



Overview of the EuroRoadS framework documents

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1 Introduction

The following figure defining the business refinement process has been presented in several EuroRoadS documents:

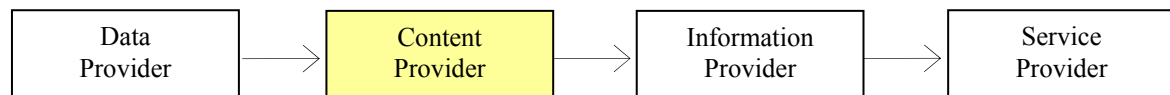


Figure 1.1 The Business refinement process, where EuroRoadS will focus on step two.

EuroRoadS WP6 is primarily concerned with the creation of specifications for data transfer between Content Providers and Information Providers. A more concrete view of this figure is shown below. The supply side represents Data- and Content Providers and the demand side represents Information- and Service providers. One important task for EuroRoadS WP6 is to supply specifications that enable successful communication between these two sides.

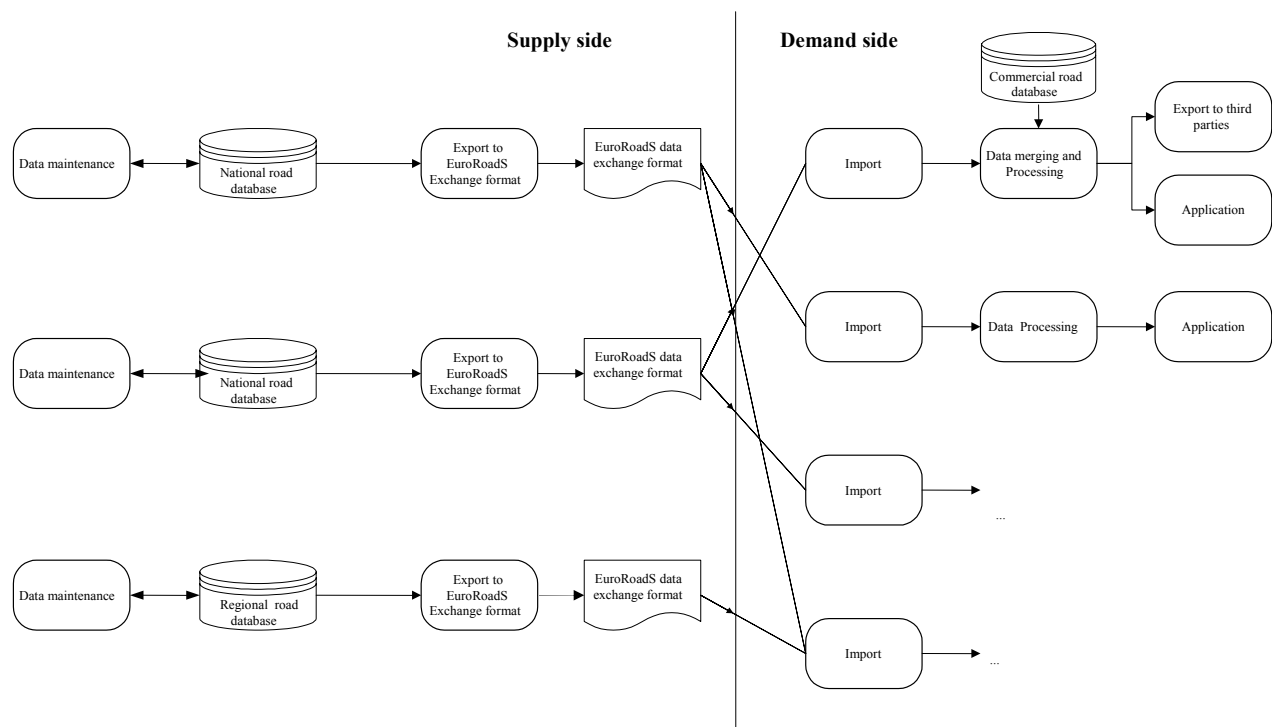


Figure 1.2 An alternative view of the business refinement process

Within this chain, the EuroRoadS specification framework will supply a definition of:

1. What is included in a EuroRoadS content is (core European road data) and
2. How EuroRoadS content is transferred between content and information providers

These specifications enable a uniform and successful data transfer between those possessing road data and those providing usable information and services for end users.

To accomplish this, it is essential to agree in a couple of areas:

- A common understanding of the road network domain and issues of interest within that domain.
- A common “road network language”. Without a common language it is not possible to communicate. This language needs to be of an appropriate formality and as unambiguous as possible. This is the **EuroRoadS Road Network Information Model**. We also need to define a clear “mapping” between the real world features and the concepts in the information model. This is the **EuroRoadS Specification of European Road Data**.
- All data that is available through EuroRoadS will be published on a metadata server (a “virtual web shop for road data”). When data is actually exchanged, there is a need to declare and describe the content of the exchanged data. The metadata necessary for EuroRoadS will be defined in the **Metadata Catalogue**.
- A common definition on how we use data structures to represent the various concepts defined by the road network information model in a data exchange situation is defined by the **EuroRoadS data exchange model**. This document also specifies some rules for how a data user could specify the content of the exchanged data. The **EuroRoadS data exchange format** defines a specific EuroRoadS XML schema according to GML.

The figure below gives another view of what is described in each document and the relation between the documents:

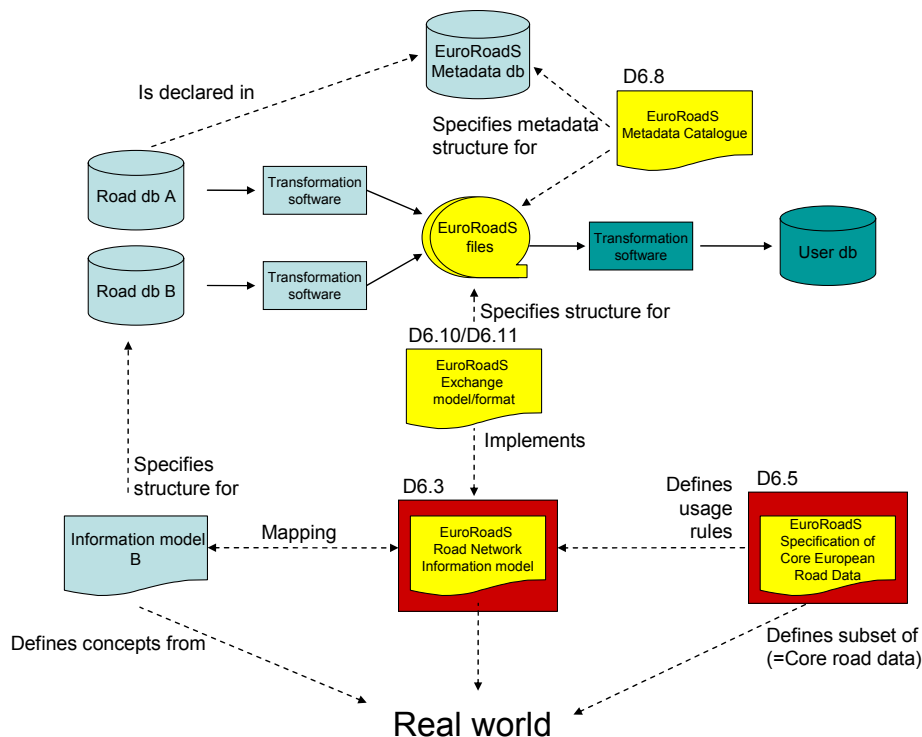


Figure 1.3 The relationship between “real world” and the EuroRoadS framework documents.

2 The Road Network Information Model [D6.3]

The final draft specification of road network information model expresses the various road data concepts in a formalized way using application schema rules from ISO 19100¹ in order to create a “unified and harmonized road data language”. Using rules from ISO 19100 in practice means to create application schemas using the UML² language defining classes that represent the various concepts from the EuroRoadS domain. This is fundamental when exchanging data. Without a common language it is not possible to communicate. The current proposal for a EuroRoadS information model defines classes that specify:

- road³ network using a simple link/node approach
 - geometric representation option defines position and shape of elements in the network
 - topological representation option explicitly defines connectivity between elements in the network
- an option to represent routes⁴ in the network
- a minimum set of mandatory attributes that describes the road network elements
- a set of optional attributes attached to the road network
- a mechanism to handle user defined attributes (i.e. attributes not yet specified by EuroRoadS)
- two options for attaching attributes to the road network elements:
 - As attributes directly connected to the network elements only identifiable and updateable as part of a network element (e.g. *FormOfWay*)
 - As separately identifiable and updateable objects connected to the network using linear referencing mechanisms (e.g. *Accident*)
- an incremental update⁵ mechanism
- metadata and quality schemas

There are existing road data solutions in the different European countries, each with their own solution. Since EuroRoadS specify **ONE** uniform and harmonized way to represent road data it can not be exactly equal to all existing solutions.

Therefore, when providing data in EuroRoadS format, each content provider will have to map their data models and transform their data into the EuroRoadS format. Data users who have their own solutions will also have to map models and transform data from the EuroRoadS format. This is shown in the figure below:

¹ International standard for Geographic Information/Geomatics (see: www.iso211.org)

² Unified Modelling Language (see: www.uml.org)

³ In D6.3 a road can either be a physical road/street for vehicles or a ferry route intended to transport vehicles (the reviewing process might indicate if there is a requirement to add cycle and pedestrian paths).

⁴ A route is a continuous path in the network without any branches. A route is especially suitable for defining stable linear referencing entities.

⁵ This mechanism makes it possible to define updates (changes) in a dataset that has occurred since a given date and time.

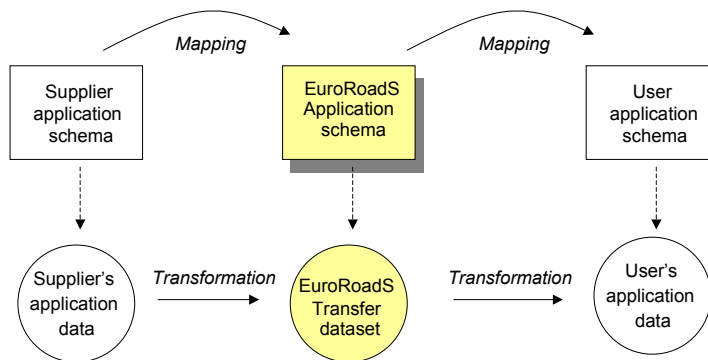


Figure 2.1 Mapping and transformation will be necessary when existing road data solutions will export and import data into EuroRoadS format.

ISO 19100 is a requirement for WP6. The background for this is:

- the business cases for EuroRoadS covers more areas than ITS, such as:
 - navigation
 - transport planning
 - map production
 - road & asset management
- EuroRoadS is restricted to *core road data*. Within the scope of INSPIRE⁶ other specifications will be developed for other contents. It is very likely that these specifications also will be based on the ISO 19100 framework since it has been accepted as European standard as well.

With the above in mind GDF⁷ is positioned as a specialization in ITS. The RADEF⁸ specification from CEDR SG Road data is positioned primarily on asset management and other issues for road authorities. From a EuroRoadS perspective these specifications are handled as important sources of requirements. For overlapping parts a mapping must be achievable.

⁶ The **I**nfrastructure for **S**patial information in **E**urope (see: <http://inspire.jrc.it>)

⁷ **G**eographic **D**ata **F**iles, an ISO standard (TC204) widely used to describe navigation datasets. Information about GDF can be found at e.g.: www.ertico.com/en/links/links/gdf_-_geographic_data_files.htm

⁸ **R**oad **A**dministration **D**ata **E**xchange **F**ormat (see: www.roaddata.org/dictionary/erdd.asp)

3 The specification of core European Road Data [D6.5]

The final draft specification of core European road data content defines which real world features are dealt with and how they are represented using the concepts defined in the information model, i.e. a mapping from the real world to the conceptual world.

Together with the road network information model, this specification deal with the issue of **WHAT**.

4 The data exchange specifications [D6.10 and D6.11]

The draft data exchange specifications defines **HOW** the real world objects represented by concepts in the information model are expressed in a data format. The data format will be the same regardless of which Content Provider the data comes from and the tools used in that content providers implementation. GML⁹ is proposed to be used for data exchange. There will be a clear mapping between the information model classes and the various XML¹⁰ elements specifying the data structures for EuroRoadS data.

A data exchange specification is one of many possible ways to implement the conceptual model.

Metadata is an important issue also for exchange datasets. The draft exchange specifications has recognised this subject but not drafted a concise exchange metadata definition yet. This work has to be carried out after the Metadata catalogue report has been published.

5 The metadata catalogue [D6.8]

The **metadata catalogue** defines the necessary metadata structures for the EuroRoadS metadata server, where supplier data is to be published, and the exchanged datasets.

Observe that it is only the structure of metadata that is defined in D6.8. Instantiation of that structure will happen when a data supplier declares data on the metadata server or in supplied datasets according to the EuroRoadS exchange format.

6 Remaining work

All framework documents are now available in version Final Draft 2.0 and uploaded to www.euroroad.org

Comments on the framework documents are welcome to be sent in until 15 June 2006. Based on comments all framework documents will be updated and a version Final 1.0 will be published by end of August 2006 (just before the EuroRoadS project close).

⁹ The Geography Markup Language is an XML encoding in compliance with ISO 19118 for the transport and storage of geographic information (see: www.opengis.net/gml)

¹⁰ Extensible Markup Language (see: www.w3.org/xml)