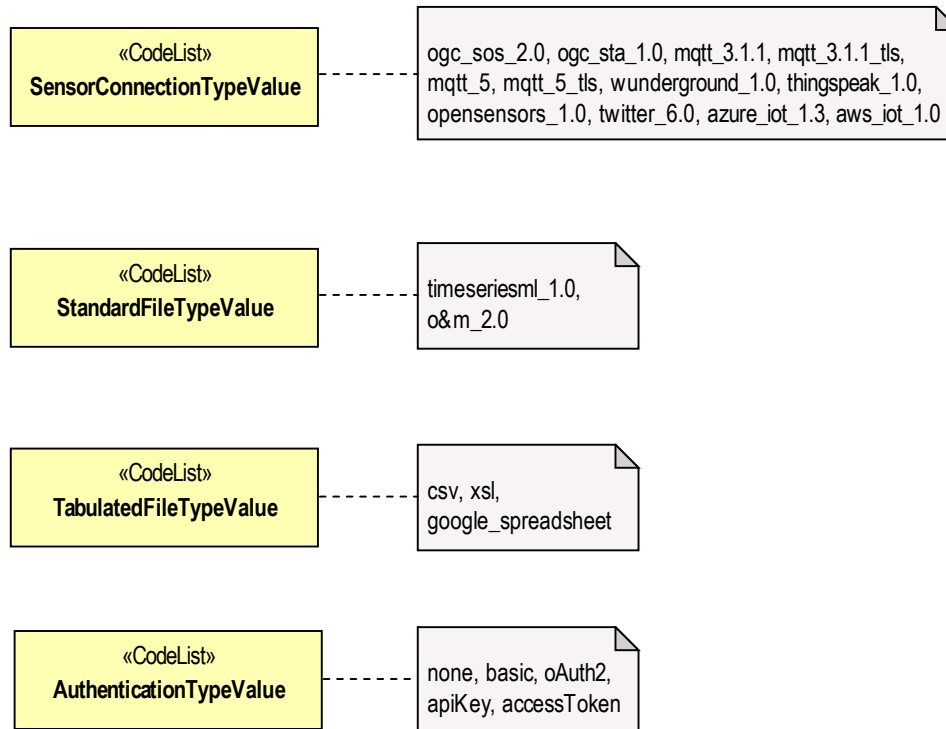
```

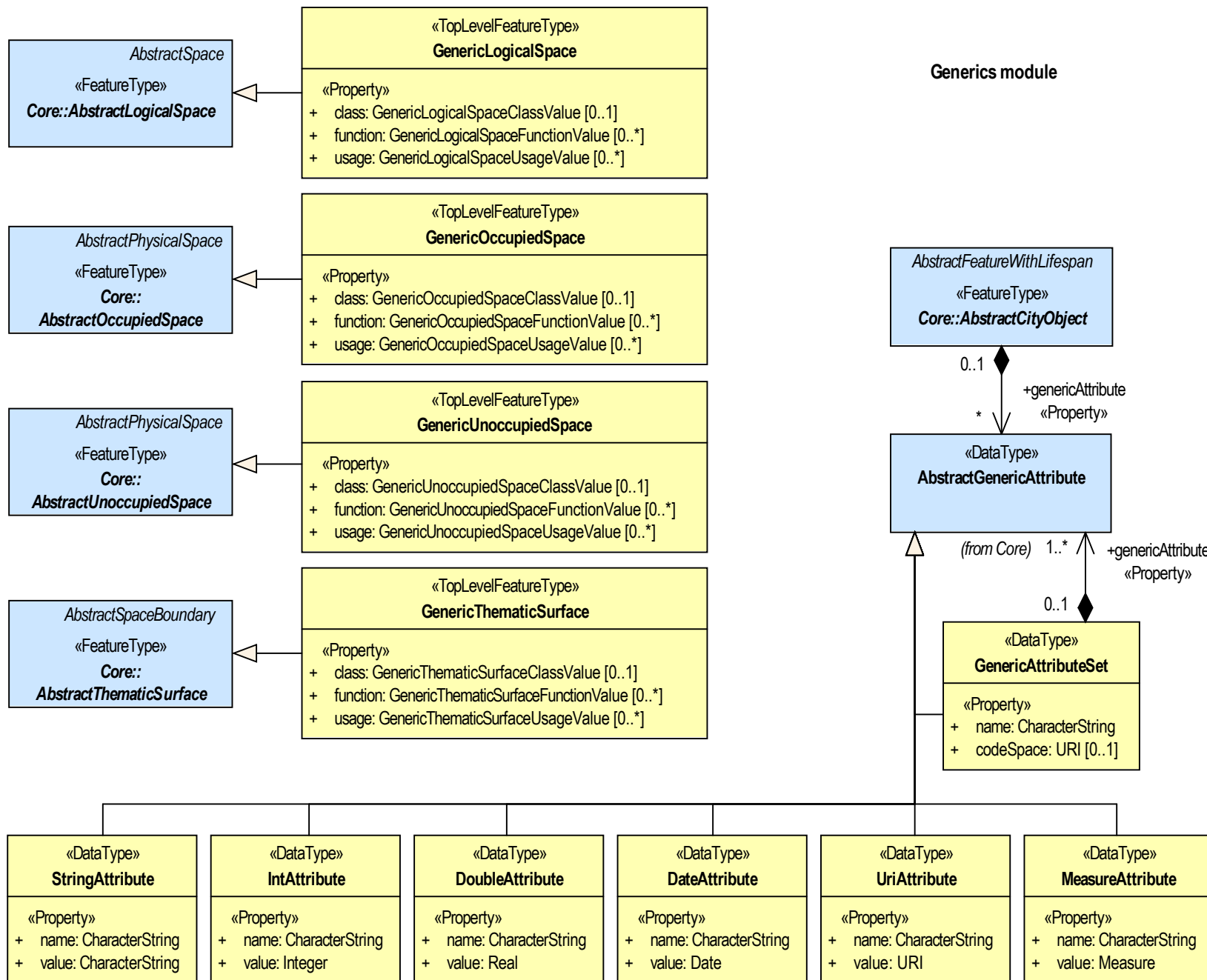
context TimeValuePair inv:
intValue->size() + doubleValue->size() + stringValue->size() +
geometryValue->size() + uriValue->size() + boolValue->size() +
implicitGeometryValue->size() + appearanceValue->size() = 1
    
```

```

context TabulatedFileTimeseries inv:
(timeColumnNo->notEmpty() or timeColumnName->notEmpty()) and
(valueColumnNo->notEmpty() or valueColumnName->notEmpty()) and
(idValue->notEmpty() implies idColumnNo->notEmpty() or idColumnName->notEmpty())
    
```

Dynamizer module - Code lists





Generics module - Code lists

«CodeList»
GenericLogicalSpaceClassValue

«CodeList»
GenericOccupiedSpaceClassValue

«CodeList»
GenericUnoccupiedSpaceClassValue

«CodeList»
GenericThematicSurfaceClassValue

«CodeList»
GenericLogicalSpaceFunctionValue

«CodeList»
GenericOccupiedSpaceFunctionValue

«CodeList»
GenericUnoccupiedSpaceFunctionValue

«CodeList»
GenericThematicSurfaceFunctionValue

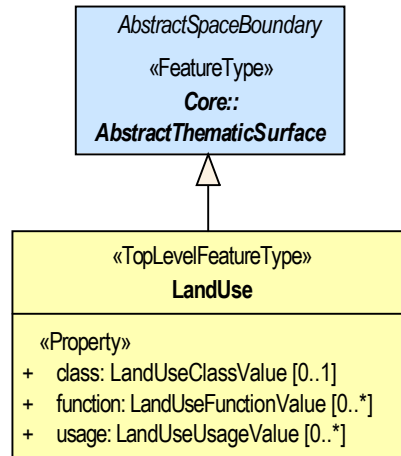
«CodeList»
GenericLogicalSpaceUsageValue

«CodeList»
GenericOccupiedSpaceUsageValue

«CodeList»
GenericUnoccupiedSpaceUsageValue

«CodeList»
GenericThematicSurfaceUsageValue

LandUse module



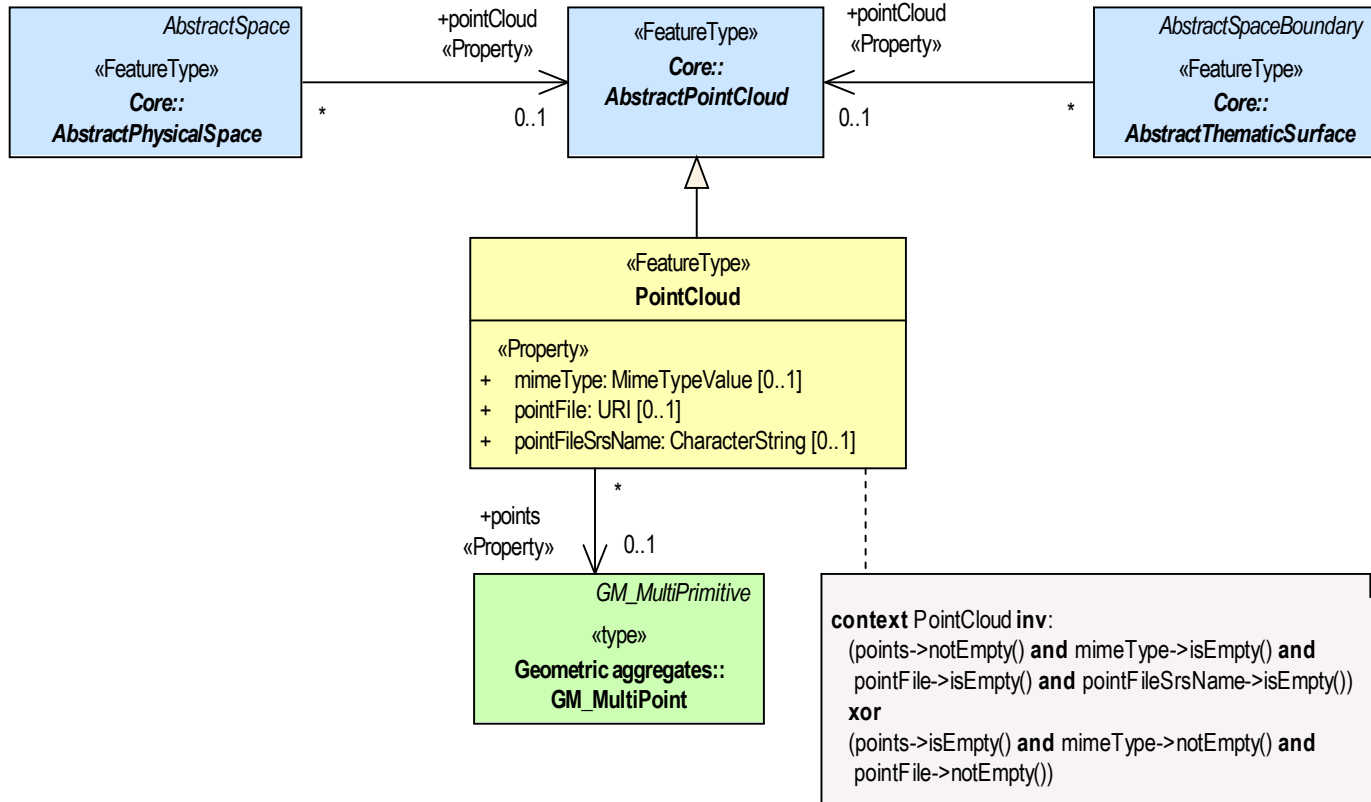
LandUse module - Code lists

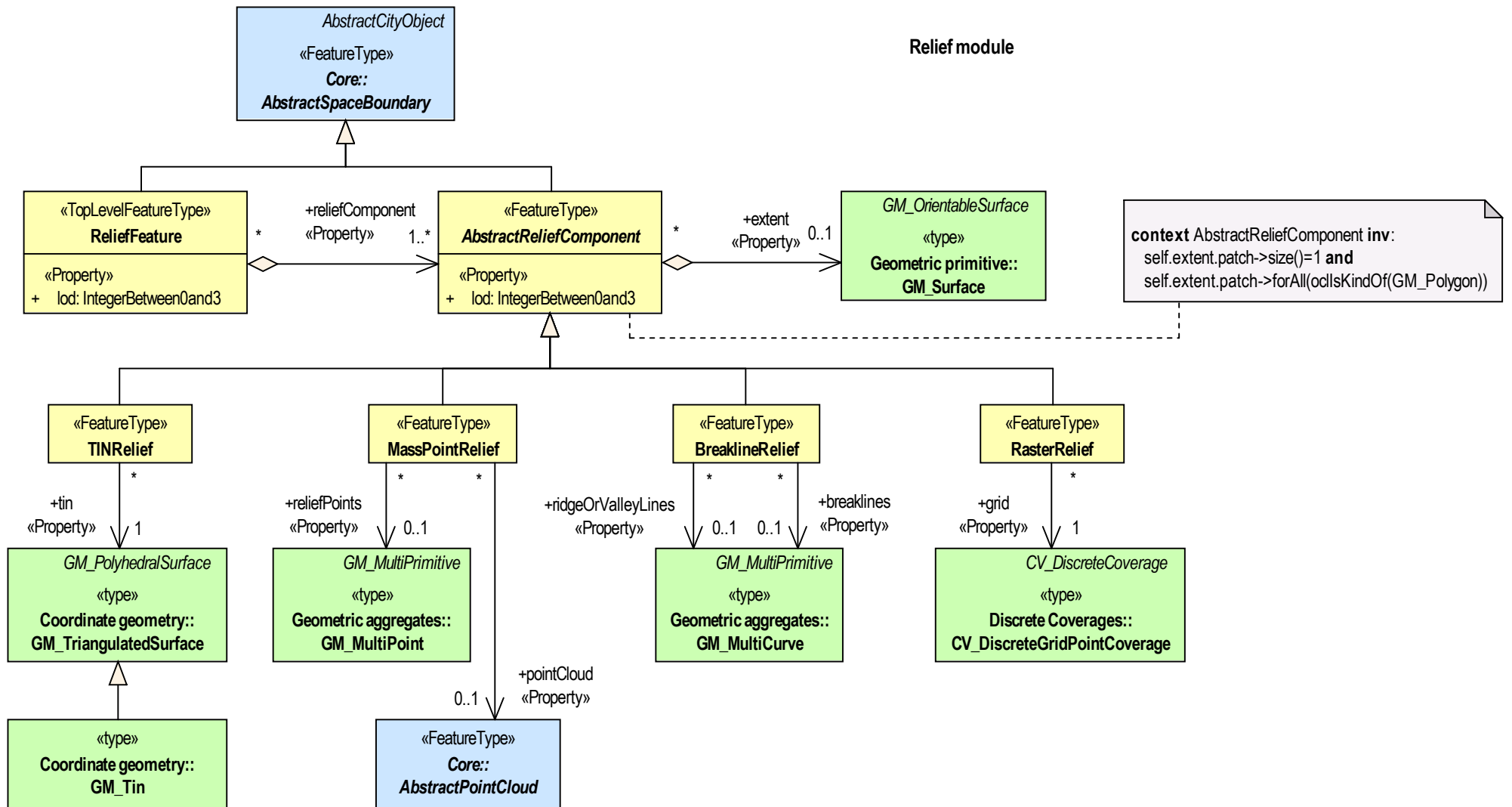
«CodeList»
LandUseClassValue

«CodeList»
LandUseFunctionValue

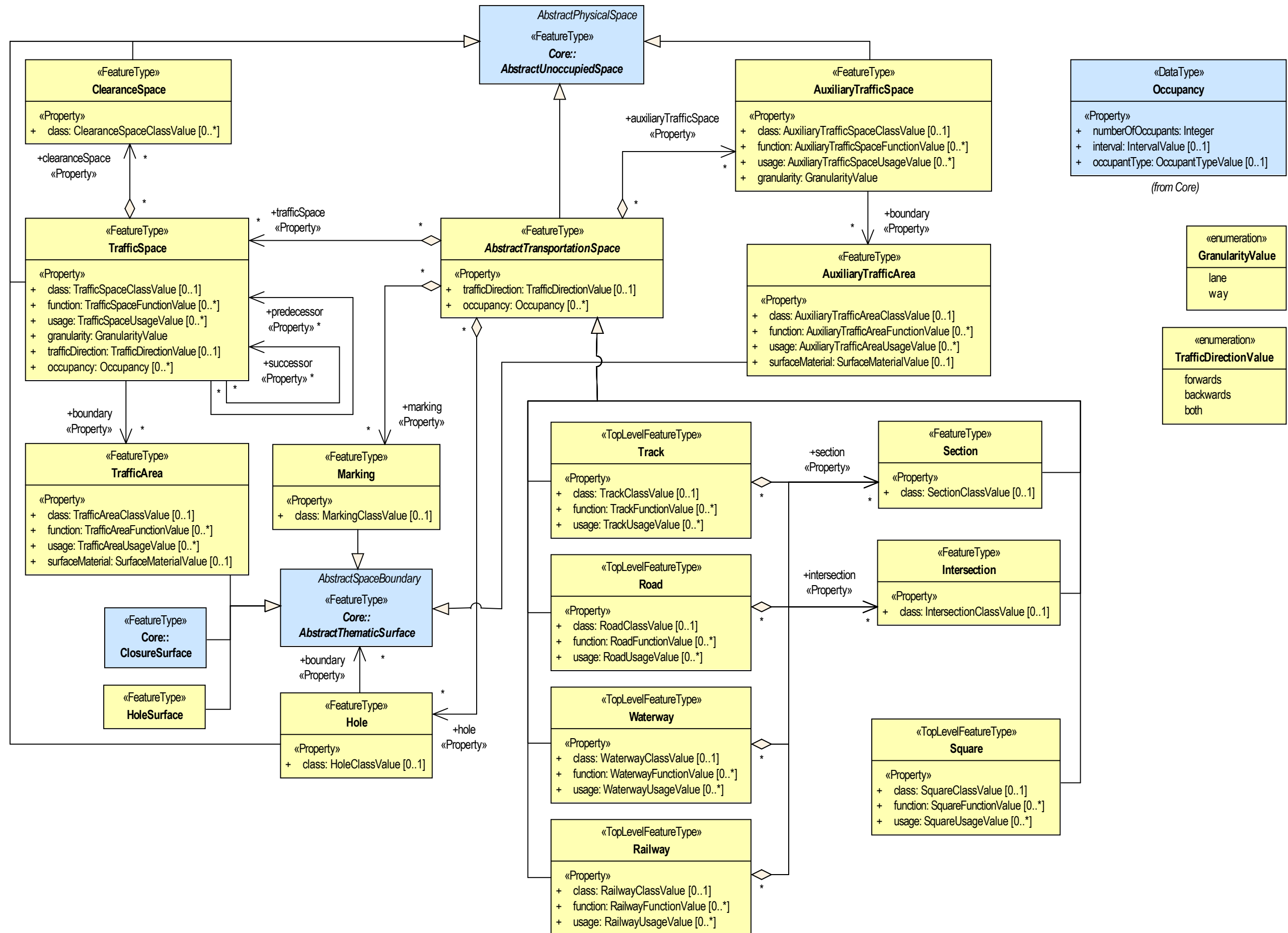
«CodeList»
LandUseUsageValue

PointCloud module

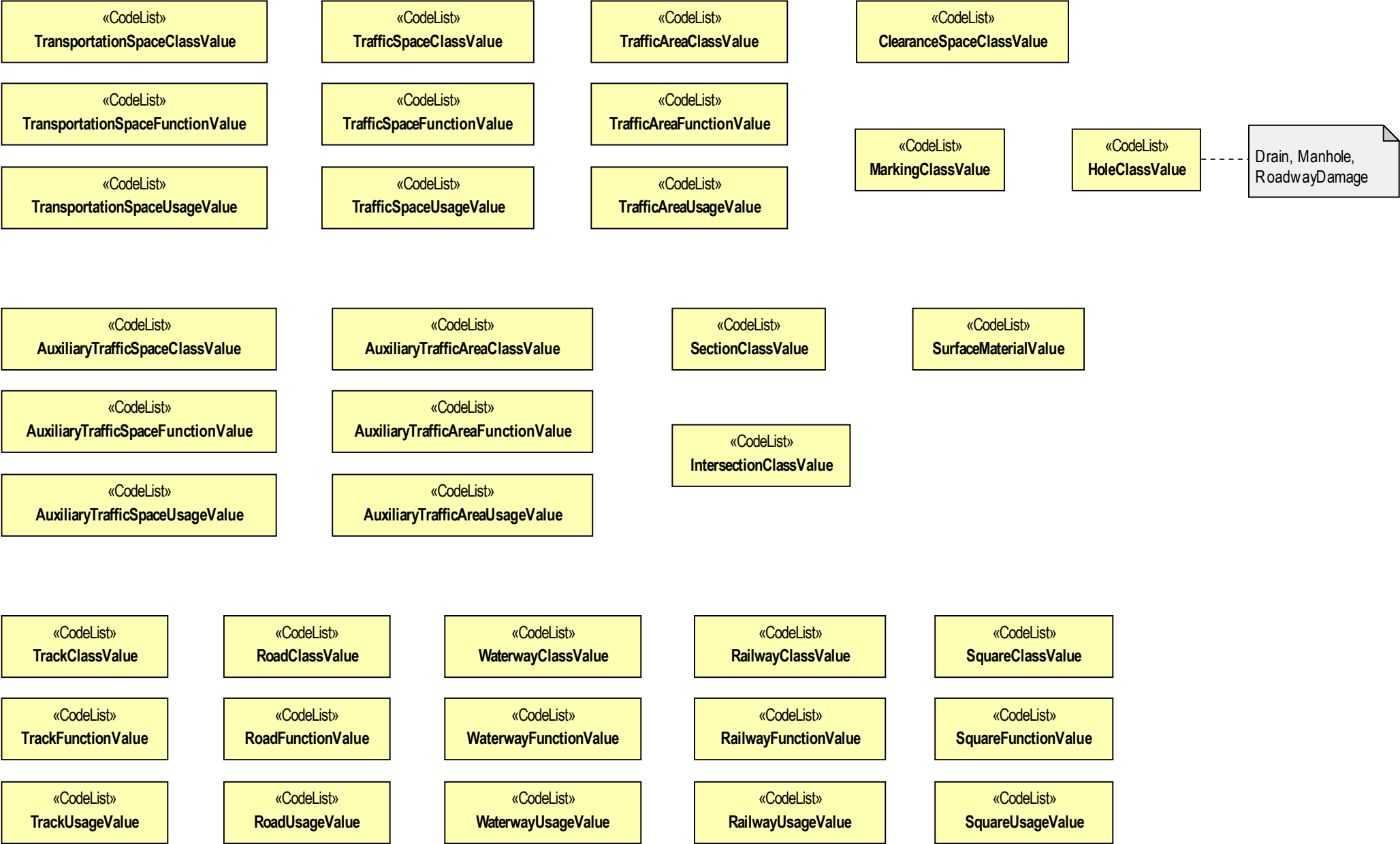




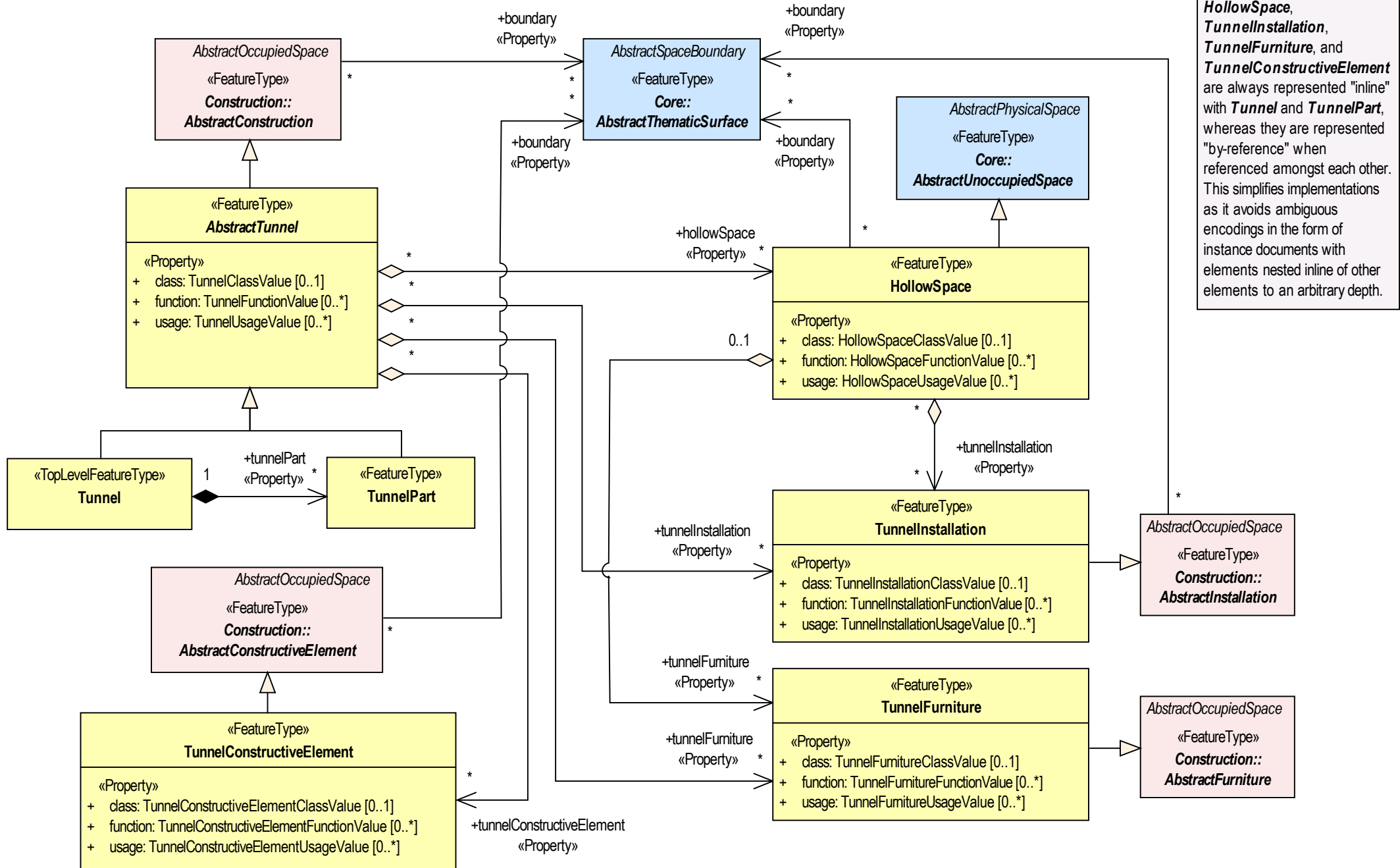
Transportation module



Transportation module - Code lists



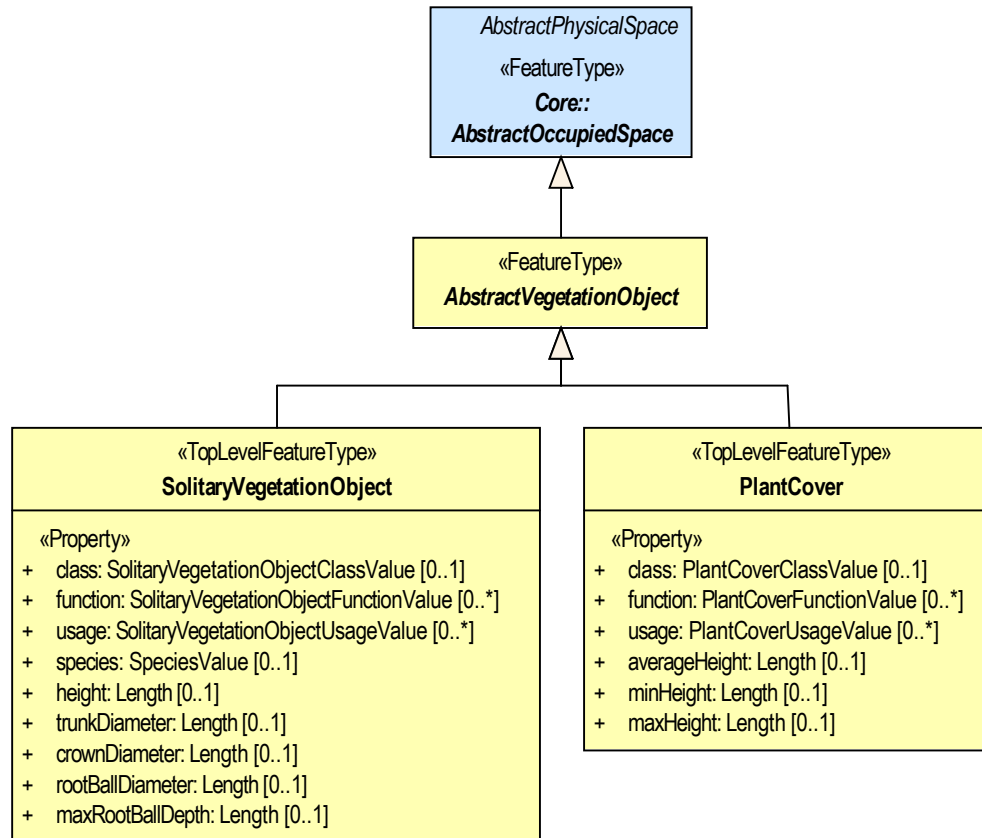
Tunnel module



Tunnel module - Code lists

«CodeList» TunnelClassValue	«CodeList» TunnelInstallationClassValue	«CodeList» TunnelFurnitureClassValue
«CodeList» TunnelFunctionValue	«CodeList» TunnelInstallationFunctionValue	«CodeList» TunnelFurnitureFunctionValue
«CodeList» TunnelUsageValue	«CodeList» TunnelInstallationUsageValue	«CodeList» TunnelFurnitureUsageValue
«CodeList» HollowSpaceClassValue	«CodeList» TunnelConstructiveElementClassValue	
«CodeList» HollowSpaceFunctionValue	«CodeList» TunnelConstructiveElementFunctionValue	
«CodeList» HollowSpaceUsageValue	«CodeList» TunnelConstructiveElementUsageValue	

Vegetation module



Vegetation module - Code lists

«CodeList»
SolitaryVegetationObjectClassValue

«CodeList»
SolitaryVegetationObjectFunctionValue

«CodeList»
SolitaryVegetationObjectUsageValue

«CodeList»
PlantCoverClassValue

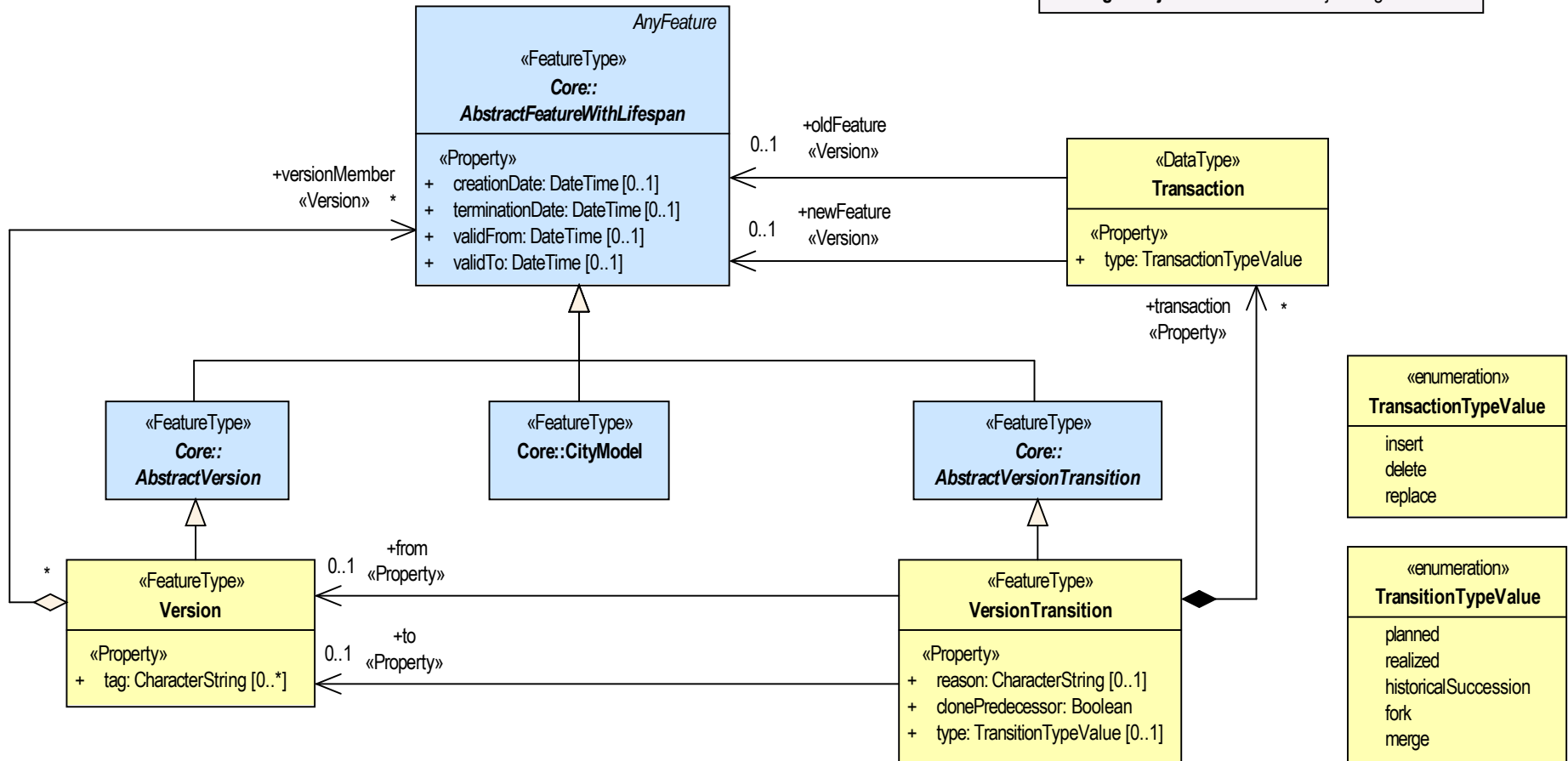
«CodeList»
PlantCoverFunctionValue

«CodeList»
PlantCoverUsageValue

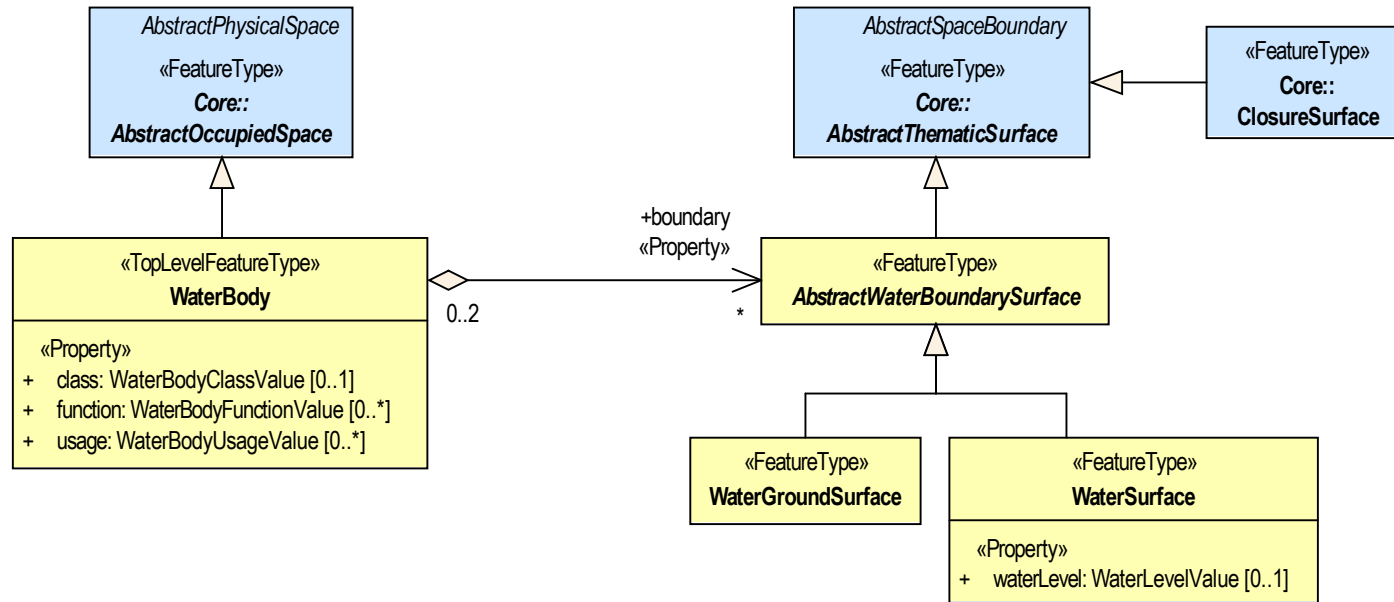
«CodeList»
SpeciesValue

Versioning module

The stereotype «Version» is adopted from INSPIRE. The stereotype is used for association roles to express that the **association refers to a specific version of the target object** and not to the object in general.



WaterBody module



WaterBody module - Code lists

«CodeList»
WaterBodyClassValue

«CodeList»
WaterBodyFunctionValue

«CodeList»
WaterBodyUsageValue

«CodeList»
WaterLevelValue