

L'interopérabilité des systèmes GIS et BIM

Quelques éléments de discussion

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Themensponsor: Coordination Nationale GeoBIM

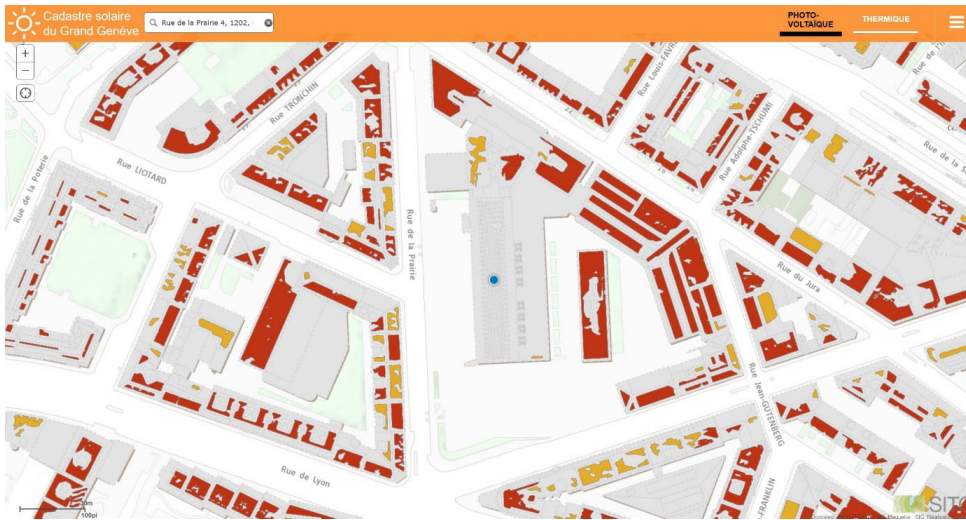
DER DIGITALE LEBENSRAUM
L'ESPACE DE VIE AU NUMERIQUE

GE+Summit 2022

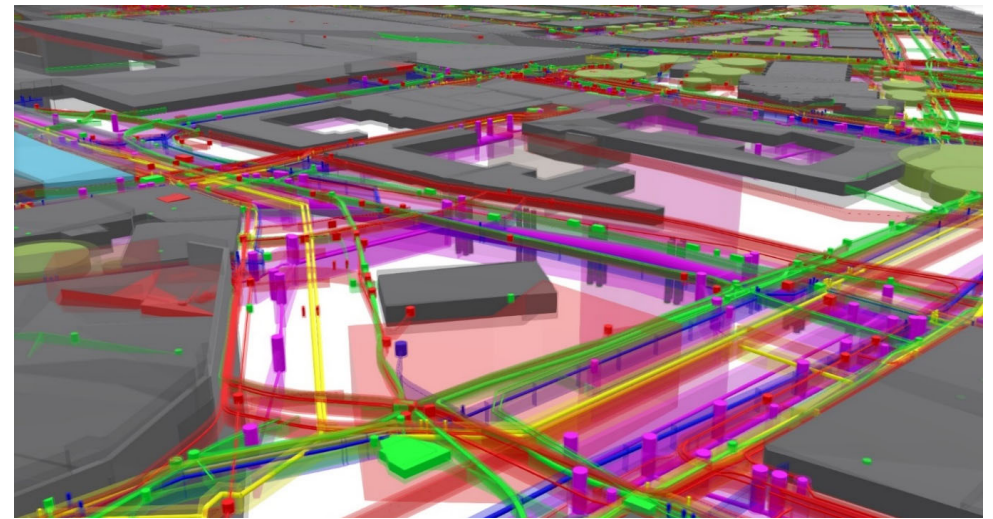
VERNETZT
MENSCH
UND RAUM

Pourquoi une convergence des geodonnées avec le BIM ?

En raison des innombrables **cas d'usage** !



Cadastre solaire, GE



Projet InnoSubsurface, GE

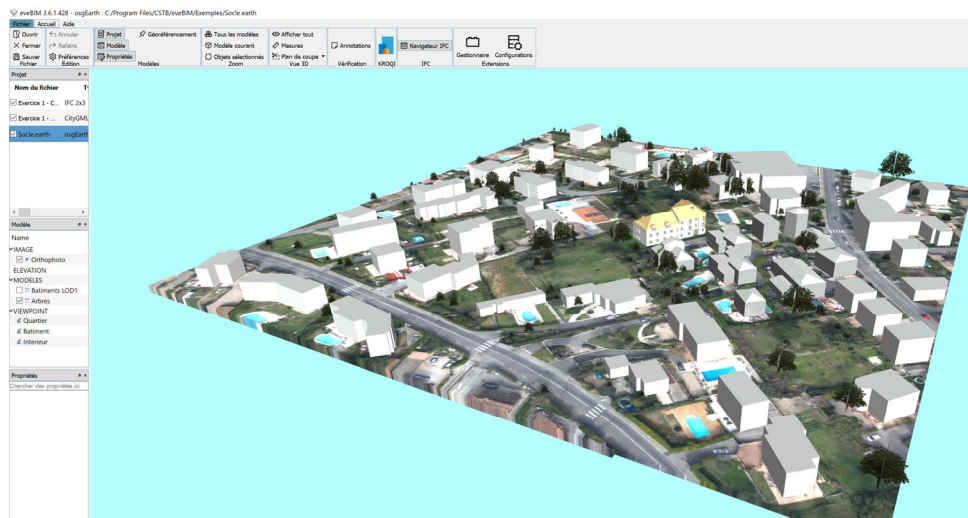
Cas d'usage

Cas d'usage	Exemple d'application
Estimation of solar irradiation	Determining the suitability of a roof surface for installing photovoltaic panels
Energy demand estimation	Assessing the return of a building energy retrofit
Estimation of shadows cast by urban features	Determination of solar envelopes
Estimation of the propagation of noise in an urban environment	Traffic planning
Urban planning	Designing green areas
Emergency response	Planning evacuation
Computational fluid dynamics	Predicting air quality
Forecasting seismic damage	Insurance
Flooding	Mitigating damage to utility management

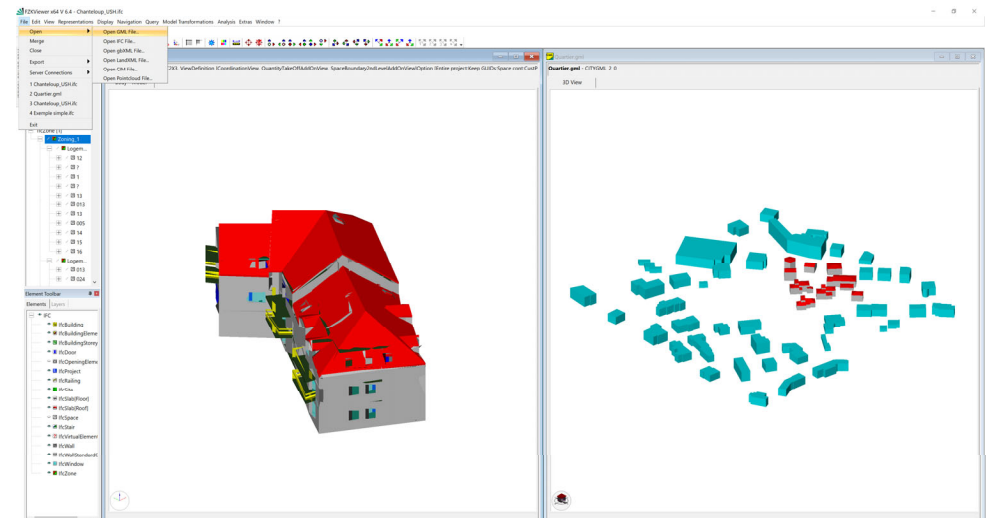
Extrait d'un tableau de Biljecki, F. (2015). Applications of 3D City Models : State of the Art Review. ISPRS Int. J. Geo-Inf., 2842-2889.

Quels logiciels pour visualiser aisément les données GIS et BIM ?

Quelques exemples de **viewer BIM/GIS**



eveBIM (CSTB)
IFC, CityGML, Earth



FZK Viewer (KIT)
IFC, CityGML, gbXML

Les différences conceptuelles entre les systèmes GIS et BIM



Source: OGC, & buildingSMART. (2020). Built environment data standards and their integration : An analysis of IFC, CityGML and LandInfra. <https://portal.ogc.org/files/92634>

CityGML vs IFC

CityGML

Markup language

basé sur l'interprétation des documents

- + Schéma moins complexe que celui des IFC
- + Facile à implémenter comme schéma interopérable

- + Facilement extensible

- Schéma avec « peu d'intelligence », l'intelligence est dans les applications

IFC

Data modeling language

pour modeler des structures et contextes complexes

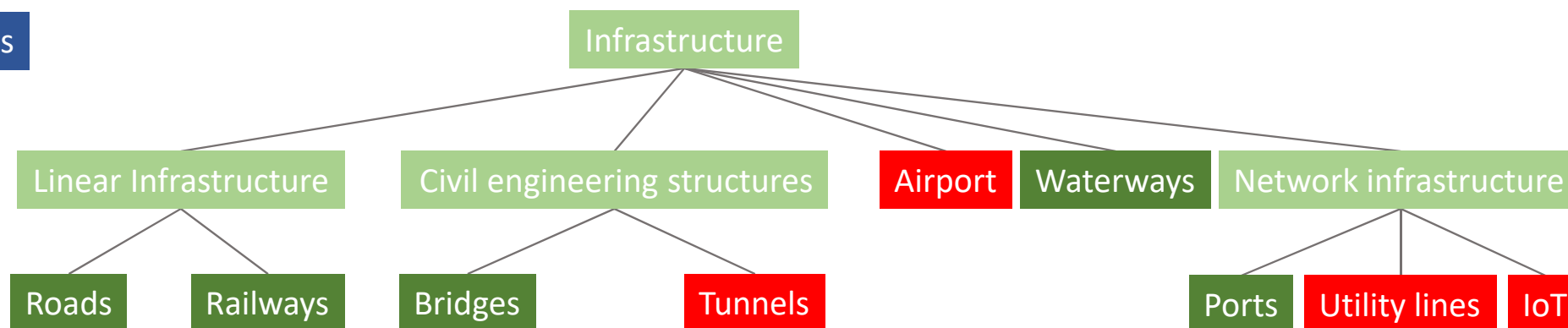
- Schéma complexe
- Implémentation pour l'export et l'import difficile

- Extensions complexes

- + Schéma « intelligent » permettant de proposer des applications complexes

La prochaine version 4.3 des IFC

Buildings



Depuis IFC 2x3

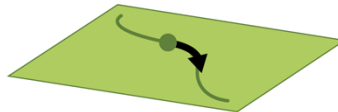
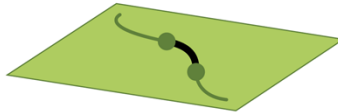
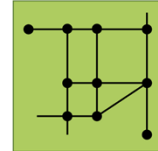
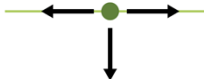


Avec IFC 4.3 RC 4

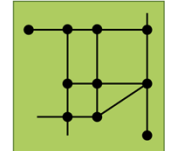
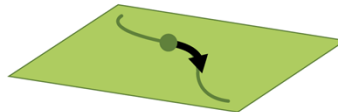
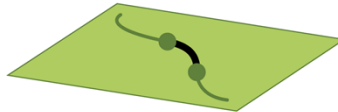
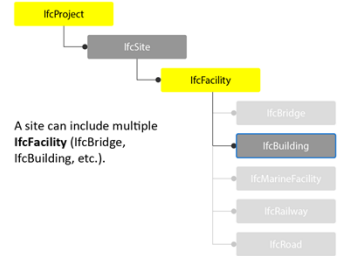
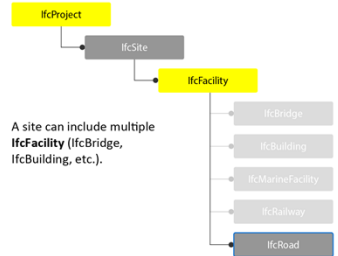
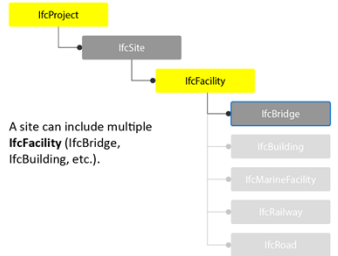
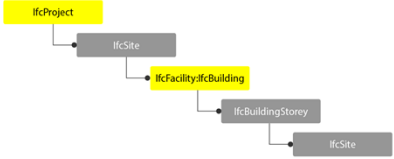
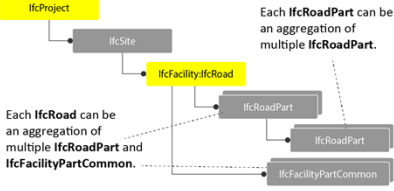
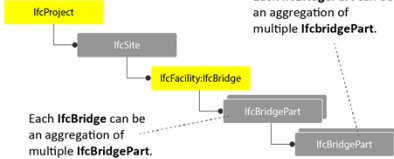


Prévu dans des futures extensions

La prochaine version 4.3 des IFC

	Buildings	Infrastructures	
		Transport infrastructures	
		Linear infrastructures	Civil engineering structures
		Roads	Bridges
Design logic (in order of priority)	Vertical (level) 	Longitudinal/horizontal (alignment) 	Horizontal (path or alignment) 
	Horizontal (space, HVAC, people flow) 	- Lateral (carriageway organization) - Vertical (loads, alignment) 	Vertical (loads, path or alignment) 
Georeferencing	Description - Refer to chapter 9.2.1 "Georeferencing" - Refer to table "Level of Georeferencing" of the same chapter Related IFC classe(s) Is either integrated for the entire project on the <i>IfcProject</i> or <i>IfcSite</i> level	Description Refer to level of georeferencing, multiple survey points necessary, project coordinate system with scale factor, etc. Related IFC classe(s) Is either integrated for the entire project on the <i>IfcProject</i> or <i>IfcSite</i> level.	Description - Project coordinate system mapped to a survey point - Angle to north Related IFC classe(s) Is either integrated for the entire project on the <i>IfcProject</i> or <i>IfcSite</i> level.
Positioning of objects / local placement • <i>IfcPositioningElement</i>	Axis, Grid, Levels <i>IfcGrid</i>	Road alignment, stationing (linear referencing points) <i>IfcLinearPositioningElement</i>	Start and end points, bridge alignment, stationing (linear referencing points) <i>IfcLinearPositioningElement</i>
Containment of objects	Level (Storey) Zone Space Objects for zones are provided by <i>IfcSystem</i> class (no geometrical representation). Objects for spaces are provided by the <i>IfcSpatialElement</i> class (with geometrical representation)	Elements defining a road, e.g.: - Road segment - Intersection - Roundabout - etc. Objects are provided by the <i>IfcSpatialElement</i> class	Elements defining a bridge, e.g.: - Superstructure - Substructure - Foundation - etc." Objects are provided by the <i>IfcSpatialElement</i> class

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Spatial breakdown structure General	 A site can include multiple IfcFacility (IfcBridge, IfcBuilding, etc.).	 A site can include multiple IfcFacility (IfcBridge, IfcBuilding, etc.).	 A site can include multiple IfcFacility (IfcBridge, IfcBuilding, etc.).
Specific		 Each IfcRoadPart can be an aggregation of multiple IfcRoadPart. Each IfcRoad can be an aggregation of multiple IfcRoadPart and IfcFacilityPartCommon.	 Each IfcBridgePart can be an aggregation of multiple IfcBridgePart. Each IfcBridge can be an aggregation of multiple IfcBridgePart.

Merci beaucoup pour votre attention!

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Auf Wiedersehen am GEOSummit 2023!