Flow of Events for Use Case – Determine Property Area

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

Overview

Used to determine and allocate the gross and net area of a property. This information is required for existing properties (on the situation map) and should also be identified for new properties (on the situation plan).
For existing planning purposes, gross and net area are shown as annotations on a drawing. In a model based situation, these values are captured specifically against objects that define the property.

Process

Preconditions

The property and property boundary are defined.

Actors

Actor

Main Flow

Flow	Entity
1. Select the property whose gross and net area is to be determined	IfcSpace
2. Get the property boundary for the property	IfcShapeRepresentation
3. Determine the coordinates of the geometric representation items that comprise the property boundary.	IfcPoint
4. Order the geometric representations (make a unique list) such that there is a start point and that the end point of each representation item becomes the start point of the next geometric representation item in the list.	
5. Calculate the gross area contained within the property boundary.	Pset_SpacePropertyArea.GrossPropertyArea
6. Decide the rules that determine the calculation of net area from the known gross area.	
7. Calculate the net area of the property.	IfcPropertyDependencyRelationship.NetPropertyArea Pset_SpacePropertyArea

Post Conditions

Gross and net area values are captured in a property set.

IFC Usage and Extension Requirements

Existing Entity/Class Usage

Entity Class Name	*Usage*

IfcPoint	Used to determine the points that define a geometric representation.
IfcPropertyDependencyRelationship	Used to determine the net area from the gross area where a protocol exists that describes a numerical relationship between two properties (one of which provides the dependency and the other of which is dependent). The dependency may be named e.g. *PropertyAreaDependency*, may have a description and allows specification of the protocol as an expression (although this is simply as a text string and not as an executable expression).
IfcShapeRepresentation	Shape of a geometric representation.
IfcSpace	The space for which the gross and net area are being determined.

New Property Set Requirement

Name:	Pset_SpacePropertyArea
Applicability:	IfcSpace
Applicable Classes:	
Applicable Type Value:	
IFC Version:	2x3
Definition:	Specifies particular information about a physical property instance

Property	***Type***	***Datatype***	***Unit***	***Definition***
GrossArea	IfcPropertySingleValue	IfcAreaMeasure		A measure of the gross area of a physical property
NetArea	IfcPropertySingleValue	IfcAreaMeasure		A measure of the net area of a physical property where the net area is determined from the physical area according to a protocol that specifies usable and non usable areas.

Issue List

Question	***Answer***
What is the approach to determining net area of a property? Is it by using an arithmetic protocol or is there a more pragmatic approach to defining what is useful and non useful?	
Is there a specific protocol for determining net area from gross area in Norway?	Yes, there is a Norwegian Standard – ”NS 3940 Areal- og volumberegninger av bygninger” (Area and Volume calculations for Buildings). This will have to be translated into English for our purpose.