Road Safety Attributes exchange infrastructure in Europe

ROSATTE framework and related deployment aspects

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ERTICO – ITS Europe

ITS Directive action 1.3 workshop, Maxime Flament, 29 Feb. 2011
Content

- What is ROSATTE?
- Road database working models
- Data quality and certification
- IPR and legal aspects
- Deployment roadmap
- Guidelines
- Next steps and conclusions
What is ROSATTE

DG INFSO project: ROad Safety ATTrIBUTES exchange infrastructure in Europe

- Budget/Funding: 4.6 M€ / 3.0 M€
- Duration: 36 months
- Completed: Dec 2011
- Coordination: ERTICO - ITS Europe

- 14 partners from both public & private
- 6 implementation trials:
  - SWE-NOR, Bavaria-DE, Flanders-BE, ASFA, Yvelines-FR, London-UK
What is ROSATTE: Proposed Scope

Attribute Maintenance
- Safety related road attributes
- National road authority
- Regional road authority
- Local road authority
- Storage and maintenance in Road Authorities databases

Data Exchange Infrastructure
- Data exchange (especially incremental updates)

Data Integration
- Many other data sources
- Map providers
- Road authorities
- Other data users
- Conversion
- Integration
- Map releases
- Incremental updates

In-vehicle systems
- Map releases on CD or DVD in specific Physical Storage Format *Current situation*
- Online incremental updates geared to specific Physical Storage Format *Future situation*

Full map in exchange format (e.g. Geographic Data Files)
- Incremental updates in exchange format (e.g. ActMAP)

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Output of ROSATTE as a project

- Complete framework to facilitate access, exchange and maintenance of spatial data from public sources including:
  - multi-level national/regional/local aggregation
  - Incremental updates of map data
- Technical & organisational guidelines
- Commitment for deployment
# What is ROSATTE: Focus

<table>
<thead>
<tr>
<th>Safety Attributes</th>
<th>Example of ADAS application</th>
<th>Change frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed limit</td>
<td>Speed alert</td>
<td>Very high (7-9% / year)</td>
</tr>
<tr>
<td>Traffic signs and regulations</td>
<td>Enhanced navigation (e.g. truck)</td>
<td>High</td>
</tr>
<tr>
<td>Lane information (number, width, divider, connectivity)</td>
<td>Lane keeping assistance, Lane departure warning, Curve warning</td>
<td>Medium</td>
</tr>
<tr>
<td>Traffic lights</td>
<td>Intersection assistance</td>
<td>Medium</td>
</tr>
<tr>
<td>Crossings (pedestrian, tram)</td>
<td>Enhanced navigation</td>
<td>Medium</td>
</tr>
<tr>
<td>Toll barriers, motorway junctions, tunnel access</td>
<td>Obstacles / change of lighting / speed limit / inter-vehicle distance management</td>
<td>Very low (new road or reshaping)</td>
</tr>
<tr>
<td>Gradient (slope)</td>
<td>Curve warning, Fuel consumption assistance (car and truck)</td>
<td>Very low (new road or reshaping)</td>
</tr>
<tr>
<td>Transverse gradient (banking)</td>
<td>Roll-over warning system (truck), Curve warning</td>
<td>Low (new road or reshaping)</td>
</tr>
</tbody>
</table>
What is ROSATTE: Architecture

WP2: Attribute maintenance

WP3: Data exchange infrastructure

WP4: Data integration

What is ROSATTE:

Service profile editing

Subscription Service

Discovery Service

Register Data Service

Send metadata

Notify changes

Register Inf.Pr.Service

Notify changes

Find data service

Information Provider Service

Data conversion

Data integration

Quality management

ADAS applications

Data Store

Tools:
- Data import
- Message handling
- Editing
- Quality management
- Integration
- Publishing
- Presentation

Notify changes

Read metadata

Read dataset

Write feedback

Query data

Read dataset

Send feedback

Additional datasources

Additional datasources
<table>
<thead>
<tr>
<th>Criteria</th>
<th>ASFA</th>
<th>BALI</th>
<th>Bavaria</th>
<th>Flanders</th>
<th>Norway/Sweden</th>
<th>London</th>
</tr>
</thead>
<tbody>
<tr>
<td>location referencing method</td>
<td>binary AGORA-C</td>
<td>specific BALI xml</td>
<td>OpenLR</td>
<td>binary AGORA-C</td>
<td>xml AGORA-C</td>
<td>OpenLR</td>
</tr>
<tr>
<td>encoding type (point/line)</td>
<td>line</td>
<td>line</td>
<td>line</td>
<td>point</td>
<td>line</td>
<td>line</td>
</tr>
<tr>
<td>test site specific legacy software</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>exchange format</td>
<td>ROSATTE</td>
<td>test site specific</td>
<td>ROSATTE</td>
<td>ROSATTE</td>
<td>ROSATTE</td>
<td>ROSATTE</td>
</tr>
<tr>
<td>feature type</td>
<td>regulation</td>
<td>regulation</td>
<td>regulation</td>
<td>sign information</td>
<td>regulation</td>
<td>regulation</td>
</tr>
</tbody>
</table>

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Road database working models
Road database “Working Models”

- State/local government controls
  - NVDB & RDT (SE) and Traffic sign dB (FL)
- Service delegation
  - ASFA
- Public private partnership
  - Bavaria
- Market initiatives
  - Navteq & Tele Atlas
State/local government control

Major advantages

- Supports and facilitates operational processes of the road authorities
  - maintenance, reparation and design of traffic signs, traffic management, etc.
- “Open” use of data collected using public funding
- Basic data available for ITS applications
  - ISA, fleet monitoring, traffic guidance, etc.
- Common definitions, Common exchange formats, Nationally uniform handling, Quality assured data,
- Better cooperation between actors contributing to the data chain
Service delegation

Major Advantages

- Administration of speed limit is delegated to road operator without investment
- Little control from PA to make the decision as contracts are long standing
- RO has a long experience of speed management
- RO has to make the investment
- Speed limit data is delivered for free to PA
- Business model for VMS and temporary data might be interesting for RO
Public private partnership

Major Advantages

- User oriented service offering from the service operator
- Control of safety attributes still in the hands of the PA
- Part of the service is delegated to the specialised service provider
- Innovative and flexible approach of the services can be setup during negotiation which can be long
- Further development of the dB is limited when outside the contract with potential lock-in situation
- Complex QoS monitoring might be necessary
Market initiatives
Major Advantages

- No common framework in place with PA
  - Each PA deliver different data with different level of quality
- Bilateral agreement with PA often involving cost
- Link with PA is part of the competitive advantage for Map makers
Data quality and certification

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Data quality and certification

- Data provided must comply with given quality requirements
- Definition of levels of quality has been proposed describing threshold for quality criteria
- Important to declare uniformly quality as part of the metadata; Responsibility of false data quality declaration must be taken
- Need for dialogue with new entrant MS
- Qualification of the Location Referencing
Data quality and certification

Advantages/Disadvantages

- Improving internal processes and establishment of quality criteria
- Improving organisational and legal soundness
- Improving the quality of other internal databases
- Compliance to quality specification
- Responsibility of data providers
### Guidelines on Metadata for MS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Entry level</th>
<th>1*</th>
<th>2*</th>
<th>3*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>Only Motorways and/or major roads</td>
<td>Motorways and main roads</td>
<td>Full network without residential streets</td>
<td>Full road network</td>
</tr>
<tr>
<td>Completeness</td>
<td>&gt;80%</td>
<td>&gt;90%</td>
<td>&gt;95%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Correctness</td>
<td>&gt;80%</td>
<td>&gt;90%</td>
<td>&gt;95%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Geometric accuracy</td>
<td>50m</td>
<td>20m</td>
<td>10m</td>
<td>5m</td>
</tr>
<tr>
<td>Up-to-dateness</td>
<td>3 months</td>
<td>Month-week</td>
<td>1 day</td>
<td>1 hour</td>
</tr>
<tr>
<td>Used location referencing technique, incl. details of used implementation</td>
<td>Provision of WGS84 coordinates with additional location information (e.g. road class, name, ...)</td>
<td>Provision of standardised and accepted location referencing code that enables accurate and reliable exchange of location information</td>
<td></td>
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</tr>
</tbody>
</table>
IPR and legal aspects

- Intellectual property (wrt map content) issues can be solved using specific guidelines with some exceptions
- Liability of the authorities in the event of inaccuracy of the information collected and distributed can be exonerated according to INSPIRE
- An implementation platform or forum should play a negotiating role with patented technologies in existing standards
Deployment roadmap

- Main goals are to provide:
  - A stepwise development path of the ROSATTE framework
  - A common understanding of the steps forward,
  - The possibility to follow-up ROSATTE implementation in time

- Used as a communication tool
# Deployment Roadmap

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<tbody>
<tr>
<td>Creation of ROSATTE Forum</td>
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<tr>
<td>WG on Location Referencing</td>
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<td>WG on specification and STD</td>
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<td>WG on Implementation Support</td>
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<tr>
<td>WG on generic tools and reference implementation</td>
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<tr>
<td>WG on Policy, awareness and dissemination</td>
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WG on Location Referencing

- Benchmarking of current LR solutions
- LR lookup and validation service
- Conversion service between LR
- Coordination with operational link to TISA and other initiatives
- Proposal for adapted improvement for ROSATTE LR
WG on Specification and STD

- Consolidation of specifications with other existing documents (e.g. EuroROADS, INSPIRE WG)
- Eventual standardisation of ROSATTE framework (data store interfaces, services, data exchange format) for late MS
- Link to TISA
- Establish links to ISO, CEN, and ETSI
- International liaison (e.g. DRM)
WG on Implementation Support

- Guidelines, best practice, Q&A
- Launch and running of basic services for the forum members including test environment and facilities
- Support to new implementation of ROSATTE (consultancy offering)
- Quality process available for ROSATTE suppliers/certification
WG on generic tools and reference implementation

Support implementation WG with

- Generic tools
- Reference implementation
- Testing and validation tools
WG on policy, awareness and dissemination

- Promote the win-win aspect of ROSATTE
- Targeted information/awareness actions to each MS about the ROSATTE forum offering
- Link to ITS Directive and INSPIRE
  - Promote legal framework and ensure inclusion of maintenance of attributes in national implementation of directives
- Follow eSafety recommendations
Guidelines

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Guidelines:
Classification of member states

European national road databases available
- Database available
- No databases available
- NA

Is updating possible?
- Updates possible
- NA
Guidelines to Member States

- Phase 1. Creation of a database
- Phase 2. Maintenance and updating the database
- Phase 3. Necessary actions to comply with ROSATTE
Guidelines to Member States
Phase 1. Creation of a database

- Creation of a National Geo-data infrastructure group (Spatial Data Infrastructure),
- Traffic rules in authority road databases are reflecting legally binding regulations,
- Definition of the road safety database specification including quality model etc.,
- Full initial supply of road safety features.
Guidelines to Member States
Phase 2. Maintenance and updating the database

- All local authorities committed to maintenance chain,
- Procedure for maintenance of database together with local authorities.
Guidelines to Member States
Phase 3. Necessary actions to comply with ROSATTE

- Formal cooperation with map makers and agreements,
- Setup of the local/regional/national ROSATTE data services (including data store),
- Commercial map makers to use ROSATTE supply systematically and provide feedback loop.
Guidelines to data consumers

- Data retrieval
- Data processing
- Data Feedback

All described in terms of:
- Security
- Performance
- Quality
Next steps:
Role of an implementation platform

- Gather PA for the deployment of a road data exchange infrastructure,
- Create a pool of experts to support the implementation,
- Maintain and update the ROSATTE specifications,
- Write implementation guidelines,
- Define procedures for making ROSATTE services searchable,
- Offer map-related tools and services,
- Clarify with member states the legal and licensing aspects,
- Raise awareness and cooperate at international level.
Next steps:
Direct actions for establishment of an implementation platform

- Gather letters of support from industry and public sector
- Revive the eSafety Digital Map Working Group to steer the platform
- Take into consideration the output of the current study on Action 1.3
- Possibly receive funding support
Conclusions

- ROSATTE has been implemented in countries with many different road dB working models
- Data quality issue is treated seriously in ROSATTE
- IPR and legal framework is not considered as a main barrier
- A Roadmap with working groups has been proposed
- Guidelines for member states
- Ready to support ITS directive Action 1.2 and 1.3 activities
- The establishment of an implementation platform or forum is recommended
Thank you for your attention…

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http://www.rosatte.eu