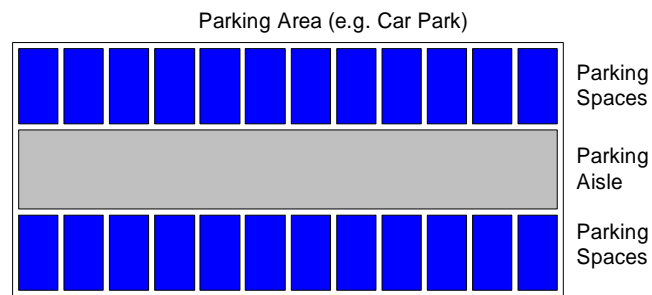


Flow of Events for Use Case – Show Parking Space

Change Log	
29/09/2004	Renamed from 'UC-ShowParkingSpace'. Modified to reflect internal and external parking spaces.
31/10/2004	Finalized for pre-integrated model

Overview

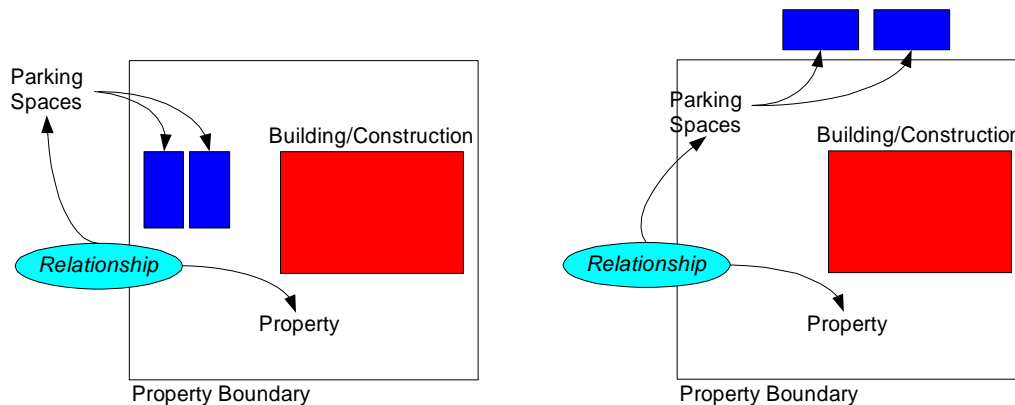
Shows parking spaces that are available or that are proposed for a physical property. The use case deals not only with individual parking spaces, but also with multiple parking spaces that may be required for a proposed construction, including the provision of parking aisles (i.e. aisles giving access to parking spaces) and parking areas (e.g. car parks). It also takes into account parking spaces for bikes and motor bikes.



General Application of Parking Spaces

In the context of this use case, a parking space is considered to be a space made available external to the building in which a vehicle may be parked. It is not intended to cover internal parking spaces per se, but it may be extended to handle internal parking spaces within a building construction for a covered car park.

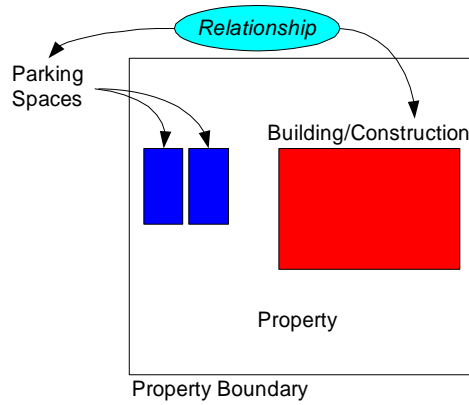
For the purposes of this use case, a parking space is related to a property and may be included within the boundary of the property or located outside the boundary and related to the property via a relationship.



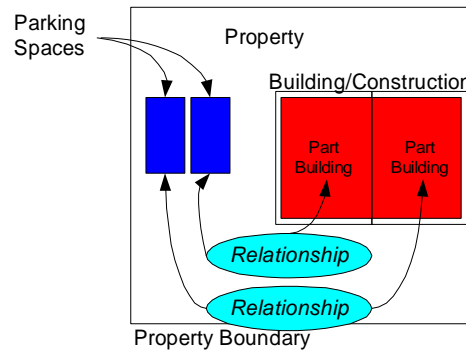
Parking Spaces Within Property Boundary

Parking Spaces Outside Property Boundary

The use case also allows for parking spaces to be related to a building construction (or to a part of a building). This reflects the practical situation where a parking space may be let to a tenant of a building. This provision may be in place of or in addition to the relationship between a parking space and a property.



Parking Spaces for a Building



Parking Spaces for Building Parts

Note that whilst parking spaces are generally considered for car parking, the concept can also be considered as appropriate for the parking of other items such as aircraft, boats etc.

Process

Preconditions

The physical property within which a parking space is to be located or with which it is to be associated are defined.

If the parking space is to be associated with a building construction, then the building to which it is to be associated must be defined.

Actors

xxxx

Main Flow

Flow	Entity
1. Determine the placement origin for the parking space (used as the datum of the local coordinate system for all geometric representation items used to represent the space).	IfcSpace
2. Place the extents of the parking space using the use case 'Place 2D Spatial Shape'	IfcShapeRepresentation
3. The representation identifier is set to 'Footprint'.	IfcShapeRepresentation
4. Create an instance of IfcSpace to designate the area and ensure attribute values are set appropriately to an internal or external space depending on the parking location.	IfcSpace
5. Set the value of the attribute ObjectType (inherited from IfcObject) as being 'ParkingArea', 'ParkingAisle' or 'ParkingSpace' according to the type of space being defined.	IfcSpace.ObjectType
6. Set the value of the attribute IfcSpace.CompositionType as being PARTIAL or ELEMENT depending on whether the space forms part of a larger, containing space or is complete as an element in itself.	IfcSpace.CompositionType

7. If the space is a partial space, assert an instance of IfcRelAggregates to define the spatial structure relationship between spaces.	IfcRelAggregates
8. Associate the footprint as a shape representation of the space.	IfcShapeRepresentation
9. Set properties as appropriate for parking spaces within instances of relevant property sets.	Pset_SpaceParking Pset_SpaceParkingAisle
10. Define relationship between the IfcSpace and the property set(s) using IfcRelDefinesByProperties.	IfcRelDefinesByProperties
11. Either <ul style="list-style-type: none"> Select the property with which a parking space is to be associated Select the building or building part with which the parking space is to be associated Select the property and building/building part with which a parking space is to be associated 	
12. Assert a relationship between parking space(s) and property and/or building as appropriate.	IfcRelConnectsElements OR IfcRelAssignsToProduct

Post Conditions

- Parking spaces are defined as instances of IfcSpace with attributes set to specify that it is an internal space (for an internal car park) or an external space (in the event of an external car park)..
- Spatial structure aggregation relationships between different hierarchical levels of parking space are defined.
- Relationships between parking spaces and the property and/or building that they serve are asserted.
- Properties of parking spaces are set within property sets.

IFC Usage and Extension Requirements

Existing Entity/Class Usage

<i>Entity Class Name</i>	<i>Usage</i>
IfcSpace	May be used to define the parking space. Ontology of object types that may be associated with IfcSpace to classify its function may need to be extended and some definitions currently referenced in property sets modified.
IfcRelAggregates	Aggregates spaces into a spatial structure hierarchy
IfcRelDefinesByProperties	Defines the type associated with an occurrence entity
IfcShapeRepresentation	Defines the shape of the parking space and recognizes its type

Existing Property Set Usage

<i>Property Set Name</i>	<i>Usage</i>
Pset_SpaceParkingAisle	Determines whether one way or two way traffic is allowed within the parking aisle

Existing Property Set with Proposed Modification

<i>Property Set Name</i>	<i>Usage</i>
Pset_SpaceParking	Specifies properties related to an individual parking space (particularly whether it is HandicapAccessible)

<i>A R M</i>	<i>Property</i>	<i>Type</i>	<i>Datatype</i>	<i>Unit</i>	<i>Definition</i>
	HandicapAccess	IfcPropertySingl	IfcBoolean		Indication that this object is designed to be accessible

	ible	eValue			by the handicapped. It is giving according to the requirements of the national building code.
A	ParkingUse	IfcPropertySingleValue	IfcLabel		Identifies the type of transportation for which the parking space is designed. Values are not predefined but might include car, compact car, motorcycle, bicycle, truck, bus etc.
A	ParkingUnits	IfcPropertySingleValue	IfcCountMeasure		Indicates the number of transportation units of the type specified by the property ParkingUse that may be accommodated within the space. Generally, this value should default to 1 unit. However, where the parking space is for motorcycles or bicycles, provision may be made for more than one unit in the space.

Issue List

<i>Question</i>	<i>Answer</i>
Requirement for parking spaces for bikes and other forms of transport.	In Norway a number of bike parking spaces may also be a condition for the building licence. We may consider if this use case should be more general than including car parking only (bikes, motorcycles, handicap car parking, electrical car parking with charging station, buses, taxis etc).