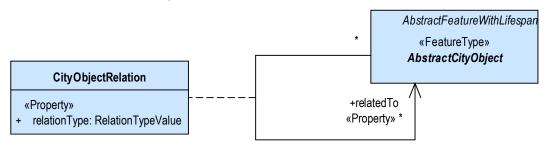
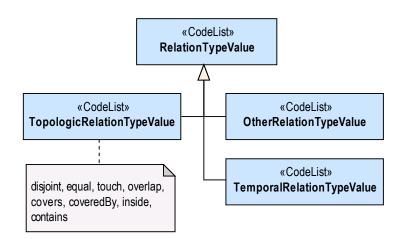
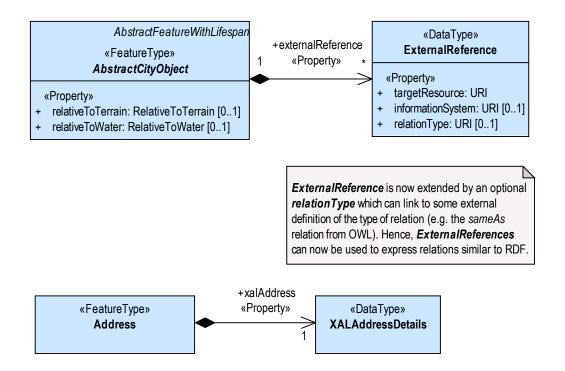


Core module - City object relations

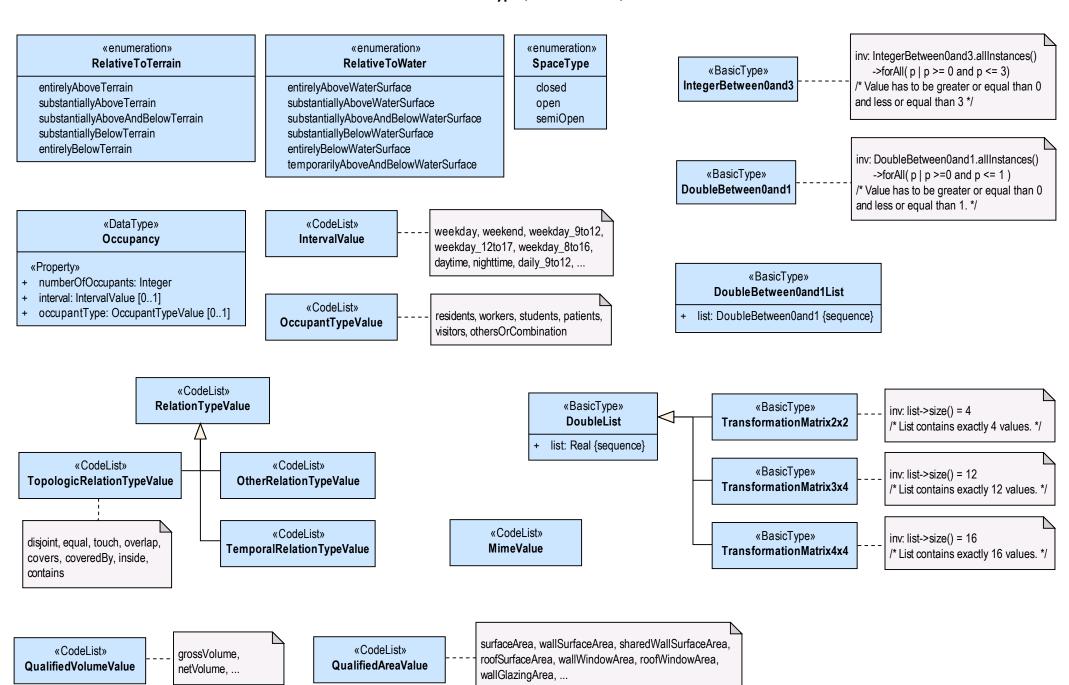


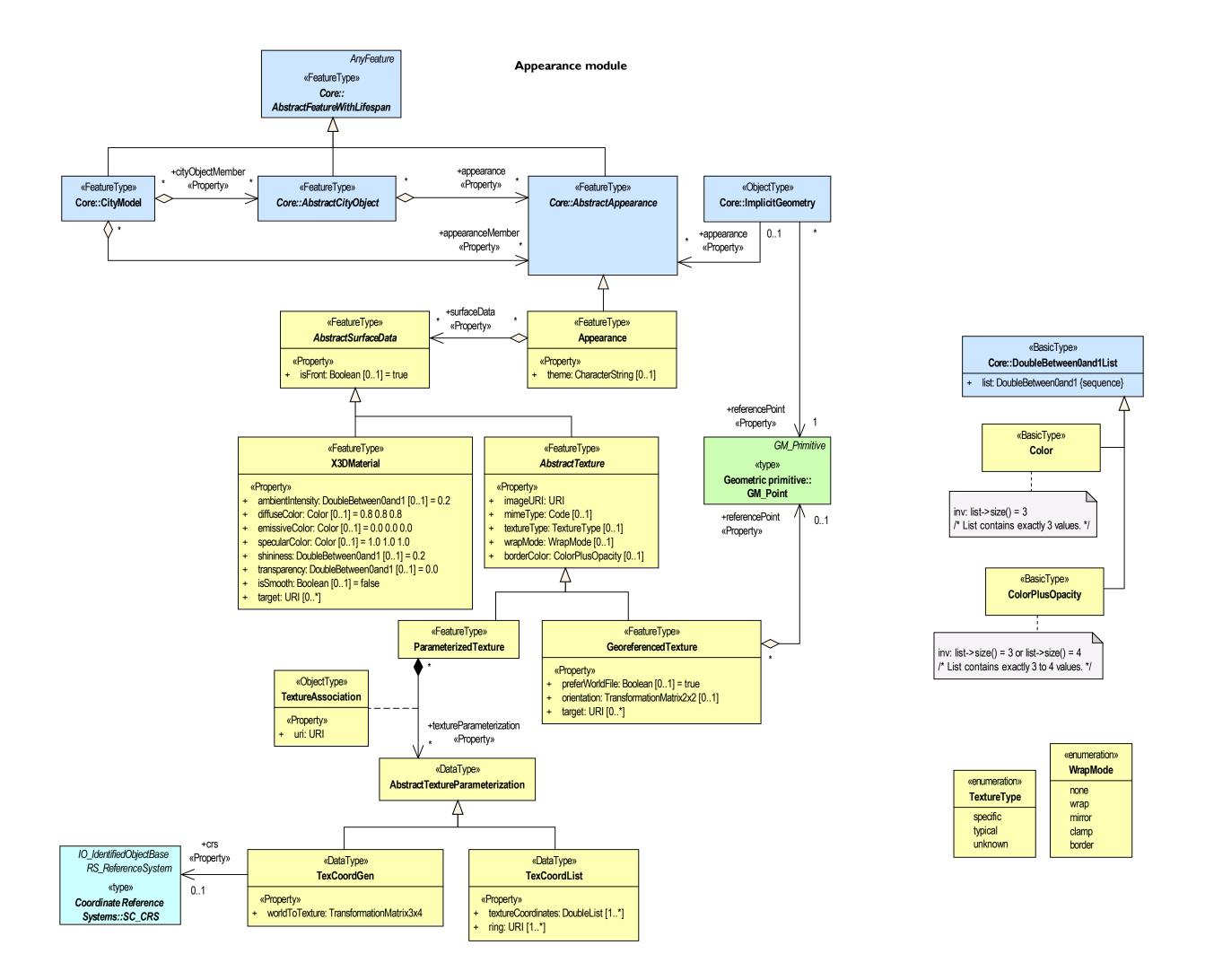


Core module - Miscellaneous

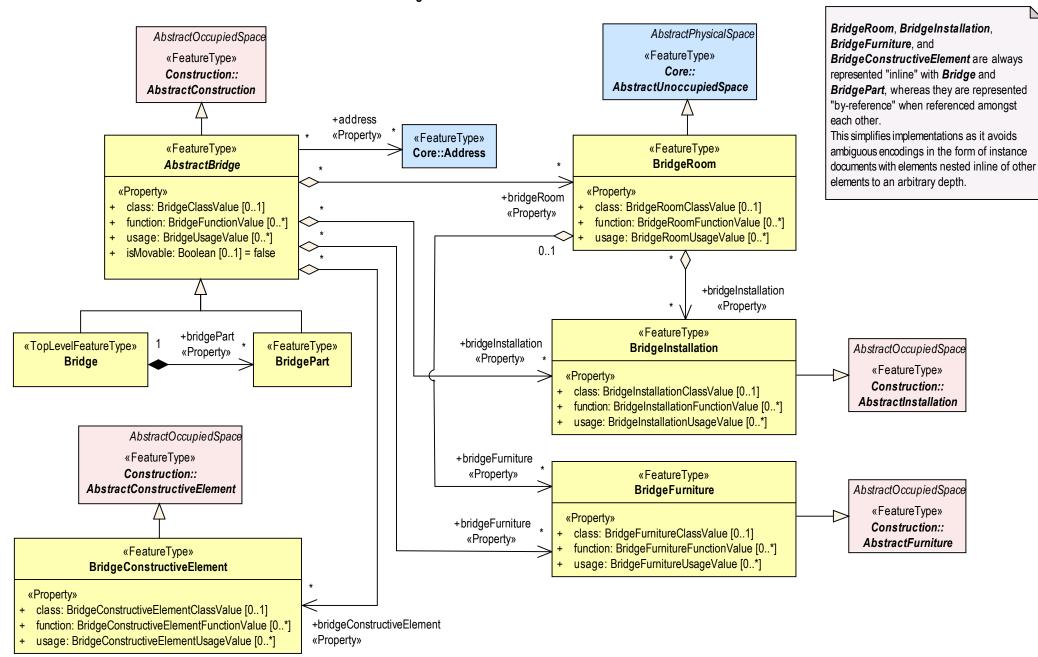


Core module - Basic Types, Enumerations, and Code lists





Bridge module



Bridge module - Code lists

«CodeList»

BridgeClassValue

«CodeList»
BridgeFurnitureClassValue

«CodeList»
BridgeInstallationClassValue

«CodeList»

BridgeFunctionValue

«CodeList»
BridgeFurnitureFunctionValue

«CodeList»
BridgeInstallationFunctionValue

«CodeList»
BridgeUsageValue

«CodeList»
BridgeFurnitureUsageValue

«CodeList»
BridgeInstallationUsageValue

«CodeList»
BridgeRoomClassValue

«CodeList»

BridgeConstructiveElementClassValue

«CodeList»

BridgeRoomFunctionValue

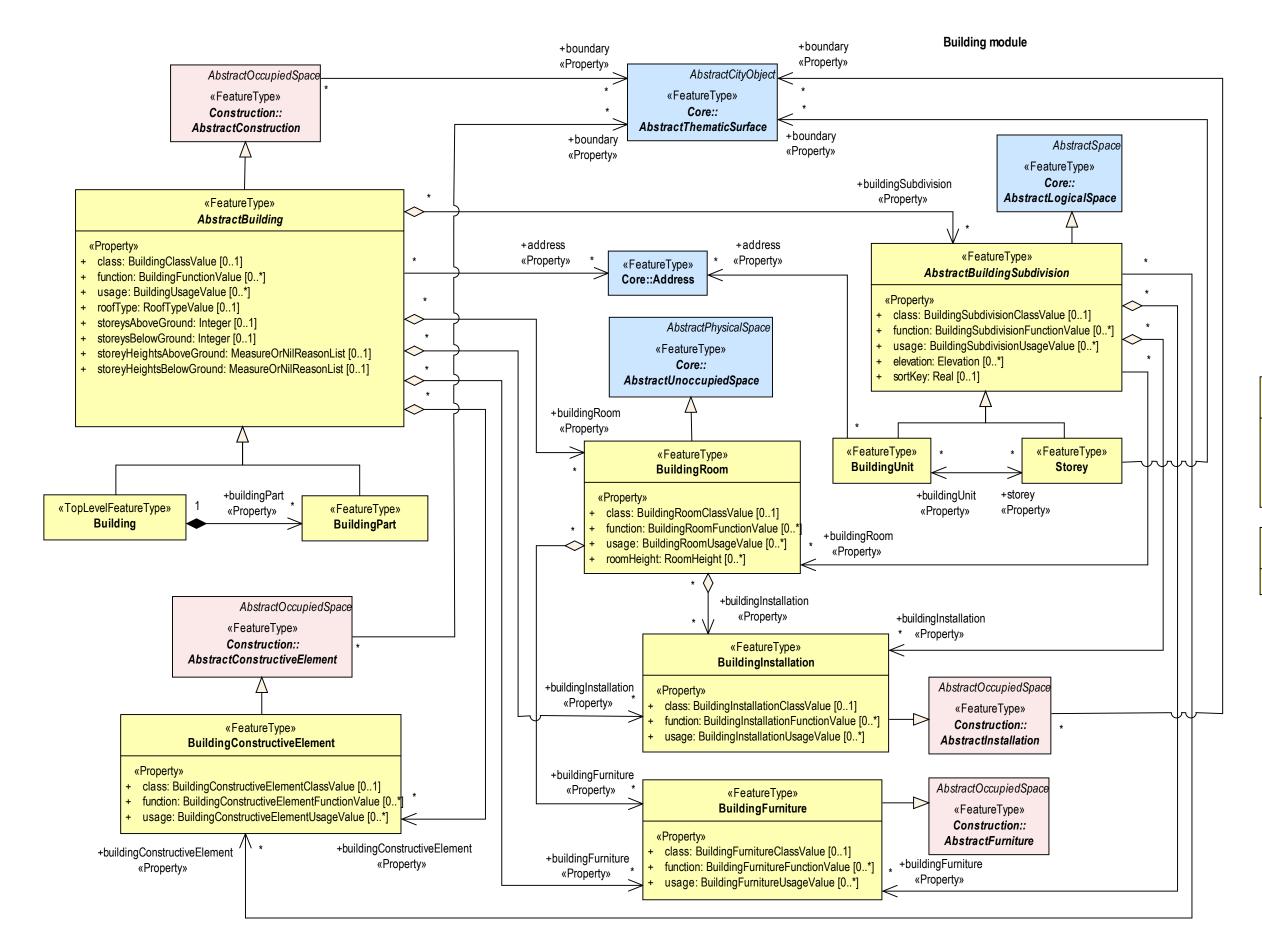
 $\label{eq:codeList} $$\ensuremath{\mathsf{WCodeList}}$ \\ \textbf{BridgeConstructiveElementFunctionValue}$

«CodeList»

BridgeRoomUsageValue

«CodeList»

BridgeConstructiveElementUsageValue



BuildingRoom, BuildingInstallation,
BuildingFurniture, and
BuildingConstructiveElement are always
represented "inline" with Building and
BuildingPart, whereas they are represented
"by-reference" when referenced amongst each other.

This simplifies implementations as it avoids ambiguous encodings in the form of instance documents with elements nested inline of other elements to an arbitrary depth.

«DataType» RoomHeight

«Property»

- + highReference: RoomElevationReferenceValue
- lowReference: RoomElevationReferenceValue
- status: HeightStatusValue
- value: Length

«enumeration»

RoomElevationReferenceValue

tbd

Building module - Code lists

«CodeList»

BuildingClassValue

«CodeList»

BuildingInstallationClassValue

«CodeList»

BuildingFurnitureClassValue

«CodeList»
RoofTypeValue

«CodeList»

BuildingFunctionValue

«CodeList»

BuildingInstallationFunctionValue

«CodeList»

BuildingFurnitureFunctionValue

«CodeList»

BuildingUsageValue

«CodeList»

BuildingInstallationUsageValue

«CodeList»

BuildingFurnitureUsageValue

«CodeList»

BuildingRoomClassValue

«CodeList»

BuildingConstructiveElementClassValue

«CodeList»

BuildingSubdivisionClassValue

«CodeList»

BuildingRoomFunctionValue

 $\label{eq:CodeList} $$ \mbox{BuildingConstructiveElementFunctionValue} $$$

«CodeList» **BuildingSubdivisionFunctionValue**

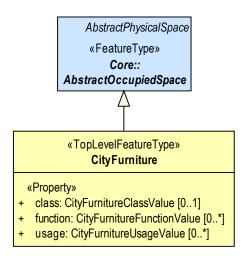
«CodeList»

BuildingRoomUsageValue

 $\label{eq:codeList} $$\operatorname{BuildingConstructiveElementUsageValue}$$

«CodeList» **BuildingSubdivisionUsageValue**

CityFurniture module



CityFurniture module - Code lists

«CodeList»

CityFurnitureClassValue

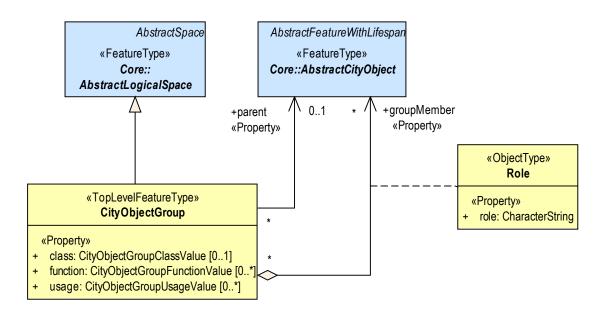
«CodeList»

CityFurnitureFunctionValue

«CodeList»

CityFurnitureUsageValue

CityObjectGroup module



CityObjectGroup module - Code lists

«CodeList»
CityObjectGroupClassValue

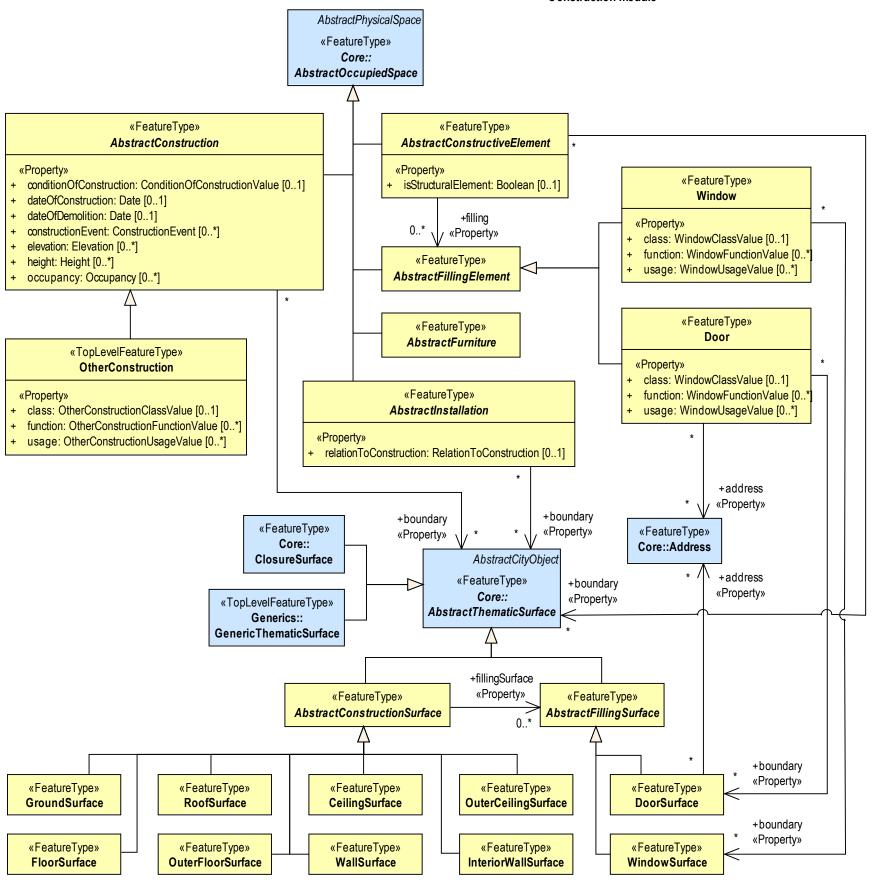
«CodeList»

CityObjectGroupFunctionValue

«CodeList»

CityObjectGroupUsageValue

Construction module



«enumeration»

ConditionOfConstructionValue

declined demolished functional projected ruin underConstruction

«enumeration» RelationToConstruction

inside outside bothInsideAndOutside

«DataType» Elevation

«Property»

- elevationReference: ElevationReferenceValue
- + elevationValue: DirectPosition

«DataType» **Height**

- «Property»
- highReference: ElevationReferenceValue
- lowReference: ElevationReferenceValue
- status: HeightStatusValue
- value: Length

«enumeration» ElevationReferenceValue

aboveGroundEnvelope bottomOfConstruction entrancePoint generalEave generalGround generalRoof generalRoofEdge highestEave highestGroundPoint highestPoint highestRoofEdge lowestEave lowestFloorAboveGround lowestGroundPoint

«enumeration» HeightStatusValue

estimated measured

Reference values for heights below ground will be added.

«DataType» ConstructionEvent

- «Property»
- event: EventValue

IowestRoofEdge

topOfConstruction

- dateOfEvent: Date
- description: CharacterString [0..1]

Construction module - Code lists

«CodeList»
OtherConstructionClassValue

«CodeList»
WindowClassValue

«CodeList»

DoorClassValue

«CodeList»
WindowFunctionValue

«CodeList»

DoorFunctionValue

 $\label{eq:codeList} $$\operatorname{\textbf{OtherConstructionFunctionValue}}$$

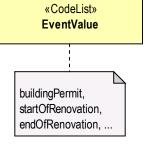
ndowrunctionvalue

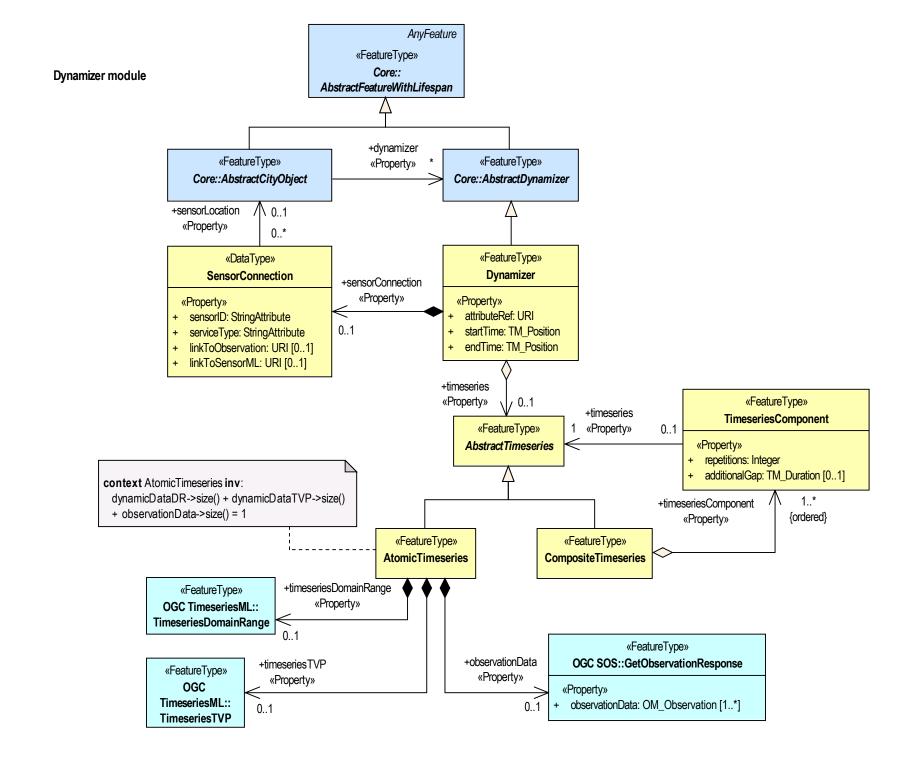
«CodeList»

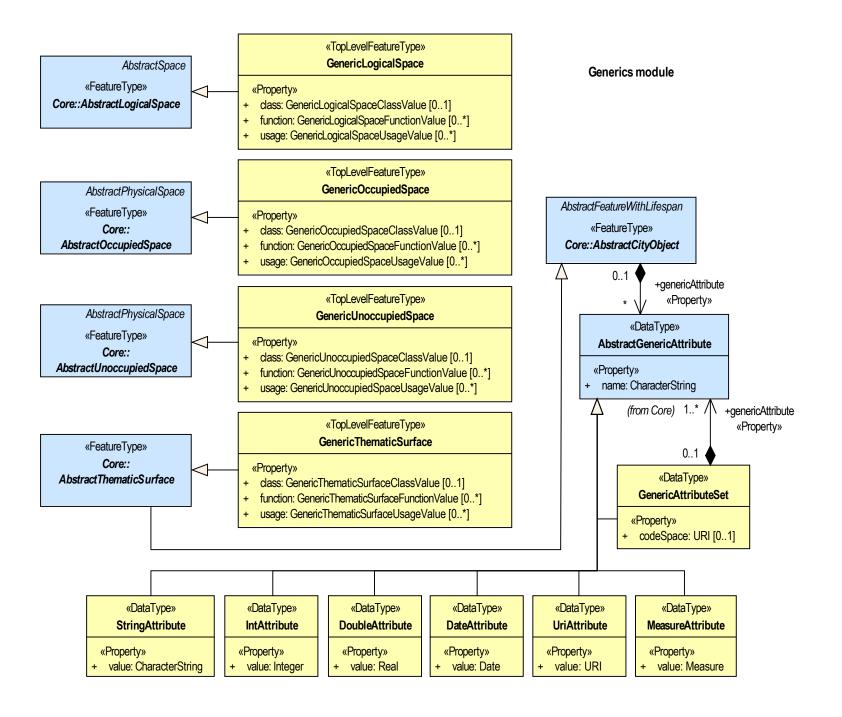
DoorUsageValue

«CodeList»
OtherConstructionUsageValue

«CodeList» WindowUsageValue







Generics module - Code lists

«CodeList»

GenericLogicalSpaceClassValue

«CodeList»

GenericOccupiedSpaceClassValue

«CodeList» «CodeList»

GenericUnoccupiedSpaceClassValue GenericThematicSurfaceClassValue

«CodeList»

GenericLogicalSpaceFunctionValue

«CodeList»

GenericOccupiedSpaceFunctionValue

«CodeList» «CodeList»

GenericUnoccupiedSpaceFunctionValue GenericThematicSurfaceFunctionValue

«CodeList»

GenericLogicalSpaceUsageValue

«CodeList»

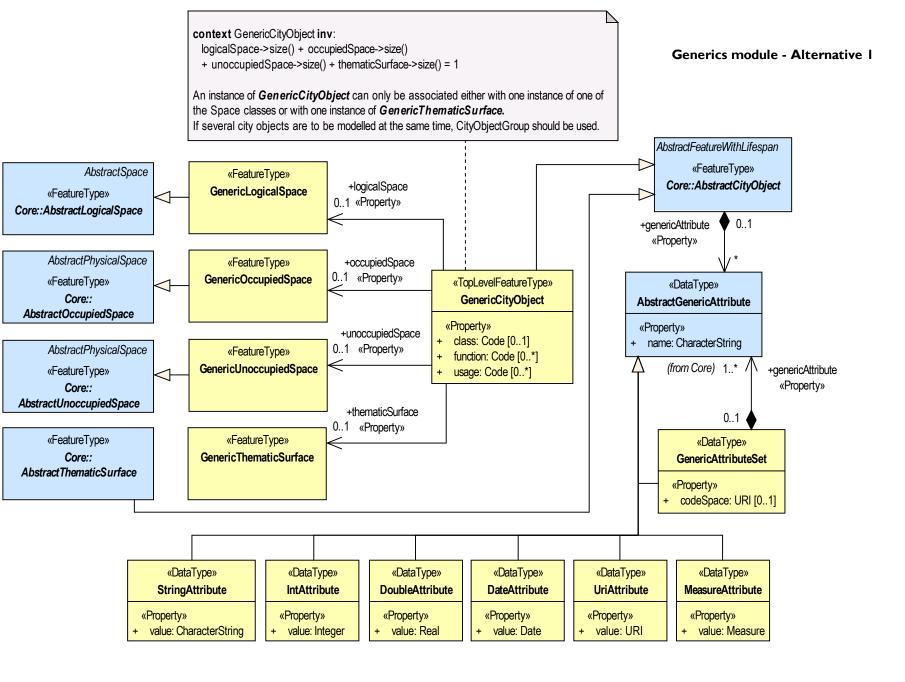
GenericOccupiedSpaceUsageValue

«CodeList»

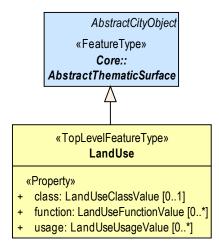
GenericUnoccupiedSpaceUsageValue

«CodeList»

GenericThematicSurfaceUsageValue



LandUse module



LandUse module - Code lists

«CodeList»

LandUseClassValue

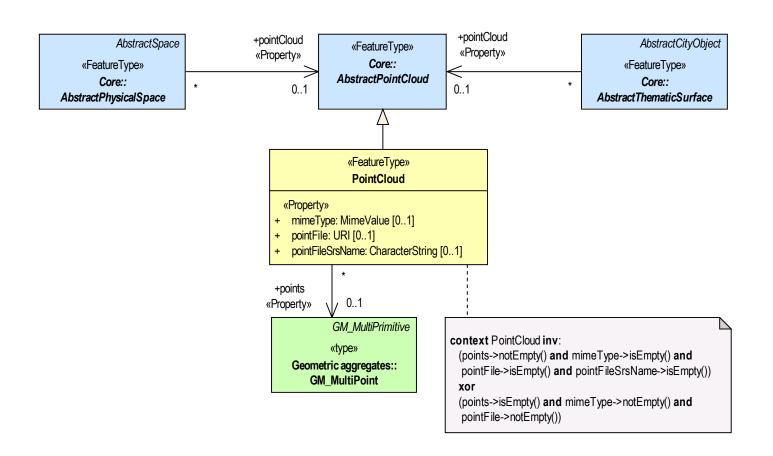
«CodeList»

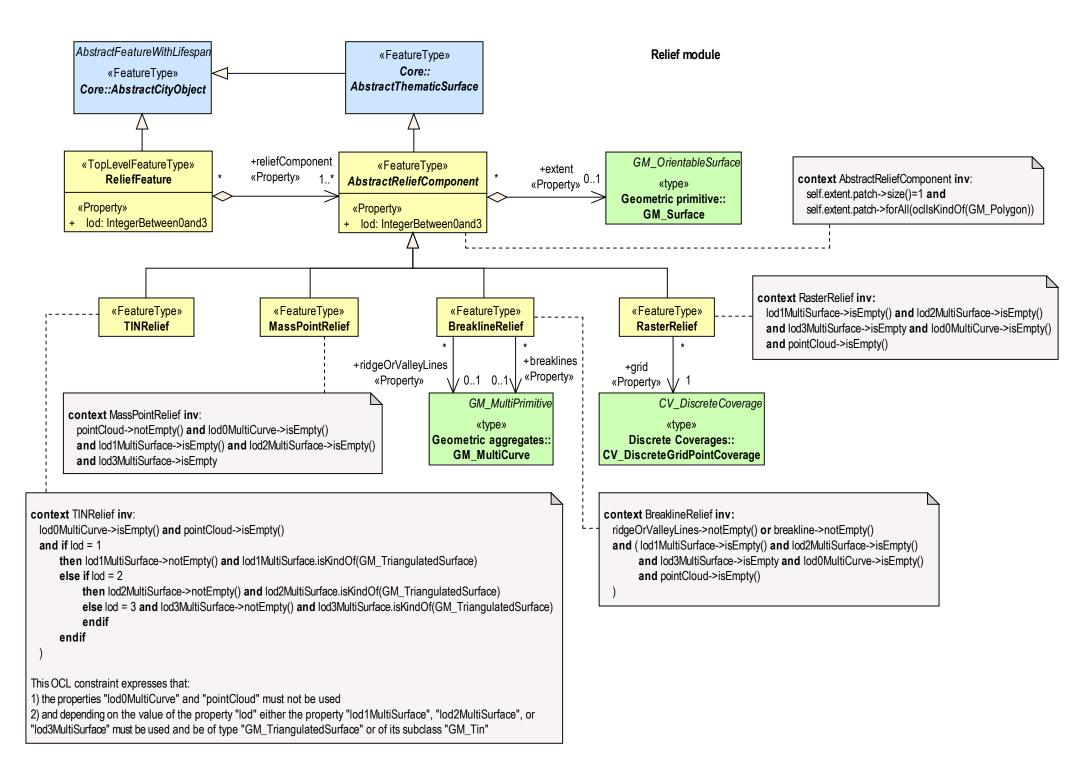
LandUseFunctionValue

«CodeList»

LandUseUsageValue

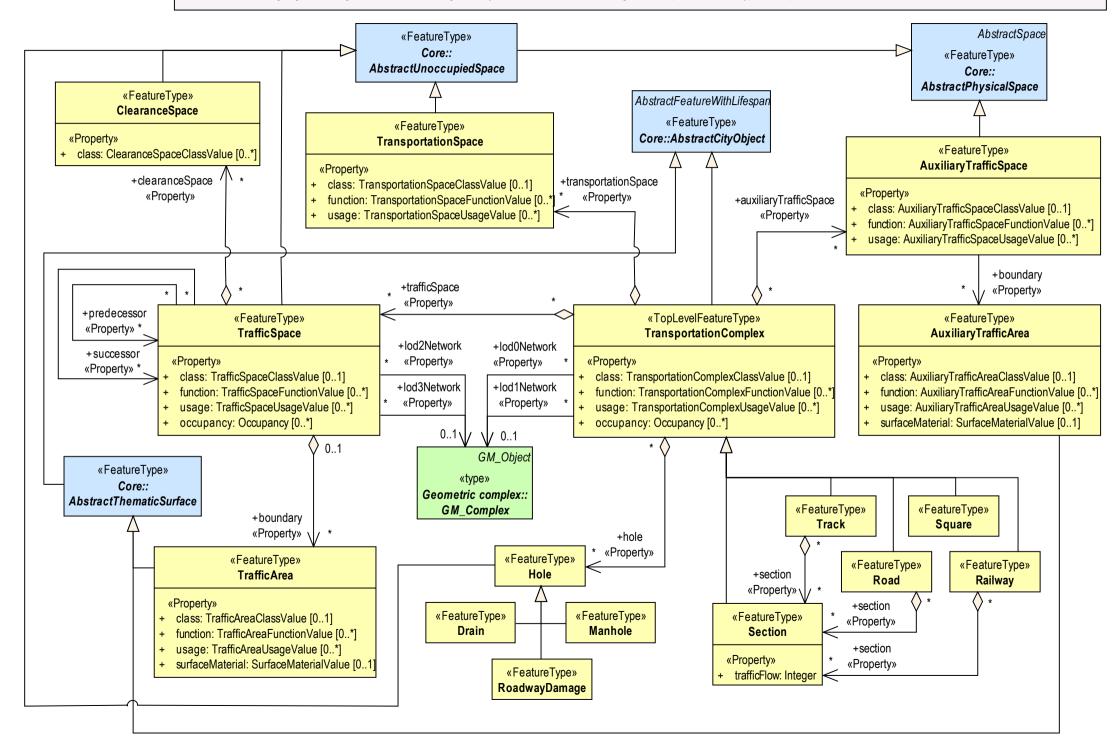
PointCloud module





Transportation module

At the 3DGeoInfo conference at TU Delft early October 2018, a discussion between Anna Labetski and Thomas H. Kolbe took place regarding some refinements proposed by TU Delft in a conference paper. These refinements are going to be integrated. The current diagram only reflects the refined modelling of the TopLevelFeatureType concept.



Transportation module - Code lists

«CodeList»

TransportationComplexClassValue

«CodeList»

TransportationComplexFunctionValue

«CodeList»

TransportationComplexUsageValue

«CodeList» **TransportationSpaceClassValue**

«CodeList»

TransportationSpaceFunctionValue

«CodeList»

TransportationSpaceUsageValue

«CodeList»

TrafficSpaceClassValue

«CodeList»

TrafficSpaceFunctionValue

«CodeList»

TrafficSpaceUsageValue

«CodeList»

TrafficAreaClassValue

«CodeList»

TrafficAreaFunctionValue

«CodeList»

TrafficAreaUsageValue

«CodeList»

AuxiliaryTrafficSpaceClassValue

«CodeList»

AuxiliaryTrafficSpaceFunctionValue

«CodeList»

AuxiliaryTrafficSpaceUsageValue

«CodeList»

AuxiliaryTrafficAreaClassValue

«CodeList»

AuxiliaryTrafficAreaFunctionValue

«CodeList»

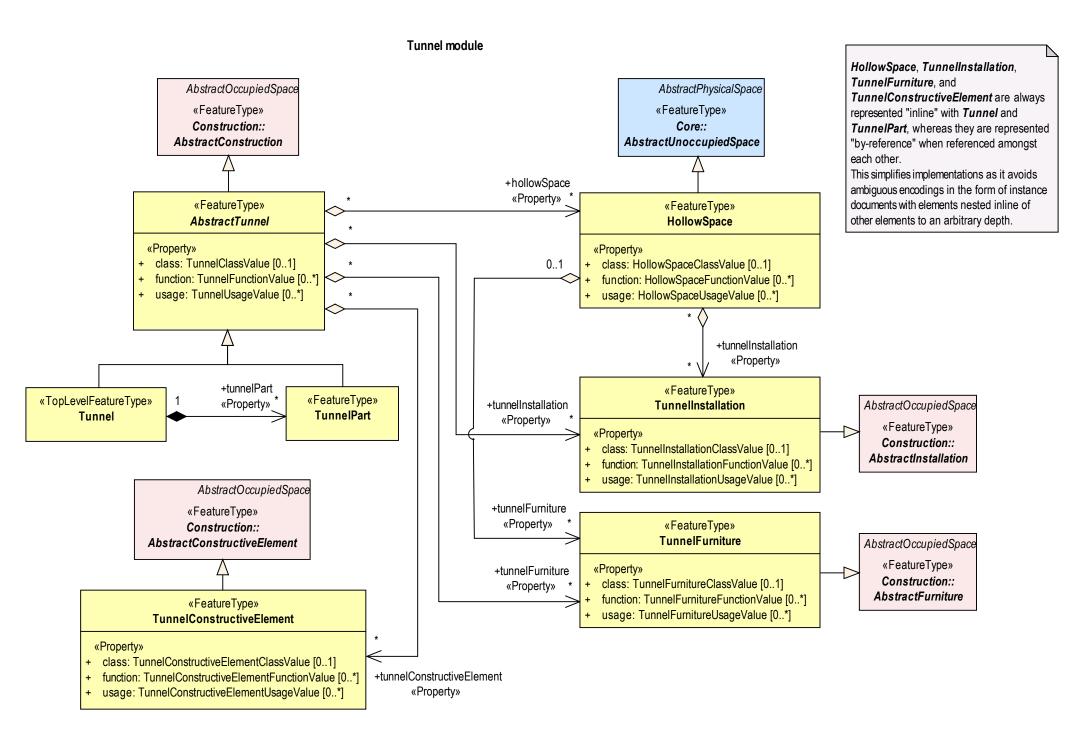
AuxiliaryTrafficAreaUsageValue

«CodeList»

ClearanceSpaceClassValue

«CodeList»

SurfaceMaterialValue



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»

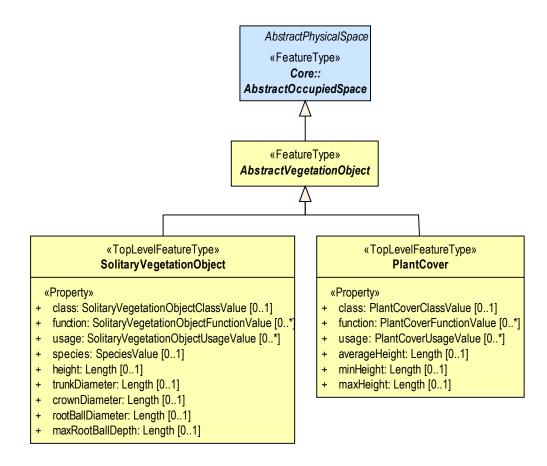
TunnelConstructiveElementFunctionValue

«CodeList»
HollowSpaceUsageValue

«CodeList»

TunnelConstructiveElementUsageValue

Vegetation module



Vegetation module - Code lists

«CodeList»

SolitaryVegetationObjectClassValue

«CodeList»

PlantCoverClassValue

«CodeList»

Solitary Vegetation Object Function Value

«CodeList»

PlantCoverFunctionValue

«CodeList»

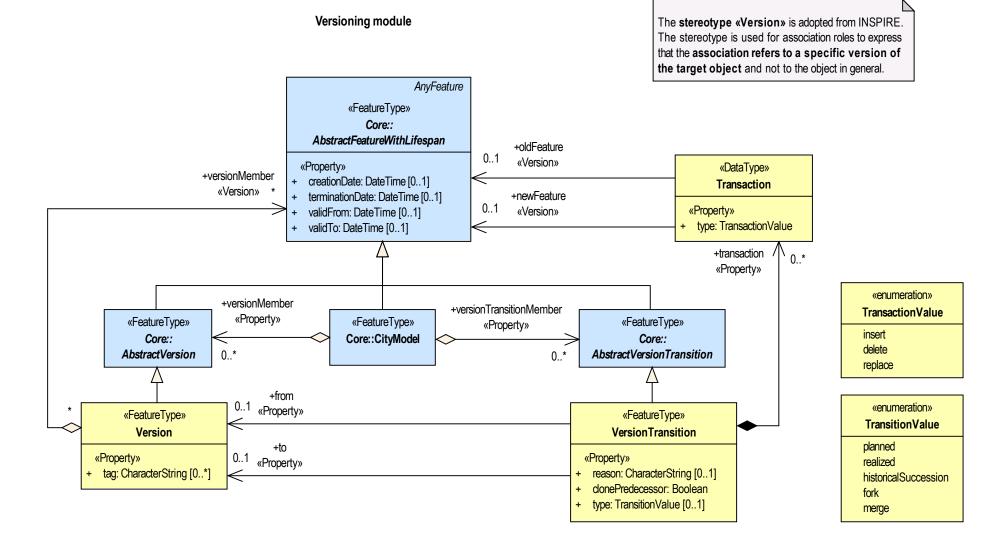
Solitary Vegetation Object Usage Value

«CodeList»

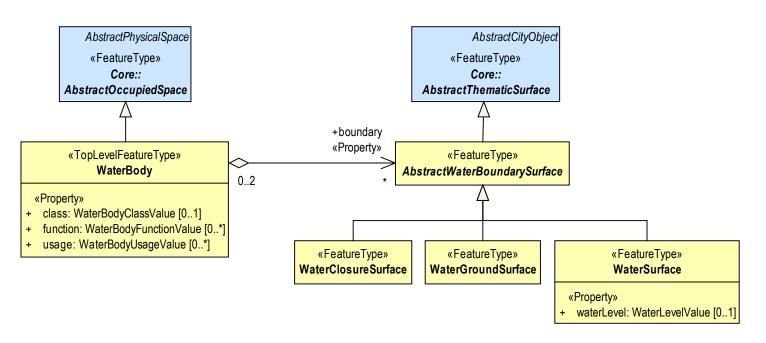
PlantCoverUsageValue

«CodeList»

SpeciesValue



WaterBody module



WaterBody module - Code lists

«CodeList»

WaterBodyClassValue

«CodeList»
WaterLevelValue

«CodeList»

WaterBodyFunctionValue

«CodeList»

WaterBodyUsageValue