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Open Geospatial Consortium

# USER GUIDE FOR OGC POINTS OF INTEREST

## USER GUIDE

**DRAFT**

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# CONTENTS

# I KEYWORDS

The following are keywords to be used by search engines and document catalogues.

ogcdoc, OGC document, API, openapi, html

# II SECURITY CONSIDERATIONS

No security considerations have been made for this document.

# III SUBMITTING ORGANIZATIONS

The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

- organization_1
- organization_2
- organization_3
- etc.

# IV ABSTRACT

CityGML is an open conceptual data model for the storage and exchange of virtual 3D city models. It is defined through a Unified Modeling Language (UML) object model. This UML model extends the ISO Technical Committee 211 (TC211) conceptual model standards for spatial and temporal data. Building on the ISO fundation assures that the man-made features described in the City Models share the same spatial-temporal universe as the surrounding countryside within which they reside.

The aim of the development of CityGML is to reach a common definition of the basic entities, attributes, and relations of a 3D city model. This is especially important with respect to the cost-effective sustainable maintenance of 3D city models, allowing the reuse of the same data in different application fields.

This Users Guide provides extended explanations and examples for the individual concepts that are defined in the CityGML 3.0 Conceptual Model Standard. Both documents, the Conceptual Model Standard and the Users Guide, are mutually linked to facilitate navigation between corresponding sections in these documents.

# 1 SCOPE

# 1 SCOPE

This document provides Engineering Guidance on the use of the CityGML 3.0 Conceptual Model Standard.

The OGC Conceptual Model Standard specifies the representation of virtual 3D city and landscape models. The CityGML 3.0 Conceptual Model is expected to be the basis for a number of future Encoding Standards in which subsets of the Conceptual Model can be implemented. These Encoding Standards will enable both storage and exchange of data.

The CityGML 3.0 Conceptual Model Standard was designed to be concise and easy to use. As a result, most non-normative content has been removed. The purpose of this Users Guide is to capture that non-normative content and make it easy to access if and when needed.

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# NORMATIVE REFERENCES

# 2 NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.


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# INTRODUCTION

# 3 INTRODUCTION

An increasing number of cities and companies are building virtual 3D city models for different application areas like urban planning, mobile telecommunication, disaster management, 3D cadastre, tourism, vehicle and pedestrian navigation, facility management and environmental simulations. Furthermore, in the implementation of the European Environmental Noise Directive (END, 2002/49/EC) 3D geoinformation and 3D city models play an important role.

In recent years, most virtual 3D city models have been defined as purely graphical or geometrical models, neglecting the semantic and topological aspects. Thus, these models could almost only be used for visualisation purposes but not for thematic queries, analysis tasks, or spatial data mining. Since the limited reusability of models inhibits the broader use of 3D city models, a more general modelling approach had to be taken in order to satisfy the information needs of the various application fields.

CityGML is a common semantic information model for the representation of 3D urban objects that can be shared over different applications. The latter capability is especially important with respect to the cost-effective sustain-able maintenance of 3D city models, allowing the possibility of selling the same data to customers from different application fields. The targeted application areas explicitly include city planning, architectural design, tourist and leisure activities, environmental simulation, mobile telecommunication, disaster management, homeland securi-ty, real estate management, vehicle and pedestrian navigation, and training simulators.

CityGML is an open conceptual data model for the storage and exchange of virtual 3D city models. It is defined through a Unified Modeling Language (UML) object model. This UML model extends the ISO Technical Committee 211 (TC211) conceptual model standards for spatial and temporal data. Building on the ISO fundation assures that the man-made features described in the City Models share the same spatial-temporal universe as the surrounding countryside within which they reside.

CityGML defines the classes and relations for the most relevant topographic objects in cities and regional models with respect to their geometrical, topological, semantical, and appearance properties. “City” is broadly defined to comprise not just built structures, but also elevation, vegetation, water bodies, “city furniture”, and more. Included are generalisation hierarchies between thematic classes, aggregations, relations between objects, and spatial properties. CityGML is applicable for large areas and small regions and can represent the terrain and 3D objects in different levels of detail simultaneously. Since either simple, single scale models without topology and few semantics or very complex multi-scale models with full topology and fine-grained semantical differenti-ations can be represented, CityGML enables lossless information exchange between different GI systems and users.

The CityGML 3.0 standard consists of several parts: 1) The CityGML 3.0 Conceptual Model standard that defines the conceptual model in UML and that is described in more detail within this Users Guide. 2) A separate Encoding standard for each Encoding to be defined. This will be the GML Encoding in the beginning, further encoding specifications (e.g. relational database schema, JSON-based representation) will follow in the future.

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# HOW TO USE THIS RESOURCE

# 4 HOW TO USE THIS RESOURCE

The Users Guide to the CityGML 3.0 Conceptual Model Standard is not intended to be read from start to finnish. Rather, it is a resource structured to provide quick answers to questions which an implementer may have about the CityGML 3.0 Standard.

The CityGML 3.0 Standard includes hyperlinks which can be used to navigate directly to relevant sections of the Users Guide.

Some content in the Users Guide has been copied from the CityGML 3.0 Conceptual Model Standard to make the content more accessible to the user. In order to make clear which content in the Users Guide has been copied, the copied text is provided within grey boxes.

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# CHOOSE RESTAURANT USE CASE

# 5 CHOOSE RESTAURANT USE CASE

Clause content.

6

# CONSTRUCTION SITE USE CASE

# 6 CONSTRUCTION SITE USE CASE

Clause content.

7

# COUNTRY COVID REQUIREMENTS USE CASE

# 7 COUNTRY COVID REQUIREMENTS USE CASE

Clause content.

Unresolved directive in 22-053.adoc — include::22-053/sections/06-covid-test-center-use-case.adoc[]

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# ELECTRICAL VEHICLE CHARGING STATIONS USE CASE

# 8 ELECTRICAL VEHICLE CHARGING STATIONS USE CASE

Clause content.

9

# INDOOR NAVIGATION USE CASE

# 9 INDOOR NAVIGATION USE CASE

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# MILITARY USE CASE

# 10 MILITARY USE CASE

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# HOUSES AND UTILITY POLES USE CASE

# 11 HOUSES AND UTILITY POLES USE CASE

Clause content.

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# PACKAGE DROP-OFF AND PICK UP SERVICE USE CASE

# 12 PACKAGE DROP-OFF AND PICK UP SERVICE USE CASE

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# POI PUBLICATION USE CASE

# 13 POI PUBLICATION USE CASE

Clause content.

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# SMART TOURISM USE CASE

# 14 SMART TOURISM USE CASE

Clause content.