INTERNATIONAL UNION
OF RAILWAYS

unity, solidarity, universality

Rail TopoModel and railML®

The foundation for an universal Infrastructure Data Exchange Format

ERIM Conference, Paris 17.9.2013

Agenda

1. Introduction
2. Business Use Cases
3. Feasibility Study
4. Proposed Solution: Topology Model & Exchange Format
5. Short term road map
6. Open Discussion
7. Conclusion – Next steps

From ERIM Masterplanning to Modeling

(ERIM= European Rail Infrastructure Masterplan)

- The UIC ERIM database and reports covered 50 000 route-km **in 32 countries on infrastructure, traffic, congestion and investments**

  → UIC input to the European rail infrastructure development, "masterplanning".

- The reports were stopped due to the **difficulties to collect data** and to the economical downturn which made "disappear" the congestion

- The ERIM resources were used internally for other database / GIS works and substantial efforts were made **to initiate a larger sector approach.**

  → Today UIC proposes **a common plate-form for the data modelling and exchange** for railways in Europe and beyond.

ERIM Task Force and the Feasibility study

- The ERIM Task Force built up itself out of a larger interest group, including **Infrabel** (BE), **Jernbaneverket** (NO), **Network Rail** (UK), **ÖBB** (AT), **Prorail** (NL) and **RFF** (FR) as well as **railML** and **UIC**.
- These actors had same needs and / or complementary approaches converging to the same conclusion → more efficiency and cooperation was needed / feasible in the data exchange.
- A **technical feasibility study** was launched in early 2013 (with TrafIT).
  - **to analyse some national / EU modelling works** and evaluate their technical compatibility **with railML specifications,**
  - **to propose a** roadmap and workload estimation**.**
- The study has generated **a concrete focus point / dynamics** and the work is already progressing "beyond" the study e.g. in ETCS and RINF works.

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Business stakes

IMs, Manufacturers, RUs,… exchange everyday network data for projects and operational needs.

Interfaces \ Field	Technical	Operational	Legal
Internal Between departments	Between technical departments (e.g. engineering + capacity allocation) often using different IT technologies and definitions ➔ synergy effect	Between planning and monitoring of operations e.g. timetabling and real-time circulation tracking ➔ synergy effects	Improved monitoring of the network condition, via dedicated dash… viding network data summaries ➔ … and processing
National / Business Between partners	Between IMs and their business partners, such as ETCS suppliers and maintenance sub-contractors ➔ savings in data production and transmission ➔ less vendor lock-in	Between IMs and RUs (e.g. for track possessions) ➔ reduced operational co… Standardised i… ➔ enhan…	… to determine permissible train …istics (esp. braking) on any infrastructure, as …quired by EU legislation (esp. TSI OPE) ➔ time savings, less errors Standardised data provision to national administrations such as land registers, regions, ministries. (Example: multiannual MS-IM contract as per 2012/34, art. 8 and 30) ➔ improved quality; scalable level of detail; improved credibility of rail
International Between countries, organisations, EU	Standardis… exchi… a… design the… ➔ fro… made to inexpen… e mass market solutions	…tandardised data exchange within corridors and between organisations (RNE, …) ➔ no need to develop multiple data conversion interfaces Information exchange concerning station accessibility ➔ contribution to TSI PRM objectives	Standardised / unique data provision to legal obligations: …S, RINF, Inspire, EU Freight corridors, TEN-T network ➔ Savings in data conversions and reduction of administrational burden

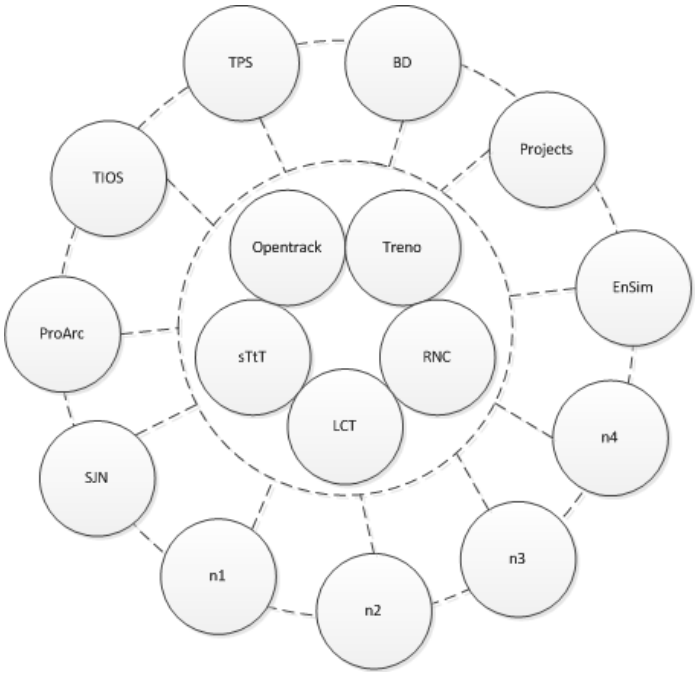
Extract from ERIM feasability study

We will present you 3 business cases :

- ➢The daily operational needs of an Infrastructure Manager
- ➢The RINF legal obligation for all IMs to deliver description of their network
- ➢The situation of manufacturers

Business cases : daily operational needs

The lack of a standardised data interface for railroad description creates a lot of wasted time and money!



Business cases : daily operational needs

In compliance with Jernbaneverkets general technology strategy, an international standard exchange format is the solution to higher efficiency in the railroad business!

Framework conditions for choosing technology

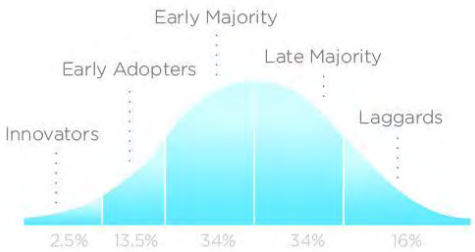
…base development of the infrastructure on familiar, established and tested technology.

→ implementation of an international standard with the possibility for Norwegian specific national requirements in extensions

… the focus is also on finding new, useful and cost-effective technological solutions…

… crucial that Jernbaneverket should be in the forefront with evaluations of new and useful technology.

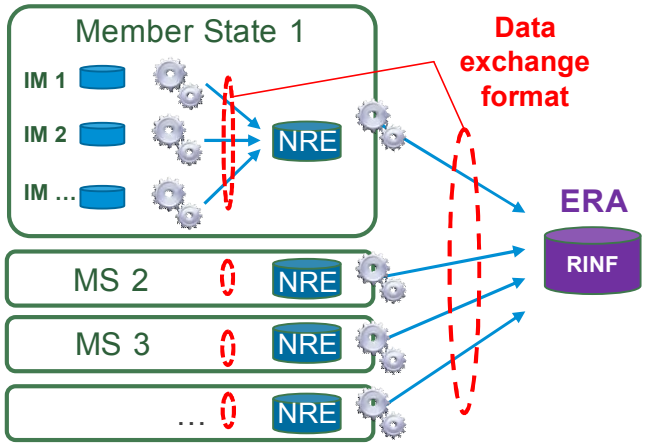
→ *participation in the UIC-ERIM / railML initiative*



Business cases : RINF project

27 EU Member States should collect and transfer to ERA their detailed network infra-structure description (network topology + 158 parameters).

Each Member State (National Registry Entity) should organize its national data collection from all national IMs, **data structuring**, and quality check, before **formatting** the national data file to transfer **quarterly** to ERA.



- The average workload to develop an industrial (repetitive) data extract and formatting is estimated 100 man-days (300 € / day); this is an average cost of **30 k€ per IM** to comply with the EU legislation.
- Knowing that several hundreds of IMs (smaller lines, ports etc.) are subject to the RINF legislation the **potential savings**, only for RINF, can be calculated **in millions**.

Business cases : RINF Project

The current RINF project plan, as designed first half of 2013, prescribes a **specific xml format** to be developed by each IM and MS for the data transfer to ERA.

→ Prescribing a **standard** railway data format would be an opportunity for each IM to invest for future re-use of the IT development.

- ❑ The complete set of tools developed for data mapping and extract, quality check, formatting, …would be re-usable for all future needs for exchange of infrastructure data.
- ❑ The "millions €" would then be an investment, and not a one shot expense.

Business cases : Manufacturers

Manufacturer's industrial performance:

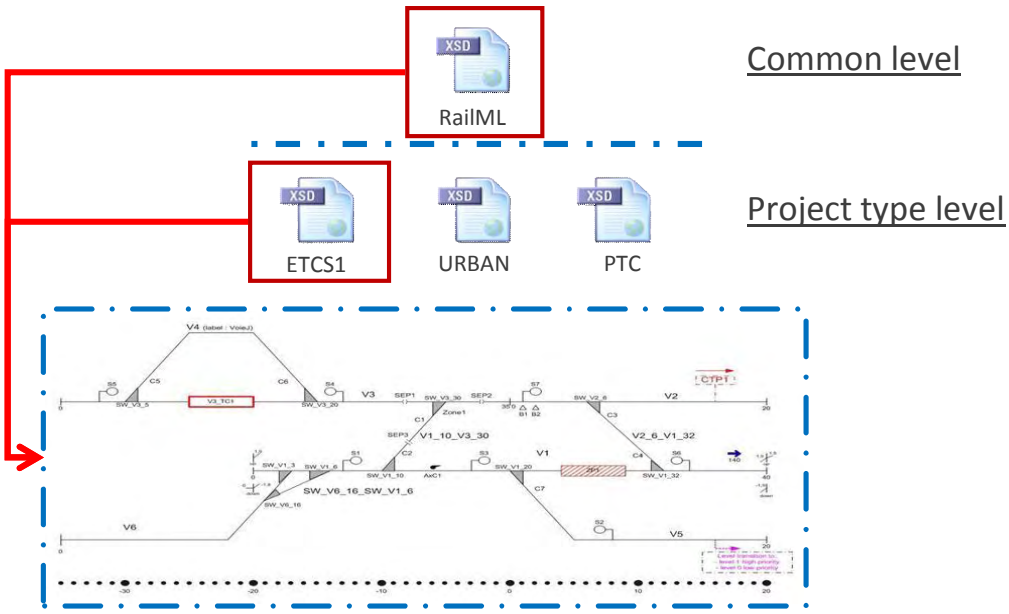
→All manufacturers share the ambition for a pivot railway data model to support data interchange between software platforms, with the perspective of re-use (create a library of re-usable software services)

e.g. : re-use of software developments on ETCS

→ Experience of ALSTOM

Alstom's current IXL Data management based on the use of railML® 2.1

➔ A dedicated project type architecture with a common schemeplan part and specific additional data regarding the project type

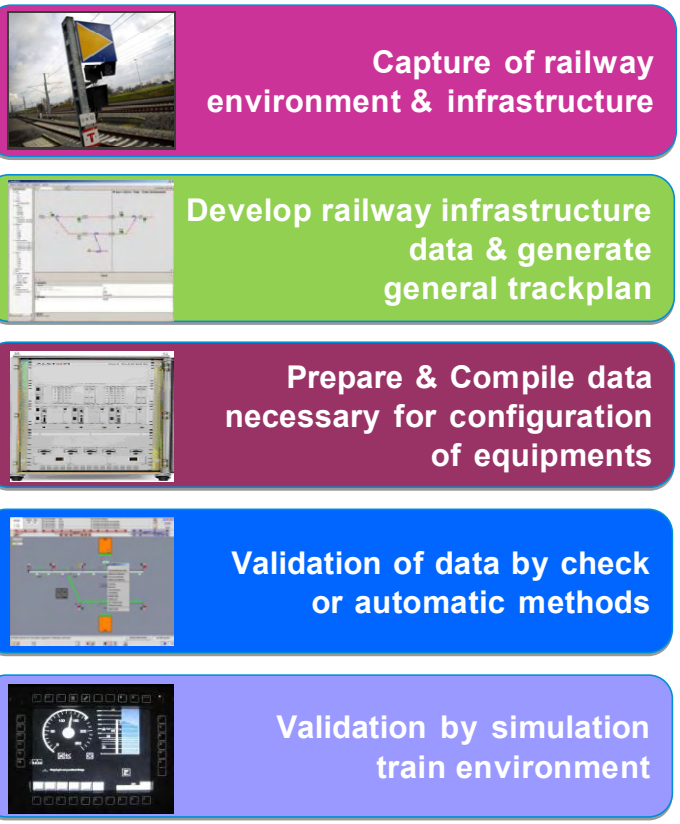


Sub-system deployment

railML® format could be used in a sub-system deployment from capture to train simulation.

➢Data secured

➢Time saving



Capture

Implement

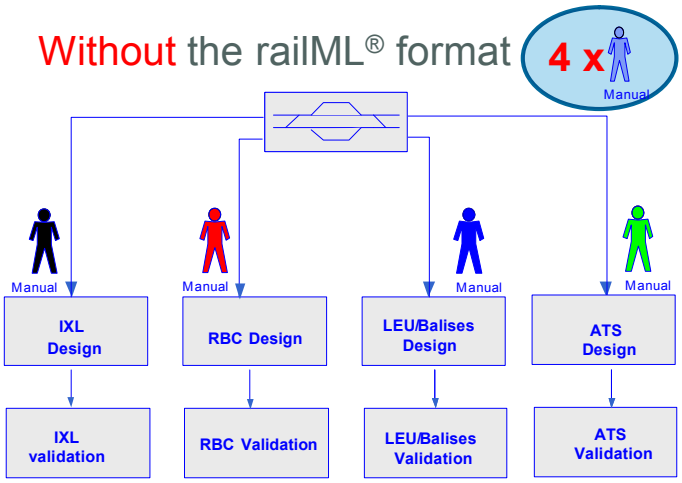
Generate

Validate

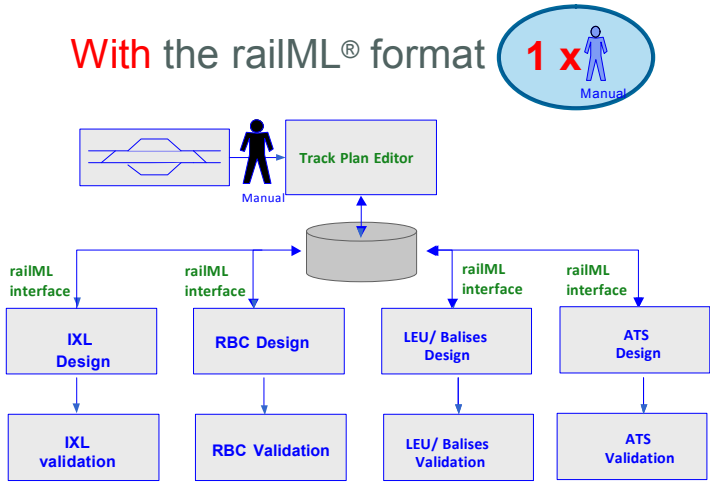
Test

Possible improvement for the sub-system data exchanges using railML®

Without the railML® format



With the railML® format



Manual encoding for each sub-system in different formats:

- Heavy (often double-encoding + verification for safety reasons)
- Time consuming
- Risks of errors
- Risks of inconsistency
- Specialists required for data exchange formats

Automatic translation and exchange of the common data in each existing sub-system tool:

- No more coding by data exchange specialists
- Fast
- Consistency between sub-systems
- Error free

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Outline

> Introduction

> Methodology

> Existing Models (National, EU)

> Requirements, Gap Analysis

> Roadmap and Workload

> Conclusions

Who We Are

trafIT solutions gmbh
founded in 2009
based in Zurich, Switzerland
http://www.trafit.ch

Ergon Informatik AG
founded in 1984
based in Zurich, Switzerland
http://www.ergon.ch

Dr. Bernhard Seybold
founder, CEO
software and transport

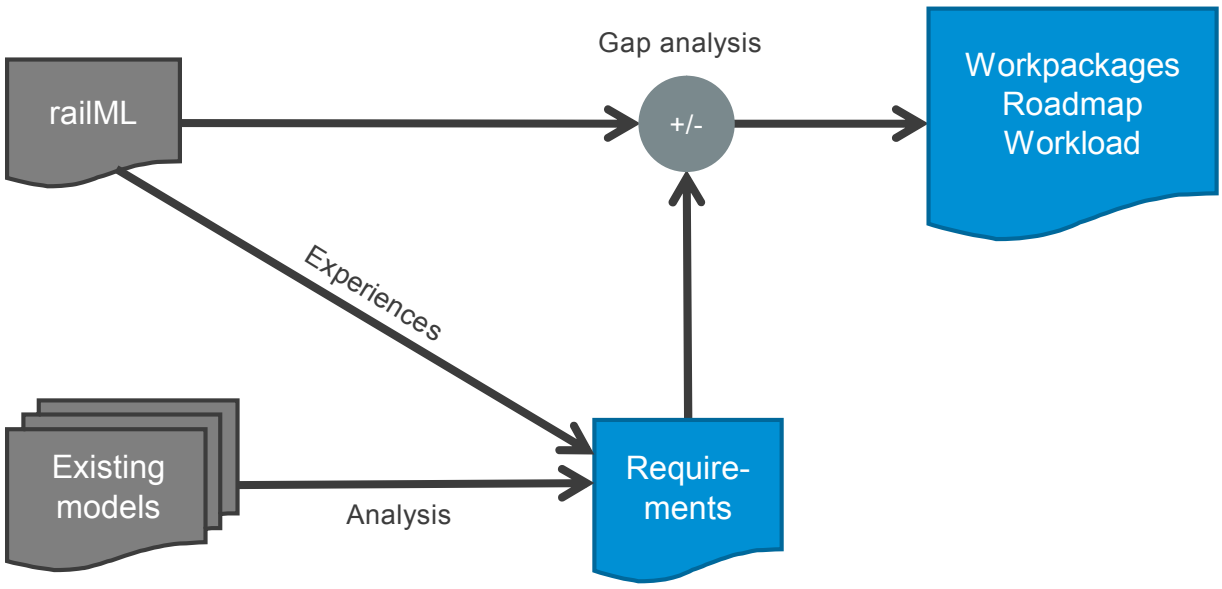
Peter Brandt
senior software analyst
software and transport

Burkhard Franke
partner, chief analyst
transport and software

Goals of the Feasibility Study

1. Investigate feasibility to have one topology model
2. Compatibility with railML
3. Propose roadmap
4. Estimate costs

Methodology



Available Models

	Model	Purpose
	RINF, INSPIRE	Network description
RÉSEAU FERRÉ DE FRANCE	ARIANE; railML for ETCS	Network description; ETCS
INFRABEL Right On Track	infraXML, InfraNet	Network description; ETCS
Jernbaneverket	EIM	Network description
ÖBB INFRA	PPROD, EADB, ADB	Assets, Signalling, Radio network
NetworkRail	RINM	Network description

	Model	Purpose
ProRail	InfraAtlas	Network description
SBB CFF FFS	UNO	Timetable / Operation

Observations In Models

> **95% of features** in topological model are **compatible**, because iron network is similar in every country

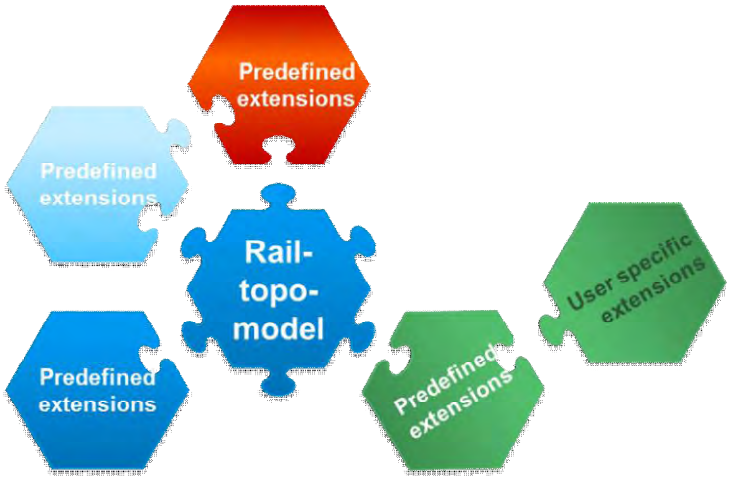
> However (topological) models are often **build for specific use cases**

> Therefore we need a **systemic approach** and **core model** that is **scalable**

> To build the model + format, the **requirements** need to be defined

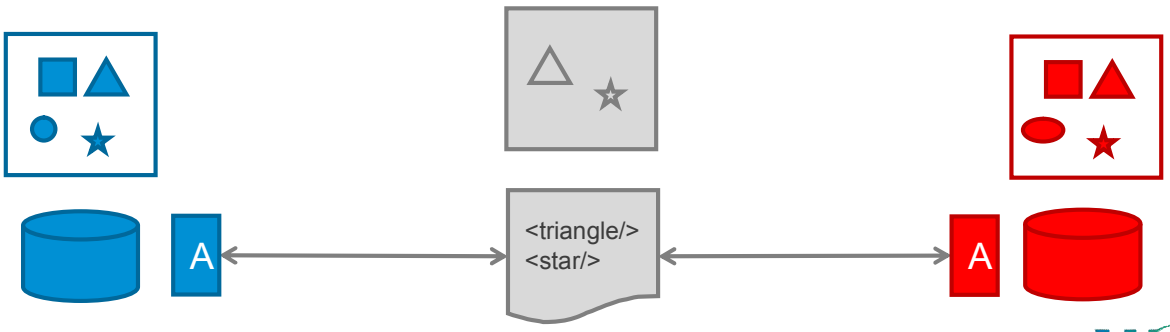
Conclusions About Models

- One unique model **covering all aspects is not feasible**
- Propose core (**iron network**) and **extension mechanism**



Definition: Model And Format

- A **model** is a description (in UML) to define business objects and their attributes
- A **format** is (one of many possible) representation of a model, typically in text-format and used for exchanging model objects
- Several models could use the same exchange format to share data, provided that there is an **adapter (A)**



Requirements (1/2)

M = Requirements for model (and format)
F = Requirements for format

Content

>C1: Contains topology [M]
- The logical representation of the iron network as a graph (nodes, edges)

>C2: Contains driveable paths [M]
- Defines paths (how trains can use the topology)

>C3: Integrates micro, meso, macro and corridor topologies [M]
- Support different levels of detail in an integrated way

>C4: Supports multiple reference systems [M]
- Geo- and screen coordinates
- Linear referencing, mileage posts and “rail addresses”

>C5: Contains geometries [M]
- Model exact shape of entities with geometries (-> GIS)

Functional

>F1: Objects can be uniquely referenced [F]
- Define identities (surrogate keys), allow references from outside

>F2: Supports validities, versions, variants [M]
- Validities: when is an object is operation / active / usable (and when not)
- Versions: states evolving over time (1.1, 1.2)
- Variants: alternative states for the same time horizon

>F3: Supports partitions and unions [M]
- Allow to build parts and to reunite those parts again
- Need to define borders, interfaces, identifiers

>F4: Validations [F]
- Syntactical / semantic correctness (ideal: syntactic -> semantic)
- Completeness (is use-case dependent -> define profiles)

Requirements (2/2)

Structural

>S1: Extensions through modules / layers [M]
- Outsource model parts not needed by all clients (e.g. coordinates, geometry)
- Allow custom models to reference the core

>S2: Normalization, univocal, stability, life-cycle, scope [F]
- One model has exactly one representation (to allow automatic diffing -> ordering is important)
- Representation is stable during the lifetime of the model since ids are used outside (see F1) -> model lifetime needs to be defined
- Versioning of model / format (compatibility: backward, forward, deprecation)

>S3: Use standards whenever possible [M]
- ISO units, UIC codes, xml standards (times, durations)
- metadata (Dublin Core)

Organizational

>O1: Open Standard
- Easily available documentation, implementation, best practices, support, community to encourage rapid adoption
- Independence (of vendors, companies, countries)

>O2: Enforce Standard Usage
- Encourage use of standard
- Prevent dilution (by prohibiting local dialects, see S1 Extensions)
- Quality control, retention

>O3: Common Conventions
- Naming conventions
- Base data (codes, status, coordinates)
- Other standards (ISO units, UIC-codes, etc.)
- Language(s)

From Requirements to Actions

- Requirements describe the properties of the Rail TopoModel in neutral way, independent of approach
- Concrete approach: based on concepts of existing models, used railML as format and the community as driver

- Gap analysis of railML against requirements
- Identify work packages

Work Packages

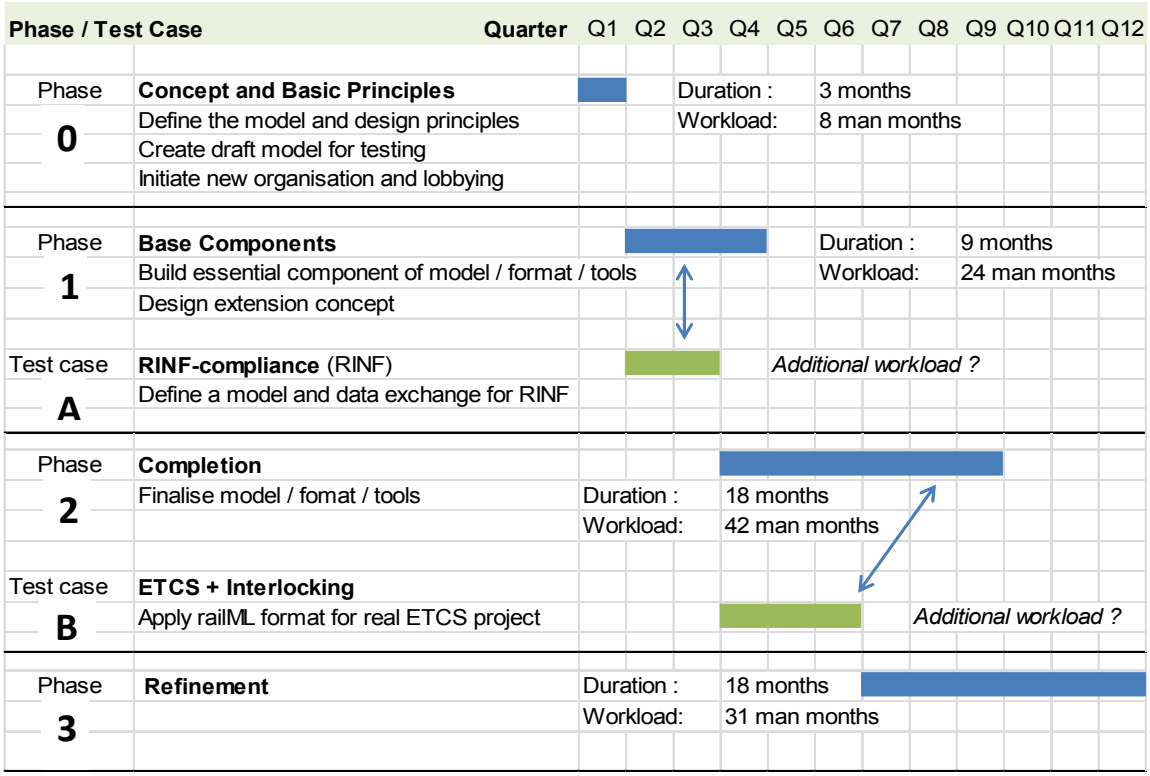
- **1. Model**
  - Create model (UML model), extension concept, documentation, examples
- **2. Format**
  - Define exchange format based on railML 2.2
- **3. Tools**
  - Tools support for model and format (validation, viewers, editors, migration)
- **4. Organization**
  - Build an organization and business plan based on open standard
- **5. Instructions**
  - Tools supporting work with model and format (validation, viewers, editors, migration)
- **6. R&D (optional)**
  - Involve research institution for studies and innovation projects

Work Load for WP1 – WP6 (in man months)

WP1: Rail-topo-model		Respon-sible	Phase 0 Q1	Phase 1 Q2-Q4	Phase 2 Q4-Q9	Phase 3 Q7-Q12	Total Q1-Q12
1,1	**UML-class model** of the UIC-topo-model	Core	2	1	2	1	6
1,2	Concept **extension mechanism**	Core	2	2	1		5
1,3	**Documentation** and sample data	Core	1		1	1	3
1,4	**UIC leaflet**	UIC			2	2	4
	Total		**5**	**3**	**6**	**4**	**18**
WP2: Exchange format (railML 3)							
2,1	Build **format for iron** network	Core	0,5	2	0,5	0,5	3,5
2,2	Create **reference system** (coordinates, mileages)	Core		2	1	1	4
2,3	Create **geometry** (new in railML)	Core			2	2	4
2,4	Build **extensions** for remaining infrastructure	Core	0,5	1	3	3	7,5
2,5	Produce documentation, **tutorials, sample data**	Core		1	3	3	7
2,6	Provide **base data**	Core		1	2	2	5
2,7	Provide libraries, **sample code**	Core		1	1	1	3
	Total		1	8	12,5	12,5	**34**

WP3: Tools		Respon-sible	Phase 0 Q1	Phase 1 Q2-Q4	Phase 2 Q4-Q9	Phase 3 Q7-Q12	Total Q1-Q12
3,1	**Validation tool** (profiles)	External	1	3	1	1	6
3,2	**Topology visualization**	External	1	3	3	1	8
3,3	**Topology editor** (based on viewer)	External		1	6	3	10
3,4	**Migration tools** (2.2 -> 3.0)	External		2	2	2	6
	Total		2	9	12	7	**30**
WP4: Define Organization							
4,1	Create **business model** based on open standard	Core		1			1
4,2	Define and set-up **organization**	Core		1	1		2
4,3	Define **service level**	Core		1	1		2
4,4	Create **certification process**	Core		1	1		2
4,5	Define **release cycles**	Core			1		1
	Total		0	4	4	0	**8**
WP5: Instruction & training							
5,1	**training concept**	Core			1		1
5,2	**train the trainers** (material + actual training)	Core / External			0,25		0,25
5,3	**training** (assumption 5 adopters)	External				1,25	1,25
	Total		0	0	1,25	1,25	**2,5**
WP6: R&D							
6,1	**R&D**	Universit.			6	6	12
	Total		0	0	6	6	**12**
	Total for all workpackages		**8**	**24**	**42**	**31**	**105**

Roadmap - Overview



Possible Project Setup

> Core team

- 4 people in full time work (50% - 100%)

> Experts

- 10 - 15 people
- Meetings every 2 - 4 weeks for questions

> Technical steering committee(s)

- 4 - 5 managers

> Advisory Group

- Decision makers from stakeholders

> Interest group

- Infrastructure managers, railways, public
- One or two conferences per phase

Recommendations

- Rail TopoModel should be a **minimal core model** allowing (national or thematic) extensions
- For interoperability, do not strive for a centralized database but for **standardisation of core model and format**
- Offer a model for railways **who do not have or wish to improve** their current model(s)
- Realize Rail TopoModel in a **phased approach** with direct case-involvement
- **The time is right!**
  - Upcoming projects gain a lot of efficiency by common standards
  - Converge on-going efforts into a combined effort

Vision

- Rail TopoModel is a UIC **recommendation**
- Model and interface specification maintained as **open standard by railML.org consortium** providing
  - Documentation, tools, services, web presence
  - Active community (forum, half-yearly meetings)
- **Interoperability** reduces costs, increases competition
- Efforts for infrastructure modelling and exchanging are **combined and coordinated**
- **Adaptations** (extensions) happen in a well-defined way

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Proposed solution

- **Rail TopoModel** :
  a Data Model which will support all railways concepts and business needs, including:
  - Topology
  - Multi-referencing : XY, Linear,…
  - Objects & events location
  - Consistent Multi scale aggregation

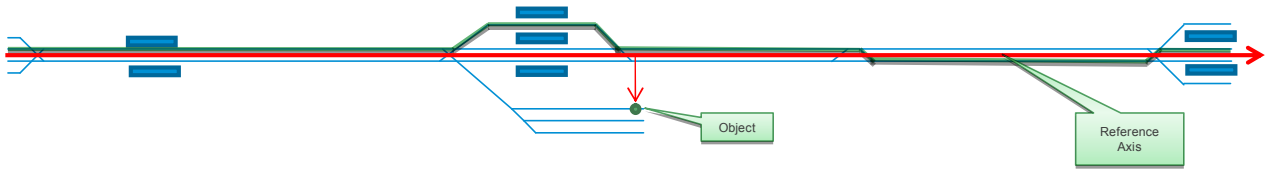
- **railML** :
  an evolution of a well-established industrial exchange format

The Railway network

The full assembly of tracks, switches and all installations to support the railway activities.

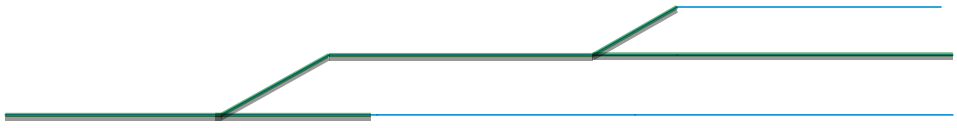
The railway business is mainly split in two main views:

- **Timetabling and traffic control:**
  It should **support routing**.
- **Maintenance:**
  It should support to **locate devices and events**.



Topology

In order to build routes, we have to know which element is connected to which other.



> This is the network topology….

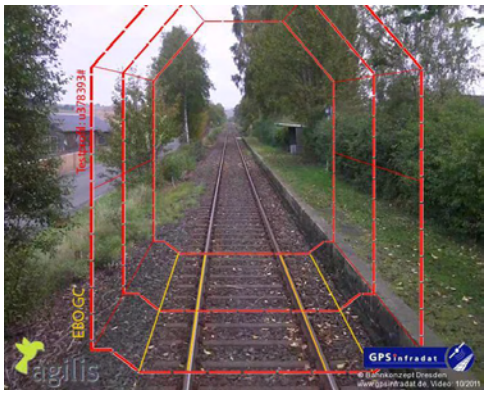
The basis of Rail TopoModel

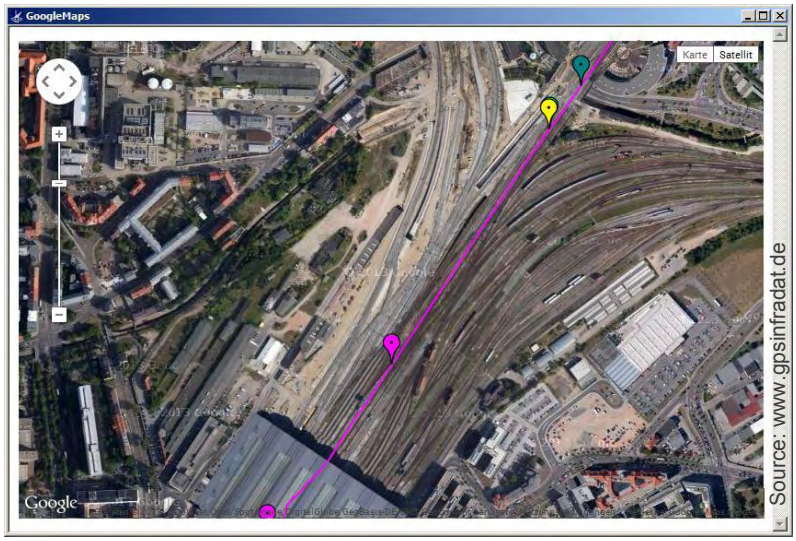
The elementary objects of TopoModel is the “trail”, at track or line level

(Trail = section of track/line between two switches/junctions/stations….)

Location: X;Y;Z coordinates and geometry

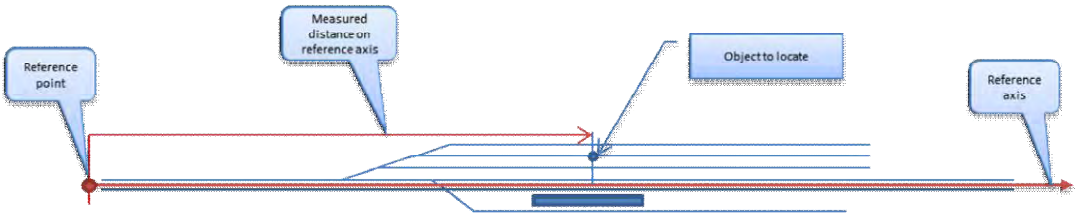
- Useful to locate on a map…
- The basis for accurate measurement of positions along the track and distances between objects
- Useful to capture and combine data / information





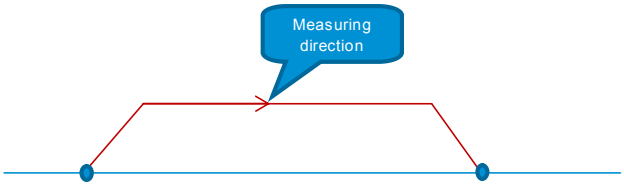
Location: Linear Referencing

- **The linear referencing allows to locate an event on a reference axis.**



Traditionally, the reference axis is the railway LINE, and the distances are measured from reference points on the field (mileposts)

- **To extend this notion, we introduce an elementary Linear Referencing System (LRS) on each trail**

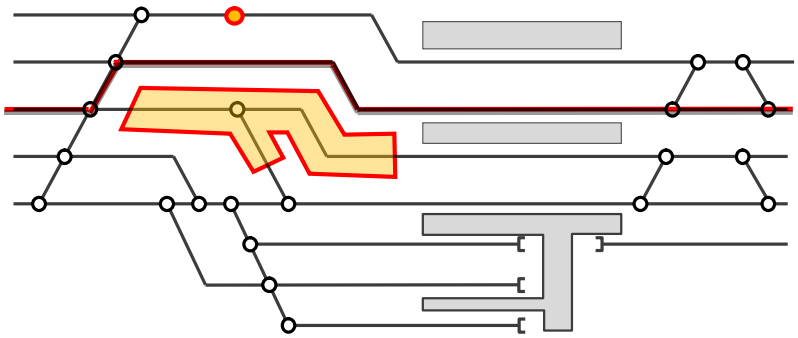


- ***Rail TopoModel will include the translation facility between XY and LRS***

Objects and Events

> Thus far, we have identified 3 types of objects/events that can happen on the network:

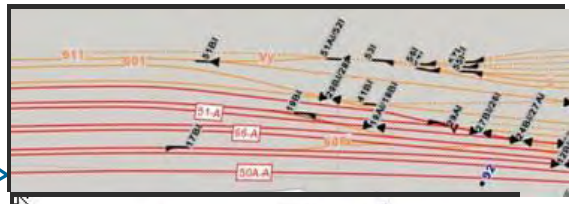
- **Point** object:
  - *Signals, boundaries, beacons, …*
- **Linear** object:
  - *Route, slope profile, speed profile, ballast renewal…*
- **Areal** object:
  - *Track circuit, catenary zone, Station, bridge…*

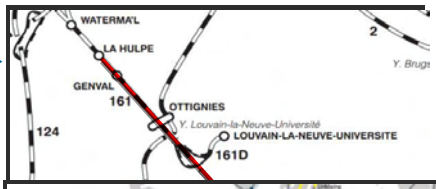


Multi-level (1/3)

we have to make routings :

- **At <u>detailed</u> level** — **(Micro)**
- **At <u>Track</u> level** — **(Meso)**
- **At <u>Line</u> level** — **(Macro)**
- **At <u>International</u> level** — **≈TEN ?**



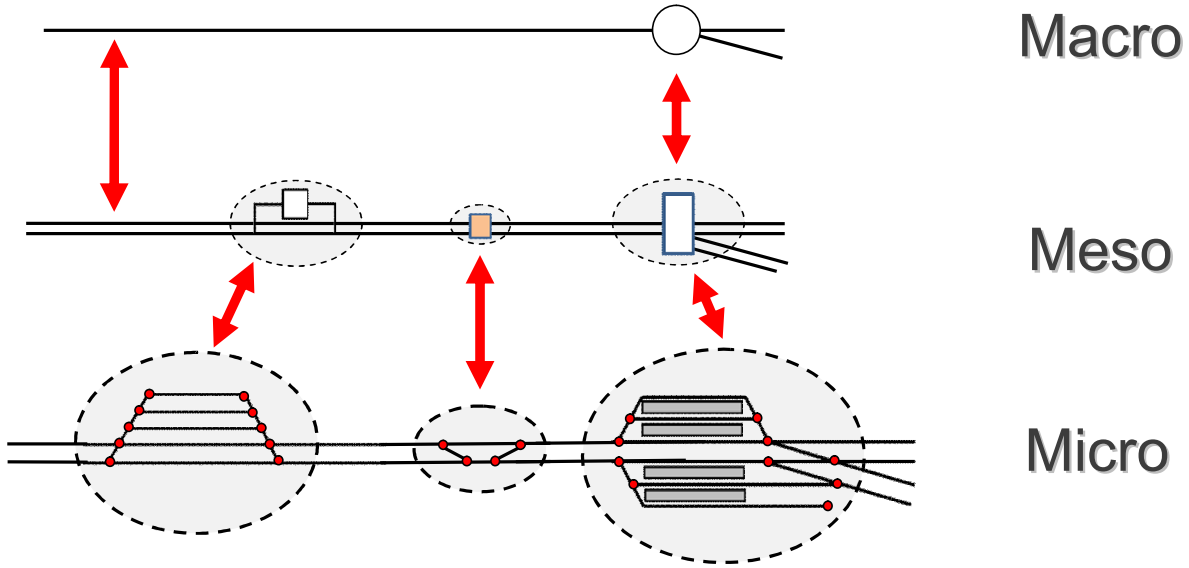


All these levels of precision share the model and the requirements
– **Routing**
– **Location**

Multi-level (2/3)

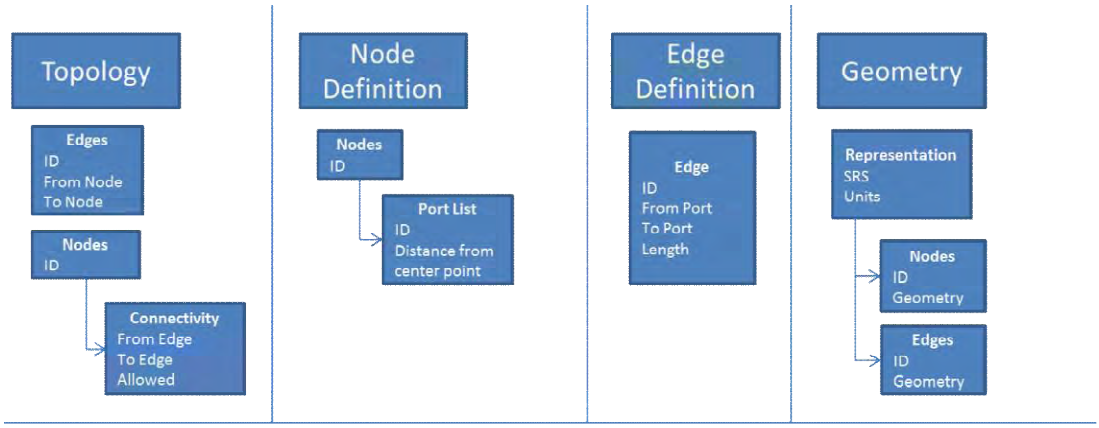
- **Rail TopoModel is designed to have the same structure at each level.**
- **It supports the automated aggregation toward higher levels**
- **It allows to start building at any level, the most suitable to each business case, depending on data availability** (e.g. at track or line level)

Multi-level (3/3)

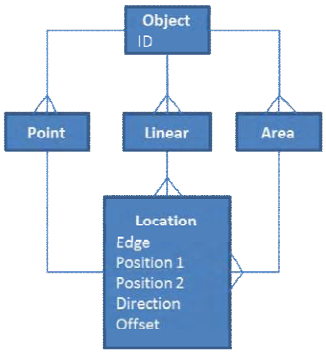


➢ *Rail TopoModel includes natively the concepts and rules for up/down consistency*

Rail TopoModel main concepts



Current status 90% completion



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railML.org and railML® files
10 years of developing and implementation history

The **Problem** of railway planning and operating processes since 2002…

- Operation concepts, slot management, simulation or infrastructure planning will need infrastructure data (track geometry, signals, routes), timetables (departure/arrival times, intervals, slots) and rolling stock data.
- Mostly this data is available in digital, but there are a lot of different legacy formats. Exchange of these data is possible only with a lot of special developed interfaces with loss of time and cost problems for IM / RU.

The **Solution**, which fulfils the

- **Technical case:** easy and handy, self-describing format close to existing standards; must be tolerant towards changes and faults
- **Business case:** decrease the wide range of interfaces and the time/cost of development, speed up data exchange processes

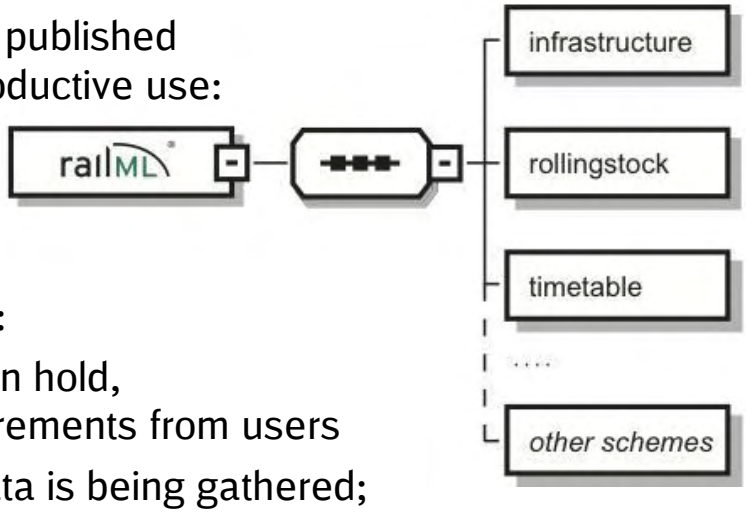
was searched and developed: railML®

railML® files – a type of XML-documents

- railML employs the systematic of XML for the description of rail-specific data; sub-areas use other XML-schemes such as *MathML* and *LandXML*
- Various types of data are described as schemes.
- At the moment the following sub schemes are in productive use:
  - *infrastructure* for the (priority topological) description of tracks and signalling equipment
  - *rolling stock* for the description of vehicles
  - *timetable* for the description of timetables
- railML-data is mainly used for the exchange between different programmes of various manufacturers
- railML-model is driven by the demands of the data exchange of railways, industry and authorities

railML®
Subschemes at a glance

- Currently version 2.2 is published
  and will get in productive use:
-



- Additional subschemes:
  - *station facilities*: on hold,
    currently no requirements from users
  - *crew rostering*: data is being gathered;
    railML.org working group being established
  - *interlocking*: active railML.org working group with regular meetings,
    Compilation of elements, allowing connection to existing
    subschemes achieved; complete solution more likely long-term.

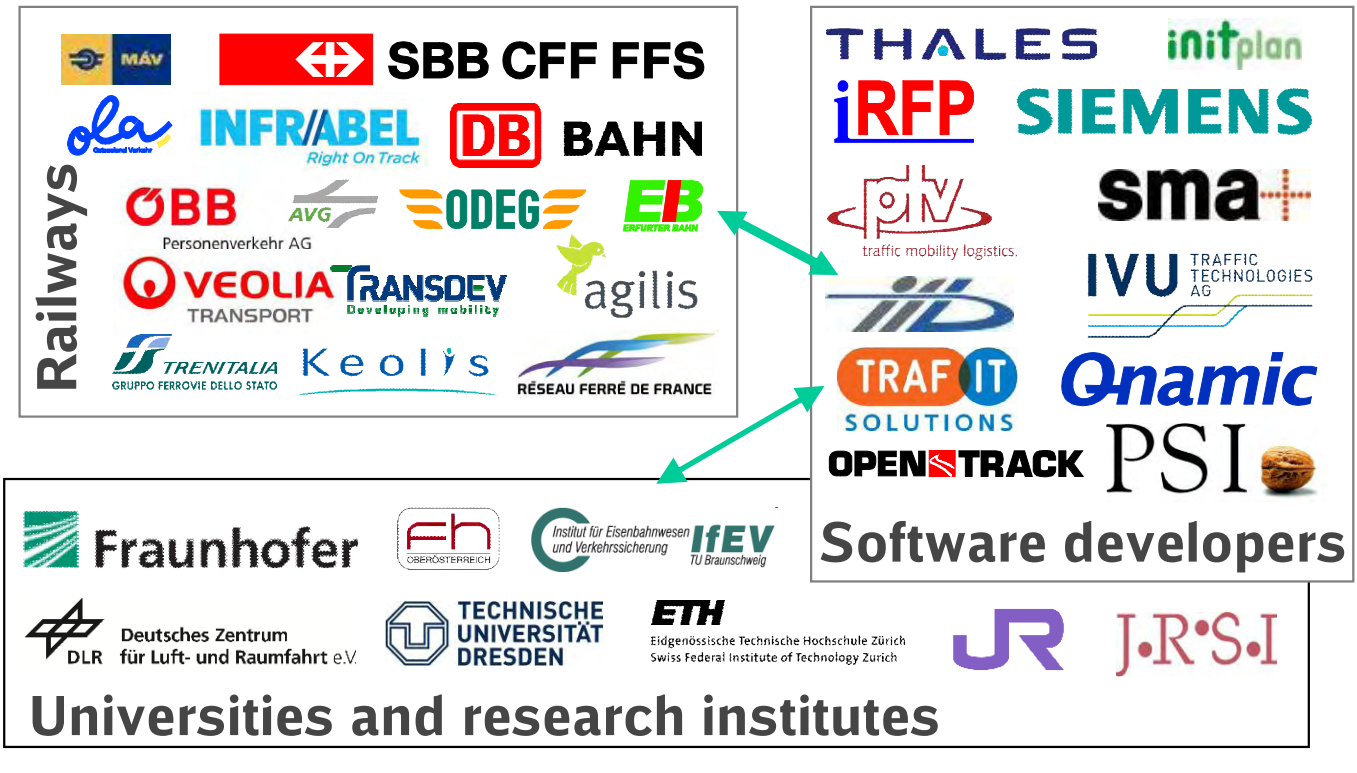
railML.org
How‘s the consortium working?

- Continuous development work based mainly internet-based
  (discussion boards, SVN for development and *alpha/beta* versions)
- Semi-annual conferences to exchange experience and discuss basics
  (next meeting: 18. September 2013 at UIC headquarter Paris/France)
- Project coordinators for the
  individual subschema moderate
  and establish *releases*
- Documentation about railML-wiki
  and HTML-explanations
- Discussions in German and
  English; Documentation
  entirely in English
- Coordination in Dresden & Zurich

railML.org
Who is who in the railML-consortium?

- The railML-consortium is a *development partnership of independent companies and organisations*, founded in 2002
  - no financial support from the Railways / Governments / EU / UIC
  - Costs of the work carried by each member
  - railML.org is independent of manufacturers and operators
- Currently:
  - 18 certified developer companies, predominantly from Germany, Switzerland, France
  - more than 30 railways, mainly from all over Europe
  - over 50 supporting firms, research institutes und authorities from all over Europe, North America, Russia and Japan
- The use of railML® requires membership of railML.org and a licensing of the schemes (both currently free of charge).

railML.org
Members in general (selection)



railML.org
Members of the interlocking group

- In 2012 railML.org established a development group to incorporate the needs of the signalling industry (predominantly with the background of upcoming ETCS installations) in a future railML 3.x version
- Members:

Industry

SIEMENS

THALES

ALSTOM

CAF Signalling

Railways

INFRABEL Right On Track

SBB CFF FFS

DLR Deutsches Zentrum für Luft- und Raumfahrt e.V.

SEVENTH FRAMEWORK PROGRAMME

ONTIME

Maturity Level
How good is railML®?

- 2002 - 2005: initial work; beta version *timetable*
- December 2005: release of railML's first productive version: *railML 1.0*
- 2005 – 2009: first practical application; learning curve; alignment to existing schemes; processing of inconsistencies/ incompatibilities
- November 2009: release of *railML 2.0*
- July 2011: release of *railML 2.1*
- June 2013: release of *railML 2.2* (V2.1/V2.2 are downwardly compatible)
- railML achieves maturity in this process and is now in multiple productive use.
- The current and some previous schemes and examples may be downloaded from www.railML.org.

Maturity Level

How good is railML®? (Detailed view)

Version and subscheme	railML V 0.x	railML V 1.0	railML V 1.1	railML V 2.0	railML V2.2	railML V 3.x
Year	2002 - 2005	December 2005	November 2007	November 2009	June 2013	expected 2014
Timetable	First test & use cases	Ready for daily use	Elements added	Total reor-ganisation	Elements added	No changes
Rolling stock	First test & use cases	Ready for daily use	Elements added	No changes	No changes	No changes
Infrastructure *macroscopic*	Not imple-mented	First test & use cases	Ready for daily use	No changes	Elements added	Total reor-ganisation
Infrastructure *microscopic*	Not implemented			First test & use cases	No changes	Total reor-ganisation
Infrastructure *interlocking*	Not implemented					Ready for daily use

Summary and Outlook

What is it and how does it work?

- railML® is an open standard for the exchange of railway data
- Three railML® Schemes for *infrastructure*, *rolling stock* and *timetable* have already been published; *interlocking* scheme in preparation
- The railML-consortium is a union of partners from industry, rail and research, who are working together on the development of the railML-schemes
- 15 programmes are listed on the railML-website which use railML® data for exchange
- Development of further subschemes under consideration
- Participation for additional members possible

railML.org

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Project Plan – *reminder for final target*

Our goal is to provide a standardized mean for data communication

The complete solution and associated services should adress and complete the following streams (model, format, tools, documentation, governance and operational organization)

MODEL
- UML class model for UIC-topo-model
- Profiles for specific use cases
- Documentation and sample data
- UIC leaflet

FORMAT
- Extract iron network
- Build extensions
- Reference systems
- Geometry concept
- Documentation and sample data
- Provision of base data
- Libraries, sample code, tutorials

ORGANIZATION
- Business model
- Define and set-up organization
- Define service levels
- Validation and certification process
- Release cycles

TOOLS
- Validation
- Viewer
- Editor

Delivering the complete picture is a heavy project, on a ~ 3 years basis

Project Plan – Short term

We have a short term milestone to fullfill : the support of RINF data collection and transmission from IMs and NREs to ERA.

European Railway Agency

European Railway Agency

UIC / ERIM Conference
RINF Status and Project Plan
17/09/2013

Jean-François Demoutiez

ERA IT Project Office Manager

RINF Project Plan Outline

- 15/09/2013 – Transition #1 (upload + validation)
- 30/11/2013 – Transition #2 (search + visualisation)
- 31/01/2014 – Transition #3 - RINF CUI Version 1.0
- 2014 / 2015:
  - Evolutive and Corrective Phase
  - Connections of the MS

Legal deadlines:

- 09/2014: All MS data collected about freight corridors
- 03/2015: All MS connected

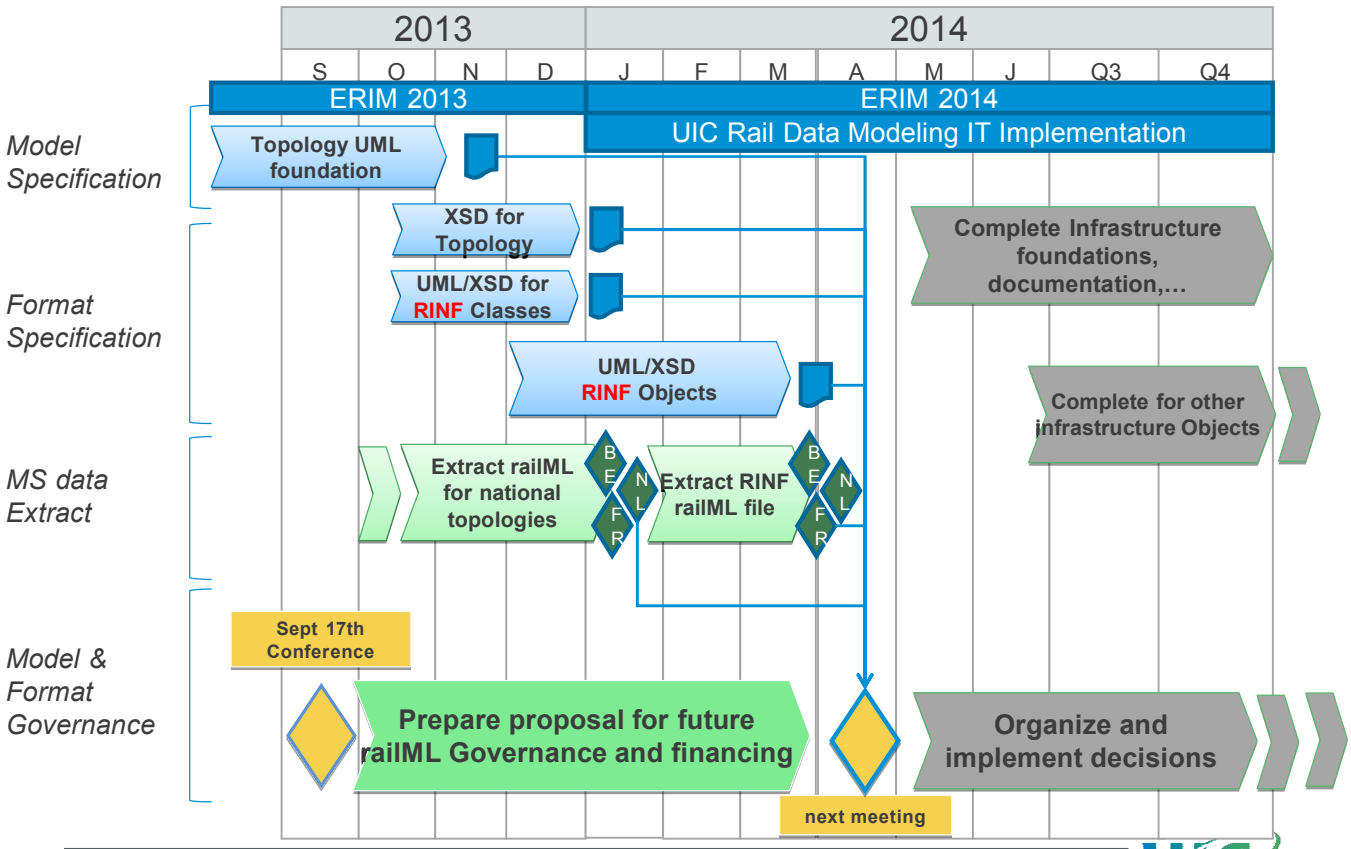
RAILML Integration Principles

- RINF CUI version 1.0 will be based on the XML schema defined and agreed within the RINF users' group
- To avoid an overhead for the MS who will base their IT solutions on RAILML, a change request is being prepared and will be introduced by a group of MS
- RINF XML format has been communicated to the 'railml.org': we have to guarantee the possibility of 'simple' XSLT transformations in both directions
  (RAILML => RINF XML and RINF data model => RAILML)
- That change request will be studied by the Agency and the RINF users' group (where stakeholders are represented)

Conclusion

- MS NRE will have the possibility to use the RINF XML format from 02/2014
- It is proposed to the MS basing their NRE on RAILML to participate to the tests of the RINF CUI (from 10/2013 to 06/2014)
- In addition MS will be able to provide from 06/2014 their data to RINF in RAILML format

Short term project plan



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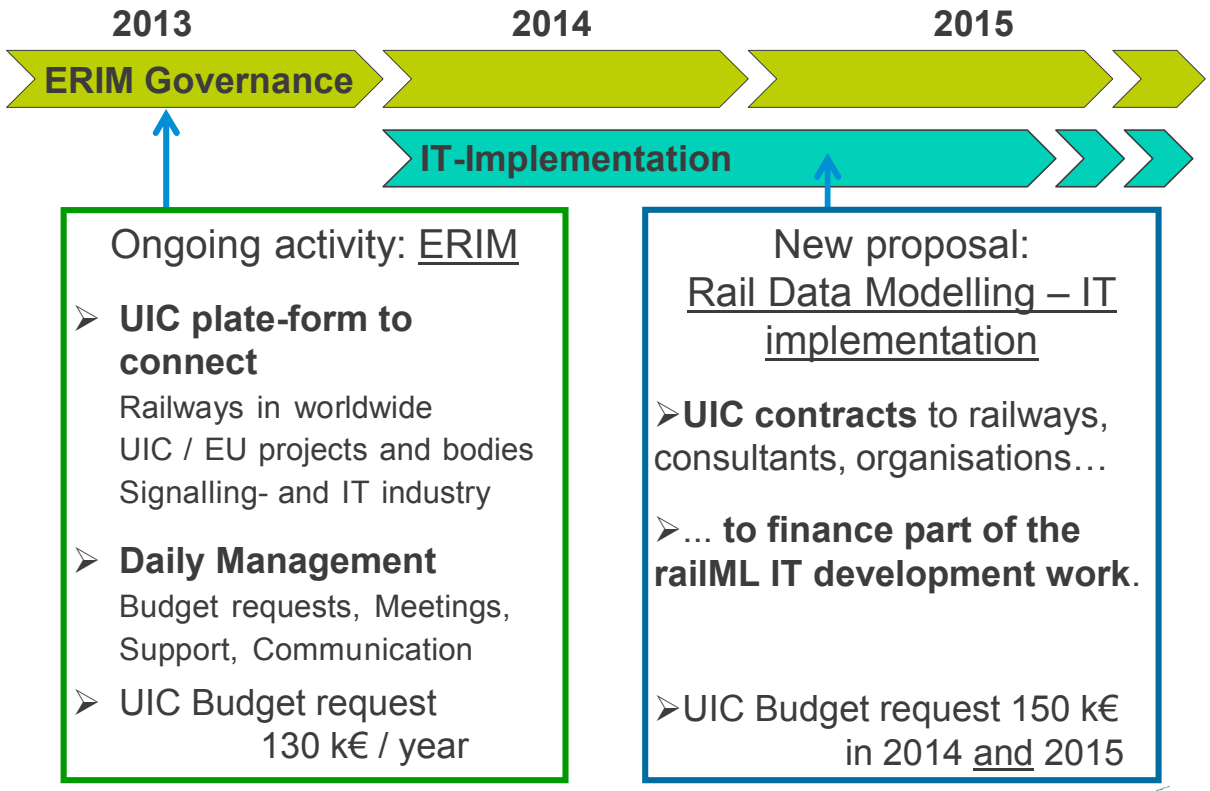
UIC projects proposal



From vision to concrete commitment
the time is right !

- To be successful this initiative needs to be **led by railway sector** to ensure the compliance between all different railway domains / needs.
- UIC proposes to start the standardization process and short term actions now because of the today's railway needs (RINF, ETCS).
  → **UIC Member railways are asked to join the UIC project proposals. The replies are expected at latest by End of September, contact your "international affaires" department or Erika Nissi (UIC).**
- TrafIT study shows, that the completion of this vision will take app. 100 man-months within the next 2-3 years. Additionally a vital railML® interface needs industrial support for the maintenance (15-20% per year).
- Additional financing is needed and joint effort from all stakeholders is welcome (with experiences, time and/or money).
  → **UIC members, other railways, organizations and industry are asked to join this railML scheme development a.s.a.p. This is your chance to influence this process.**

■ ■ ■ Thank you for your kind attention

■ ■ ■ See you on April 8th 2014