ISO JWG11: Collaboration between the GIS and ITS committees
Challenges and Solutions

2022-12-07 Standards in Action
Jonathan Harrod Booth and Trond Hovland
Agenda

• ITS Associations - motivation and relevance
• Standards: The Gap – and how to fix it
• Summing up
Smarter, Safer and Sustainable Transport

Traveller centric
- Metro public networks
- Stations
- Road/Rail – Bus/Train public network
- Airport
- Flights/airways

Goods/freight centric
- Public road/rail networks
- Terminal/harbour
- Sea lanes/Fairways

Source: ITS Norway
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Photo: ITS Norway and VG
BIM, laser, lidar and map

Source: Tomtom, Here, Building Smart International, Norwegian Mapping Authority

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Geographic standards – need interactions

Figure 1: Roles and relations in the digital geospatial environment.

Source: Dr Knut Jetlund, Doctoral thesis
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Geographic standards

ISO/TC 211 - Geographic information/Geomatics

Scope
Standardization in the field of digital geographic information. This work aims to establish a structured set of standards for information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth.

ISO/TC 204 - Intelligent transport systems

Scope
Standardization of information, communication and control systems in the field of urban and rural surface transportation, including intermodal and multimodal aspects thereof, traveller information, traffic management, public transport, commercial transport, emergency services and commercial services in the intelligent transport systems (ITS) field.
The Gap

TC204 GDF

TC211 GIS

GDF for ITS purposes

Gap – lost interoperability ...

GIS for all mapping purposes
Including all-round road models

1998 今天的 gap

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Exchange of data

Mapping Authorities

Road Authorities

Traffic Management

Position
Map/HD Map
Navigation
Rules/regulation
Events
Traffic conditions

Collecting and sharing data and maps

On the streets: ITS Stations and Sensors

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Geographic standards – Development

TC204 /WG3
ITS GEOGRAPHIC DATA
GDF 5.1
NAVIGATION AND MOBILITY

TC204 /WG3
ITS GEOGRAPHIC DATA
GDF 6.0
NAVIGATION AND MOBILITY

TC211
Basic GIS Conceptual standards
Linear Referencing
Transfer Nodes
Location Based Services

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Geographic standards - Cooperation

WI 1: Gap-analysis GDF and TC211 based model – TR
• Redefine the GDF-model based on TC211-standards
• Enable handling of very detailed and accurate geometries
• Enable map-data exchange between all actors
• Align with data models based on ISO 19100 like TISA, TN-ITS, DATEX II, etc.

WI 2: Linear/Location references – TR
• Support for the belt road concept, shareable database and dynamic data
• Input to the revision of 19148

WI 3: Terminology – investigation by TMG
• JWG members will investigate terminology issues between the two TCs
• Report in the form of a standing document
1. **Model structure** - A more specific modularisation of GDF according to the structure of the ISO 19100 standards is recommended.

2. **General Conceptual Models** - The internal GDF stereotypes with the ISO 19109 stereotypes

3. **The GDF** - The GDF Feature, Attribute, should be modelled as application schemas according to the rules in ISO 19109.

4. **Encoding rules.**
   GML implementation schemas for GDF should be derived from the GDF application schemas.

5. **Aligning terminology.** To be addressed by ISO/TC204 and ISO/TC211

6. **And:**
   - Linear Referencing System and Location Referencing
   - Belt Concept
   - Time domain
Geographic standards ISO/PWI 5974

ISO/PWI 5974 (Stage 00.00 since 2020-10-05)

• Title: Evolution and revision formation for Geographic Data Files (GDF)

• Scope and intent: To define how to organize, segment, and sequence the set of future work items that will be required to deliver a modular future version of GDF, responding to TR 19169

• To address specific harmonization challenges: Belt concept, Linear referencing, and Time domain modeling

• Goal: To encourage ISO/TC204/WG3 to initiate NWIP of GDF revision
Geographic standards ISO/PWI 5974

Discussion with possible GDF stakeholders:

• Bilateral discussions with all important stakeholders: (OADF, NDS, CCAM, C-Roads, TN-ITS, DATEX II, TISA, TPEG, HERE, Tomtom, OGC, ...)

• Basic question: Do they need a global road data model in GDF 6.0 – based on TC211-UML principles?

• Based on the discussion in JWG11 and findings from the bilateral meetings: Develop a simple scope for GDF 6.0

• Create a communication package to enlist supporters within both the standardization committee and external stakeholders
Shaping of next generation GDF

Vision for next-gen GDF:

• Aligning ITS concepts with GIS core standards, ...

• Working with stakeholders to create a base reference standard for road networks – a standard for road operators to publish road network map data – for lane-level navigation, targeting data needs for connected and automated vehicles
  
  o a stakeholder need for a common standardised publication of map-oriented data (from public administrations) especially to provide the data infrastructure for AVs is identified – but the need is not fully defined
  
  o We need your input and help!
What would next generation GDF offer?

Formally recognised ISO Standard:

• Targeted as the baseline for road operators to publish road network ‘map’ data

• The scope of network features is broad to support a wide spectrum of applications, but we will work with stakeholders to define minimum data profiles (and quality requirements) to support key applications (such as map data for Avs)

• Not intended to provide full range of standardised services from road operator source to delivery of map services into vehicles – seeking to work & align with NDS
What happens next?

• ISO looking to initiate work items to revise GDF
• Requesting stakeholder inputs to define data profile needs
• Develop regular stakeholder outreach
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What is the idea?

ITS aims to support multimodal operations
One standard base map for all modes

The road sector is the most advanced
It should be map-aligned
What is the idea?

TC204 WG3 GDF 5.1
Today
ISO TC211 GIS

TC204 WG3 GDF 6.0
Based on TC211 and UML

TC204 WG3 GDF 6.0
Linear RS/Location RS
Align with NDS, HD Maps
and more

TC204 WG3 GDF 6.0
New Global Road Data Model

Map Exchange requirements
Tomtom and Here
Other mapmakers

Use-cases/requirements
TN-ITS
CCAM
OADF
more

Support
C-ITS/CCAM
ITS use-cases
Pipeline to feed HD Maps
Aligned with
Legacy Road DB
INSPIRE

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What is the idea?

Standardize a Global Road Data Model as GDF 6.0 to enable easy exchange of map and road features between all actors
Thank you for listening!

Please reach out to us with questions and comments

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