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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

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II

(Non-legislative acts)

REGULATIONS

COMMISSION REGULATION (EU) No 1088/2010

of 23 November 2010

amending Regulation (EC) No 976/2009 as regards download services and transformation services

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) [1], and in particular Article 16 thereof,

Whereas:

(1) Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services [2] sets out common technical specifications and minimum performance criteria for two types of network services — view and discovery services.

(2) Network services also include download services and transformation services. Download services are services which give users access to the information contained in the spatial data sets related to the spatial data themes defined in Directive 2007/2/EC. Spatial data sets made available through download services should be in conformity with Commission Regulation (EU) No 1089/2010 [3]. Transformation services are services which may be used to put spatial data sets in conformity with that Regulation.

(3) In order to ensure the interoperability of the infrastructures for spatial information established by the Member States, it is appropriate to lay down common technical specifications and minimum performance criteria for download services and transformation services.

(4) Regulation (EC) No 976/2009 should therefore be amended accordingly.

(5) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 22 of Directive 2007/2/EC,

HAS ADOPTED THIS REGULATION:

Article 1

Regulation (EC) No 976/2009 is amended as follows:

1. in the second subparagraph of Article 2, the following point (12) is added:

'12. "Direct Access Download" means a Download Service which provides access to the Spatial Objects in Spatial Data Sets based upon a query.';

2. in Article 3, the following points (c) and (d) are added:

'(c) as concerns the Download Services, the applicable specific requirements and characteristics set out in Annexes I and IV;

(d) as concerns the Transformation Services, the applicable specific requirements and characteristics set out in Annexes I and V.';

3. in Article 4, the following paragraphs 3 to 6 are added:

'3. Not later than 28 June 2012, Member States shall provide the Download Services with initial operating capability.

4. Not later than 28 December 2012, Member States shall provide the Download Services in conformity with this Regulation.

[1] OJ L 108, 25.4.2007, p. 1.
[2] OJ L 274, 20.10.2009, p. 9.
[3] See page 11 of this Official Journal.

5. Not later than 28 June 2012, Member States shall provide the Transformation Services with initial operating capability.

6. Not later than 28 December 2012, Member States shall provide the Transformation Services in conformity with this Regulation.';

4. Annex I is replaced by the text set out in Annex I to this Regulation;

5. Annex IV, set out in Annex II to this Regulation, is added;

6. Annex V, set out in Annex III to this Regulation, is added.

Article 2

Entry into force

This Regulation shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 23 November 2010.

For the Commission
The President
José Manuel BARROSO

ANNEX I

'ANNEX I

QUALITY OF SERVICE

Third party network services linked pursuant to Article 12 of Directive 2007/2/EC shall not be taken into account in the quality of service appraisal to avoid any deterioration which may result from cascading effects.

The following Quality of Service criteria relating to performance, capacity and availability shall apply.

1. PERFORMANCE

The normal situation represents periods out of peak load. It is set at 90 % of the time.

The response time for sending the initial response to a discovery service request shall be maximum 3 seconds in normal situation.

For a 470 Kilobytes image (e.g. 800 × 600 pixels with a colour depth of 8 bits), the response time for sending the initial response to a Get Map Request to a view service shall be maximum 5 seconds in normal situation.

For the Get Download Service Metadata operation, the response time for sending the initial response shall be maximum 10 seconds in normal situation.

For the Get Spatial Data Set operation and for the Get Spatial Object operation, and for a query consisting exclusively of a bounding box, the response time for sending the initial response shall be maximum 30 seconds in normal situation then, and still in normal situation, the download service shall maintain a sustained response greater than 0,5 Megabytes per second or greater than 500 Spatial Objects per second.

For the Describe Spatial Data Set operation and for the Describe Spatial Object Type operation, the response time for sending the initial response shall be maximum 10 seconds in normal situation then, and still in normal situation, the download service shall maintain a sustained response greater than 0,5 Megabytes per second or greater than 500 descriptions of Spatial Objects per second.

2. CAPACITY

The minimum number of simultaneous requests to a discovery service to be served in accordance with the quality of service performance criteria shall be 30 per second.

The minimum number of simultaneous service requests to a view service to be served in accordance with the quality of service performance criteria shall be 20 per second.

The minimum number of simultaneous requests to a download service to be served in accordance with the quality of service performance criteria shall be 10 requests per second. The number of requests processed in parallel may be limited to 50.

The minimum number of simultaneous requests to a transformation service to be served in accordance with the quality of service performance criteria shall be 5 requests per second.

3. AVAILABILITY

The probability of a network service to be available shall be 99 % of the time.'

ANNEX II

'ANNEX IV

DOWNLOAD SERVICES

PART A

Download Operations

1. LIST OF OPERATIONS

In order to be in conformity with Article 11(1)(c) of Directive 2007/2/EC, the Download Service shall at least provide the operations listed in Table 1 of this Annex.

Table 1

Operation	Role
Get Download Service Metadata	Provides all necessary information about the service, the available Spatial Data Sets, and describes the service capabilities.
Get Spatial Data Set	The Get Spatial Data Set operation allows the retrieval of a Spatial Data Set.
Describe Spatial Data Set	This operation returns the description of all the types of Spatial Objects contained in the Spatial Data Set.
Link Download Service	Allows the declaration, by a Public Authority or a Third Party, of the availability of a Download Service for downloading Spatial Data Sets or, where practicable, Spatial Objects, through the Member State's Download Service while maintaining the downloading capability at the Public Authority or the Third Party location.

The request and response parameters of each operation complete the description of each operation and form an integral part of the Download Service's technical specifications.

2. GET DOWNLOAD SERVICE METADATA OPERATION

2.1. **Get Download Service Metadata request**

2.1.1. *Get Download Service Metadata request parameter*

The Get Download Service Metadata request parameter shall indicate the natural language to be used for the content of the Get Download Service Metadata response.

2.2. **Get Download Service Metadata response**

The Get Download Service Metadata response shall contain the following sets of parameters:

— Download Service Metadata,

— Operations Metadata,

— Languages,

— Spatial Data Sets Metadata.

2.2.1. *Download Service Metadata parameter*

The Download Service Metadata parameters shall at least contain the INSPIRE metadata elements of the Download Service.

2.2.2. *Operations Metadata parameter*

The Operations metadata parameter provides metadata about the operations implemented by the Download Service. It shall at least provide a description of each operation, including as a minimum a description of the data exchanged and the network address.

2.2.3. *Languages parameter*

Two language parameters shall be provided:

— the response Language parameter indicating the natural language used in the Get Download Service Metadata response parameters,

— the Supported languages parameter containing the list of the natural languages supported by the Download Service.

2.2.4. *Spatial Data Sets Metadata parameters*

The INSPIRE metadata elements of the available Spatial Data Sets shall be provided. In addition, for each Spatial Data Set, the list of those Coordinate Reference Systems referred to in Regulation (EU) No 1089/2010 which are available shall also be provided.

3. GET SPATIAL DATA SET OPERATION

3.1. **Get Spatial Data Set request**

The Get Spatial Data Set request contains the following parameters:

— Language,

— Spatial Data Set Identifier,

— Coordinate Reference System.

3.1.1. *Language parameter*

The Language parameter shall indicate the natural language requested for the Spatial Data Set.

3.1.2. *Spatial Data Set Identifier parameter*

The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the Spatial Data Set.

3.1.3. *Coordinate Reference System parameter*

The Coordinate Reference System parameter shall contain one of the Coordinate Reference Systems included in the list of available Coordinate Reference Systems referred to in point 2.2.4.

3.2. **Get Spatial Data Set response**

3.2.1. *Get Spatial Data Set response parameter*

The Get Spatial Data Set response parameter shall be the requested Spatial Data Set in the requested language and in the requested Coordinate Reference System.

4. DESCRIBE SPATIAL DATA SET OPERATION

4.1. **Describe Spatial Data Set request**

The Describe Spatial Data Set request shall contain the following parameters:

— Language,

— Spatial Data Set Identifier.

4.1.1. *Language parameter*

The Language parameter shall indicate the natural language requested for the description of the Spatial Objects type.

4.1.2. *Spatial Data Set Identifier parameter*

The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the Spatial Data Set.

4.2. **Describe Spatial Data Set response**

4.2.1. *Describe Spatial Data Set response parameter*

The Describe Spatial Data Set response parameter shall be the description of the Spatial Objects in the requested Spatial Data Set and in the requested language.

5. LINK DOWNLOAD SERVICE OPERATION

The Link Download Service operation allows the declaration of the availability of a Download Service compliant with this Regulation, for the download of resources through the Member State's Download Service while maintaining the resources at the owner location.

5.1. **Link Download Service request**

5.1.1. *Link Download Service request parameter*

The Link Download Service request parameter shall provide all information about the Public Authority's or Third Party's Download Service compliant with this Regulation, enabling the Member State Download Service to provide access to Spatial Data Sets and, where practicable, to Spatial Objects from the Public Authority's or Third Party's Download Service.

PART B

Direct Access Download Operations

6. LIST OF OPERATIONS

Where the Download Service gives direct access to spatial data sets, it shall provide, in addition to the operations listed in Table 1, the operations listed in Table 2 of this Annex.

Table 2

Operation	Role
Get Spatial Object	This operation allows the retrieval of Spatial Objects based upon a query.
Describe Spatial Object Type	This operation returns the description of the specified Spatial Objects types.

The request and response parameters of each operation complete the description of each operation and form an integral part of the Download Service's technical specifications.

7. GET SPATIAL OBJECT OPERATION

7.1. **Get Spatial Object request**

The Get Spatial Object request shall support the following parameters:

— Language,

— Spatial Data Set Identifier,

— Coordinate Reference System,

— Query.

7.1.1. *Language parameter*

The Language parameter shall indicate the natural language requested for the Spatial Objects.

7.1.2. *Spatial Data Set Identifier parameter*

The Spatial Data Set Identifier parameter shall contain the Unique Resource Identifier of the required Spatial Data Set. Where the parameter is not provided, it shall be assumed that all available Spatial Data Sets have been selected.

7.1.3. *Coordinate Reference System parameter*

The Coordinate Reference System parameter shall contain one of the Coordinate Reference Systems included in the list of Coordinate Reference Systems set out in Regulation (EU) No 1089/2010.

7.1.4. *Query parameter*

The query parameter shall be composed of the search criteria listed in part C.

7.2. **Get Spatial Object response**

The Get Spatial Object response shall contain the following parameters:

— Spatial Objects Set,

— Spatial Objects Set Metadata.

7.2.1. *Spatial Objects Set parameter*

The Spatial Objects Set parameter shall be the set of Spatial Objects which complies with Regulation (EU) No 1089/2010 and fulfils the search criteria in the query, in the requested language and in the Coordinate Reference System.

7.2.2. *Spatial Objects Set Metadata parameter*

The Spatial Objects Set Metadata parameter shall contain at least the INSPIRE metadata elements of the set of Spatial Objects.

8. DESCRIBE SPATIAL OBJECT TYPE OPERATION

8.1. **Describe Spatial Object Type request**

The Describe Spatial Object Type request shall contain the following parameters:

— Language,

— Spatial Object Type.

8.1.1. *Language parameter*

The Language parameter shall indicate the natural language requested for the description of the Spatial Object type.

8.1.2. *Spatial Object Type parameter*

The Spatial Object Type parameter shall contain the language-neutral name of the Spatial Object Type as specified in Regulation (EU) No 1089/2010. Where the parameter is not provided, it shall be assumed that all types of Spatial Objects have been selected.

8.2. **Describe Spatial Object Type response**

8.2.1. *Describe Spatial Object Type response parameter*

The Describe Spatial Object type response parameter shall be the description of the spatial object type, in conformity with Regulation (EU) No 1089/2010.

PART C

Search Criteria for the Get Spatial Object Operation

For the purposes of the Get Spatial Object Operation of the Download Service, the following search criteria shall be implemented:

— Unique Resource Identifier of Spatial Data Set,

— all relevant key attributes and the relationship between Spatial Objects as set out in Regulation (EU) No 1089/2010; in particular the Unique Identifier of Spatial Object and the temporal dimension characteristics, including the date of update,

— bounding box, expressed in any of the Coordinate Reference Systems listed in Regulation (EU) No 1089/2010,

— Spatial Data Theme.

To allow for discovering spatial objects through a combination of search criteria, logical and comparison operators shall be supported.'

ANNEX III

'ANNEX V

TRANSFORMATION SERVICES

Transformation Operations

1. LIST OF OPERATIONS

In order to be in conformity with Article 11(1)(d) of Directive 2007/2/EC, the Transformation Service shall provide the operations listed in Table 1 of this Annex.

Table 1

Operation	Role
Get Transformation Service Metadata	Provides all necessary information about the service and describes the service capabilities, including the supported transformation category, supported transformations, accepted input data types, supported model definition and mapping languages.
Transform	Carries out the actual transformation process.
Link Transformation Service	Allows the declaration of availability of a Transformation Service for Transforming Spatial Data Sets through the Member State's Transformation Services while maintaining the Transformation capability at the Public Authority or the Third party location.

The request and response parameters of each operation complete the description of each operation and form an integral part of the Transformation Service's technical specifications.

2. GET TRANSFORMATION SERVICE METADATA OPERATION

2.1. **Get Transformation Service Metadata request**

2.1.1. *Get Transformation Service Metadata request parameter*

The Get Transformation Service Metadata request parameter shall indicate the natural language for the content of the Get Transformation Service Metadata response.

2.2. **Get Transformation Service Metadata response**

The Get Transformation Service Metadata response shall contain the following sets of parameters:

— Transformation Service Metadata,

— Operations Metadata,

— Languages.

2.2.1. *Transformation Service Metadata parameter*

The Transformation Service Metadata parameter shall at least contain the INSPIRE metadata elements of the Transformation Service.

2.2.2. *Operations Metadata parameter*

The Operations Metadata parameter provides metadata about the operations implemented by the Transformation Service.

It shall describe each operation, including as a minimum a description of the data exchanged and the network address, and shall list the following:

— the transformation categories accepted by the Transform operation,

— the encoding for the input Spatial Data Set accepted by the Transform operation,

— the Data Model languages accepted by the Transform operation,

— the Model Mapping languages accepted by the Transform operation.

2.2.3. *Languages parameter*

Two parameters shall be provided:

— the response language parameter indicating the natural language used in the Get Transformation Service Metadata response,

— the supported languages parameter containing the list of the natural languages supported by the Transformation Service.

3. TRANSFORM OPERATION

3.1. **Transform request**

The Transform request shall contain the following parameters:

— Input Spatial Data Set,

— Source Model,

— Target Model,

— Model Mapping.

3.1.1. *Input Spatial Data Set parameter*

The Input Spatial Data Set parameter shall indicate the Spatial Data Set to be transformed.

3.1.2. *Source Model parameter*

The Source Model parameter shall specify the model of the Input Spatial Data Set.

3.1.3. *Target Model parameter*

The Target Model parameter shall specify the model to which the input Spatial Data Set shall be transformed.

3.1.4. *Model Mapping parameter*

The Model Mapping parameter shall specify the mapping from the Source Model to the Target Model.

3.2. **Transform response**

3.2.1. *Transform response parameter*

The Transform response parameter shall contain the Spatial Data Set transformed in conformity with Regulation (EU) No 1089/2010.

4. LINK TRANSFORMATION SERVICE OPERATION

4.1. **Link Transformation Service request**

4.1.1. *Link Transformation Service request parameter*

The Link Transformation Service request parameter shall provide all information about the Public Authority's or Third Party's Transformation Service in conformity with this Regulation, enabling the use of the Public Authority's or Third Party's Transformation Service by the Member State's Transformation Service.'

COMMISSION REGULATION (EU) No 1089/2010

of 23 November 2010

implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) [1], and in particular Article 7(1) thereof,

Whereas:

(1) Directive 2007/2/EC lays down general rules for the establishment of the Infrastructure for Spatial Information in the European Community. Within this infrastructure, Member States are required to make available data sets related to one or several of the Annexes in Directive 2007/2/EC and the corresponding spatial data services in conformity with the technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and services.

(2) The technical arrangements take into account relevant user requirements, which were elicited from stakeholders through a user requirements survey and by analysing the submitted reference material and relevant Union environmental policies and policies or activities which may have an impact on the environment.

(3) The feasibility of the technical arrangements and their proportionality in terms of the likely costs and benefits were analysed by the Commission based on the testing results reported by the stakeholders, replies from Member States through the national contact points to a request for information on cost benefit considerations and evidence from studies conducted by Member States on the costs and benefits of spatial data infrastructures at regional level.

(4) Representatives of Member States as well as other natural or legal persons with an interest in the spatial data, including users, producers, added value service providers or any coordinating body were given the opportunity to participate in the drafting of the technical arrangements through proposed experts and to evaluate the draft implementing rules through a stakeholder consultation and testing exercise.

(5) In order to achieve interoperability and benefit from the endeavours of users' and producers' communities, when appropriate, international standards are integrated into the concepts and definitions of the elements of spatial data themes listed in the Directive 2007/2/EC Annex I, II or III.

(6) In order to ensure interoperability and harmonisation across spatial data themes, the Member States should meet requirements for common data types, the identification of spatial objects, metadata for interoperability, generic network model and other concepts and rules that apply to all spatial data themes.

(7) In order to ensure the interoperability and harmonisation within one spatial data theme, the Member States should use the classifications and definitions of spatial objects, their key attributes and association roles, data types, value domains and specific rules that apply to individual spatial data theme.

(8) Since the code list values required for the implementation of this Regulation are not included in this Regulation, this Regulation should only become applicable once these are adopted as a legal act. It is therefore appropriate to defer the applicability of this Regulation.

(9) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 22 of Directive 2007/2/EC,

HAS ADOPTED THIS REGULATION:

Article 1

Subject Matter

This Regulation sets out the requirements for technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and spatial data services corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC.

Article 2

Definitions

For the purpose of this Regulation, the following definitions as well as the theme-specific definitions set out in Annex II shall apply:

1. 'abstract type' means a type that cannot be instantiated, but which may have attributes and association roles,

[1] OJ L 108, 25.4.2007, p. 1.

2. 'association role' means a value or object, to which a type has a relationship, as referred to in Article 8 (2b) of Directive 2007/2/EC,

3. 'attribute' means a characteristic of a type, as referred to in Article 8 (2c) of Directive 2007/2/EC,

4. 'candidate type' means a type which is already used as part of the specification of a spatial data theme in Annex I of Directive 2007/2/EC, but which will be fully specified in the spatial data theme in Annex II or III of Directive 2007/2/EC where it thematically belongs,

5. 'code list' means an open enumeration that can be extended,

6. 'data type' means a descriptor of a set of values that lack identity, in accordance with ISO 19103,

7. 'enumeration' means a data type whose instances form a fixed list of named literal values. Attributes of an enumerated type may only take values from this list,

8. 'external object identifier' means a unique object identifier which is published by the responsible body, which may be used by external applications to reference the spatial object,

9. 'identifier' means a linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated, in accordance with EN ISO 19135,

10. 'instantiate' means to create an object that is conformant with the definition, attributes, association roles and constraints specified for the instantiated type,

11. 'layer' means a basic unit of geographic information that may be requested as a map from a server in accordance with EN ISO 19128,

12. 'life-cycle information' means a set of properties of a spatial object that describe the temporal characteristics of a version of a spatial object or the changes between versions,

13. 'metadata element' means a discrete unit of metadata, in accordance with EN ISO 19115,

14. 'package' means a general purpose mechanism for organizing elements into groups,

15. 'register' means a set of files containing identifiers assigned to items with descriptions of the associated items, in accordance with EN ISO 19135,

16. 'spatial object type' means a classification of spatial objects,

17. 'style' means a mapping from spatial object types and their properties and constraints to parameterized symbols used in drawing maps,

18. 'sub-type of' means a relationship between a more specific type and a more general type, where the more specific type is fully consistent with the more general type and contains additional information, as adapted from ISO 19103,

19. 'type' means spatial object type or data type,

20. 'voidable' means that, for an attribute or association role a value of 'void' may be made available if no corresponding value is contained in the spatial data sets maintained by the Member States or no corresponding value can be derived from existing values at reasonable costs. If an attribute or association role is not voidable, the table cell specifying its voidability is left blank.

Article 3

Common Types

Types that are common to several of the themes listed in Annexes I, II and III to Directive 2007/2/EC shall conform to the definitions and constraints and include the attributes and association roles set out in Annex I.

Article 4

Types for the Exchange and Classification of Spatial Objects

1. Member States shall use the spatial object types and associated data types, enumerations and code lists defined in Annex II for the exchange and classification of spatial objects from data sets meeting the conditions laid down in Article 4 of Directive 2007/2/EC.

2. Spatial object types and data types shall comply with the definitions and constraints and include the attributes and association roles set out in Annex II.

3. The enumerations used in attributes or association roles of spatial object types or data types shall comply with the definitions and include the values set out in Annex II. The enumeration values are language-neutral mnemonic codes for computers.

4. The code lists used in attributes or association roles of spatial object types or data types shall comply with the definitions set out in Annex II.

Article 5

Types

1. For all types defined in this Regulation, a language-neutral name for computers is given between parentheses in the title of the section specifying the requirements for that type. This language-neutral name shall be used for referring to the corresponding type in the definition of an attribute or association role.

2. Types that are a sub-type of another type shall also include all this type's attributes and association roles.

3. Abstract types shall not be instantiated.

4. Candidate types shall be considered during the development of requirements for the spatial data theme they thematically belong to. During this development, the only allowed change to the specification of the candidate type is to extend it.

Article 6

Code Lists and Enumerations

1. Code lists shall be of one of the following types, as specified in Annex II:

(a) code lists that are managed in a common code list register and that shall not be extended by Member States;

(b) code lists that may be extended by Member States.

2. Where a Member State extends a code list, the allowed values of the extended code lists shall be made available in a register.

3. Attributes or association roles of spatial object types or data types that have a code list type may only take values that are valid according to the register in which the code list is managed.

4. Attributes or association roles of spatial object types or data types that have an enumeration type may only take values from the lists specified for the enumeration type.

Article 7

Encoding

1. Every encoding rule used to encode spatial data shall conform to EN ISO 19118. In particular, it shall specify schema conversion rules for all spatial object types and all attributes and association roles and the output data structure used.

2. Every encoding rule used to encode spatial data shall be made available.

Article 8

Updates

1. Member States shall make available updates of data on a regular basis.

2. All updates shall be made at the latest 6 months after the change was applied in the source data set, unless a different period is specified for a specific spatial data theme in Annex II.

Article 9

Identifier Management

1. The data type Identifier defined in Section 2.1 of Annex I shall be used as a type for the external object identifier of a spatial object.

2. The external object identifier for the unique identification of spatial objects shall not be changed during the life-cycle of a spatial object.

Article 10

Life-cycle of Spatial Objects

1. Different versions of the same spatial object shall always be instances of the same spatial object type.

2. The namespace and localId attributes of the external object identifier shall remain the same for different versions of a spatial object.

3. Where the attributes beginLifespanVersion and endLifespanVersion are used, the value of endLifespanVersion shall not be before the value of beginLifespanVersion.

Article 11

Temporal Reference Systems

1. The default temporal reference system referred to in point 5 of part B of the Annex to Commission Regulation (EC) No 1205/2008 [1] shall be used, unless other temporal reference systems are specified for a specific spatial data theme in Annex II.

2. If other temporal reference systems are used, these shall be specified in the data set metadata.

Article 12

Other Requirements & Rules

1. The value domain of spatial properties defined in this Regulation shall be restricted to the Simple Feature spatial schema as defined by EN ISO 19125-1, unless specified otherwise for a specific spatial data theme or type.

[1] OJ L 326, 4.12.2008, p. 12.

2. All measurement values shall be expressed using SI units, unless specified otherwise for a specific spatial data theme or type.

3. Where the attributes validFrom and validTo are used, the value of validTo shall not be before the value of validFrom.

4. In addition, all theme-specific requirements set out in Annex II shall apply.

Article 13

Metadata required for Interoperability

The metadata describing a spatial data set shall include the following metadata elements required for interoperability:

1. Coordinate Reference System: Description of the coordinate reference system(s) used in the data set.

2. Temporal Reference System: Description of the temporal reference system(s) used in the data set.

   This element is mandatory only if the spatial data set contains temporal information that does not refer to the default temporal reference system.

3. Encoding: Description of the computer language construct(s) specifying the representation of data objects in a record, file, message, storage device or transmission channel.

4. Topological Consistency: Correctness of the explicitly encoded topological characteristics of the data set as described by the scope.

   This element is mandatory only if the data set includes types from the Generic Network Model and does not assure centreline topology (connectivity of centrelines) for the network.

5. Character Encoding: The character encoding used in the data set.

   This element is mandatory only if an encoding is used that is not based on UTF-8.

Article 14

Portrayal

1. For the portrayal of spatial data sets using a view network service as specified in Commission Regulation No 976/2009 [1], the following shall be available:

(a) the layers specified in Annex II for the theme or themes the data set is related to;

(b) for each layer at least a default portrayal style, with as a minimum an associated title and a unique identifier.

2. For each layer, Annex II defines the following:

(a) a human readable title of the layer to be used for display in user interface;

(b) the spatial object type(s) that constitute the content of the layer.

Article 15

Entry into force

This Regulation shall enter into force on the twentieth day following its publication in the *Official Journal of the European Union*.

It shall apply from 15 December 2010.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 23 November 2010.

For the Commission
The President
José Manuel BARROSO

[1] OJ L 274, 20.10.2009, p. 9.

ANNEX I

COMMON TYPES

1. TYPES DEFINED IN EUROPEAN AND INTERNATIONAL STANDARDS

1. For the types Area, Boolean, CharacterString, DateTime, Distance, Integer, Length, Measure, Number, Sign and Velocity used in definitions of attributes and association roles of spatial object types or data types, the definitions given in ISO 19103 shall apply.

2. For the types GM_Curve, GM_MultiSurface, GM_Object, GM_Point, GM_Primitive and GM_Surface used in spatial attributes or association roles of spatial object types or data types, the definitions given in EN ISO 19107 shall apply.

3. For the type TM_Period used in definitions of attributes and association roles of spatial object types or data types, the definitions given in EN ISO 19108 shall apply.

4. For the types CI_Citation and MD_Resolution used in definitions of attributes and association roles of spatial object types or data types, the definitions given in EN ISO 19115 shall apply.

5. For the types LocalisedCharacterString and URI used in definitions of attributes and association roles of spatial object types or data types, the definitions given in ISO 19139 shall apply.

2. COMMON DATA TYPES

2.1. **Identifier (Identifier)**

External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.

Attributes of the data type Identifier

Attribute	Definition	Type	Voidability
localId	A local identifier, assigned by the data provider. The local identifier is unique within the namespace, that is no other spatial object carries the same unique identifier.	CharacterString	
namespace	Namespace uniquely identifying the data source of the spatial object.	CharacterString	
versionId	The identifier of the particular version of the spatial object, with a maximum length of 25 characters. If the specification of a spatial object type with an external object identifier includes life-cycle information, the version identifier is used to distinguish between the different versions of a spatial object. Within the set of all versions of a spatial object, the version identifier is unique.	CharacterString	voidable

Constraints of the data type Identifier

The localId and the namespace shall only use the following set of characters: {'A' … 'Z', 'a' … 'z,' '0' … '9', '_', '.', '–'}, that is only letters from the Latin alphabet, digits, underscore, point, and dash are allowed.

3. COMMON ENUMERATIONS

3.1. **Vertical Position (VerticalPositionValue)**

The relative vertical position of a spatial object.

Allowed values for the enumeration VerticalPositionValue

Value	Definition
onGroundSurface	The spatial object is on ground level.
suspendedOrElevated	The spatial object is suspended or elevated.
underground	The spatial object is underground.

4. COMMON CODE LISTS

4.1. **Condition Of Facility (ConditionOfFacilityValue)**

The status of a facility with regards to its completion and use.

This code list shall be managed in a common code list register.

4.2. **Country Code (CountryCode)**

Country code as defined in the Interinstitutional style guide published by the Publications Office of the European Union.

5. GENERIC NETWORK MODEL

5.1. **Spatial Object Types**

5.1.1. *Cross Reference (CrossReference)*

Represents a reference between two elements in the same network.

Association roles of the spatial object type CrossReference

Association role	Definition	Type	Voidability
element	The cross referenced elements	NetworkElement	

5.1.2. *Generalised Link (GeneralisedLink)*

Abstract base type representing a linear network element that may be used as a target in linear referencing.

This type is a sub-type of NetworkElement.

This type is abstract.

5.1.3. *Grade Separated Crossing (GradeSeparatedCrossing)*

Indicator which of two or more intersecting elements is/are below and which is/are above, to be used if elevation coordinates are not present or cannot be trusted.

This type is a sub-type of NetworkElement.

Association roles of the spatial object type GradeSeparatedCrossing

Association role	Definition	Type	Voidability
element	Sequence of crossing links. The order reflects their elevation; the first link is the lower link.	Link	

5.1.4. *Link (Link)*

Curvilinear network element that connects two positions and represents a homogeneous path in the network. The connected positions may be represented as nodes.

This type is a sub-type of GeneralisedLink.

This type is abstract.

Attributes of the spatial object type Link

Attribute	Definition	Type	Voidability
centrelineGeometry	The geometry that represents the centreline of the link.	GM_Curve	
fictitious	Indicator that the centreline geometry of the link is a straight line with no intermediate control points – unless the straight line represents the geography in the resolution of the data set appropriately.	Boolean	

Association roles of the spatial object type Link

Association role	Definition	Type	Voidability
endNode	The optional end node for this link. The end node may be the same instance as the start node.	Node	
startNode	The optional start node for this link.	Node	

5.1.5. *Link Sequence (LinkSequence)*

A network element which represents a continuous path in the network without any branches. The element has a defined beginning and end and every position on the link sequence is identifiable with one single parameter such as length.

This type is a sub-type of GeneralisedLink.

This type is abstract.

Attributes of the spatial object type LinkSequence

Attribute	Definition	Type	Voidability
link	The ordered collection of directed links that constitute the link sequence.	DirectedLink	

5.1.6. *Link Set (LinkSet)*

A collection of link sequences and/or individual links that has a specific function or significance in a network.

This type is a sub-type of NetworkElement.

This type is abstract.

Association roles of the spatial object type LinkSet

Association role	Definition	Type	Voidability
link	The set of links and link sequences that constitute the link set.	GeneralisedLink	

5.1.7. *Network (Network)*

A network is a collection of network elements.

Attributes of the spatial object type Network

Attribute	Definition	Type	Voidability
geographicalName	Geographical name for this network.	GeographicalName	voidable

Association roles of the spatial object type Network

Association role	Definition	Type	Voidability
elements	The collection of elements that constitutes the network.	NetworkElement	

5.1.8. *Network Area (NetworkArea)*

A 2-dimensional element in a network.

This type is a sub-type of NetworkElement.

This type is abstract.

Attributes of the spatial object type NetworkArea

Attribute	Definition	Type	Voidability
geometry	Represents the geometric properties of the area	GM_Surface	

5.1.9. *Network Connection (NetworkConnection)*

Represents a logical connection between two or more network elements in different networks.

This type is a sub-type of NetworkElement.

Attributes of the spatial object type NetworkConnection

Attribute	Definition	Type	Voidability
type	Categorisation of the network connection.	ConnectionTypeValue	voidable

Association roles of the spatial object type NetworkConnection

Association role	Definition	Type	Voidability
element	Network elements in different networks	NetworkElement	

Constraints of the spatial object type NetworkConnection

All elements have to be in different networks

5.1.10. *Network Element (NetworkElement)*

Abstract base type representing an element in a network. Every element in a network provides some function that is of interest in the network.

This type is abstract.

Attributes of the spatial object type NetworkElement

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	

Association roles of the spatial object type NetworkElement

Association role	Definition	Type	Voidability
inNetwork	The networks in which a network element is a member.	Network	voidable

5.1.11. *Network Property (NetworkProperty)*

Abstract base type representing phenomena located at or along a network element. This base type provides general properties to associate the network-related phenomena (network properties) with the network elements.

This type is abstract.

Attributes of the spatial object type NetworkProperty

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
networkRef	Spatial reference of the network-related property.	NetworkReference	voidable

5.1.12. *Node (Node)*

Represents a significant position in the network that always occurs at the beginning or the end of a link.

This type is a sub-type of NetworkElement.

This type is abstract.

Attributes of the spatial object type Node

Attribute	Definition	Type	Voidability
geometry	The location of the node.	GM_Point	

Association roles of the spatial object type Node

Association role	Definition	Type	Voidability
spokeEnd	The links that enter the node.	Link	voidable
spokeStart	The links that leave the node.	Link	voidable

5.2. **Data Types**

5.2.1. *Directed Link (DirectedLink)*

A link either in its positive or negative direction.

Attributes of the data type DirectedLink

Attribute	Definition	Type Voidability	Voidability
direction	Indicates if the directed link agrees (positive) or disagrees (negative) with the positive direction of the link.	Sign	

Association roles of the data type DirectedLink

Association role	Definition	Type Voidability	Voidability
link	The link	Link	

5.2.2. *Link Reference (LinkReference)*

A network reference to a linear network element.

This type is a sub-type of NetworkReference.

Attributes of the data type LinkReference

Attribute	Definition	Type	Voidability
applicableDirection	The directions of the generalised link to which the reference applies. In cases where a property does not apply *to* a direction along a link, but represents a phenomenon *along* a link, 'inDirection' refers to the right side in the direction of the link.	LinkDirectionValue	voidable

Constraints of the data type LinkReference

Linear reference targets must be linear network elements. That is, if linear referencing is used or direction is relevant, the target of the network reference shall be a link or a link sequence.

5.2.3. *Network Reference (NetworkReference)*

A reference to a network element.

Association roles of the data type NetworkReference

Association role	Definition	Type	Voidability
element	The referenced network element.	NetworkElement	

5.2.4. *Simple Linear Reference (SimpleLinearReference)*

A network reference that is restricted to part of a linear network element. The part is the part of the network element between fromPosition and toPosition.

This type is a sub-type of LinkReference.

Attributes of the data type SimpleLinearReference

Attribute	Definition	Type	Voidability
fromPosition	The start position of the linear element, expressed as the distance from the start of the linear network element along its curve geometry.	Length	
offset	An offset from the centreline geometry of the generalised link, where applicable; a positive offset is to the right in the direction of the link, a negative offset is to the left.	Length	voidable
toPosition	The end position of the linear element, expressed as the distance from the start of the linear network element along its curve geometry.	Length	

5.2.5. *Simple Point Reference (SimplePointReference)*

A network reference that is restricted to a point on a linear network element. The point is the location on the network element at the position atPosition along the network.

This type is a sub-type of LinkReference.

Attributes of the data type SimplePointReference

Attribute	Definition	Type	Voidability
atPosition	Position of the point, expressed as the distance from the start of the linear network element along its curve geometry.	Length	
offset	An offset from the centreline geometry of the generalised link, where applicable; a positive offset is to the right in the direction of the link, a negative offset is to the left.	Length	voidable

5.3. **Code Lists**

5.3.1. *Connection Type (ConnectionTypeValue)*

Types of connections between different networks.

This code list shall be managed in a common code list register.

5.3.2. *Link Direction (LinkDirectionValue)*

List of values for directions relative to a link

This code list shall be managed in a common code list register.

ANNEX II

REQUIREMENTS FOR SPATIAL DATA THEMES LISTED IN ANNEX I TO DIRECTIVE 2007/2/EC

1. COORDINATE REFERENCE SYSTEMS

1.1. Definitions

In addition to the definitions set out in Article 2, the following definitions shall apply:

— 'datum' means a parameter or set of parameters that define the position of the origin, the scale, and the orientation of a coordinate system, in accordance with EN ISO 19111,

— 'geodetic datum' means a datum describing the relationship of a coordinate system to the Earth, in accordance with EN ISO 19111,

— 'coordinate system' means a set of mathematical rules for specifying how coordinates are to be assigned to points, in accordance with EN ISO 19111,

— 'coordinate reference system' means a coordinate system which is related to the real world by a datum, in accordance with EN ISO 19111. This definition includes coordinate systems based on geodetic or Cartesian coordinates and coordinate systems based on map projections.

— 'map projection' means a change of coordinates, based on a one-to-one relationship, from a geodetic coordinate system to a plane, based on the same datum, in accordance with EN ISO 19111,

— 'compound coordinate reference system' means a coordinate reference system using two other independent coordinate reference systems, one for the horizontal component and one for the vertical component, to describe a position, in accordance with EN ISO 19111,

— 'geodetic coordinate system' means a coordinate system in which position is specified by geodetic latitude, geodetic longitude and (in the three-dimensional case) ellipsoidal height, in accordance with EN ISO 19111.

1.2. Datum for three-dimensional and two-dimensional coordinate reference systems

For the three-dimensional and two-dimensional coordinate reference systems and the horizontal component of compound coordinate reference systems used for making spatial data sets available, the datum shall be the datum of the European Terrestrial Reference System 1989 (ETRS89) in areas within its geographical scope, or the datum of the International Terrestrial Reference System (ITRS) or other geodetic coordinate reference systems compliant with ITRS in areas that are outside the geographical scope of ETRS89. Compliant with the ITRS means that the system definition is based on the definition of the ITRS and there is a well documented relationship between both systems, according to EN ISO 19111.

1.3. Coordinate Reference Systems

Spatial data sets shall be made available using at least one of the coordinate reference systems specified in sections 1.3.1, 1.3.2 and 1.3.3, unless one of the conditions specified in section 1.3.4 holds.

1.3.1. *Three-dimensional Coordinate Reference Systems*

— Three-dimensional Cartesian coordinates based on a datum specified in 1.2 and using the parameters of the Geodetic Reference System 1980 (GRS80) ellipsoid.

— Three-dimensional geodetic coordinates (latitude, longitude and ellipsoidal height) based on a datum specified in 1.2 and using the parameters of the GRS80 ellipsoid.

1.3.2. *Two-dimensional Coordinate Reference Systems*

— Two-dimensional geodetic coordinates (latitude and longitude) based on a datum specified in 1.2 and using the parameters of the GRS80 ellipsoid.

— Plane coordinates using the ETRS89 Lambert Azimuthal Equal Area coordinate reference system.

— Plane coordinates using the ETRS89 Lambert Conformal Conic coordinate reference system.

— Plane coordinates using the ETRS89 Transverse Mercator coordinate reference system.

1.3.3. *Compound Coordinate Reference Systems*

1. For the horizontal component of the compound coordinate reference system, one of the coordinate reference systems specified in section 1.3.2 shall be used.

2. For the vertical component, one of the following coordinate reference systems shall be used:

— For the vertical component on land, the European Vertical Reference System (EVRS) shall be used to express gravity-related heights within its geographical scope. Other vertical reference systems related to the Earth gravity field shall be used to express gravity-related heights in areas that are outside the geographical scope of EVRS.

— For the vertical component in the free atmosphere, barometric pressure, converted to height using ISO 2533:1975 International Standard Atmosphere shall be used.

1.3.4. *Other Coordinate Reference Systems*

Exceptions, where other coordinate reference systems than those listed in 1.3.1, 1.3.2 or 1.3.3 may be used, are:

1. Other coordinate reference systems may be specified for specific spatial data themes in this Annex.

2. For regions outside of continental Europe, Member States may define suitable coordinate reference systems.

The geodetic codes and parameters needed to describe these coordinate reference systems and to allow conversion and transformation operations shall be documented and an identifier shall be created, according to EN ISO 19111 and ISO 19127.

1.4. **Coordinate Reference Systems used in the View Network Service**

For the display of spatial data sets with the view network service as specified in Regulation No 976/2009, at least the coordinate reference systems for two-dimensional geodetic coordinates (latitude, longitude) shall be available.

1.5. **Coordinate Reference System Identifiers**

1. Coordinate reference system parameters and identifiers shall be managed in one or several common registers for coordinate reference systems.

2. Only identifiers contained in a common register shall be used for referring to the coordinate reference systems listed in this Section.

2. GEOGRAPHICAL GRID SYSTEMS

2.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

— 'grid' means a network composed of two or more sets of curves in which the members of each set intersect the members of the other sets in an algorithmic way,

— ‘grid cell’ means a cell delineated by grid curves,

— ‘grid point’ means a point located at the intersection of two or more curves in a grid.

2.2. **Grids**

The grid specified in section 2.2.1 shall be used in INSPIRE, unless one of the conditions specified in section 2.2.2 holds.

2.2.1. *Grid for pan-European spatial analysis and reporting*

The grid defined in this Section shall be used as a geo-referencing framework where grids with fixed and unambiguously defined locations of equal-area grid cells are required.

The grid is based on the ETRS89 Lambert Azimuthal Equal Area (ETRS89-LAEA) coordinate reference system with the centre of the projection at the point 52° N, 10° E and false easting: x_0 = 4 321 000 m, false northing: y_0 = 3 210 000 m.

The origin of the grid coincides with the false origin of the ETRS89-LAEA coordinate reference system (x=0, y=0).

Grid points of grids based on ETRS89-LAEA shall coincide with grid points of the grid.

The grid is hierarchical, with resolutions of 1m, 10m, 100m, 1 000m, 10 000m and 100 000m.

The grid orientation is south-north, west-east.

The grid is designated as Grid_ETRS89-LAEA. For identification of an individual resolution level the cell size in metres is appended.

The reference point of a grid cell shall be the lower left corner of the grid cell.

For the unambiguous referencing and identification of a grid cell, the cell code composed of the size of the cell and the coordinates of the lower left cell corner in ETRS89-LAEA shall be used. The cell size shall be denoted in metres (‘m’) for cell sizes up to 100m or kilometres (‘km’) for cell sizes of 1 000m and above. Values for northing and easting shall be divided by 10^n, where *n* is the number of trailing zeros in the cell size value.

2.2.2. *Other Grids*

Exceptions, where other grids than that specified in section 2.2.1 may be used, are:

1. Other grids may be specified for specific spatial data themes in this Annex. In this case, data exchanged using such a theme-specific grid shall use standards in which the grid definition is either included with the data, or linked by reference.

2. For grid referencing in regions outside of continental Europe Member States may define their own grid based on a geodetic coordinate reference system compliant with ITRS and a Lambert Azimuthal Equal Area projection, following the same principles as laid down for the grid specified in section 2.2.1. In this case, an identifier for the coordinate reference system shall be created.

3. GEOGRAPHICAL NAMES

3.1. **Spatial Object Types**

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Geographical Names:

— Named Place

3.1.1. *Named Place (NamedPlace)*

Any real world entity referred to by one or several proper nouns.

Attributes of the spatial object type NamedPlace

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometry associated to the named place. This data specification does not restrict the geometry types.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
leastDetailedViewingResolution	Resolution, expressed as the inverse of an indicative scale or a ground distance, above which the named place and its associated name(s) should no longer be displayed in a basic viewing service.	MD_Resolution	voidable
localType	Characterisation of the kind of entity designated by geographical name(s), as defined by the data provider, given in at least in one official language of the European Union.	LocalisedCharacterString	voidable
mostDetailedViewingResolution	Resolution, expressed as the inverse of an indicative scale or a ground distance, below which the named place and its associated name(s) should no longer be displayed in a basic viewing service.	MD_Resolution	voidable
name	Name of the named place.	GeographicalName	
relatedSpatialObject	Identifier of a spatial object representing the same entity but appearing in other themes of INSPIRE, if any.	Identifier	voidable
type	Characterisation of the kind of entity designated by geographical name(s).	NamedPlaceTypeValue	voidable

3.2. **Data Types**

3.2.1. *Geographical Name (GeographicalName)*

Proper noun applied to a real world entity.

Attributes of the data type GeographicalName

Attribute	Definition	Type	Voidability
grammaticalGender	Classes of nouns reflected in the behaviour of associated words.	GrammaticalGenderValue	voidable
grammaticalNumber	Grammatical category of nouns that expresses count distinctions.	GrammaticalNumberValue	voidable
language	Language of the name, given as a three letters code, in accordance with either ISO 639-3 or ISO 639-5.	CharacterString	voidable
nameStatus	Qualitative information enabling to discern which credit should be given to the name with respect to its standardisation and/or its topicality.	NameStatusValue	voidable
nativeness	Information enabling to acknowledge if the name is the one that is/was used in the area where the spatial object is situated at the instant when the name is/was in use.	NativenessValue	voidable
pronunciation	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of the geographical name.	PronunciationOfName	voidable
sourceOfName	Original data source from which the geographical name is taken from and integrated in the data set providing/publishing it. For some named spatial objects it might refer again to the publishing data set if no other information is available.	CharacterString	voidable
spelling	A proper way of writing the geographical name.	SpellingOfName	

3.2.2. *Pronunciation Of Name (PronunciationOfName)*

Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name.

Attributes of the data type PronunciationOfName

Attribute	Definition	Type	Voidability
pronunciationIPA	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name, expressed in International Phonetic Alphabet (IPA).	CharacterString	voidable
pronunciationSoundLink	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name, expressed by a link to any sound file.	URI	voidable

Constraints of the data type PronunciationOfName

At least one of the two attributes pronunciationSoundLink and pronunciationIPA shall not be void.

3.2.3. *Spelling Of Name (SpellingOfName)*

Proper way of writing a name.

Attributes of the data type SpellingOfName

Attribute	Definition	Type	Voidability
script	Set of graphic symbols (for example an alphabet) employed in writing the name, expressed using the four letters codes defined in ISO 15924, where applicable.	CharacterString	voidable
text	Way the name is written.	CharacterString	
transliterationScheme	Method used for the names conversion between different scripts.	CharacterString	voidable

3.3. **Code Lists**

3.3.1. *Grammatical Gender (GrammaticalGenderValue)*

The grammatical gender of a geographical name.

This code list shall be managed in a common code list register.

3.3.2. *Grammatical Number (GrammaticalNumberValue)*

The grammatical number of a geographical name.

This code list shall be managed in a common code list register.

3.3.3. *Name Status (NameStatusValue)*

The status of a geographical name, that is the information enabling to discern which credit should be given to the name with respect to its standardisation and/or its topicality.

This code list shall be managed in a common code list register.

3.3.4. *Named Place Type (NamedPlaceTypeValue)*

The type of a named place.

This code list shall be managed in a common code list register.

3.3.5. *Nativeness (NativenessValue)*

The nativeness of a geographical name.

This code list shall be managed in a common code list register.

3.4. **Layers**

Layer for the spatial data theme Geographical Names

Layer Name	Layer Title	Spatial object type
GN.GeographicalNames	Geographical Names	NamedPlace

4. ADMINISTRATIVE UNITS

4.1. **Spatial Object Types**

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Administrative Units:

— Administrative Boundary

— Administrative Unit

— Condominium

— NUTS Region

4.1.1. *Administrative Boundary (AdministrativeBoundary)*

A line of demarcation between administrative units.

Attributes of the spatial object type AdministrativeBoundary

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
country	Two-character country code according to the Interinstitutional style guide published by the Publications Office of the European Union.	CountryCode	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of border line.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
legalStatus	Legal status of this administrative boundary.	LegalStatusValue	voidable
nationalLevel	The hierarchy levels of all adjacent administrative units this boundary is part of.	AdministrativeHierarchyLevel	
technicalStatus	The technical status of the administrative boundary.	TechnicalStatusValue	voidable

Association roles of the spatial object type AdministrativeBoundary

Association role	Definition	Type	Voidability
admUnit	The administrative units separated by this administrative boundary.	AdministrativeUnit	voidable

4.1.2. *Administrative Unit (AdministrativeUnit)*

Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.

Attributes of the spatial object type AdministrativeUnit

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
country	Two-character country code according to the Interinstitutional style guide published by the Publications Office of the European Union.	CountryCode	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of spatial area covered by this administrative unit.	GM_MultiSurface	
inspireId	External object identifier of the spatial object.	Identifier	
name	Official national geographical name of the administrative unit, given in several languages where required.	GeographicalName	
nationalCode	Thematic identifier corresponding to the national administrative codes defined in each country.	CharacterString	
nationalLevel	Level in the national administrative hierarchy, at which the administrative unit is established.	AdministrativeHierarchyLevel	
nationalLevelName	Name of the level in the national administrative hierarchy, at which the administrative unit is established.	LocalisedCharacterString	voidable
residenceOfAuthority	Center for national or local administration.	ResidenceOfAuthority	voidable

Association roles of the spatial object type AdministrativeUnit

Association role	Definition	Type	Voidability
administeredBy	Administrative unit established at same level of national administrative hierarchy that administers this administrative unit.	AdministrativeUnit	voidable
boundary	The administrative boundaries between this administrative unit and all the units adjacent to it.	AdministrativeBoundary	voidable
coAdminister	Administrative unit established at same level of national administrative hierarchy which is co-administered by this administrative unit.	AdministrativeUnit	voidable
condominium	Condominium administered by this administrative unit.	Condominium	voidable

Association role	Definition	Type	Voidability
lowerLevelUnit	Units established at a lower level of the national administrative hierarchy which are administered by the administrative unit.	AdministrativeUnit	voidable
NUTS	NUTS region that topologically contains this administrative unit.	NUTSRegion	voidable
upperLevelUnit	Unit established at a higher level of national administrative hierarchy that this administrative unit administers	AdministrativeUnit	voidable

Constraints of the spatial object type AdministrativeUnit

Association role condominium applies only for administrative units which nationalLevel='1st order' (country level).

No unit at lowest level can associate units at lower level.

No unit at highest level can associate units at a higher level.

4.1.3. *Condominium (Condominium)*

An administrative area established independently to any national administrative division of territory and administered by two or more countries.

Attributes of the spatial object type Condominium

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of spatial area covered by this condominium	GM_MultiSurface	
inspireId	External object identifier of the spatial object.	Identifier	
name	Official geographical name of this condominium, given in several languages where required.	GeographicalName	voidable

Association roles of the spatial object type Condominium

Association role	Definition	Type	Voidability
admUnit	The administrative unit administering the condominium	AdministrativeUnit	voidable

4.1.4. *NUTS Region (NUTSRegion)*

Territorial unit for statistics defined in the framework of the Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003.

This type is a candidate type to be considered by the spatial data theme Statistical units in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type NUTSRegion

Attribute	Definition	Type	Voidability
NUTSCode	Unique code of the territorial unit for statistics as defined in the framework of the Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003.	CharacterString	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of spatial area covered by this NUTS region.	GM_MultiSurface	
inspireId	External object identifier of the spatial object.	Identifier	

4.2. **Data Types**

4.2.1. *Residence Of Authority (ResidenceOfAuthority)*

Data type representing the name and position of a residence of authority.

Attributes of the data type ResidenceOfAuthority

Attribute	Definition	Type	Voidability
geometry	Position of the residence of authority.	GM_Point	voidable
Name	Name of the residence of authority.	GeographicalName	

4.3. **Enumerations**

4.3.1. *Legal Status (LegalStatusValue)*

Description of the legal status of administrative boundaries.

Allowed values for the enumeration LegalStatusValue

Value	Definition
agreed	The edge-matched boundary has been agreed between neighbouring administrative units and is stable now.
notAgreed	The edge-matched boundary has not yet been agreed between neighbouring administrative units and could be changed.

4.3.2. *Technical Status (TechnicalStatusValue)*

Description of the technical status of administrative boundaries.

Allowed values for the enumeration TechnicalStatusValue

Value	Definition
edgeMatched	The boundaries of neighbouring administrative units have the same set of coordinates.
notEdgeMatched	The boundaries of neighbouring administrative units do not have the same set of coordinates.

4.4. **Code Lists**

4.4.1. *Administrative Hierarchy Level (AdministrativeHierarchyLevel)*

Levels of administration in the national administrative hierarchy. This code list reflects the level in the hierarchical pyramid of the administrative structures, which is based on geometric aggregation of territories and does not necessarily describe the subordination between the related administrative authorities.

This code list shall be managed in a common code list register.

4.5. **Theme-specific Requirements**

1. Each instance of spatial object type AdministrativeUnit, except for the country level unit representing a Member State and co-administered units, shall refer exactly to one unit at a higher level of administrative hierarchy. This correspondence shall be expressed by the upperLevelUnit association role of AdministrativeUnit spatial object type.

2. Each instance of spatial object type AdministrativeUnit, except for those at the lowest level, shall refer to their respective lower level units. This correspondence shall be expressed by the lowerLevelUnit association role of AdministrativeUnit spatial object type.

3. If an administrative unit is co-administered by two or more other administrative units the association role administeredBy shall be used. The units co-administering this unit shall apply inverse role coAdminister.

4. Administrative units at the same level of administrative hierarchy shall not conceptually share common areas.

5. Instances of the spatial object type AdministrativeBoundary shall correspond to the edges in the topological structure of the complete (including all levels) boundary graph.

6. The spatial extent of a condominium may not be part of the geometry representing the spatial extent of an administrative unit.

7. Condominiums can only be administered by administrative units at country level.

4.6. **Layers**

Layers for the spatial data theme Administrative Units

Layer Name	Layer Title	Spatial object type
AU.AdministrativeUnit	Administrative unit	AdministrativeUnit
AU.AdministrativeBoundary	Administrative boundary	AdministrativeBoundary
AU.Condominium	Condominium	Condominium
AU.NUTSRegion	NUTS Region	NUTSRegion

5. ADDRESSES

5.1. **Definitions**

In addition to the definitions set out in Article 2, the following definition shall apply:

— 'addressable object' means a spatial object to which it is meaningful to associate addresses.

5.2. **Spatial Object Types**

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Addresses:

— Address

— Address Area Name

— Address Component

— Administrative Unit Name

— Postal Descriptor

— Thoroughfare Name

5.2.1. *Address (Address)*

An identification of the fixed location of property by means of a structured composition of geographic names and identifiers.

Attributes of the spatial object type Address

Attribute	Definition	Type	Voidability
alternativeIdentifier	External, thematic identifier of the address spatial object, which enables interoperability with existing legacy systems or applications.	CharacterString	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
locator	Human readable designator or name.	AddressLocator	
position	Position of a characteristic point which represents the location of the address according to a certain specification, including information on the origin of the position.	GeographicPosition	
status	Validity of the address within the life-cycle (version) of the address spatial object.	StatusValue	voidable
validFrom	Date and time of which this version of the address was or will be valid in the real world.	DateTime	voidable
validTo	Date and time at which this version of the address ceased or will cease to exist in the real world.	DateTime	voidable

Association roles of the spatial object type Address

Association role	Definition	Type	Voidability
building	Building that the address is assigned to or associated with.	Type to be specified in the spatial data theme Buildings	voidable
component	Represents that the address component is engaged as a part of the address.	AddressComponent	
parcel	Cadastral parcel that this address is assigned to or associated with.	CadastralParcel	voidable
parentAddress	Main (parent) address with which this (sub) address is tightly connected	Address	voidable

Constraints of the spatial object type Address

An address shall have an administrative unit address component spatial object whose level is 1 (Country).

An address shall have exactly one default geographic position (the 'default' attribute of the GeographicPosition spatial object must be 'true').

5.2.2. *Address Area Name (AddressAreaName)*

An address component which represents the name of a geographic area or locality that groups a number of addressable objects for addressing purposes, without being an administrative unit.

This type is a sub-type of AddressComponent.

Attributes of the spatial object type AddressAreaName

Attribute	Definition	Type	Voidability
name	Proper noun applied to the address area.	GeographicalName	

Association roles of the spatial object type AddressAreaName

Association role	Definition	Type	Voidability
namedPlace	The named place that this address area name represents.	NamedPlace	voidable

5.2.3. *Address Component (AddressComponent)*

Identifier or geographic name of a specific geographic area, location, or other spatial object which defines the scope of an address.

This type is abstract.

Attributes of the spatial object type AddressComponent

Attribute	Definition	Type	Voidability
alternativeIdentifier	External, thematic identifier of the address component spatial object, which enables interoperability with existing legacy systems or applications.	CharacterString	voidable

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
status	Validity of the address component within the life-cycle (version) of the address component spatial object.	StatusValue	voidable
validFrom	Date and time of which this version of the address component was or will be valid in the real world.	DateTime	voidable
validTo	Date and time at which the address component ceased/will cease to exist in the real world.	DateTime	voidable

Association roles of the spatial object type AddressComponent

Association role	Definition	Type	Voidability
situatedWithin	Another address component within which the spatial object represented by this address component is situated.	AddressComponent	voidable

5.2.4. *Administrative Unit Name (AdminUnitName)*

An address component which represents the name of a unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.

This type is a sub-type of AddressComponent.

Attributes of the spatial object type AdminUnitName

Attribute	Definition	Type	Voidability
level	The level of administration in the national administrative hierarchy.	AdministrativeHierarchyLevel	
name	Official, geographical name of the administrative unit, given in different languages where required.	GeographicalName	

Association roles of the spatial object type AdminUnitName

Association role	Definition	Type	Voidability
adminUnit	The administrative unit that is the source of the content of the administrative unit name.	AdministrativeUnit	voidable

5.2.5. *Postal Descriptor (PostalDescriptor)*

An address component which represents the identification of a subdivision of addresses and postal delivery points in a country, region or city for postal purposes.

This type is a sub-type of AddressComponent.

Attributes of the spatial object type PostalDescriptor

Attribute	Definition	Type	Voidability
postCode	A code created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	CharacterString	
postName	One or more names created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	GeographicalName	

Constraints of the spatial object type PostalDescriptor

If no post code exists, a post name is required.

If no post name exists, a post code is required.

5.2.6. *Thoroughfare Name (ThoroughfareName)*

An address component which represents the name of a passage or way through from one location to another.

This type is a sub-type of AddressComponent.

Attributes of the spatial object type ThoroughfareName

Attribute	Definition	Type	Voidability
name	Name of the thoroughfare.	ThoroughfareNameValue	

Association roles of the spatial object type ThoroughfareName

Association role	Definition	Type	Voidability
transportLink	One or several transport network links to which the spatial object of the thoroughfare name has been designated.	TransportLink	voidable

5.3. **Data Types**

5.3.1. *Address Locator (AddressLocator)*

Human readable designator or name that allows a user or application to reference and distinguish the address from neighbour addresses, within the scope of a thoroughfare name, address area name, administrative unit name or postal descriptor, in which the address is situated.

Attributes of the data type AddressLocator

Attribute	Definition	Type	Voidability
designator	A number or a sequence of characters that uniquely identifies the locator within the relevant scope(s).	LocatorDesignator	
level	The level to which the locator refers.	LocatorLevelValue	
name	A geographic name or descriptive text associated to a property identified by the locator.	LocatorName	

Association roles of the data type AddressLocator

Association role	Definition	Type	Voidability
withinScopeOf	The address component that defines the scope within which the address locator is assigned according to rules ensuring unambiguousness.	AddressComponent	voidable

Constraints of the data type AddressLocator

If no designator exists, a name is required.

If no name exists, a designator is required.

5.3.2. *Address Representation (AddressRepresentation)*

Representation of an address spatial object for use in external application schemas that need to include the basic, address information in a readable way.

Attributes of the data type AddressRepresentation

Attribute	Definition	Type	Voidability
addressArea	The name or names of a geographic area or locality that groups a number of addressable objects for addressing purposes, without being an administrative unit.	GeographicalName	voidable
adminUnit	The name or names of a unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.	GeographicalName	
locatorDesignator	A number or a sequence of characters which allows a user or an application to interpret, parse and format the locator within the relevant scope. A locator may include more locator designators.	CharacterString	
locatorName	Proper noun(s) applied to the real world entity identified by the locator.	GeographicalName	
postCode	A code created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	CharacterString	voidable
postName	One or more names created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	GeographicalName	voidable
thoroughfare	The name or names of a passage or way through from one location to another like a road or a waterway.	GeographicalName	voidable

Association roles of the data type AddressRepresentation

Association role	Definition	Type	Voidability
addressFeature	Reference to the address spatial object.	Address	voidable

5.3.3. *Geographic Position (GeographicPosition)*

The position of a characteristic point which represents the location of the address according to a certain specification, including information on the origin of the position.

Attributes of the data type GeographicPosition

Attribute	Definition	Type	Voidability
default	Specifies whether or not this position should be considered as the default.	Boolean	
geometry	The position of the point expressed in coordinates in the chosen spatial reference system.	GM_Point	
method	Description of how and by whom the geographic position of the address was created or derived.	GeometryMethodValue	voidable
specification	Information defining the specification used to create or derive this geographic position of the address.	GeometrySpecificationValue	voidable

5.3.4. *Locator Designator (LocatorDesignator)*

A number or a sequence of characters that uniquely identifies the locator within the relevant scope(s). The full identification of the locator could include one or more locator designators.

Attributes of the data type LocatorDesignator

Attribute	Definition	Type	Voidability
designator	The identifying part of the locator designator composed by one or more digits or other characters.	CharacterString	
type	The type of locator value, which enables an application to interpret, parse or format it according to certain rules.	LocatorDesignatorTypeValue	

5.3.5. *Locator Name (LocatorName)*

Proper noun applied to the real world entity identified by the locator.

Attributes of the data type LocatorName

Attribute	Definition	Type	Voidability
name	The identifying part of the locator name.	GeographicalName	
type	The type of locator value, which enables an application to interpret, parse or format it according to certain rules.	LocatorNameTypeValue	

5.3.6. *Part Of Name (PartOfName)*

A part of the full name resulting from the subdivision of the thoroughfare name into separate, semantic parts, using the same language and script as the full thoroughfare name.

Attributes of the data type PartOfName

Attribute	Definition	Type	Voidability
part	The character string that expresses the separate part of the name using the same language and script as the full thoroughfare name.	CharacterString	
type	A classification of the part of name according to its semantics (meaning) in the complete thoroughfare name.	PartTypeValue	

5.3.7. *Thoroughfare Name Value (ThoroughfareNameValue)*

Proper noun applied to thoroughfare optionally including a subdivision of the name into parts.

Attributes of the data type ThoroughfareNameValue

Attribute	Definition	Type	Voidability
name	Proper noun applied to the thoroughfare.	GeographicalName	
nameParts	One or several parts into which the thoroughfare name can be subdivided.	PartOfName	voidable

5.4. **Code Lists**

5.4.1. *Geometry Method (GeometryMethodValue)*

Description of how and by whom this geographic position of the address was created or derived.

This code list shall be managed in a common code list register.

5.4.2. *Geometry Specification (GeometrySpecificationValue)*

Information defining the specification used to create or derive this geographic position of the address.

This code list shall be managed in a common code list register.

5.4.3. *Locator Designator Type (LocatorDesignatorTypeValue)*

Description of the semantics of the locator designator.

This code list shall be managed in a common code list register.

5.4.4. *Locator Level (LocatorLevelValue)*

The level to which the locator refers.

This code list shall be managed in a common code list register.

5.4.5. *Locator Name Type (LocatorNameTypeValue)*

Description of the semantics of the locator name.

This code list shall be managed in a common code list register.

5.4.6. *Part Type (PartTypeValue)*

A classification of the part of name according to its semantics in the complete thoroughfare name.

This code list shall be managed in a common code list register.

5.4.7. *Status (StatusValue)*

Current validity of the real world address or address component.

This code list shall be managed in a common code list register.

5.5. **Theme-specific Requirements**

5.5.1. *The Address Position*

1. In the data set, the position of the address shall be represented by the coordinates of the actual location with the best available accuracy. This will be the most precise directly captured coordinates or, if none exist, then coordinates derived from one of the address components, with priority given to the component that allows the position to be most accurately determined.

2. If an address has more than one position, the specification attribute shall be populated with a different value for each of these.

5.5.2. *Association roles*

1. The withinScopeOf association role shall be populated for all locators which are assigned according to rules that seek to ensure unambiguousness within a specific address component (that is thoroughfare name, address area name, postal descriptor or administrative unit name).

2. The association role parentAddress shall be populated for all addresses which are connected to a parent (or main) address.

3. An address shall have an association to the name of the country in which it is located. Furthermore, an address must have associations to the additional address components necessary to the unambiguous identification and location of the address instance.

5.6. **Layers**

Layer for the spatial data theme Addresses

Layer Name	Layer Title	Spatial object type
AD.Address	Addresses	Address

6. CADASTRAL PARCELS

6.1. **Spatial Object Types**

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Cadastral Parcels:

— Basic Property Unit

— Cadastral Boundary

— Cadastral Parcel

— Cadastral Zoning

Cadastral Parcels shall always be made available.

Basic property units shall be made available by Member States where unique cadastral references are given only for basic property units and not for parcels.

Cadastral boundaries shall be made available by Member States where absolute positional accuracy information is recorded for the cadastral boundary.

6.1.1. *Basic Property Unit (BasicPropertyUnit)*

The basic unit of ownership that is recorded in the land books, land registers or equivalent. It is defined by unique ownership and homogeneous real property rights, and may consist of one or more adjacent or geographically separate parcels.

Attributes of the spatial object type BasicPropertyUnit

Attribute	Definition	Type	Voidability
areaValue	Registered area value giving quantification of the area projected on the horizontal plane of the cadastral parcels composing the basic property unit.	Area	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
nationalCadastralReference	Thematic identifier at national level, generally the full national code of the basic property unit. Must ensure the link to the national cadastral register or equivalent.	CharacterString	
validFrom	Official date and time the basic property unit was/will be legally established.	DateTime	voidable
validTo	Date and time at which the basic property unit legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type BasicPropertyUnit

Association role	Definition	Type	Voidability
administrativeUnit	The administrative unit of lowest administrative level containing this basic property unit.	AdministrativeUnit	voidable

Constraints of the spatial object type BasicPropertyUnit

Value of areaValue shall be given in square meters

6.1.2. *Cadastral Boundary (CadastralBoundary)*

Part of the outline of a cadastral parcel. One cadastral boundary may be shared by two neighbouring cadastral parcels.

Attributes of the spatial object type CadastralBoundary

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
estimatedAccuracy	Estimated absolute positional accuracy of the cadastral boundary in the used INSPIRE coordinate reference system. Absolute positional accuracy is the mean value of the positional uncertainties for a set of positions, where the positional uncertainties are the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
geometry	Geometry of the cadastral boundary.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
validFrom	Official date and time the cadastral boundary was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral boundary legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralBoundary

Association role	Definition	Type	Voidability
parcel	The cadastral parcel(s) outlined by this cadastral boundary. A cadastral boundary may outline one or two cadastral parcels.	CadastralParcel	voidable

Constraints of the spatial object type CadastralBoundary

Value of estimatedAccuracy shall be given in meters.

6.1.3. *Cadastral Parcel (CadastralParcel)*

Areas defined by cadastral registers or equivalent.

Attributes of the spatial object type CadastralParcel

Attribute	Definition	Type	Voidability
areaValue	Registered area value giving quantification of the area projected on the horizontal plane of the cadastral parcel.	Area	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometry of the cadastral parcel.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
label	Text commonly used to display the cadastral parcel identification.	CharacterString	
nationalCadastralReference	Thematic identifier at national level, generally the full national code of the cadastral parcel. Must ensure the link to the national cadastral register or equivalent.	CharacterString	
referencePoint	A point within the cadastral parcel.	GM_Point	voidable
validFrom	Official date and time the cadastral parcel was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral parcel legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralParcel

Association role	Definition	Type	Voidability
administrativeUnit	The administrative unit of lowest administrative level containing this cadastral parcel.	AdministrativeUnit	voidable
basicPropertyUnit	The basic property unit(s) containing this cadastral parcel.	BasicPropertyUnit	voidable
zoning	The cadastral zoning of lowest level containing this cadastral parcel.	CadastralZoning	voidable

Constraints of the spatial object type CadastralParcel

Value of areaValue shall be given in square meters.

Type of geometry shall be GM_Surface or GM_MultiSurface

6.1.4. *Cadastral Zoning (CadastralZoning)*

Intermediary areas used in order to divide national territory into cadastral parcels.

Attributes of the spatial object type CadastralZoning

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
estimatedAccuracy	The estimated absolute positional accuracy of cadastral parcels within the cadastral zoning in the used INSPIRE coordinate reference system. Absolute positional accuracy is the mean value of the positional uncertainties for a set of positions, where the positional uncertainties are the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
geometry	Geometry of the cadastral zoning.	GM_MultiSurface	
inspireId	External object identifier of spatial object.	Identifier	
label	Text commonly used to display the cadastral zoning identification.	CharacterString	
level	Level of the cadastral zoning in the national cadastral hierarchy.	CadastralZoningLevelValue	voidable
levelName	Name of the level of the cadastral zoning in the national cadastral hierarchy, in at least one official language of the European Union.	LocalisedCharacterString	voidable
name	Name of the cadastral zoning.	GeographicalName	voidable
nationalCadastalZoningReference	Thematic identifier at national level, generally the full national code of the cadastral zoning.	CharacterString	
originalMapScaleDenominator	The denominator in the scale of the original paper map (if any) to whose extent the cadastral zoning corresponds.	Integer	voidable
referencePoint	A point within the cadastral zoning.	GM_Point	voidable

Attribute	Definition	Type	Voidability
validFrom	Official date and time the cadastral zoning was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral zoning legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralZoning

Association role	Definition	Type	Voidability
upperLevelUnit	The next upper level cadastral zoning containing this cadastral zoning.	CadastralZoning	voidable

Constraints of the spatial object type CadastralZoning

Value of estimatedAccuracy shall be given in meters.

A lower level cadastral zoning shall be part of an upper level zoning.

6.2. **Code Lists**

6.2.1. *Cadastral Zoning Level (CadastralZoningLevelValue)*

Levels of hierarchy of the cadastral zonings.

This code list shall be managed in a common code list register.

6.3 **Theme-specific Requirements**

6.3.1. *Geometry Representation*

1. The value domain of spatial properties defined in this Section is not restricted to the Simple Feature spatial schema as defined by EN ISO 19125-1.

2. If cadastral boundaries are provided, the cadastral boundaries corresponding to the outline of a cadastral parcel shall form closed ring(s).

6.3.2. *Modelling of object references*

All instances of the spatial object type CadastralParcel shall carry as a thematic identifier the attribute nationalCadastralReference. This attribute must enable users to make the link with rights, owners and other cadastral information in national cadastral registers or equivalent.

6.3.3. *Coordinate Reference Systems*

If data related to the spatial data theme Cadastral Parcels are made available in plane coordinates using the Lambert Conformal Conic projection, they shall also be made available in at least one other of the coordinate reference systems specified in sections 1.3.1, 1.3.2 and 1.3.3.

6.4. **Portrayal Rules**

6.4.1. *Layers*

Layer for the spatial data theme Cadastral Parcels

Layer Name	Layer Title	Spatial object type
CP.CadastralParcel	Cadastral Parcel	CadastralParcel
CP.CadastralZoning	Cadastral Zoning	CadastralZoning
CP.CadastralBoundary	Cadastral Boundary	CadastralBoundary

7. TRANSPORT NETWORKS

7.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

— 'aerodrome reference point' means the designated geographical location of an aerodrome, located near the initial or planned geometric centre of the aerodrome and normally remaining where originally established,

— 'airport/heliport' means a defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters,

— 'deep water route' means a route in a designated area within defined limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles to a minimum indicated depth of water,

— 'inter-modal connection' means a connection between two elements in different transport networks that use a different transport mode, giving the possibility to change transported media (people, goods, etc) from one transport mode to another,

— 'linear element' means a 1-dimensional object that serves as the axis along which linear referencing is performed,

— 'linear referencing' means a specification of a location relative to a one-dimensional object as a measurement along (and optionally offset from) that element,

— 'navaid equipment' means a physical navaid equipment placed on the Earth surface, like Very High Frequency Omnidirectional Radio Range (VOR), Distance Measuring Equipment (DME), localizer, Tactical Air Navigation Beacon (TACAN) etc., which help in guiding aircraft traffic safely through existing air routes,

— 'object referencing' means providing the spatial extent of an object by referring to an existing spatial object or collection of spatial objects,

— 'railway yard' means an area crossed by a number of parallel railway tracks (usually more than two) interconnected between them, which are used to stop trains in order to load / unload freight without interrupting the traffic of a main railway line,

— 'significant point' means a specified geographical location used to define an Air Traffic Service (ATS) route, the flight path of an aircraft or for other navigation/ATS purposes.

7.2. **Structure of the Spatial Data Theme Transport Networks**

The types specified for the spatial data theme transport networks are structured in the following packages:

— Common Transport Elements

— Air Transport Network

— Cable Transport Network

— Railway Transport Network

— Road Transport Network

— Water Transport Network

7.3. **Common Transport Elements**

7.3.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Common Transport Elements:

— Access Restriction

— Condition Of Facility

— Maintenance Authority

— Marker Post

— Owner Authority

— Restriction for Vehicles

— Traffic Flow Direction

— Transport Area

— Transport Link

— Transport Link Sequence

— Transport Link Set

— Transport Network

— Transport Node

— Transport Object

— Transport Point

— Transport Property

— Vertical Position

7.3.1.1. Access Restriction (AccessRestriction)

A restriction on the access to a transport element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type AccessRestriction

Attribute	Definition	Type	Voidability
restriction	Nature of the access restriction.	AccessRestrictionValue	

7.3.1.2. Condition Of Facility (ConditionOfFacility)

State of a transport network element with regards to its completion and use.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type ConditionOfFacility

Attribute	Definition	Type	Voidability
currentStatus	Current status value of a transport network element with regards to its completion and use.	ConditionOfFacilityValue	

7.3.1.3. Maintenance Authority (MaintenanceAuthority)

The authority responsible for maintenance of the transport element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type MaintenanceAuthority

Attribute	Definition	Type	Voidability
authority	Identification of the maintenance authority.	CI_Citation	

7.3.1.4. Marker Post (MarkerPost)

Reference marker placed along a route in a transport network, mostly at regular intervals, indicating the distance from the beginning of the route, or some other reference point, to the point where the marker is located.

This type is a sub-type of TransportPoint.

Attributes of the spatial object type MarkerPost

Attribute	Definition	Type	Voidability
location	Distance from the beginning of the route, or some other reference point, to the point where a marker post is located.	Distance	

Association roles of the spatial object type MarkerPost

Association role	Definition	Type	Voidability
route	Route in a transport network along which the marker post is placed.	TransportLinkSet	voidable

7.3.1.5. Owner Authority (OwnerAuthority)

The authority owning the transport element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type OwnerAuthority

Attribute	Definition	Type	Voidability
authority	Identification of the owning authority.	CI_Citation	

7.3.1.6. Restriction For Vehicles (RestrictionForVehicles)

Restriction on vehicles on a transport element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RestrictionForVehicles

Attribute	Definition	Type	Voidability
measure	The measure for the restriction.	Measure	
restrictionType	The type of restriction.	RestrictionTypeValue	

7.3.1.7. Traffic Flow Direction (TrafficFlowDirection)

Indicates the direction of the flow of traffic in relation to the direction of the transport link vector.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type TrafficFlowDirection

Attribute	Definition	Type	Voidability
direction	Indicates the direction of the flow of traffic.	LinkDirectionValue	

Constraints of the spatial object type TrafficFlowDirection

This property can only be associated with a spatial object of the type Link or LinkSequence.

7.3.1.8. Transport Area (TransportArea)

Surface that represents the spatial extent of an element of a transport network.

This type is a sub-type of NetworkArea.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportArea

Attribute	Definition	Type	Voidability
validFrom	The time when the transport area started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport area no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportArea

All transport areas have an external object identifier.

7.3.1.9. Transport Link (TransportLink)

A linear spatial object that describes the geometry and connectivity of a transport network between two points in the network.

This type is a sub-type of Link.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLink

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportLink

All transport links have an external object identifier.

7.3.1.10. Transport Link Sequence (TransportLinkSequence)

A linear spatial object, composed of an ordered collection of transport links, which represents a continuous path in the transport network without any branches. The element has a defined beginning and end and every position on the transport link sequence is identifiable with one single parameter such as length. It describes an element of the transport network, characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of LinkSequence.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLinkSequence

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link sequence started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link sequence no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportLinkSequence

A transport link sequence must be composed of transport links that all belong to the same transport network.

All transport link sequences have an external object identifier.

7.3.1.11. Transport Link Set (TransportLinkSet)

A collection of transport link sequences and or individual transport links that has a specific function or significance in a transport network.

This type is a sub-type of LinkSet.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLinkSet

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link set started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link set no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type TransportLinkSet

Association role	Definition	Type	Voidability
post	Marker post along a route in a transport network.	MarkerPost	voidable

Constraints of the spatial object type TransportLinkSet

A transport link set must be composed of transport links and or transport link sequences that all belong to the same transport network.

All transport link sets have an external object identifier.

7.3.1.12. Transport Network (TransportNetwork)

Collection of network elements that belong to a single mode of transport.

This type is a sub-type of Network.

Attributes of the spatial object type TransportNetwork

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
typeOfTransport	Type of transport network, based on the type of infrastructure the network uses.	TransportTypeValue	

7.3.1.13. Transport Node (TransportNode)

A point spatial object which is used for connectivity.

This type is a sub-type of Node.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportNode

Attribute	Definition	Type	Voidability
validFrom	The time when the transport node started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport node no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportNode

All transport nodes have an external object identifier.

7.3.1.14. Transport Object (TransportObject)

An identity base for transport network objects in the real world.

This type is abstract.

Attributes of the spatial object type TransportObject

Attribute	Definition	Type	Voidability
geographicalName	A geographical name that is used to identify the transport network object in the real world. It provides a 'key' for implicitly associating different representations of the object.	GeographicalName	voidable

7.3.1.15. Transport Point (TransportPoint)

A point spatial object - which is not a node - that represents the position of an element of a transport network.

This type is a sub-type of NetworkElement.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportPoint

Attribute	Definition	Type	Voidability
geometry	The location of the transport point.	GM_Point	
validFrom	The time when the transport point started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport point no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportPoint

All transport points have an external object identifier.

7.3.1.16. Transport Property (TransportProperty)

A reference to a property that falls upon the network. This property can apply to the whole of the network element it is associated with or - for linear spatial objects - be described using linear referencing.

This type is a sub-type of NetworkProperty.

This type is abstract.

Attributes of the spatial object type TransportProperty

Attribute	Definition	Type	Voidability
validFrom	The time when the transport property started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport property no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportProperty

All transport properties have an external object identifier.

7.3.1.17. Vertical Position (VerticalPosition)

Vertical level relative to other transport network elements.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type VerticalPosition

Attribute	Definition	Type	Voidability
verticalPosition	Relative vertical position of the transport element.	VerticalPositionValue	

7.3.2. *Enumerations*

7.3.2.1. Transport Type (TransportTypeValue)

Possible types of transport networks.

Allowed values for the enumeration TransportTypeValue

Value	Definition
air	The transport network consists of transport by air.
cable	The transport network consists of transport by cable.
rail	The transport network consists of transport by rail.
road	The transport network consists of transport by road.
water	The transport network consists of transport by water.

7.3.3. *Code Lists*

7.3.3.1. Access Restriction (AccessRestrictionValue)

Types of access restrictions for a transport element.

This code list shall be managed in a common code list register.

7.3.3.2. Restriction Type (RestrictionTypeValue)

Possible restrictions on vehicles that can access a transport element.

This code list shall be managed in a common code list register.

7.4. **Air Transport Network**

7.4.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Air Transport Network:

— Aerodrome Area

— Aerodrome Category

— Aerodrome Node

— Aerodrome Type

— Air Link

— Air Link Sequence

— Air Node

— Air Route

— Air Route Link

— Airspace Area

— Apron Area

— Condition of Air Facility

— Designated Point

— Element Length

— Element Width

— Field Elevation

— Instrument Approach Procedure

— Lower Altitude Limit

— Navaid

— Procedure Link

— Runway Area

— Runway Centreline Point

— Standard Instrument Arrival

— Standard Instrument Departure

— Surface Composition

— Taxiway Area

— Touch Down Lift Off Area

— Upper Altitude Limit

— Use Restriction

7.4.1.1. Aerodrome Area (AerodromeArea)

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft and/or helicopters.

This type is a sub-type of TransportArea.

7.4.1.2. Aerodrome Category (AerodromeCategory)

Aerodrome category concerning the scope and importance of the air traffic services offered from and to it.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type AerodromeCategory

Attribute	Definition	Type	Voidability
aerodromeCategory	Value which indicates the category of an aerodrome.	AerodromeCategoryValue	

Constraints of the spatial object type AerodromeCategory

This property can only be associated with a spatial object that is an Aerodrome Node or an Aerodrome Area.

7.4.1.3. Aerodrome Node (AerodromeNode)

Node located at the aerodrome reference point of an airport/heliport, which is used to represent it in a simplified way.

This type is a sub-type of AirNode.

Attributes of the spatial object type AerodromeNode

Attribute	Definition	Type	Voidability
designatorIATA	The three letter IATA designator of the aerodrome (airport/heliport).	CharacterString	voidable
locationIndicatorICAO	The four letter ICAO location indicator of the aerodrome (airport/heliport), as listed in ICAO DOC 7910.	CharacterString	voidable

Association roles of the spatial object type AerodromeNode

Association role	Definition	Type	Voidability
controlTowers	The set of control towers belonging to an aerodrome (airport/heliport).	Type to be specified in the spatial data theme Buildings	voidable

7.4.1.4. Aerodrome Type (AerodromeType)

A code specifying the type of aerodrome.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type AerodromeType

Attribute	Definition	Type	Voidability
aerodromeType	The type of aerodrome.	AerodromeTypeValue	

Constraints of the spatial object type AerodromeType

This property can only be associated with a spatial object that is an Aerodrome Node or Aerodrome Area.

7.4.1.5. Air Link (AirLink)

A linear spatial object that describes the geometry and connectivity of the air network between two points in the network.

This type is a sub-type of TransportLink.

This type is abstract.

7.4.1.6. Air Link Sequence (AirLinkSequence)

A linear spatial object, composed of an ordered collection of air links, which represents a continuous path in the air network without any branches.

This type is a sub-type of TransportLinkSequence.

7.4.1.7. Air Node (AirNode)

A node which occurs in an air network.

This type is a sub-type of TransportNode.

This type is abstract.

Attributes of the spatial object type AirNode

Attribute	Definition	Type	Voidability
significantPoint	Attribute which indicates whether the air node is or is not a significant point.	Boolean	

7.4.1.8. Air Route (AirRoute)

A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services, from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

This type is a sub-type of TransportLinkSet.

Attributes of the spatial object type AirRoute

Attribute	Definition	Type	Voidability
airRouteType	Route classification.	AirRouteTypeValue	voidable
designator	Code or designator that identifies an Air Route.	CharacterString	voidable

7.4.1.9. Air Route Link (AirRouteLink)

A portion of a route to be flown usually without an intermediate stop, as defined by two consecutive significant points.

This type is a sub-type of AirLink.

Attributes of the spatial object type AirRouteLink

Attribute	Definition	Type	Voidability
airRouteLinkClass	The class or type of an air route link.	AirRouteLinkClassValue	voidable

7.4.1.10. Airspace Area (AirspaceArea)

A defined volume in the air, described as horizontal projection with vertical limits.

This type is a sub-type of TransportArea.

Attributes of the spatial object type AirspaceArea

Attribute	Definition	Type	Voidability
AirspaceAreaType	A code indicating the general structure or characteristics of a particular airspace.	AirspaceAreaTypeValue	

7.4.1.11. Apron Area (ApronArea)

A defined area, on a land aerodrome/heliport, intended to accommodate aircraft/helicopters for purposes of loading and unloading passengers, mail or cargo, and for fuelling, parking or maintenance.

This type is a sub-type of TransportArea.

7.4.1.12. Condition Of Air Facility (ConditionOfAirFacility)

State of an air transport network element with regards to its completion and use.

This type is a sub-type of ConditionOfFacility.

Constraints of the spatial object type ConditionOfAirFacility

This property can only be associated with a spatial object that is an Aerodrome Node, an Aerodrome Area or a Runway Area.

7.4.1.13. Designated Point (DesignatedPoint)

A geographical location not marked by the site of a radio navigation aid, used in defining an ATS route, the flight path of an aircraft or for other navigation or ATS purposes.

This type is a sub-type of AirNode.

Attributes of the spatial object type DesignatedPoint

Attribute	Definition	Type	Voidability
designator	The coded designator of the point.	CharacterString	voidable

7.4.1.14. Element Length (ElementLength)

The physical length of the element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type ElementLength

Attribute	Definition	Type	Voidability
length	The physical length of the element.	Measure	

Constraints of the spatial object type ElementLength

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area or Touch Down Lift Off Area.

7.4.1.15. Element Width (ElementWidth)

The physical width of the element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type ElementWidth

Attribute	Definition	Type	Voidability
width	The physical width of the element.	Measure	

Constraints of the spatial object type ElementWidth

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area or Touch Down Lift Off Area.

7.4.1.16. Field Elevation (FieldElevation)

The aerodrome elevation as the vertical distance between the highest point of the landing area of an aerodrome and mean sea level.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FieldElevation

Attribute	Definition	Type	Voidability
altitude	Value of the field altitude.	Measure	

Constraints of the spatial object type FieldElevation

This property can only be associated with a spatial object that is an Aerodrome Node or Aerodrome Area.

7.4.1.17. Instrument Approach Procedure (InstrumentApproachProcedure)

A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

This type is a sub-type of ProcedureLink.

7.4.1.18. Lower Altitude Limit (LowerAltitudeLimit)

Altitude that defines the lower limit of an air transport network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type LowerAltitudeLimit

Attribute	Definition	Type	Voidability
altitude	Value of the altitude limit.	Measure	

Constraints of the spatial object type LowerAltitudeLimit

This property can only be associated with a spatial object that is an Air Route Link or Airspace Area.

7.4.1.19. Navaid (Navaid)

One or more Navaid Equipments providing navigation services.

This type is a sub-type of AirNode.

Attributes of the spatial object type Navaid

Attribute	Definition	Type	Voidability
designator	The coded identifier given to the navaid system.	CharacterString	voidable
navaidType	Type of the navaid service.	NavaidTypeValue	voidable

7.4.1.20. Procedure Link (ProcedureLink)

A series of predetermined manoeuvres with specified protection from obstacles.

This type is a sub-type of AirLink.

7.4.1.21. Runway Area (RunwayArea)

A defined rectangular area on a land aerodrome/heliport prepared for the landing and take-off of aircraft.

This type is a sub-type of TransportArea.

Attributes of the spatial object type RunwayArea

Attribute	Definition	Type	Voidability
designator	The full textual designator of the runway, used to uniquely identify it at an aerodrome/heliport which has more than one.	CharacterString	voidable
runwayType	The type of runway, either runway for airplanes or final approach and take off area (FATO) for helicopters.	RunwayTypeValue	voidable

7.4.1.22. Runway Centreline Point (RunwayCentrelinePoint)

An operationally significant position on the centreline of a runway direction.

This type is a sub-type of AirNode.

Attributes of the spatial object type RunwayCentrelinePoint

Attribute	Definition	Type	Voidability
pointRole	The role of the point along the runway direction centreline.	PointRoleValue	

7.4.1.23. Standard Instrument Arrival (StandardInstrumentArrival)

A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

This type is a sub-type of ProcedureLink.

Attributes of the spatial object type StandardInstrumentArrival

Attribute	Definition	Type	Voidability
designator	The textual designator of the Standard Instrument Arrival.	CharacterString	voidable

7.4.1.24. Standard Instrument Departure (StandardInstrumentDeparture)

A designated instrument flight rule (IFR) departure route linking the aerodrome or a specific runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.

This type is a sub-type of ProcedureLink.

Attributes of the spatial object type StandardInstrumentDeparture

Attribute	Definition	Type	Voidability
designator	The full textual designator of the Standard Instrument Departure.	CharacterString	voidable

7.4.1.25. Surface Composition (SurfaceComposition)

The composition of an aerodrome/heliport related surface.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type SurfaceComposition

Attribute	Definition	Type	Voidability
surfaceComposition	A code indicating the composition of an aerodrome/heliport related surface.	SurfaceCompositionValue	

Constraints of the spatial object type SurfaceComposition

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area, Apron Area or Touch Down Lift Off Area.

7.4.1.26. Taxiway Area (TaxiwayArea)

A defined path at an aerodrome/heliport established for the taxiing of aircraft/helicopters and intended to provide a link between one part of the aerodrome and another.

This type is a sub-type of TransportArea.

Attributes of the spatial object type TaxiwayArea

Attribute	Definition	Type	Voidability
designator	The textual designator of the taxiway.	CharacterString	voidable

7.4.1.27. Touch Down Lift Off Area (TouchDownLiftOff)

A load bearing area on which a helicopter may touch down or lift-off.

This type is a sub-type of AirNode.

Attributes of the spatial object type TouchDownLiftOff

Attribute	Definition	Type	Voidability
designator	The textual designator of the touch down and lift-off area.	CharacterString	voidable

7.4.1.28. Upper Altitude Limit (UpperAltitudeLimit)

Altitude that defines the upper limit of an air transport network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type UpperAltitudeLimit

Attribute	Definition	Type	Voidability
altitude	Value of the altitude limit.	Measure	

Constraints of the spatial object type UpperAltitudeLimit

This property can only be associated with a spatial object that is an Air Route Link or Airspace Area.

7.4.1.29. Use Restriction (UseRestriction)

The restrictions to the use of an air network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type UseRestriction

Attribute	Definition	Type	Voidability
restriction	The type of use restriction for the air network object.	AirUseRestrictionValue	

Constraints of the spatial object type UseRestriction

This property can only be associated with a spatial object that is an Air Route, Air Link (or specialized Air Link), Air Node (or specialized Air Node) or Aerodrome Area.

7.4.2. *Code Lists*

7.4.2.1. Aerodrome Category (AerodromeCategoryValue)

Aerodrome possible categories concerning the scope and importance of the air traffic services offered from and to it.

This code list shall be managed in a common code list register.

7.4.2.2. Aerodrome Type (AerodromeTypeValue)

A code specifying whether a particular entity occurrence is an Aerodrome or a Heliport.

This code list shall be managed in a common code list register.

7.4.2.3. Air Route Link Class (AirRouteLinkClassValue)

The type of the route from the navigation point of view.

This code list shall be managed in a common code list register.

7.4.2.4. Air Route Type (AirRouteTypeValue)

The route classification as ATS route or North Atlantic Tracks.

This code list shall be managed in a common code list register.

7.4.2.5. Air Use Restriction (AirUseRestrictionValue)

The use restrictions for an air network object.

This code list shall be managed in a common code list register.

7.4.2.6. Airspace Area Type (AirspaceAreaTypeValue)

Recognised types of Airspace.

This code list shall be managed in a common code list register.

7.4.2.7. Navaid Type (NavaidTypeValue)

Types of Navaid Services.

This code list shall be managed in a common code list register.

7.4.2.8. Point Role (PointRoleValue)

Role of the Runway Centreline Point.

This code list shall be managed in a common code list register.

7.4.2.9. Runway Type (RunwayTypeValue)

A code that makes a distinction between runways for airplanes and FATO for helicopters.

This code list shall be managed in a common code list register.

7.4.2.10. Surface Composition (SurfaceCompositionValue)

A code indicating the composition of a surface.

This code list shall be managed in a common code list register.

7.5. **Cable Transport Network**

7.5.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Cable Transport Network:

— Cableway Link

— Cableway Link Sequence

— Cableway Link Set

— Cableway Node

7.5.1.1. Cableway Link (CablewayLink)

Linear spatial object that describes the geometry and connectivity of a cable network between two points in a cableway transport network.

This type is a sub-type of TransportLink.

Attributes of the spatial object type CablewayLink

Attribute	Definition	Type	Voidability
cablewayType	The type of a cableway transport.	CablewayTypeValue	voidable

7.5.1.2. Cableway Link Sequence (CablewayLinkSequence)

An ordered collection of cableway links that are characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.5.1.3. Cableway Link Set (CablewayLinkSet)

A collection of cableway link sequences and or individual cableway links that has a specific function or significance in a cable transport network.

This type is a sub-type of TransportLinkSet.

7.5.1.4. Cableway Node (CablewayNode)

A point spatial object that is used to represent connectivity between two consecutive cableway links.

This type is a sub-type of TransportNode.

7.5.2. *Code Lists*

7.5.2.1. Cableway Type (CablewayTypeValue)

The possible types of cableway transport.

This code list shall be managed in a common code list register.

7.6. **Railway Transport Network**

7.6.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Railway Transport Network:

— Design Speed

— Nominal Track Gauge

— Number of Tracks

— Railway Area

— Railway Electrification

— Railway Line

— Railway Link

— Railway Link Sequence

— Railway Node

— Railway Station Area

— Railway Station Code

— Railway Station Node

— Railway Type

— Railway Use

— Railway Yard Area

— Railway Yard Node

7.6.1.1. Design Speed (DesignSpeed)

The specification of the maximum speed to which a railway line is designed for.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type DesignSpeed

Attribute	Definition	Type	Voidability
speed	The specification of the maximum speed to which a railway line is designed for.	Velocity	

Constraints of the spatial object type DesignSpeed

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.2. Nominal Track Gauge (NominalTrackGauge)

The nominal distance between the two outer rails (gauge) of a railway track.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NominalTrackGauge

Attribute	Definition	Type	Voidability
nominalGauge	A single value that identifies the track gauge.	Measure	voidable
nominalGaugeCategory	Provision of the gauge of a railway track as a fuzzy category with respect to the European standard nominal gauge.	TrackGaugeCategoryValue	voidable

Constraints of the spatial object type NominalTrackGauge

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.3. Number Of Tracks (NumberOfTracks)

The number of tracks for a railway stretch.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NumberOfTracks

Attribute	Definition	Type	Voidability
minMaxNumberOfTracks	Indicates whether the number of tracks are counted as minimum or maximum value.	MinMaxTrackValue	voidable
numberOfTracks	The number of tracks present.	Integer	

Constraints of the spatial object type NumberOfTracks

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.4. Railway Area (RailwayArea)

Surface occupied by a railway track, including ballast.

This type is a sub-type of TransportArea.

7.6.1.5. Railway Electrification (RailwayElectrification)

Indication whether the railway is provided with an electric system to power vehicles moving along it.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayElectrification

Attribute	Definition	Type	Voidability
electrified	Indicates whether the railway is provided with an electric system to power vehicles moving along it.	Boolean	

Constraints of the spatial object type RailwayElectrification

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.6. Railway Line (RailwayLine)

A collection of railway link sequences and or individual railway links that are characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of TransportLinkSet.

Attributes of the spatial object type RailwayLine

Attribute	Definition	Type	Voidability
railwayLineCode	A code assigned to a railway line which is unique within a Member State.	CharacterString	voidable

7.6.1.7. Railway Link (RailwayLink)

A linear spatial object that describes the geometry and connectivity of a railway network between two points in the network.

This type is a sub-type of TransportLink.

Attributes of the spatial object type RailwayLink

Attribute	Definition	Type	Voidability
fictitious	The railway link does not represent a real and existing railway track but a fictitious trajectory.	Boolean	voidable

7.6.1.8. Railway Link Sequence (RailwayLinkSequence)

A linear spatial object, composed of an ordered collection of railway links, which represents a continuous path in a railway network without any branches. The element has a defined beginning and end and every position on the railway link sequence is identifiable with one single parameter such as length. It describes an element of the railway network, characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.6.1.9. Railway Node (RailwayNode)

A point spatial object which represents a significant point along the railway network or defines an intersection of railway tracks used to describe its connectivity.

This type is a sub-type of TransportNode.

Attributes of the spatial object type RailwayNode

Attribute	Definition	Type	Voidability
formOfNode	The function of a railway node within the railway network.	FormOfRailwayNodeValue	voidable

7.6.1.10. Railway Station Area (RailwayStationArea)

An area spatial object which is used to represent the topographical limits of the facilities of a railway station (buildings, railway yards, installations and equipment) devoted to carry out railway station operations.

This type is a sub-type of TransportArea.

7.6.1.11. Railway Station Code (RailwayStationCode)

The unique code assigned to a railway station.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayStationCode

Attribute	Definition	Type	Voidability
stationCode	A unique code assigned to a railway station.	CharacterString	

Constraints of the spatial object type RailwayStationCode

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.12. Railway Station Node (RailwayStationNode)

A railway node which represents the location of a railway station along the railway network.

This type is a sub-type of RailwayNode.

Attributes of the spatial object type RailwayStationNode

Attribute	Definition	Type	Voidability
numberOfPlatforms	A value indicating the number of platforms available at a railway station.	Integer	voidable

Constraints of the spatial object type RailwayStationNode

For a railway station node, the value for the 'formOfNode' attribute shall always be 'RailwayStop'.

7.6.1.13. Railway Type (RailwayType)

The type of railway transport the line is designed for.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayType

Attribute	Definition	Type	Voidability
type	The type of railway transport to which the line is designed for.	RailwayTypeValue	

Constraints of the spatial object type RailwayType

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.14. Railway Use (RailwayUse)

The current use of the railway.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayUse

Attribute	Definition	Type	Voidability
use	The current use of the railway.	RailwayUseValue	

Constraints of the spatial object type RailwayUse

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.15. Railway Yard Area (RailwayYardArea)

An area spatial object which is used to represent the topographical limits of a railway yard.

This type is a sub-type of TransportArea.

7.6.1.16. Railway Yard Node (RailwayYardNode)

A railway node which occurs within a railway yard area.

This type is a sub-type of RailwayNode.

Constraints of the spatial object type RailwayYardNode

For a railway yard node, the value for the 'formOfNode' attribute shall always be 'RailwayStop'.

7.6.2. *Enumerations*

7.6.2.1. Minimum Or Maximum Track Number (MinMaxTrackValue)

Values to indicate whether number of tracks are counted as the maximum, minimum or average number.

Allowed values for the enumeration MinMaxTrackValue

Value	Definition
average	The number of tracks is the average value for a given part of the railway network.
maximum	The number of tracks is the maximum value for a given part of the railway network.
minimum	The number of tracks is the minimum value for a given part of the railway network.

7.6.2.2. Track Gauge Category (TrackGaugeCategoryValue)

The possible categories of railways concerning its nominal track gauge.

Allowed values for the enumeration TrackGaugeCategoryValue

Value	Definition
broad	The nominal track gauge property is broader than the standard one.
standard	The nominal track gauge property is equal to the European standard (1 435 millimetres).
narrow	The nominal track gauge property is narrower than the standard one.
notApplicable	The definition of a nominal track gauge property is not applicable to the type of railway transport.

7.6.3. *Code Lists*

7.6.3.1. Form Of Railway Node (FormOfRailwayNodeValue)

The possible functions of a railway node within the railway network.

This code list shall be managed in a common code list register.

7.6.3.2. Railway Type (RailwayTypeValue)

The possible types of railway transport.

This code list shall be managed in a common code list register.

7.6.3.3. Railway Use (RailwayUseValue)

The possible uses of railways.

This code list shall be managed in a common code list register.

7.7. **Road Transport Network**

7.7.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Road Transport Network:

— E-Road

— Form of Way

— Functional Road Class

— Number of Lanes

— Road

— Road Area

— Road Link

— Road Link Sequence

— Road Name

— Road Node

— Road Service Area

— Road Service Type

— Road Surface Category

— Road Width

— Speed Limit

— Vehicle Traffic Area

7.7.1.1. E-Road (ERoad)

A collection of road link sequences and or individual road links that represents a route that is part of the international E-road network, characterized by its European route number.

This type is a sub-type of TransportLinkSet.

Attributes of the spatial object type ERoad

Attribute	Definition	Type	Voidability
europeanRouteNumber	Code, identifying the route in the international E-road network. The code always starts with a letter 'E', followed by a one-, two- or three-digit number.	CharacterString	voidable

7.7.1.2. Form Of Way (FormOfWay)

A classification based on the physical properties of the Road Link.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FormOfWay

Attribute	Definition	Type	Voidability
formOfWay	Physical form of the way.	FormOfWayValue	

Constraints of the spatial object type FormOfWay

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.3. Functional Road Class (FunctionalRoadClass)

A classification based on the importance of the role that the road performs in the road network.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FunctionalRoadClass

Attribute	Definition	Type	Voidability
functionalClass	Functional rank of the road link in the road network.	FunctionalRoadClassValue	

Constraints of the spatial object type FunctionalRoadClass

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.4. Number Of Lanes (NumberOfLanes)

The number of lanes of a road element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NumberOfLanes

Attribute	Definition	Type	Voidability
direction	Indicates which direction the number of lanes is valid for.	LinkDirectionValue	voidable
minMaxNumberOfLanes	Indicates if the number of lanes is counted as minimum or maximum value.	MinMaxLaneValue	voidable
numberOfLanes	Number of lanes.	Integer	

Constraints of the spatial object type NumberOfLanes

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.5. Road (Road)

A collection of road link sequences and/or individual road links that are characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSet.

Attributes of the spatial object type Road

Attribute	Definition	Type	Voidability
localRoadCode	Identification code assigned to the road by the local road authority.	CharacterString	voidable
nationalRoadCode	The national number of the road.	CharacterString	voidable

7.7.1.6. Road Area (RoadArea)

Surface which extends to the limits of a road, including vehicular areas and other parts of it.

This type is a sub-type of TransportArea.

7.7.1.7. Road Link (RoadLink)

A linear spatial object that describes the geometry and connectivity of a road network between two points in the network. Road links can represent paths, bicycle roads, single carriageways, multiple carriageway roads and even fictitious trajectories across traffic squares.

This type is a sub-type of TransportLink.

7.7.1.8. Road Link Sequence (RoadLinkSequence)

A linear spatial object, composed of an ordered collection of road links, which represents a continuous path in a road network without any branches. The element has a defined beginning and end and every position on the road link sequence is identifiable with one single parameter such as length. It describes an element of the road network, characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.7.1.9. Road Name (RoadName)

Name of a road, as assigned by the responsible authority.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadName

Attribute	Definition	Type	Voidability
name	Name of the road.	GeographicalName	

Constraints of the spatial object type RoadName

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.10. Road Node (RoadNode)

A point spatial object that is used to either represent connectivity between two road links or to represent a significant spatial object such as a services station or roundabout.

This type is a sub-type of TransportNode.

Attributes of the spatial object type RoadNode

Attribute	Definition	Type	Voidability
formOfRoadNode	Description of the function of a road node in the road transport network.	FormOfRoadNodeValue	voidable

7.7.1.11. Road Service Area (RoadServiceArea)

Surface annexed to a road and devoted to offer particular services for it.

This type is a sub-type of TransportArea.

7.7.1.12. Road Service Type (RoadServiceType)

Description of the type of road service area and the available facilities.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadServiceType

Attribute	Definition	Type	Voidability
availableFacility	Facility that is available for a given road service area.	ServiceFacilityValue	
type	Type of road service area.	RoadServiceTypeValue	

Constraints of the spatial object type RoadServiceType

This property can only be associated with a spatial object of the type RoadServiceArea or RoadNode (when formOfRoadNode=roadServiceArea).

7.7.1.13. Road Surface Category (RoadSurfaceCategory)

Specification of the state of the surface of the associated Road Element. Indicates whether a road is paved or unpaved.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadSurfaceCategory

Attribute	Definition	Type	Voidability
surfaceCategory	Type of road surface.	RoadSurfaceCategoryValue	

Constraints of the spatial object type RoadSurfaceCategory

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.14. Road Width (RoadWidth)

The width of the road, measured as an average value.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadWidth

Attribute	Definition	Type	Voidability
measuredRoadPart	Indicates to which part of a road the value for the attribute 'width' applies.	RoadPartValue	voidable
width	Road width value.	Measure	

Constraints of the spatial object type RoadWidth

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.15. Speed Limit (SpeedLimit)

Limit for the speed of a vehicle on a road.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type SpeedLimit

Attribute	Definition	Type	Voidability
areaCondition	Speed limit is dependent on environmental circumstances.	AreaConditionValue	voidable
direction	Indicates which direction the speed limit is valid for.	LinkDirectionValue	voidable
laneExtension	Number of lanes (including the start lane) to which the speed limit applies.	Integer	voidable
speedLimitMinMaxType	Indicates if the speed limit is maximum or minimum and if it is recommended.	SpeedLimitMinMaxValue	
speedLimitSource	Source for speed limit.	SpeedLimitSourceValue	voidable
speedLimitValue	Value for speed limit.	Velocity	

Attribute	Definition	Type	Voidability
startLane	Index of the first lane to which speed limit applies. For countries with right-hand traffic, the index 1 refers to the rightmost lane and the index is incremented to the left; for countries with left-hand traffic, the index 1 refers to the leftmost lane, and the index is incremented to the right.	Integer	voidable
validityPeriod	Period during which the speed limit is valid.	TM_Period	voidable
vehicleType	Vehicle type the speed limit is restricted to.	VehicleTypeValue	voidable
weatherCondition	Weather condition the speed limit is dependent on.	WeatherConditionValue	voidable

Constraints of the spatial object type SpeedLimit

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.16. Vehicle Traffic Area (VehicleTrafficArea)

Surface that represents the part of a road which is used for the normal traffic of vehicles.

This type is a sub-type of TransportArea.

7.7.2. *Enumerations*

7.7.2.1. Functional Road Class (FunctionalRoadClassValue)

Values for the functional road classification. This classification is based on the importance of the role that the road performs in the road network.

Allowed values for the enumeration FunctionalRoadClassValue

Value	Definition
mainRoad	The most important roads in a given network.
firstClass	The second most important roads in a given network.
secondClass	The third most important roads in a given network.
thirdClass	The fourth most important roads in a given network.
fourthClass	The fifth most important roads in a given network.
fifthClass	The sixth most important roads in a given network.
sixthClass	The seventh most important roads in a given network.
seventhClass	The eighth most important roads in a given network.
eighthClass	The ninth most important roads in a given network.
ninthClass	The least important roads in a given network.

7.7.2.2. Minimum Or Maximum Lane Number (MinMaxLaneValue)

Values to indicate whether number of lanes are counted as the maximum, minimum or average number.

Allowed values for the enumeration MinMaxLaneValue

Value	Definition
maximum	The number of lanes is the maximum value for a given part of the road network.
minimum	The number of lanes is the minimum value for a given part of the road network.
average	The number of lanes is the average value for a given part of the road network.

7.7.2.3. Nature Of Speed Limit (SpeedLimitMinMaxValue)

Possible values to indicate the nature of a speed limit.

Allowed values for the enumeration SpeedLimitMinMaxValue

Value	Definition
maximum	Speed limit is a maximum value
minimum	Speed limit is a minimum value
recommendedMaximum	Speed limit is a recommended maximum value
recommendedMinimum	Speed limit is a recommended minimum value

7.7.3. *Code Lists*

7.7.3.1. Area Condition (AreaConditionValue)

Speed limit restriction depending on the area.

This code list shall be managed in a common code list register.

7.7.3.2. Form Of Road Node (FormOfRoadNodeValue)

Functions of road nodes.

This code list shall be managed in a common code list register.

7.7.3.3. Form Of Way (FormOfWayValue)

Classification based on the physical properties of the road link.

This code list shall be managed in a common code list register.

7.7.3.4. Road Part (RoadPartValue)

Indication to which part of a road the value of a measurement applies.

This code list shall be managed in a common code list register.

7.7.3.5. Road Service Type (RoadServiceTypeValue)

Types of road service areas.

This code list shall be managed in a common code list register.

7.7.3.6. Road Surface Category (RoadSurfaceCategoryValue)

Values to indicate whether a road is paved or not paved.

This code list shall be managed in a common code list register.

7.7.3.7. Service Facility (ServiceFacilityValue)

Possible service facilities available at a road service area.

This code list shall be managed in a common code list register.

7.7.3.8. Speed Limit Source (SpeedLimitSourceValue)

Possible sources for speed limits.

This code list shall be managed in a common code list register.

7.7.3.9. Vehicle Type (VehicleTypeValue)

Possible types of vehicles.

This code list shall be managed in a common code list register.

7.7.3.10. Weather Condition (WeatherConditionValue)

Values to indicate weather conditions that affect speed limits.

This code list shall be managed in a common code list register.

7.8. **Water Transport Network**

7.8.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Water Transport Network:

— Beacon

— Buoy

— CEMT Class

— Condition of Water Facility

— Fairway Area

— Ferry Crossing

— Ferry Use

— Inland Waterway

— Marine Waterway

— Port Area

— Port Node

— Restriction for Water Vehicles

— Traffic Separation Scheme

— Traffic Separation Scheme Area

— Traffic Separation Scheme Crossing

— Traffic Separation Scheme Lane

— Traffic Separation Scheme Roundabout

— Traffic Separation Scheme Separator

— Water Link Sequence

— Water Node

— Water Traffic Flow Direction

— Waterway

— Waterway Link

— Waterway Node

7.8.1.1. Beacon (Beacon)

A prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation, or for use in hydrographic survey.

This type is a sub-type of TransportPoint.

7.8.1.2. Buoy (Buoy)

A floating object moored to the bottom in a particular (charted) place, as an aid to navigation or for other specific purposes.

This type is a sub-type of TransportPoint.

7.8.1.3. CEMT Class (CEMTClass)

Classification of an inland waterway according to CEMT (European Conference of Ministers of Transport).

This type is a sub-type of TransportProperty.

Attributes of the spatial object type CEMTClass

Attribute	Definition	Type	Voidability
CEMTClass	Value indicating the classification of an Inland waterway according to CEMT (European Conference of Ministers of Transport).	CEMTClassValue	

Constraints of the spatial object type CEMTClass

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.4. Condition Of Water Facility (ConditionOfWaterFacility)

State of a water transport network element with regards to its completion and use.

This type is a sub-type of ConditionOfFacility.

Constraints of the spatial object type ConditionOfWaterFacility

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.5. Fairway Area (FairwayArea)

The main travelled part of a waterway.

This type is a sub-type of TransportArea.

7.8.1.6. Ferry Crossing (FerryCrossing)

A special waterway aimed at supporting the transport of passengers, vehicles or other cargo/freight across a water body, and which is normally used as a connection linking two or more nodes of a land based transport network.

This type is a sub-type of Waterway.

7.8.1.7. Ferry Use (FerryUse)

The type of transport carried out by a ferry crossing.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FerryUse

Attribute	Definition	Type	Voidability
ferryUse	Value indicating the type of transport carried out by a ferry crossing.	FerryUseValue	

Constraints of the spatial object type FerryUse

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.8. Inland Waterway (InlandWaterway)

Waterway which is defined at inland continental waters.

This type is a sub-type of Waterway.

7.8.1.9. Marine Waterway (MarineWaterway)

Waterway which is defined at sea waters.

This type is a sub-type of Waterway.

Attributes of the spatial object type MarineWaterway

Attribute	Definition	Type	Voidability
deepWaterRoute	Attribute which indicates if the maritime waterway is a deep water route.	Boolean	voidable

7.8.1.10. Port Area (PortArea)

An area spatial object which is used to represent the physical limits of all the facilities which constitute the terrestrial zone of a sea or inland port.

This type is a sub-type of TransportArea.

7.8.1.11. Port Node (PortNode)

A point spatial object which is used to represent a sea or inland port in a simplified way, aproximately located at the bank of the waterbody where the port is placed.

This type is a sub-type of WaterNode.

7.8.1.12. Restriction For Water Vehicles (RestrictionForWaterVehicles)

Restriction on vehicles on a water transport element.

This type is a sub-type of RestrictionForVehicles.

Constraints of the spatial object type RestrictionForWaterVehicles

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.13. Traffic Separation Scheme (TrafficSeparationScheme)

A scheme which aims at reducing the risk of collision in congested and/or converging areas by separating traffic moving in opposite, or nearly opposite, directions.

This type is abstract.

Association roles of the spatial object type TrafficSeparationScheme

Association role	Definition	Type	Voidability
component	A component of a traffic separation scheme.	TrafficSeparationSchemeArea	
marineWaterRoute	The collection of marine waterways associated with a traffic separation scheme.	MarineWaterway	
markerBeacon	A marker forming part of a traffic separation scheme.	Beacon	
markerBuoy	A marker forming part of a traffic separation scheme.	Buoy	

7.8.1.14. Traffic Separation Scheme Area (TrafficSeparationSchemeArea)

An area spatial object forming part of a traffic separation scheme.

This type is a sub-type of TransportArea.

This type is abstract.

7.8.1.15. Traffic Separation Scheme Crossing (TrafficSeparationSchemeCrossing)

A defined area where traffic lanes cross.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.16. Traffic Separation Scheme Lane (TrafficSeparationSchemeLane)

An area within defined limits in which one-way traffic flow is established.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.17. Traffic Separation Scheme Roundabout (TrafficSeparationSchemeRoundabout)

A traffic separation scheme in which traffic moves in a counter-clockwise direction around a specified point or zone.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.18. Traffic Separation Scheme Separator (TrafficSeparationSchemeSeparator)

A zone separating the lanes in which ships are proceeding in opposite or nearly opposite directions; or separating traffic lanes designated for particular classes of ships proceeding in the same direction.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.19. Water Link Sequence (WaterLinkSequence)

A linear spatial object, composed of an ordered collection of waterway and/or watercourse links (as necessary), which represents a continuous path in the water network without any branches.

This type is a sub-type of TransportLinkSequence.

7.8.1.20. Water Node (WaterNode)

A point spatial object which is used to represent the connectivity between two different waterway links, or between a waterway link and a watercourse link, in the water transport network.

This type is a sub-type of TransportNode.

This type is abstract.

7.8.1.21. Water Traffic Flow Direction (WaterTrafficFlowDirection)

Indicates the direction of the flow of water transport traffic in relation to the direction of the water transport link vector.

This type is a sub-type of TrafficFlowDirection.

Constraints of the spatial object type WaterTrafficFlowDirection

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.22. Waterway (Waterway)

A collection of water link sequences and or individual waterway and/or watercourse links (as necessary) that are characterized by one or more thematical identifiers and/or properties, which perform a navigable route within a water body (oceans, seas, rivers, lakes, channels or canals).

This type is a sub-type of TransportLinkSet.

This type is abstract.

7.8.1.23. Waterway Link (WaterwayLink)

A linear spatial object that describes the geometry or connectivity of the water transport network between two consecutive waterway or watercourse nodes. It represents a linear section across a body of water which is used for shipping.

This type is a sub-type of TransportLink.

7.8.1.24. Waterway Node (WaterwayNode)

A point spatial object which is used to represent the connectivity between two different waterway links, or between a waterway link and a watercourse link, in the water transport network.

This type is a sub-type of WaterNode.

Attributes of the spatial object type WaterwayNode

Attribute	Definition	Type	Voidability
formOfWaterwayNode	Description of the function of a waterway node in the water transport network.	FormOfWaterwayNodeValue	voidable

7.8.2. *Enumerations*

7.8.2.1. CEMT Class (CEMTClassValue)

Inland waterway classification according to CEMT (European Conference of Ministers of Transport) Resolution No 92/2.

Allowed values for the enumeration CEMTClassValue

Value	Definition
I	Inland waterway belonging to CEMT-class I, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
II	Inland waterway belonging to CEMT-class II, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
III	Inland waterway belonging to CEMT-class III, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
IV	Inland waterway belonging to CEMT-class IV, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
Va	Inland waterway belonging to CEMT-class Va, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
Vb	Inland waterway belonging to CEMT-class Vb, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIa	Inland waterway belonging to CEMT-class VIa, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIb	Inland waterway belonging to CEMT-class VIb, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIc	Inland waterway belonging to CEMT-class VIc, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VII	Inland waterway belonging to CEMT-class VII, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.

7.8.3. *Code Lists*

7.8.3.1. Ferry Use (FerryUseValue)

Types of transport carried out by a ferry.

This code list shall be managed in a common code list register.

7.8.3.2. Form Of Waterway Node (FormOfWaterwayNodeValue)

Function of a Waterway Node in the water transport network.

This code list shall be managed in a common code list register.

7.9. **Theme-specific Requirements**

7.9.1. *Consistency between spatial data sets*

1. Transport Networks centreline representations and nodes shall always be located within the extent of the area representation of the same object.

2. Connectivity between Transport Networks across state borders and – where applicable – also across regional borders (and data sets) within Member States shall be established and maintained by the respective authorities, using the cross-border connectivity mechanisms provided by the NetworkConnection type.

7.9.2. *Modelling of object references*

1. When linear referencing is used in Transport Networks data, the position of referenced properties on links and link sequences shall be expressed as distances measured along the supplied geometry of the underlying link object(s).

2. An inter-modal connection shall always reference two elements which belong to different networks.

7.9.3. *Geometry representation*

1. Transport link ends shall be connected wherever an intersection exists between the real world phenomena they represent. No connections shall be created at crossing network elements when it is not possible to pass from one element to another.

2. In a Transport Networks data set which contains nodes, these nodes shall only be present where Transport Links connect or end.

7.9.4. *Modelling of object references*

The Water transport networks shall re-use, where it exists and is practicable, the water network centreline geometry of the Hydrography theme. Therefore, object referencing shall be used to link the water transport course with the existing water network geometry in the Hydrography theme.

7.9.5. *Centrelines*

The centrelines of Road and Rail objects shall fall within the extent of the physical real world object that they represent if the Link is indicated as not being 'fictitious'.

7.9.6. *Ensuring Network Connectivity*

1. Wherever a connection exists in a transport network, all connected link ends and the optional node that take part in this connection have to be positioned at a distance of less than the connectivity tolerance from each other.

2. Link ends and nodes that are not connected shall always be separated by a distance that is greater than the connectivity tolerance.

3. In data sets where both transport links and nodes are present, the relative position of nodes and link ends in relation to the specified connectivity tolerance shall correspond to the associations that exist between them in the data set.

7.10. **Layers**

Layers for the spatial data theme Transport networks

Layer Type	Layer Title	Spatial object type(s)
TN.CommonTransportElements.TransportNode	Generic Transport Node	TransportNode
TN.CommonTransportElements.TransportLink	Generic Transport Link	TransportLink
TN.CommonTransportElements.TransportArea	Generic Transport Area	TransportArea
TN.RoadTransportNetwork.RoadLink	Road Link	RoadLink
TN.RoadTransportNetwork.VehicleTrafficArea	Vehicle traffic Area	VehicleTrafficArea
TN.RoadTransportNetwork.RoadServiceArea	Road Service Area	RoadServiceArea
TN.RoadTransportNetwork.RoadArea	Road Area	RoadArea
TN.RailTransportNetwork.RailwayLink	Railway Link	RailwayLink
TN.RailTransportNetwork.RailwayStationArea	Railway Station Area	RailwayStationArea
TN.RailTransportNetwork.RailwayYardArea	Railway Yard Area	RailwayYardArea
TN.RailTransportNetwork.RailwayArea	Railway Area	RailwayArea
TN.WaterTransportNetwork.WaterwayLink	Waterway Link	WaterwayLink
TN.WaterTransportNetwork.FairwayArea	Fairway Area	FairwayArea
TN.WaterTransportNetwork.PortArea	Port Area	PortArea
TN.AirTransportNetwork.AirLink	Air Link	AirLink
TN.AirTransportNetwork.AerodromeArea	Aerodrome Area	AerodromeArea
TN.AirTransportNetwork.RunwayArea	Runway Area	RunwayArea
TN.AirTransportNetwork.AirspaceArea	Airspace Area	AirspaceArea
TN.AirTransportNetwork.ApronArea	Apron Area	ApronArea
TN.AirTransportNetwork.TaxiwayArea	Taxiway Area	TaxiwayArea
TN.CableTransportNetwork.CablewayLink	Cableway Link	CablewayLink

8. HYDROGRAPHY

8.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

— ‘aquifer’ means a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater,

— ‘groundwater’ means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil,

— ‘sub-basin’ means an area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course,

8.2. **Structure of the Spatial Data Theme Hydrography**

The types specified for the spatial data theme Hydrography are structured in the following packages:

— Hydro - base

— Hydro - Network

— Hydro - Physical Waters

— Hydro - Reporting

8.3. **Hydro - base**

8.3.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - base:

— Hydro Object

8.3.1.1. Hydro Object (HydroObject)

An identity base for hydrographic (including man-made) objects in the real world.

This type is abstract.

Attributes of the spatial object type HydroObject

Attribute	Definition	Type	Voidability
geographicalName	A geographical name that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.	GeographicalName	voidable
hydroId	An identifier that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.	HydroIdentifier	

Association roles of the spatial object type HydroObject

Association role	Definition	Type	Voidability
relatedHydroObject	A related hydrographic object representing the same real-world entity.	HydroObject	voidable

8.3.2. *Data Types*

8.3.2.1. Hydro Identifier (HydroIdentifier)

A hydrographic thematic identifier.

Attributes of the data type HydroIdentifier

Attribute	Definition	Type	Voidability
classificationScheme	A description of the identification scheme (National, European, etc.) being used.	CharacterString	
localId	A local identifier, assigned by some authority.	CharacterString	
Namespace	An indicator of the scope for the local identifier.	CharacterString	

8.4. **Hydro - Network**

8.4.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - Network:

— Hydro Node

— Watercourse Link

— Watercourse Link Sequence

— Watercourse Separated Crossing

8.4.1.1. Hydro Node (HydroNode)

A node within the hydrographic network.

This type is a sub-type of Node.

This type is a sub-type of HydroObject.

Attributes of the spatial object type HydroNode

Attribute	Definition	Type	Voidability
hydroNodeCategory	Nature of the hydro node.	HydroNodeCategoryValue	voidable

8.4.1.2. Watercourse Link (WatercourseLink)

A segment of a watercourse within a hydrographic network.

This type is a sub-type of Link.

This type is a sub-type of HydroObject.

Attributes of the spatial object type WatercourseLink

Attribute	Definition	Type	Voidability
flowDirection	Direction of water flow in the segment relative to digitisation of segment geometry.	LinkDirectionValue	voidable
length	Length of network segment.	Length	voidable

8.4.1.3. Watercourse Link Sequence (WatercourseLinkSequence)

A sequence of watercourse links representing a non-branching path through a hydrographic network.

This type is a sub-type of LinkSequence.

This type is a sub-type of HydroObject.

8.4.1.4. Watercourse Separated Crossing (WatercourseSeparatedCrossing)

An element in the hydrographic network used to indicate non-interacting crossing of watercourse links separated by level.

This type is a sub-type of GradeSeparatedCrossing.

This type is a sub-type of HydroObject.

8.4.2. *Code Lists*

8.4.2.1. Hydro Node Category (HydroNodeCategoryValue)

Defines categories for different types of hydrographic network nodes.

This code list shall be managed in a common code list register.

8.5. **Hydro - Physical Waters**

8.5.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - Physical Waters:

— Crossing

— Dam or Weir

— Drainage Basin

— Embankment

— Falls

— Fluvial Point

— Ford

— Hydro Point of Interest

— Hydro Power Plant

— Inundated Land

— Land-Water Boundary

— Lock

— Man-made Object

— Ocean Region

— Pipe

— Pumping Station

— Rapids

— River Basin

— Shore

— Shoreline Construction

— Sluice

— Standing Water

— Surface Water

— Watercourse

— Wetland

8.5.1.1. Crossing (Crossing)

A man-made object allowing the passage of water above or below an obstacle.

This type is a sub-type of ManMadeObject.

Attributes of the spatial object type Crossing

Attribute	Definition	Type	Voidability
type	The type of physical crossing.	CrossingTypeValue	voidable

8.5.1.2. Dam Or Weir (DamOrWeir)

A permanent barrier across a watercourse used to impound water or to control its flow.

This type is a sub-type of ManMadeObject.

8.5.1.3. Drainage Basin (DrainageBasin)

Area having a common outlet for its surface runoff.

This type is a sub-type of HydroObject.

Attributes of the spatial object type DrainageBasin

Attribute	Definition	Type	Voidability
area	Size of the drainage basin area.	Area	voidable
basinOrder	Number (or code) expressing the degree of branching/dividing in a drainage basin system.	HydroOrderCode	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the drainage basin, as a surface.	GM_Surface	
inspireId	External object identifier of the spatial object.	Identifier	
origin	Origin of the drainage basin.	OriginValue	voidable

Association roles of the spatial object type DrainageBasin

Association role	Definition	Type	Voidability
outlet	The surface water outlet(s) of a drainage basin.	SurfaceWater	voidable
containsBasin	A smaller sub-basin contained within a larger basin	DrainageBasin	voidable

Constraints of the spatial object type DrainageBasin

A river basin may not be contained in any other basin

8.5.1.4. Embankment (Embankment)

A man-made raised long mound of earth or other material.

This type is a sub-type of ManMadeObject.

This type is a candidate type to be considered by the spatial data theme Natural risk zones in Annex III to Directive 2007/2/EC.

8.5.1.5. Falls (Falls)

A vertically descending part of a watercourse where it falls from a height.

This type is a sub-type of FluvialPoint.

Attributes of the spatial object type Falls

Attribute	Definition	Type	Voidability
height	Distance measured from the lowest point of the base at ground or water level (downhill side/downstream side) to the tallest point of the spatial object.	Length	voidable

8.5.1.6. Fluvial Point (FluvialPoint)

A hydro point of interest that affects the flow of a watercourse.

This type is a sub-type of HydroPointOfInterest.

This type is abstract.

8.5.1.7. Ford (Ford)

A shallow part of a watercourse used as a road crossing.

This type is a sub-type of ManMadeObject.

8.5.1.8. Hydro Point Of Interest (HydroPointOfInterest)

A natural place where water appears, disappears or changes its flow.

This type is a sub-type of HydroObject.

This type is abstract.

Attributes of the spatial object type HydroPointOfInterest

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
geometry	The geometry of the hydro point of interest, as a point, curve or surface.	GM_Primitive	voidable
inspireId	External object identifier of the spatial object.	Identifier	
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	

8.5.1.9. Hydro Power Plant (HydroPowerPlant)

A facility for the generation of power from moving water.

This type is a sub-type of ManMadeObject.

This type is a candidate type to be considered by the spatial data theme Energy resources in Annex III to Directive 2007/2/EC.

8.5.1.10. Inundated Land (InundatedLand)

A tract periodically covered by flood water, excluding tidal waters.

This type is a sub-type of HydroObject.

This type is a candidate type to be considered by the spatial data theme Natural risk zones in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type InundatedLand

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the inundated land, as a surface.	GM_Surface	
inspireId	External object identifier of the spatial object.	Identifier	
inundationReturnPeriod	The average period (in years) between the occurrences of an inundation event.	Number	voidable
inundationType	The type of a land subject to inundation based on the cause of its flooding.	InundationValue	voidable

8.5.1.11. Land-Water Boundary (LandWaterBoundary)

The line where a land mass is in contact with a body of water.

Attributes of the spatial object type LandWaterBoundary

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the land-water boundary, as a curve.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
origin	Origin of the land-water boundary.	OriginValue	voidable
waterLevelCategory	Water-level defining the land-water boundary.	WaterLevelValue	voidable

8.5.1.12. Lock (Lock)

An enclosure with a pair or series of gates used for raising or lowering vessels as they pass from one water level to another.

This type is a sub-type of ManMadeObject.

8.5.1.13. Man-made Object (ManMadeObject)

An artificial object which lies inside a body of water and has one of the following types of function: - Retains the water; - Regulates the quantity of water; - Alters the course of the water; - Allows watercourses to cross each other.

This type is a sub-type of HydroObject.

This type is abstract.

Attributes of the spatial object type ManMadeObject

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
condition	The state of planning, construction, repair, and/or maintenance of the structures and/or equipment comprising a facility and/or located at a site, as a whole.	ConditionOfFacilityValue	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the man-made object, as a point, curve or surface.	GM_Primitive	voidable
inspireId	External object identifier of the spatial object.	Identifier	
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	

8.5.1.14. Ocean Region (OceanRegion)

One of the three large regions of the world-wide ocean, each with associated sub- and marginal areas and subject to an independent flow-regime.

This type is a sub-type of HydroObject.

This type is a candidate type to be considered by the spatial data theme Sea regions in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type OceanRegion

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the ocean region, as a surface.	GM_Surface	voidable
inspireId	External object identifier of the spatial object.	Identifier	

Association roles of the spatial object type OceanRegion

Association role	Definition	Type	Voidability
foreshore	The part of the shore or beach which lies between the low water mark and the upper limit of normal wave action.	Shore	voidable

8.5.1.15. Pipe (Pipe)

A tube for the conveyance of solids, liquids or gases.

This type is a sub-type of ManMadeObject.

This type is a candidate type to be considered by the spatial data theme Utility and governmental services in Annex III to Directive 2007/2/EC.

8.5.1.16. Pumping Station (PumpingStation)

A facility to move solids, liquids or gases by means of pressure or suction.

This type is a sub-type of ManMadeObject.

This type is a candidate type to be considered by the spatial data theme Utility and governmental services in Annex III to Directive 2007/2/EC.

8.5.1.17. Rapids (Rapids)

Portions of a stream with accelerated current where it descends rapidly but without a break in the slope of the bed sufficient to form a waterfall.

This type is a sub-type of FluvialPoint.

8.5.1.18. River Basin (RiverBasin)

The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.

This type is a sub-type of DrainageBasin.

8.5.1.19. Shore (Shore)

The narrow strip of land in immediate contact with any body of water including the area between high and low water lines.

This type is a sub-type of HydroObject.

This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.

Attributes of the spatial object type Shore

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
composition	The primary type(s) of material composing a spatial object, exclusive of the surface.	ShoreTypeValue	voidable
delineationKnown	An indication that the delineation (for example: limits and information) of a spatial object is known.	Boolean	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the shore, as a surface.	GM_Surface	
inspireId	External object identifier of the spatial object.	Identifier	

8.5.1.20. Shoreline Construction (ShorelineConstruction)

An artificial structure attached to land bordering a body of water and fixed in position.

This type is a sub-type of ManMadeObject.

8.5.1.21. Sluice (Sluice)

An open, inclined conduit fitted with a gate for regulating water flow.

This type is a sub-type of ManMadeObject.

8.5.1.22. Standing Water (StandingWater)

A body of water that is entirely surrounded by land.

This type is a sub-type of SurfaceWater.

Attributes of the spatial object type StandingWater

Attribute	Definition	Type	Voidability
elevation	Elevation above mean sea level.	Length	voidable
meanDepth	Average depth of the body of water.	Length	voidable
surfaceArea	Surface area of the body of water.	Area	voidable

Constraints of the spatial object type StandingWater

Standing water geometry may be a surface or point

8.5.1.23. Surface Water (SurfaceWater)

Any known inland waterway body.

This type is a sub-type of HydroObject.

This type is abstract.

Attributes of the spatial object type SurfaceWater

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the surface water: - either a curve or surface for a watercourse; - either a point or surface for a standing water.	GM_Primitive	
inspireId	External object identifier of the spatial object.	Identifier	
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	
localType	Provides 'local' name for the type of surface water.	LocalisedCharacterString	voidable
origin	Origin of the surface water.	OriginValue	voidable
persistence	The degree of persistence of water.	HydrologicalPersistenceValue	voidable
tidal	Identifies whether the surface water is affected by tidal water.	Boolean	voidable

Association roles of the spatial object type SurfaceWater

Association role	Definition	Type	Voidability
bank	The bank(s) associated to a surface water.	Shore	voidable
drainsBasin	The basin(s) drained by a surface water.	DrainageBasin	voidable
neighbour	An association to another instance of the same real-world surface water in another data set.	SurfaceWater	voidable

8.5.1.24. Watercourse (Watercourse)

A natural or man-made flowing watercourse or stream.

This type is a sub-type of SurfaceWater.

Attributes of the spatial object type Watercourse

Attribute	Definition	Type	Voidability
condition	The state of planning, construction, repair, and/or maintenance of a watercourse.	ConditionOfFacilityValue	voidable
delineationKnown	An indication that the delineation (for example: limits and information) of a spatial object is known.	Boolean	voidable
length	Length of the watercourse.	Length	voidable
level	Vertical location of watercourse relative to ground.	VerticalPositionValue	voidable
streamOrder	Number (or code) expressing the degree of branching in a stream system.	HydroOrderCode	voidable
width	Width of watercourse (as a range) along its length.	WidthRange	voidable

Constraints of the spatial object type Watercourse

Watercourse geometry may be a curve or surface

A condition attribute may be specified only for a man-made watercourse

8.5.1.25. Wetland (Wetland)

A poorly drained or periodically flooded area where the soil is saturated with water, and vegetation is supported.

This type is a sub-type of HydroObject.

This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.

Attributes of the spatial object type Wetland

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	The geometry of the wetland, as a surface.	GM_Surface	
inspireId	External object identifier of the spatial object.	Identifier	
localType	Provides 'local' name for the type of wetland.	LocalisedCharacterString	voidable
Tidal	Identifies whether the wetland is affected by tidal water.	Boolean	voidable

8.5.2. *Data Types*

8.5.2.1. Hydro Order Code (HydroOrderCode)

A hydrologically meaningful 'order code' for ordering hierarchies of watercourses and drainage basins.

Attributes of the data type HydroOrderCode

Attribute	Definition	Type	Voidability
order	Number (or code) expressing the degree of branching or dividing in a stream or drainage basin system.	CharacterString	
orderScheme	A description of the concept for ordering.	CharacterString	
scope	An indicator of the scope or origin for an order code (including whether it is national, supranational or European).	CharacterString	

8.5.2.2. Width Range (WidthRange)

The range of a watercourse's horizontal width along its length.

Attributes of the data type WidthRange

Attribute	Definition	Type	Voidability
lower	Lower bound of width.	Length	
upper	Upper bound of width.	Length	

8.5.3. *Enumerations*

8.5.3.1. Origin (OriginValue)

An enumeration type specifying a set of hydrographic 'origin' categories (natural, man-made) for various hydrographic objects.

Allowed values for the enumeration OriginValue

Value	Definition
natural	An indication that a spatial object is natural.
manMade	An indication that a spatial object is man-made.

8.5.4. *Code Lists*

8.5.4.1. Crossing Type (CrossingTypeValue)

Man-made physical watercourse crossing types.

This code list shall be managed in a common code list register.

8.5.4.2. Hydrological Persistence (HydrologicalPersistenceValue)

Categories of hydrological persistence of a body of water.

This code list shall be managed in a common code list register.

8.5.4.3. Inundation (InundationValue)

The type of a land subject to inundation.

This type is a candidate type to be considered by the spatial data theme Natural risk zones in Annex III to Directive 2007/2/EC.

This code list shall be managed in a common code list register.

8.5.4.4. Shore Type (ShoreTypeValue)

Categories of shore area composition.

This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.

This code list shall be managed in a common code list register.

8.5.4.5. Water Level (WaterLevelValue)

The tidal datum / waterlevel to which depths and heights are referenced.

This code list shall be managed in a common code list register.

8.6. **Hydro - Reporting**

8.6.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - Reporting:

— WFD Coastal Water

— WFD Ground Water Body

— WFD Lake

— WFD River

— WFD River or Lake

— WFD Surface Water Body

— WFD Transitional Water

— WFD Water Body

8.6.1.1. WFD Coastal Water (WFDCoastalWater)

Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

This type is a sub-type of WFDSurfaceWaterBody.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Constraints of the spatial object type WFDCoastalWater

Coastal water geometry must be a surface

8.6.1.2. WFD Ground Water Body (WFDGroundWaterBody)

A distinct volume of groundwater within an aquifer or aquifers.

This type is a sub-type of WFDWaterBody.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type WFDGroundWaterBody

Attribute	Definition	Type	Voidability
geometry	The geometry of the WFD groundwater body.	GM_Primitive	voidable

8.6.1.3. WFD Lake (WFDLake)

A body of standing inland surface water.

This type is a sub-type of WFDRiverOrLake.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Constraints of the spatial object type WFDLake

Lake geometry must be a surface

8.6.1.4. WFD River (WFDRiver)

A body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.

This type is a sub-type of WFDRiverOrLake.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Constraints of the spatial object type WFDRiver

River geometry must be a curve

Main and large attributes may not be specified for canals

8.6.1.5. WFD River Or Lake (WFDRiverOrLake)

Abstract class containing common attributes for a WFD river or lake.

This type is a sub-type of WFDSurfaceWaterBody.

This type is abstract.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type WFDRiverOrLake

Attribute	Definition	Type	Voidability
large	Rivers with a catchment area > 50,000 km^2; or rivers and main tributaries that have a catchment area between 5,000 km^2 and 50,000 km^2. Lakes that have a surface area > 500 km^2.	Boolean	voidable
main	Rivers that have a catchment area > 500 km^2. Lakes that have a surface area > 10 km^2.	Boolean	voidable

8.6.1.6. WFD Surface Water Body (WFDSurfaceWaterBody)

A discrete and significant element of surface water.

This type is a sub-type of WFDWaterBody.

This type is abstract.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type WFDSurfaceWaterBody

Attribute	Definition	Type	Voidability
artificial	'Artificial water body' means a body of surface water created by human activity.	Boolean	
geometry	The geometry of the WFD surface water body: - a surface for a WFD coastal water; - a surface for a WFD transitional water; - a curve for a WFD river; - a surface for a WFD lake.	GM_Primitive	
heavilyModified	'Heavily modified water body' means a body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of WFD Annex II.	Boolean	
representativePoint	Representative point of the WFD water body.	GM_Point	voidable

Constraints of the spatial object type WFDSurfaceWaterBody

heavilyModified attribute allowed only if not artificial

8.6.1.7. WFD Transitional Water (WFDTransitionalWater)

Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

This type is a sub-type of WFDSurfaceWaterBody.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Constraints of the spatial object type WFDTransitionalWater

Transitional water geometry must be a surface

8.6.1.8. WFD Water Body (WFDWaterBody)

Abstract class representing a WFD body of surface water or body of groundwater.

This type is a sub-type of HydroObject.

This type is abstract.

This type is a candidate type to be considered by the spatial data theme Area management/restriction/regulation zones and reporting units in Annex III to Directive 2007/2/EC.

Attributes of the spatial object type WFDWaterBody

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	

8.7. **Theme-specific Requirements**

8.7.1. *Consistency between spatial data sets*

1. Hydrography links, centrelines and nodes shall always be located within the extent of the area representation of the same object.

2. Connectivity between hydrographic networks across state borders and – where applicable – also across regional borders (and data sets) within Member States shall be established and maintained by the respective authorities, using the cross-border connectivity mechanisms provided by the NetworkConnection type.

3. All attribution of objects in this schema shall be the same as the equivalent property of that object used for reporting obligations under Directive 2000/60/EC.

8.7.2. *Identifier management*

1. If a geographical name is used as a unique hydrologic ID for an object in this specification then it shall be derived, where possible, from a pan-European Gazetteer or another authoritative, pan-European source.

2. The localId attribute of the external object identifier of a spatial object shall be the same as the ID used for reporting obligations under Directive 2000/60/EC.

8.7.3. *Modelling of object references*

1. If the same real world object in a data set is exchanged using spatial objects from more than one of the Hydrography application schemas then these spatial objects shall carry either the same, unique, geographical name or the same hydrographic thematic identifier.

2. When linear referencing is used in hydrographic Network data, the position of referenced properties on links and link sequences shall be expressed as distances measured along the supplied geometry of the underlying link object(s).

8.7.4. *Geometry representation*

1. If spatial objects are provided at different spatial resolutions, the spatial resolution must be specified for each spatial object using the levelOfDetail attribute where applicable.

2. Watercourse links shall intersect wherever a connection exists between the real world phenomena they represent. No intersections shall be created at crossing network elements when it is not possible for water to pass from one element to another.

3. In a hydrographic network data set which contains nodes, these nodes shall only be present where Watercourse Links connect or end.

4. The geometry shall be the same as the geometry used for reporting obligations under Directive 2000/60/EC.

8.7.5. *Use of the DelineationKnown Attribute*

1. The attribute delineationKnown shall not be used to indicate that the accuracy / precision of a certain geometry is low; this indication should be given using the appropriate data quality element(s).

2. The attribute delineationKnown shall not be used to indicate a change of geometry over time where this change of geometry is known.

8.7.6. *Centrelines*

The centrelines of watercourse objects shall fall within the extent of the physical real world object that they represent if the Watercourse Link is indicated as not being 'fictitious'.

8.7.7. *Ensuring Network Connectivity*

1. Wherever a connection exists in a hydrographic network, all connected link ends and the optional node that take part in this connection have to be positioned at a distance of less than the connectivity tolerance from each other.

2. Link ends and nodes that are not connected shall always be separated by a distance that is greater than the connectivity tolerance.

3. In data sets where both transport links and nodes are present, the relative position of nodes and link ends in relation to the specified connectivity tolerance shall correspond to the associations that exist between them in the data set.

8.8. **Layers**

Layers for the spatial data theme Hydrography

Layer Type	Layer Title	Spatial object type(s)
HY.PhysicalWaters.Waterbodies	Waterbody	Watercourse, StandingWater
HY.PhysicalWaters.LandWaterBoundary	Land-Water Boundary	LandWaterBoundary
HY.PhysicalWaters.Catchments	Catchment	DrainageBasin, RiverBasin
HY.Network	Hydrographic Network	HydroNode, WatercourseLink
HY.PhysicalWaters.HydroPointOfInterest	Hydro Point of Interest	Rapids, Falls
HY.PhysicalWaters.ManMadeObject	Man-made Object	Crossing, DamOrWeir, Sluice, Lock, Ford, ShorelineConstruction
HY.HydroObject	Shore, Wetland	Shore, Wetland
HY.Reporting.WFDRiver	WFD-River	WFDRiver
HY.Reporting.WFDLake	WFD-Lake	WFDLake
HY.Reporting.WFDTransitionalWater	WFD-Transitional water	WFDTransitionalWater
HY.Reporting.WFDCoastalWater	WFD-Coastal water	WFDCoastalWater
HY.OceanRegion	Ocean Region	OceanRegion

9. PROTECTED SITES

9.1. **Spatial Object Types**

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Protected Sites:

— Protected Site

9.1.1 *Protected Site (ProtectedSite)*

An area designated or managed within a framework of international, Union and Member States' legislation to achieve specific conservation objectives.

Attributes of the spatial object type ProtectedSite

Attribute	Definition	Type	Voidability
geometry	The geometry defining the boundary of the Protected Site.	GM_Object	
inspireID	External object identifier of the spatial object.	Identifier	
legalFoundationDate	The date that the protected site was legally created. This is the date that the real world object was created, not the date that its representation in an information system was created.	DateTime	voidable
legalFoundationDocument	A URL or text citation referencing the legal act that created the Protected Site.	CI_Citation	voidable
siteDesignation	The designation (type) of Protected Site.	DesignationType	voidable
siteName	The name of the Protected Site.	GeographicalName	voidable
siteProtectionClassification	The classification of the protected site based on the purpose for protection.	ProtectionClassificationValue	voidable

9.2. **Data Types**

9.2.1 *Designation Type (DesignationType)*

A data type designed to contain a designation for the Protected Site, including the designation scheme used and the value within that scheme.

Attributes of the data type DesignationType

Attribute	Definition	Type	Voidability
designation	The actual Site designation.	DesignationValue	
designationScheme	The scheme from which the designation code comes.	DesignationSchemeValue	
percentageUnderDesignation	The percentage of the site that falls under the designation. This is used in particular for the IUCN categorisation. If a value is not provided for this attribute, it is assumed to be 100 %	Percentage	

Constraints of the data type DesignationType

Sites must use designations from an appropriate designation scheme, and the designation code value must agree with the designation scheme.

9.3. **Enumerations**

9.3.1 *Protection Classification (ProtectionClassificationValue)*

The protected site classification based on the purpose of protection.

Allowed values for the enumeration ProtectionClassificationValue

Value	Definition
natureConservation	The Protected Site is protected for the maintenance of biological diversity.
archaeological	The Protected Site is protected for the maintenance of archaeological heritage.
cultural	The Protected Site is protected for the maintenance of cultural heritage.
ecological	The Protected Site is protected for the maintenance of ecological stability.
landscape	The Protected Site is protected for the maintenance of landscape characteristics.
environment	The Protected Site is protected for the maintenance of environmental stability.
Geological	The Protected Site is protected for the maintenance of geological characteristics.

9.4. **Code Lists**

9.4.1. *Designation Scheme (DesignationSchemeValue)*

The scheme used to assign a designation to the Protected Sites.

This code list may be extended by the Member States.

9.4.2. *Designation (DesignationValue)*

Abstract base type for code lists containing the classification and designation types under different schemes.

This type is abstract.

9.4.3. *IUCN Designation (IUCNDesignationValue)*

A code list for the International Union for the Conservation of Nature classification scheme.

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

9.4.4. *National Monuments Record Designation (NationalMonumentsRecordDesignationValue)*

A code list for the National Monuments Record classification scheme.

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

9.4.5. *Natura2000 Designation (Natura2000DesignationValue)*

A code list for the Natura2000 designation scheme, in accordance with Council Directive 92/43/EEC [1] (Habitats Directive).

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

[1] OJ L 206, 22.7.1992, p. 7.

9.4.6. *Ramsar Designation (RamsarDesignationValue)*

A code list for the Convention on Wetlands of International Importance (Ramsar Convention) designation scheme.

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

9.4.7. *UNESCO Man And Biosphere Programme Designation (UNESCOManAndBiosphereProgrammeDesignationValue)*

A code list for the Man and Biosphere Programme classification scheme.

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

9.4.8. *UNESCO World Heritage Designation (UNESCOWorldHeritageDesignationValue)*

A code list for the World Heritage designation scheme.

This type is a sub-type of DesignationValue.

This code list shall be managed in a common code list register.

9.5. **Layers**

Layers for the spatial data theme Protected Sites

Layer Type	Layer Title	Spatial object type(s)
PS.ProtectedSite	Protected Sites	ProtectedSite

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