ITS Database Technology and LDM Standardization

February 8, 2012; Doha, Qatar
Jun Shibata
Convenor, ISO TC204 WG3
(Japan Digital Road Map Association)
Agenda

1. Introduction of WG3
2. Past Activities
3. LDM-related Activities
4. Remarks
WG3 within ISO TC204

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<th>Convening country</th>
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<td>WG5</td>
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<td>WG10</td>
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<td>WG11</td>
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<td>WG16</td>
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<td>WG17</td>
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<td>WG18</td>
<td>Cooperative Systems</td>
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# Why does Japan convene?

## History of Car Navigation Systems in Japan

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<th>Generation</th>
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### Technology Topics
- **Digital Map**
- **MAP Matching**
- **Route Planning**
- **VICS**
- **G-BOOK, etc.**
- **High-speed Radio Communication**
- **GPS**
- **D-GPS**
- **DVD**
- **HDD**

*Source: Kiwi-W Consortium*
Brief History of WG3

• Created in 1993
• To support horizontal ITS database technology of all WGs within TC204
• Started with two items:
  ▫ Geographic Data Files (14825)
  ▫ Physical Storage Format (14826)
• Several items added later
Participating Countries

- Korea
- Japan
- USA
- Germany
- France
- Canada
- Czech Republic
- UK
- Australia
Sub-WG/Product

Location Referencing (SWG3.3): ISO 17572

Map Center
- Data collection
- Data editing

Service Center
- Server application

Car Navigation System
- Navi application

Data Delivery (SWG3.2): ISO 24099

API (SWG3.4): ISO 17267

PSF (SWG3.2): TS 20452

GDF5.0 (SWG3.1): ISO 14825

GDF4.0 (SWG3.1): ISO 14825

*Source: Kiwi-W Consortium
Geographic Data Files 5.0 (ISO 14825)

- Exchange format used among map providers
- Conceptual, logical, and physical model and etc. specified
- ISO published: July 2011
Physical Storage Format (TS 20452)

- Physical storage format used in car navigation systems
- Basic requirements
  - Compact data size
  - Higher data-access speed
  - Media independent
  - Application independent
  - Extensibility
- TS published: June 2007
  - No consensus of ISO in 2002
Extension of map database specifications for applications of cooperative ITS (NP 14296)

- NP approved: April 2011
- Target date: April 2014
- Emergence of requirements:
  - Cooperative Systems (LDM)
  - ADAS
  - Multi-modal Navigation
Collaboration with ETSI

ISO TC204 WG18

Participation in WG3 meetings
July 2010 - October 2011

ISO TC204 WG3

ETSI BSA (Basic Set of Applications) analysis

Vehicular Communications Basic Set of Applications; Local Dynamic Map (LDM), Rationale for and guidance on standardization

1. Comments on ETSI use cases
2. WG3 use cases
3. Data definitions & data elements

ETSI TC ITS

Dr. Kovacikova,
Chair of ETSI
STF 404 on LDM

Mr. Segarra,
Chair of ETSI TC ITS WG1
New Work Item: TS 17931

NP 14296
Approved: April 2011

ISO 14296
Publication: April 2014

LDM
ADAS
Multi-modal navigation

LDM

TS 17931
Publication: July 2012

LDM
ADAS
Multi-modal navigation
New Work Item: TS 17931

- Title: Intelligent transport systems - Extension of map database specifications for Local Dynamic Map for applications of Cooperative ITS
- LDM part of NP 14296
- NP approved: January 2012
- CD: April 2012
- TS publication: July 2012
New Work Item: TS 17931

- **Scope:** This project will provide the map-related functional requirements, data model (logical data model/logical data organization), and data elements for Local Dynamic Map for those applications of Cooperative ITS that require information derived from map databases.

The scope will be focused on data elements of a static nature.
LDM Standardization (1)
ITS station view -driven by 3 parties-

Work area of ETSI STF:
Vehicle ITS Station (V2V)
Roadside ITS Station (V2I only)

Work area of CEN/ISO (WG18):
Roadside ITS Station
Central ITS Station
Nomadic ITS Station
Vehicle ITS Station (I2V only)

All ITS stations covered by ISO TC204 WG3

*Source: Mr. Hans-Joachim Schade, ISO TC204 WG18 Convenor
LDM Standardization (2)

Data content view -driven by 3 parties-
- ISO TC204 WG18-DT3 (coordination of all activities)
- ISO TC204 WG3
- ETSI TC ITS WG1

Layer Relations:
- **Type 3 and 4**
  - Dynamic and highly dynamic data
    - ETSI TC ITS WG1
- **Type 2 and 3**
  - Quasi-static and dynamic data
    - ISO/TC204 /WG18-DT3
- **Type 1 and 2**
  - Static and quasi-static data
    - ISO TC204 WG3

*Source: Mr. Hans-Joachim Schade, ISO TC204 WG18 Convenor*
LDM Standardization (3)

Type-1 & -2 information examples

- Traffic lights, signs, poles
- Lighting
- Arrows and further road markings
- Slip road
- Pedestrian walking and bicycle path (landmark)
- Green belt (landmark)
- Crossings (pedestrian, bicycle)
- Curbs (landmark)
- Reference tracks
- Dividers, stop line (landmark)
- Building facades

*Source: Dr. Achim Brakemeier, Daimler AG
TS 17931: Logical Data Model

Overall Model

- Dynamic Traffic Information
- Map
- Cartographic
- Transportation
- Service/POI
- Address Location
TS 17931: Transportation Package
TS 17931: Road Data Package
Remarks (1)...our intention

- **WG3 would learn a lot from Europe regarding Local Dynamic Map through cooperative/collaborative standardization process:**
  - Europe has much more experience of LDM implementation
  - LDM is not merely a database of geographic information but including various management functions such as API, reliability, security, ...
Remarks (2)... our weak side

• **Slow standardization process**
  ▫ To reinforce experience & expertise
  ▫ To seek sponsorship
  ▫ To improve voting process

• **Lack of experts from European countries**
  ▫ Active countries: France, Korea, Japan
Any questions?

jshibata@drm.or.jp

Where there is a will, there is a way.

*Source: ERTICO*