

Research Project of the Federal Ministry of Transport, Building and Urban Development

-
“Preparation of a study on dangerous goods
telematics”
-

Project results



Dr. rer. nat. Josef Kaltwasser
AlbrechtConsult GmbH

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Overview

- ▶ **Project recap**
- ▶ **Results and recommendations of each WP**
 - Relevant Standards
 - Certification Structures
 - IT Security Concept
 - Data/Process Modelling
- ▶ **Overall Conclusions/Recommendations**

Project recap



Background

- ▶ **Regulatory frameworks for Dangerous Goods Transport**
 - Inland waterways (ADN), Road (ADR), Rail (RID)
- ▶ **Regulation principles**
 - Classification, packaging and labelling of dangerous goods
 - Construction, equipment and monitoring of vehicles and tanks
 - Training of safety officers, drivers and other people involved in the transport of dangerous goods
- ▶ **Growing influence of telematics systems on technical, organisational and administrative processes in DGT is obvious**
 - Therefore the Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods established a working group (WG Telematics)
 - Because telematics systems offer a great potential for improvement of both, safety and security of such transports, the Federal Ministry of Transport, Building and Urban Development (BMVBS) has launched a study on the application of *Telematics in Dangerous Goods Transport*.
 - Main questions
 - How to regulate telematics systems in DGT?
 - Are there different requirements compared to “traditional” items of regulation?
 - What framework conditions are required to enable integration of telematics regulation into ADN / ADR / RID?

Project “Study on dangerous goods telematics”

- Timeframe: 20 months
- Start of the project: June 2010
- Budget provided by the Federal Ministry of Transport, Building and Urban Development
- Working Group on Telematics is proposed to act as review committee

Project outline

WP100 Project Management & General Approach



WP200 Relevant Standards



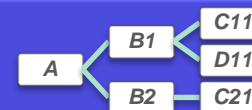
WP300 Certification Structures



WP400 IT Security Concept



WP500 Data/Process Modelling



Work Package 200 – Relevant Standards



WP 200 - Results achieved

- ▶ **Review of areas of telematics standards relevant to Dangerous Goods domain space:**
 - Which Standards Development Organisations have relevant work?
 - Known relevant activities
 - Identification of standards and standards needs for priority areas
- ▶ **Overview report plus recommendations – future actions**

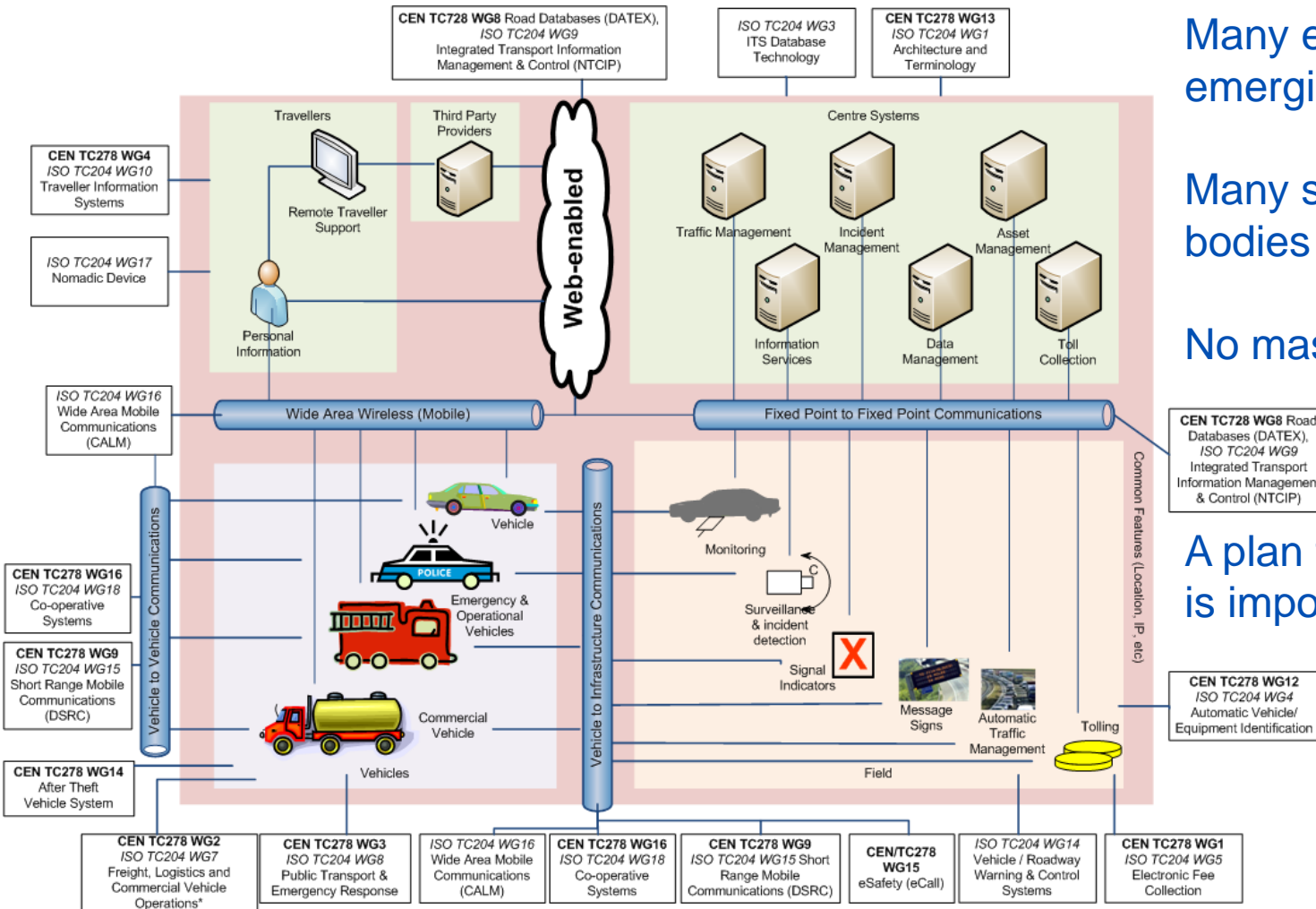
WP 200 - Highlights

Many existing & emerging standards

Many standardisation bodies

No masterplan!

A plan for engagement is important



Based on a design concept of AustRoads, 2010

WP 200 – Recommendations (1 of 2) - Extract

► General

- The data model should be maintained to ensure alignment with the current regulations
→ alignment between standards making reference to Dangerous Goods
- Analysis of costs and benefits of potential regulated applications & available standardised technologies should be undertaken → reduce the risk of abortive effort;
- ISO 15638 *Framework for collaborative telematics applications for regulated commercial freight vehicles* should be investigated further → it is important to consider the wide range of Dangerous Goods Transport services collectively as part of a structured programme within a coherent architecture, rather than a number of discrete isolated applications or services
- Consideration of a programme of engagement with relevant bodies to ensure greatest efficiency and collaborative working
→ reasonable alignment of standards both to one another and to the regulations

► Freight and Commercial domain

- review and if necessary comment upon UBL 2.1 as an industry de-facto standard of growing importance
- Wider communities of interest should be encouraged to use, comment and aid improvement to the data model to promote its widest use, where appropriate, as a common reference model

WP 200 – Recommendations (2 of 2) - Extract

► **Incident Notification and Emergency Response domain**

- Review ISO 16787 to seek enhancement, in the context of other related approaches to support incident notification and emergency response;
- Strengthened the dialogue with standardisation bodies to promote consistency of approach to the embedment of requirements supporting applications in relation to the Transport of Dangerous Goods. *eCall & ISO 15638 Framework for collaborative telematics applications for regulated commercial freight vehicles;*
- Efforts should be made to ensure the incident notification technical solutions for road and rail are aligned as reasonably practical;
- There is scope for harmonisation and standardisation of the data exchange of incident and response related information for incidents involving Dangerous Goods between PSAPs and road operators and additionally between PSAPs and the emergency services. Further work on these topics could be beneficial for the promotion of harmonised emergency response across jurisdictions.

► **The Telematics Working Group needs to carefully consider the cost and benefit of priority applications**

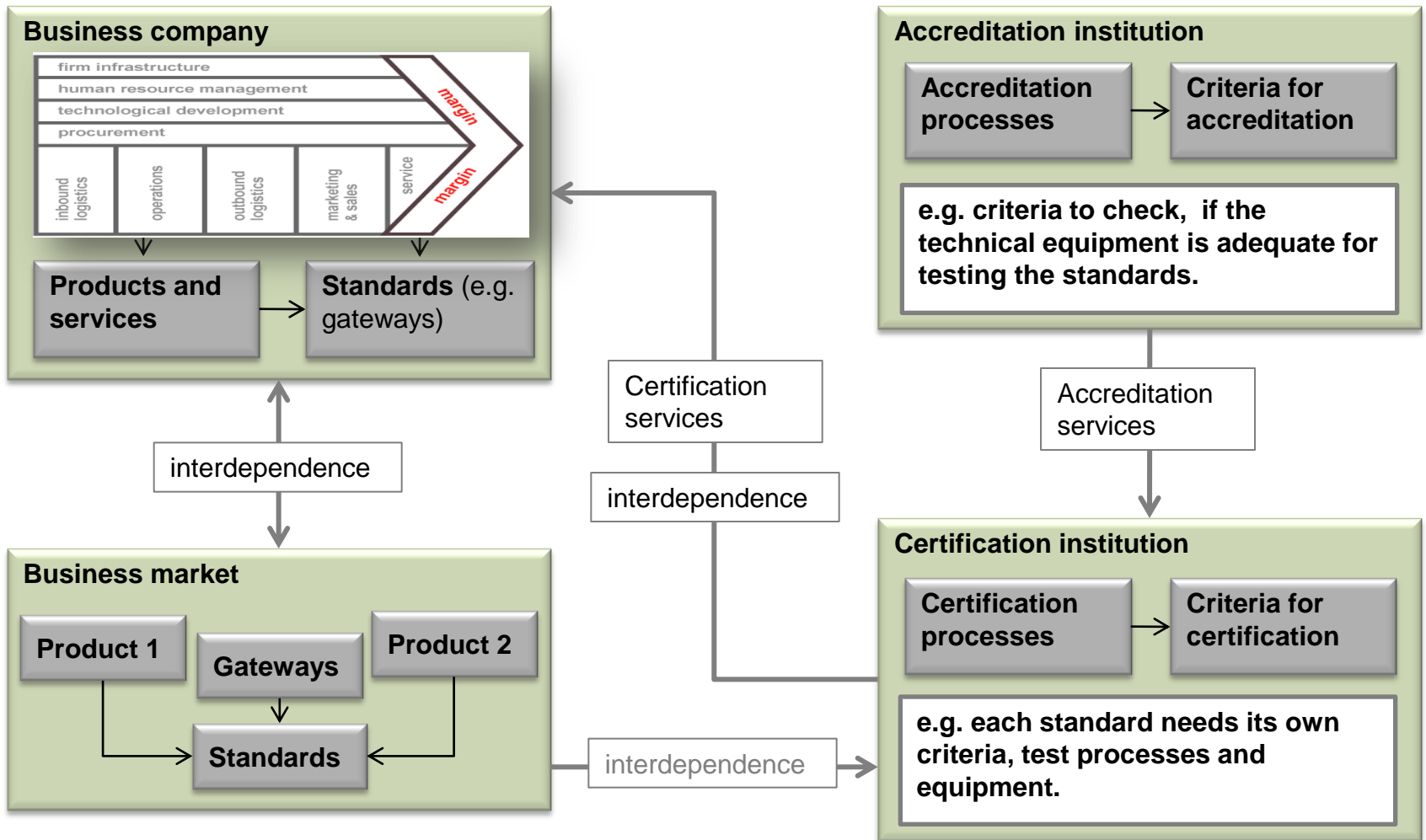
Work Package 300 – Certification Structures



WP 300 - Results achieved

- ▶ **Overview of existing accreditation and certification structures**
 - Which institutions may certify standardised specifications in dangerous goods transport domain and which requirements must comply with?
- ▶ **Accreditation and certification requirements of telematics in Dangerous Goods Transport**
 - Domain experts were identified and interviewed to collect the requirements of market players.
- ▶ **Report with recommendations**
 - Based on these requirements further recommendations for action could be derived.

WP 300 - Highlights



WP 300 - Recommendations (extract)

▶ **Accreditation**

- As an example, the BMVBS in Germany - together with subordinated authorities - is formally equivalent to an accreditation body. The design of the accreditation framework – including the establishment of the evaluation criteria – should be performed in the context of a multidisciplinary workshop series.

▶ **Data storage (background application)**

- System stability is seen as a potential risk, as negative experience already has been gained. To minimize this risk, data centres should be certified according to e.g. ISO 27001, SAS 70 etc.

▶ **Vehicle components**

- Vehicle components – as e.g. for data exchange in the case of eCall – can be certified using the EC operating approval process.

Work Package 400 – IT-Security Concept

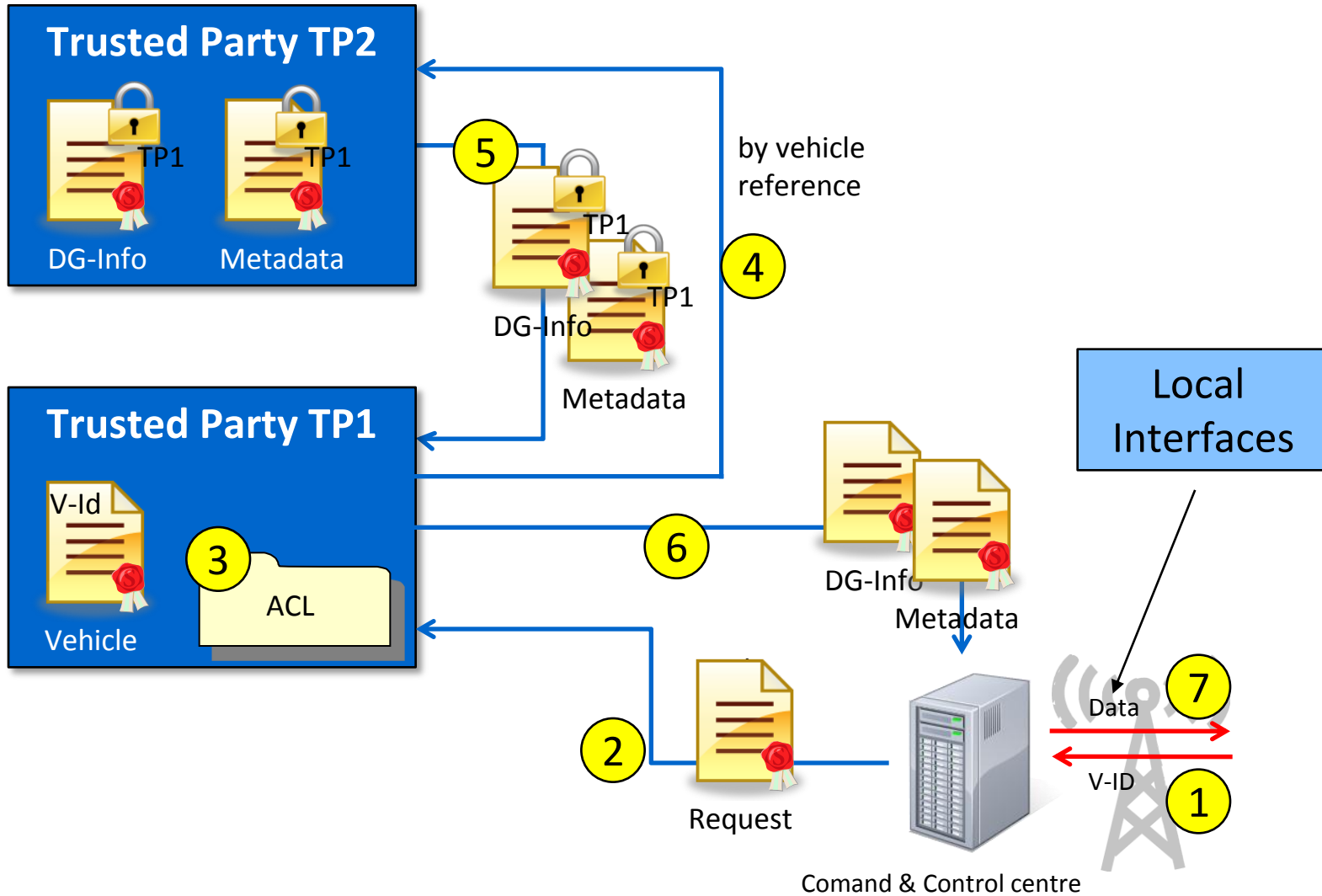


WP 400 - Results achieved

► IT-Security Concept

- Definition of objectives and specific requirements for data protection and data security for telematics in dangerous goods transport;
- Identification of disparate types of data and a role-based access control matrix form a basis for appropriate handling of collected and processed data in the framework of the transport;
- Description of basic security mechanisms and their application in a generic process model;
- Introduction of a procedure of distributed trusted instances (trusted parties) to distribute dangerous goods information. This method reflects special protection needs, especially from economic and security perspectives;
- Model studies for selected communication patterns
 - Examination of security mechanisms for storing/updating, retrieving and deleting data;
 - Presentation of three different data retrieval scenarios and evaluation of their implementation characteristics;
 - Classification of the models; mapping to existing initiatives like EUCARIS and eCall.

WP 400 - Highlights



WP 400 - Recommendations (extract)

- ▶ **The project results are necessarily based on assumptions, because agreed objectives as a framework for system design do not exist. Therefore, the recommendation on the further course of action is divided into three parts:**
 - Alignment of the technical assumptions in the context of the WG on telematics
 - Concretisation of the access control list in terms of roles and data types;
 - Further analysis, evaluation and decision on the draft proposal for the establishment of separate trusted instances TP1 and TP2;
 - Determination of communication patterns to be supported in principle
 - Embedding the approach into existing projects, notably eCall HGV
 - Role of the PSAPs as a control centres in the sense of communication pattern 3 or forwarding of the VehicleID from PSAP to another control centre.
 - Development of necessary specifications for deployment of the concept
 - Format and content specifications for documents to be transmitted (Vehicle-ID, metadata, DG data, ...);
 - Public key infrastructure for managing keys, certificates and attributes, in particular, use multiple PKIs from several countries

Work Package 500 – Data/Process Modelling

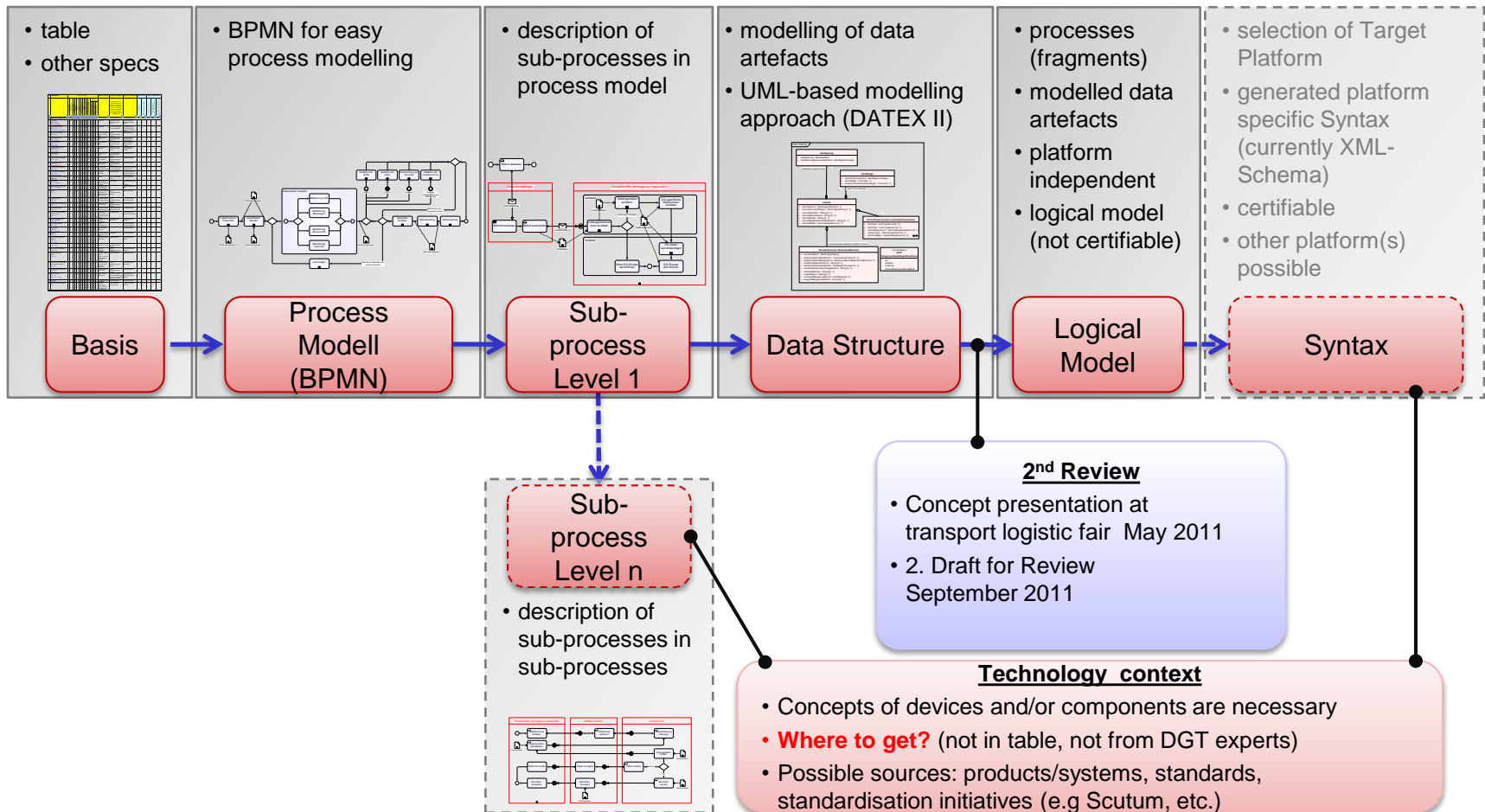


WP 500 - Results achieved

► Data model (based on the WHO DOES WHAT table)

- Starting point for future considerations of regulations regarding telematics applications and interfaces in the ADR, ADN and RID themselves
- Communication base with other relevant specification and standardisation processes. Such 'external' standards could potentially also become a source of reference for future versions of the regulatory frameworks
- The proposed data modelling effort has used state-of-the-art methods from the domain of Information and Communication Technology (ICT), in particular the Unified Modelling Language (UML).
- The DATEX initiative – developed for creating the CEN/TS 16157 family of Telematics standards for Traffic Management (first three specifications published by CEN in October 2011) – provided a good starting point with the following features:
 - UML profile suitable for this type of modelling effort;
 - Defined mapping to XML schema definitions (incl. Software Tool);
 - Detailed (technical) part of the resulting model can be fed back to DATEX for CEN standardisation, providing alignment of future versions of the interface standard for traffic management.

WP 500 - Highlights



WP 500 - Recommendations (extract)

► General

- The modelling experts are no dangerous goods experts and are overwhelmed by the width and depth of information. Therefore, the model prone to errors and inconsistencies. The data model should be reviewed.
- Some metadata cannot be derived systematically from ADR, ADN & RID or the WDW table. Therefore not all tagged values can be filled from this source. A definition is mandatory and needs to be agreed with the WG on Telematics.
- Data type modelling – Enumerations in particular – is a powerful tool, but implies maintenance to keep aligned with the regulations. In addition, there might be a need in the future to change the structure of the ASR/ADN/RID to better support the link to modelling. It is recommended to define a maintenance strategy.

► Data Model

- The data modelling exercise implied opportunities to reconsider/restructure certain data constructs. Dangerous goods experts need to discuss whether this reflects real world requirements and constraints properly.
 - E.g. information about the composition of a train, single rail wagons and reference to the load carried by using unique identifiers

Conclusions



Recommendations for the WG on Telematics regarding the mandate

ECE/TRANS/WP.15/AC.1/108/Add.3

page 2

I. TERMS OF REFERENCE OF THE INFORMAL WORKING GROUP ON THE USE OF TELEMATICS FOR THE CARRIAGE OF DANGEROUS GOODS

The working group shall:

1. Consider what information provided by telematics enhances the safety and security of the transport of dangerous goods and facilitates such transport. In particular, consider who might benefit from the provision of such information and in what way, having regard, inter alia, to: consignors, transport operators, emergency responders, enforcers, regulators;

Who Does What table

 2. Consider necessary parameters for telematics systems, and examine if existing systems meet these parameters and what further developments might be necessary;

DGT data model WP500

3. Consider the cost/benefit analysis of utilising telematics for the purposes identified above;

 4. Consider what procedures/responsibilities might be necessary to monitor the information captured by telematics and how access to data should be controlled, and

Recommendations WP400

 5. Consider interfa

Recommendations WP200

Recommendations for the WG on Telematics

► **Potential use of a data model for regulation**

- The data model needs to be reviewed and maintained
- It can server as a common dangerous goods transport data definition (reference model) – especially for liaison with (other, non-DG) Telematics standardisation activities
- Use cases e.g. accident, enforcement, monitoring etc. should be considered and prioritised
 - Influence or at least create awareness of corresponding standards and standardisation initiatives (ISO 15638 TARV, eCall, SCUTUM etc.) → scoping technology context (target platform, platform specific syntax)
 - Development of certification structures, if and where needed
 - Reference of this standards (and/or certificates) in the regulations
 - If needed: mandate complementary standardisation

Recommendations for the WG on Telematics

► The ‘Indexing’ discussion

(A good example for the ‘technology context’ issue!)

- Arose from discussions in the context of the eCall liaison.
eCall provides only very limited bandwidth for the transmission of an incident notification. Therefore, the dangerous goods information (a combination of different attributes from the regulatory frameworks) would have to be ‘compressed’ by an the use of a – currently not existing! – index into table A.
- But: the index would be obsolete if a background application is available!
 - In emergency and enforcement situations a comprehensive set of dangerous goods information could easily be retrieved via a broadband data channel on the backbone (e.g. provided from the electronic transport document)
 - An emergency call system would exchange only a reference to the complete dangerous goods information (e.g. Vehicle-ID or a Transport-ID automatically generated during initialization of the transport).
- Advantages and disadvantages of both scenarios need to be duly compared during the next steps of the mandate – next steps and further technical refinement are dependent and have to be postponed after a final choice

Albrecht

Thank you!

**Josef Kaltwasser
AlbrechtConsult GmbH**



direct contact
Tel: +49 1520 877 04 02
Fax: +49 241 500 718
Josef.Kaltwasser@albrechtconsult.com