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LISBON CONGRESS CENTER, PORTUGAL

Implementing a Railways Operational Topology based on INSPIRE: An Interoperability Improvement with RINF

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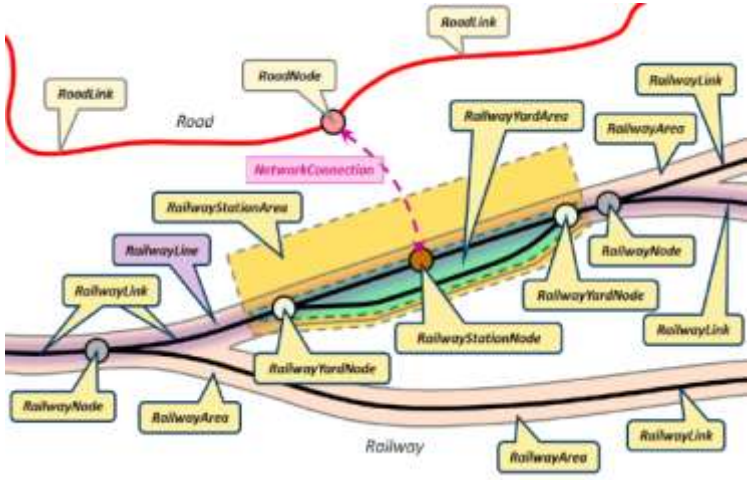
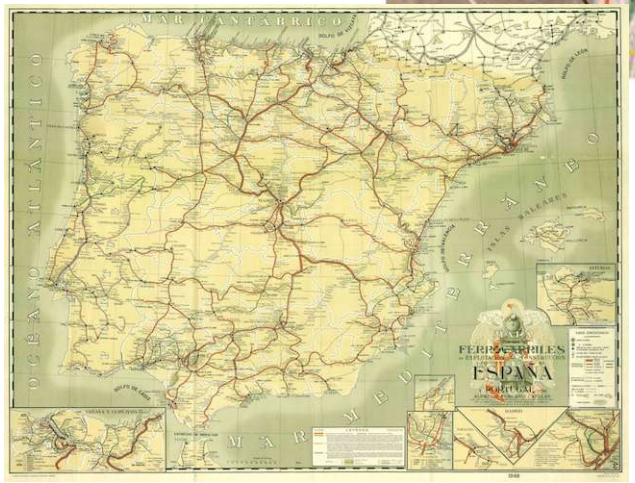
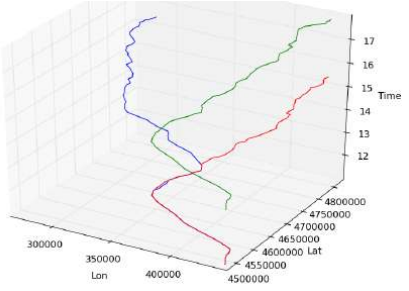




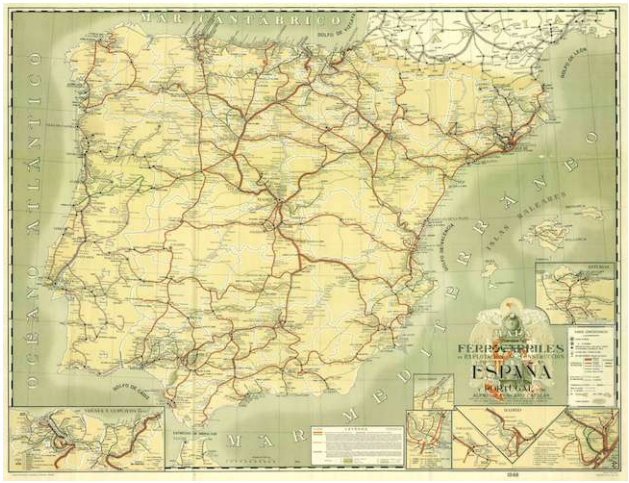


Agenda

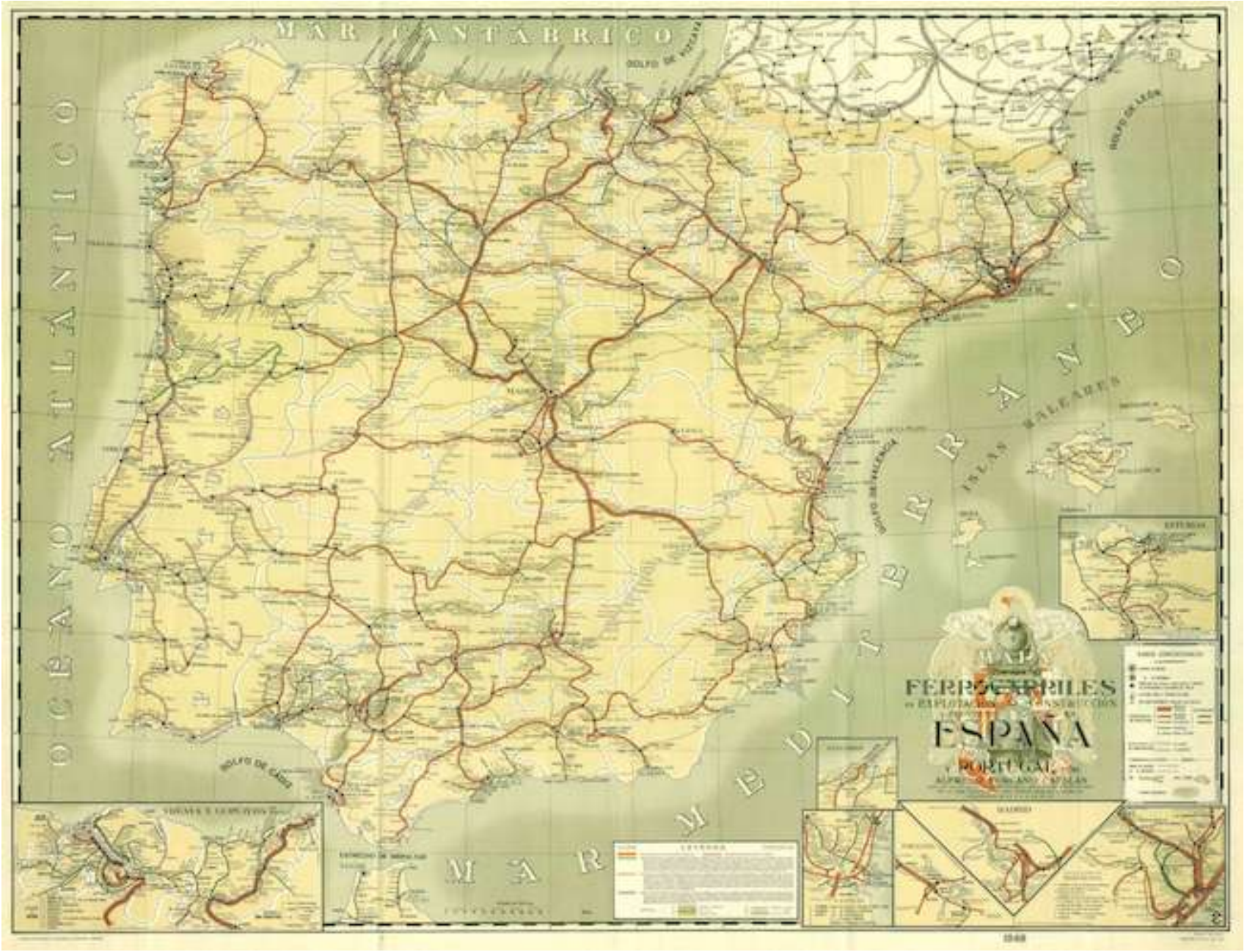
Objective
Previous situation
INSPIRE Railways
RINF
Operational Examples

Objective

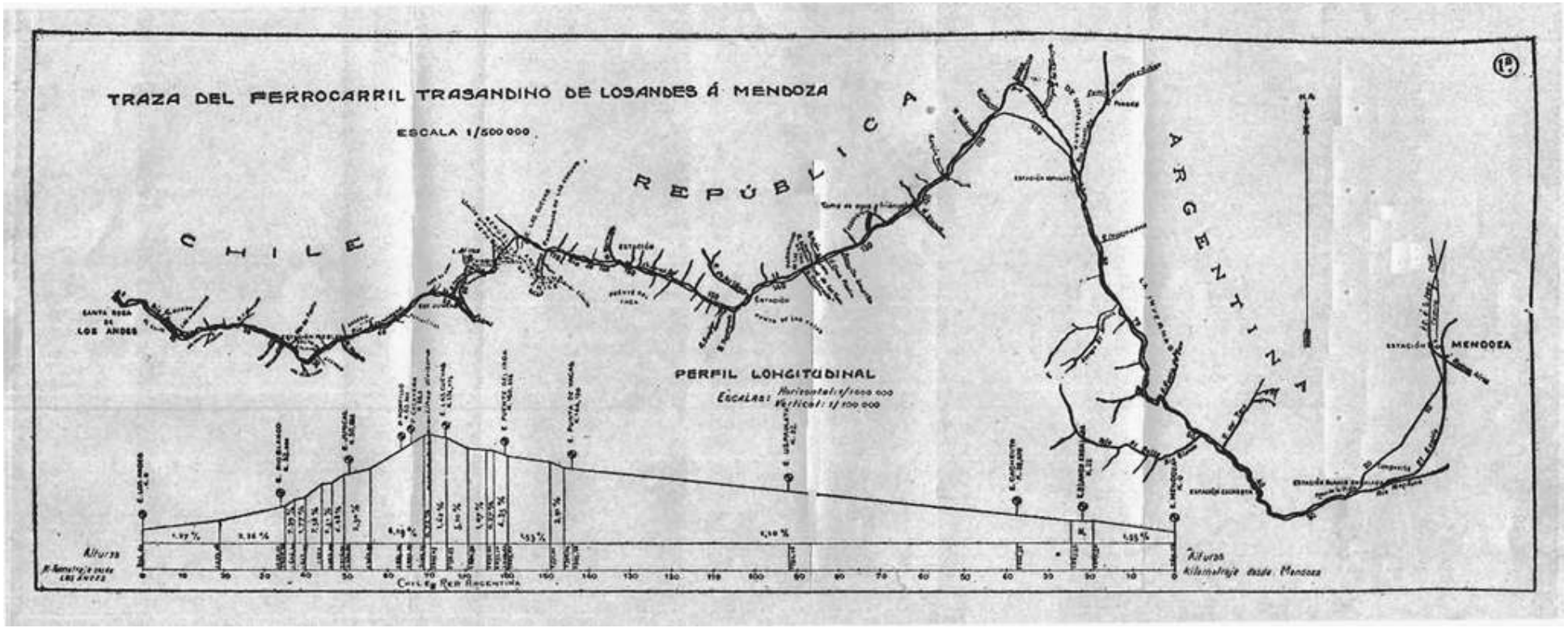
The aim of this work is to implement traditional geometries an
Attributes, defined in RINF, using INSPIRE railways features in
an operational environment, and show some working examples



Once Upon a Time – Railways geography

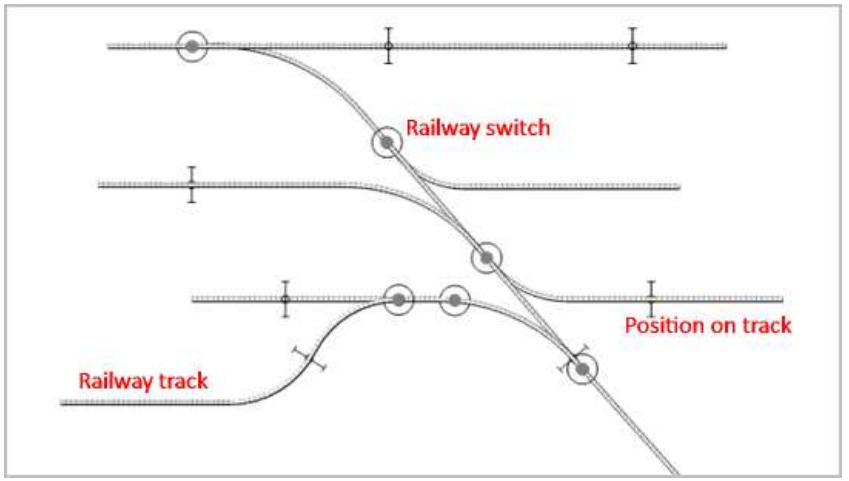


Once Upon a Time – Railways characteristics

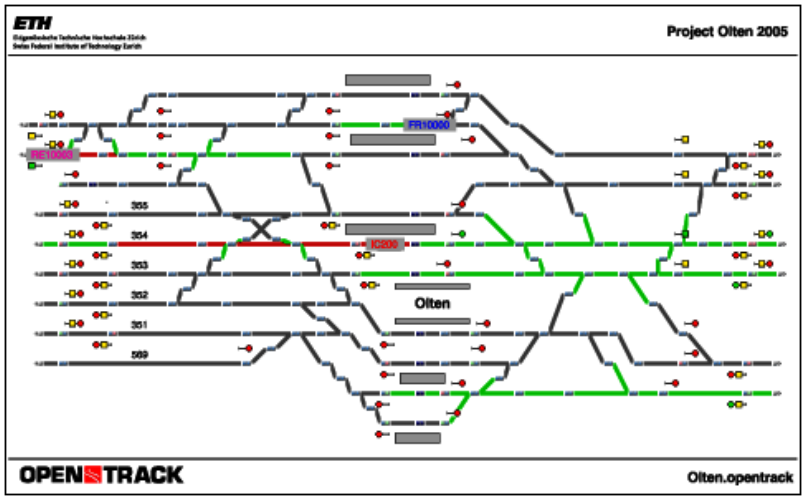


From construction plans and sketches
No interoperability
Difficult up to date

Today – Different railways topologies



railML.org



DB

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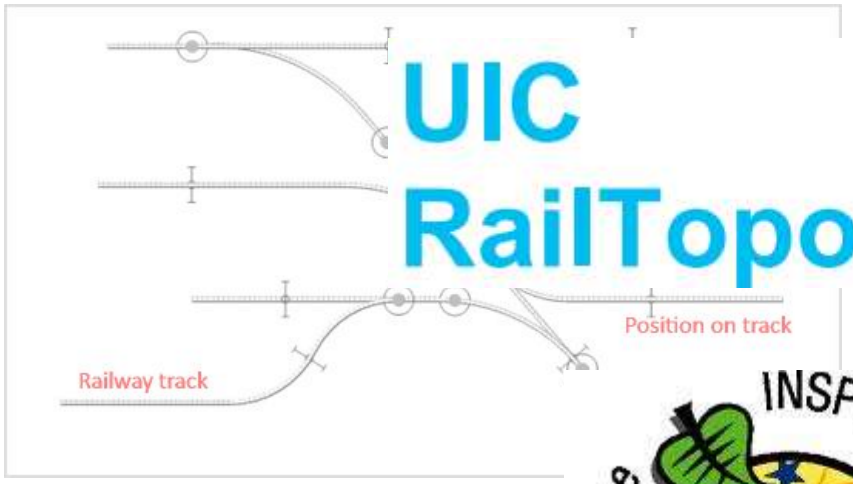
SNCF

Indra

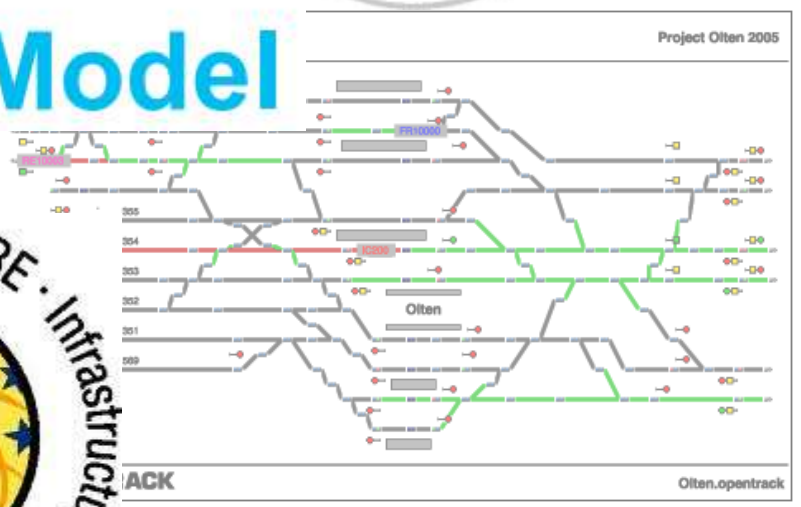
Every organization has its own propietary attributes and topology

Today – Standards



UIC RailTopoModel

ML.org



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INSPIRE · Infrastructure for Spatial Information in Europe

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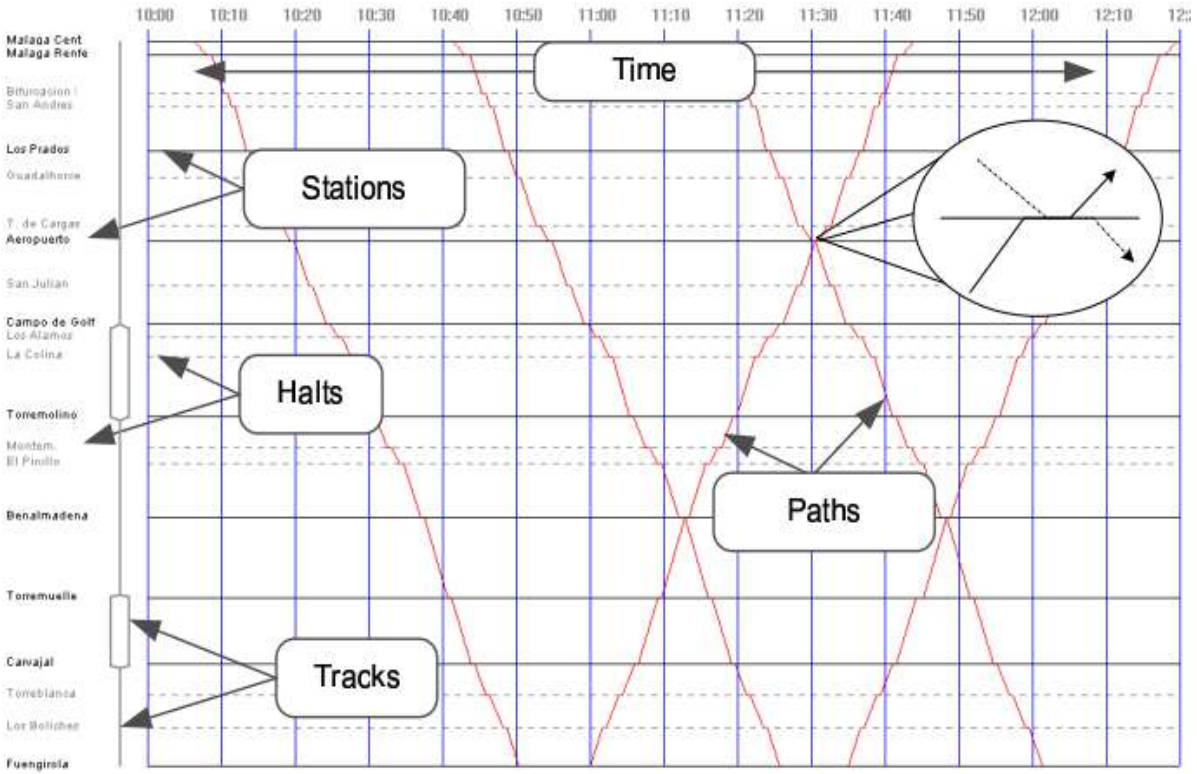
Indra

Common data infrastructure model

Railway capacity and topology uses

Railway capacity is the maximum number of trains which can be scheduled in the

Timetable
Interlocking
Building planning



Tools

Datasources

- ADIF Infrastructure attribute data
- IDEADIF – ADIF Spatial Data Infrastructure
- IGN

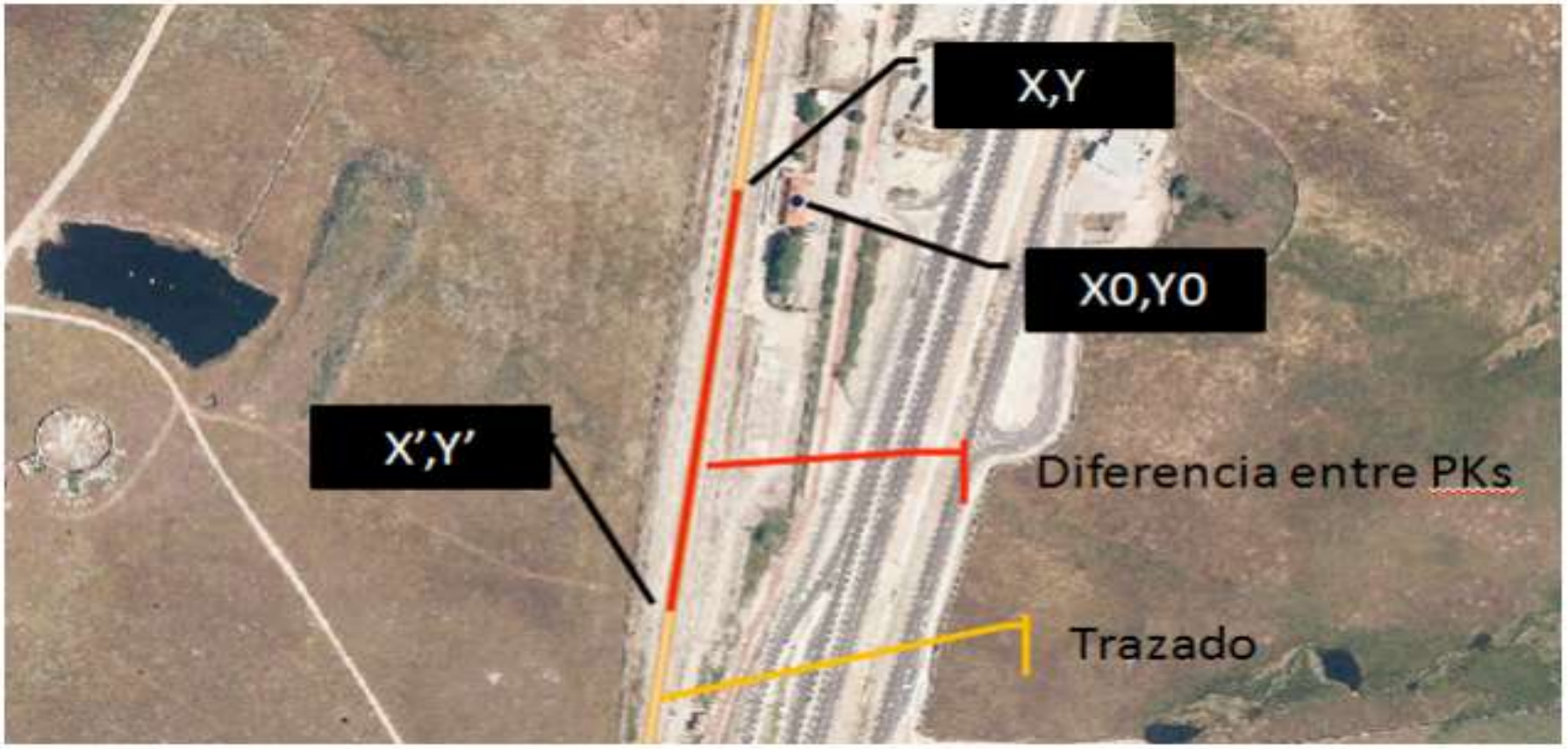
Tools

- Python
- GDAL
- PostGis Database
- Apache
- Geoserver

INSPIRE feature implementation

IDEADIF IGN → Load Postgis database → Feature identification from attributes → Track split Inspire feature computations

X, Y RailwayNodes
X0, Y0 RailwayStationNode
X,Y – X',Y' RailwayLink



INSPIRE feature implementation

IDEADIF IGN → Load Postgis database → Feature identification from attributes → Track split Inspire feature computations

X,Y – X',Y' RailwayLink ←

INSPIRE & RINF

INSPIRE Railways

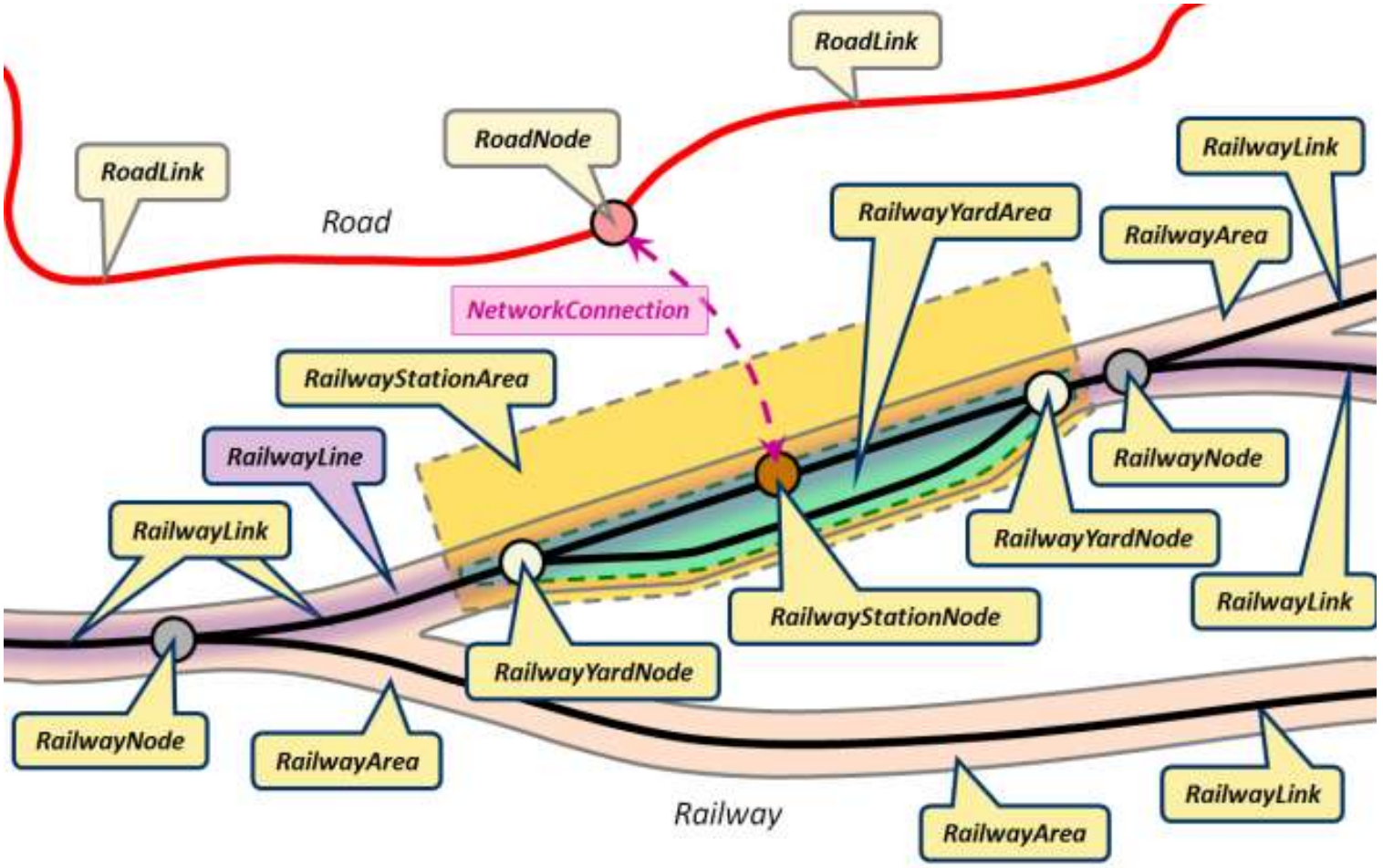
The Rail Transport Networks application schema (Rail Schema) employs a link and node structure torepresent the rail tracks used for transportation in the form of a lin network. The Rail Schemainherits classes from the Common Transport Schema and a creates its own classes to describe properties of the rail network such as Ownership restrictions that can apply to whole sections ofthe network element or subsections th can be described using linear referencing.

RINF

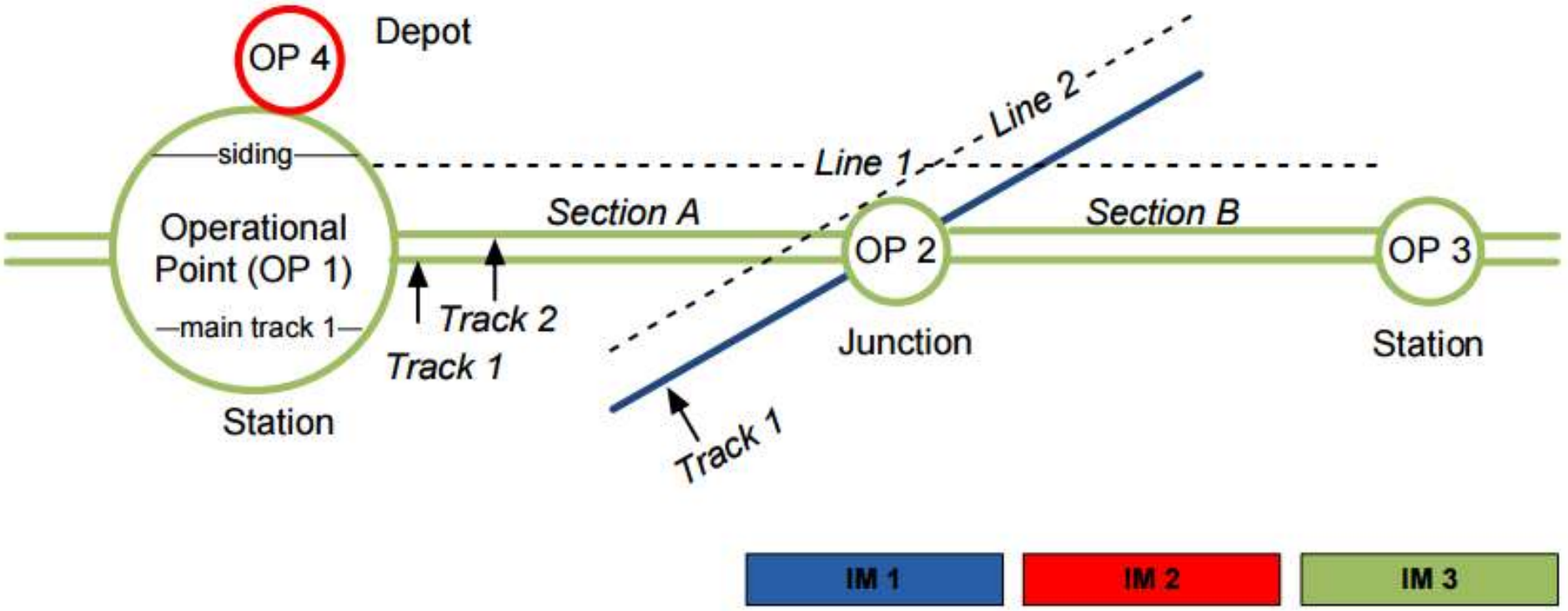
The activity of the WG Register of Infrastructure (RINF)‘ scheduled in the ERA work programme 2009 is based on Article 18 of Regulation 1335/2008 amending Regulation 881/2004 establishing a European Railway Agency (ERA) and Article 35 of Directive 2008/57/EC on the Interoperability of the Rail System within the Community.

INSPIRE	Common	RINF
Focused on Spatial Data	20 common attributes Coordinate Systems RINF Annex H	Focused on Attribute Data

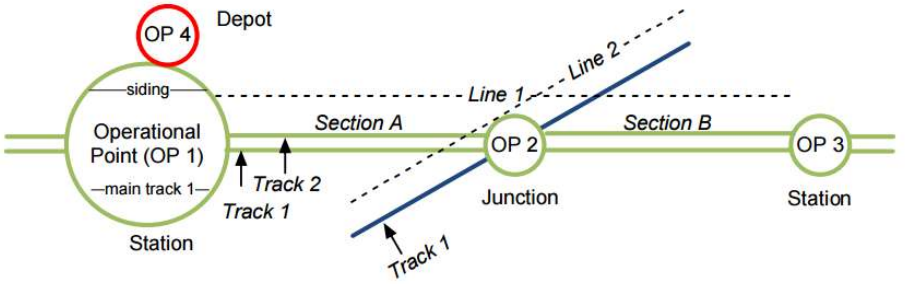
INSPIRE & RINF – INSPIRE elements

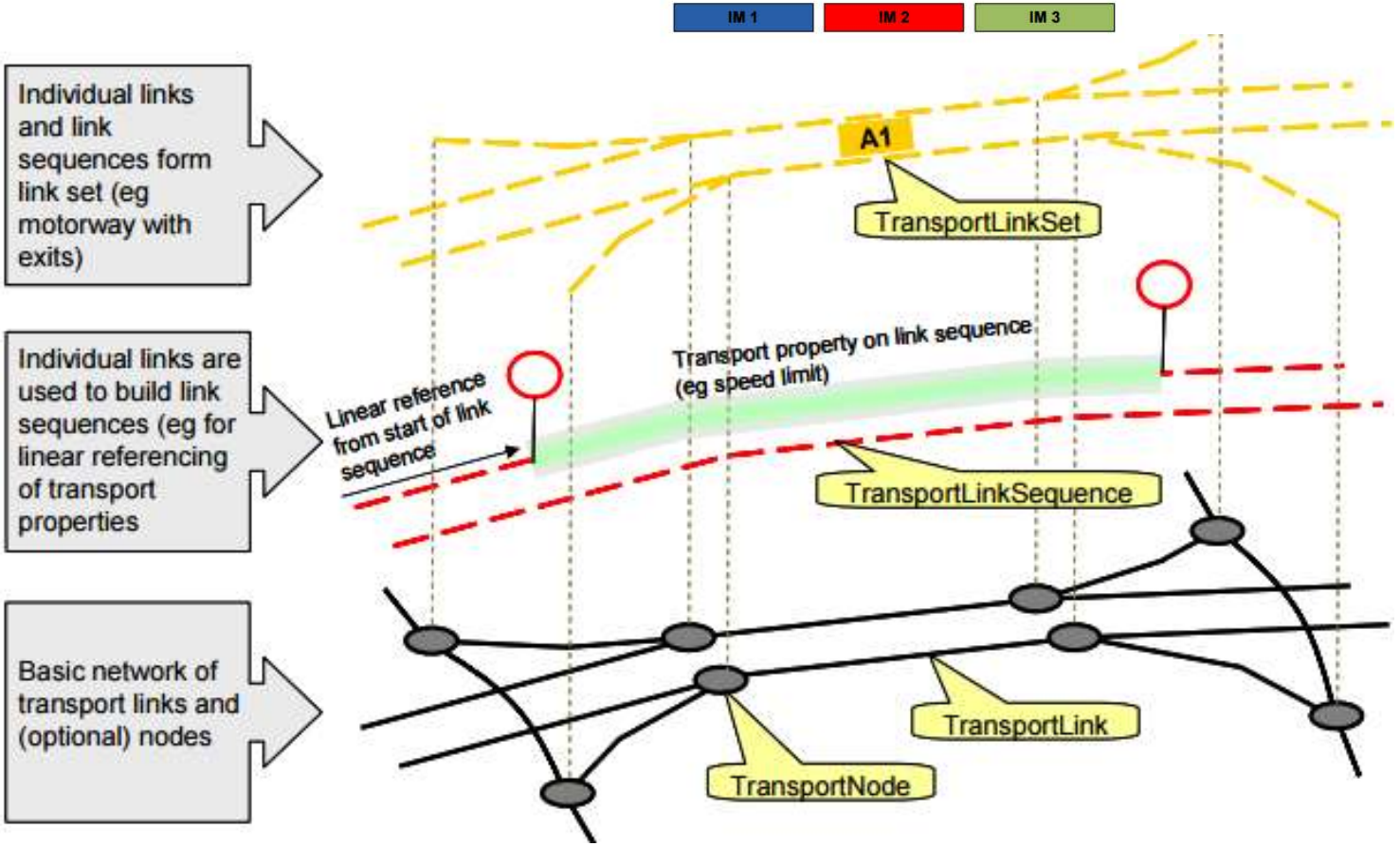


INSPIRE & RINF – RINF elements

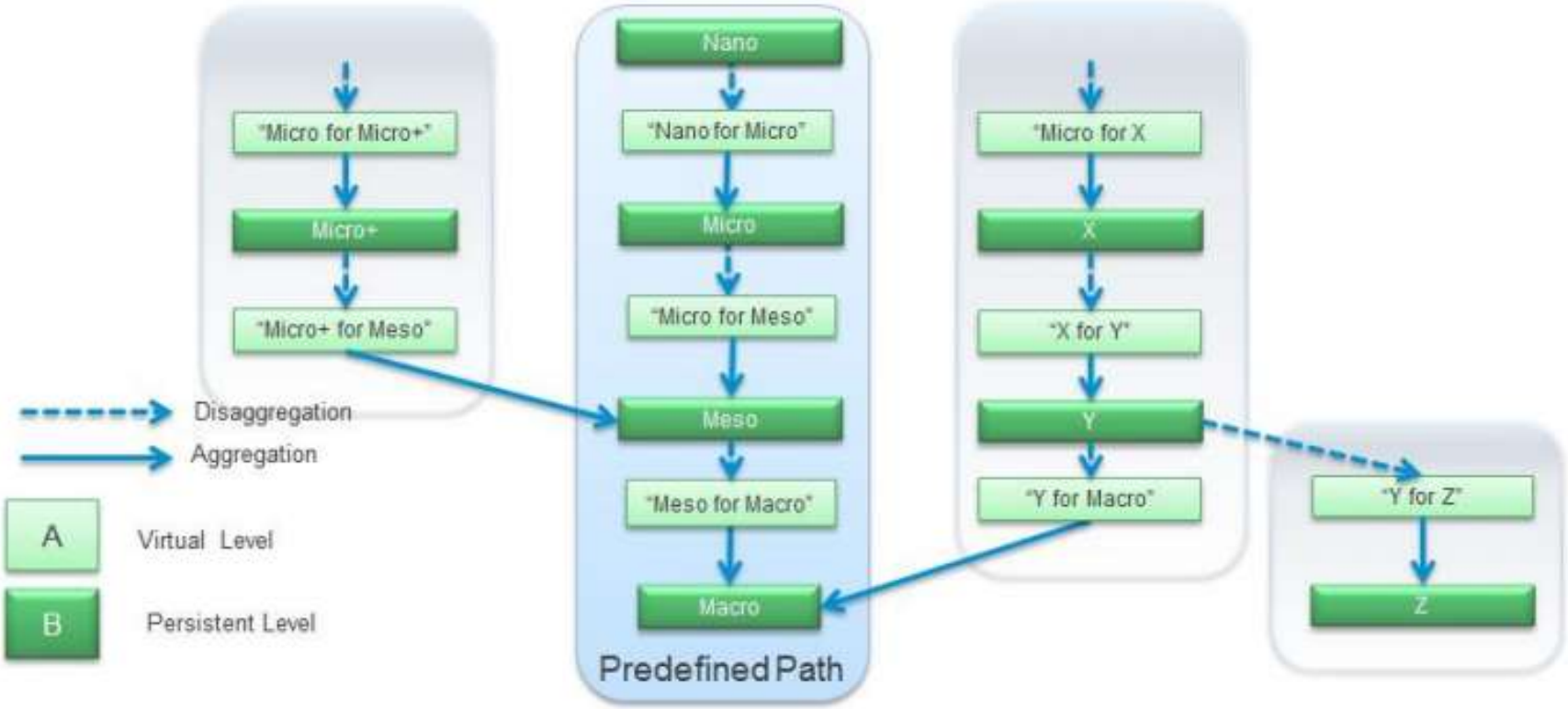


INSPIRE & RINF

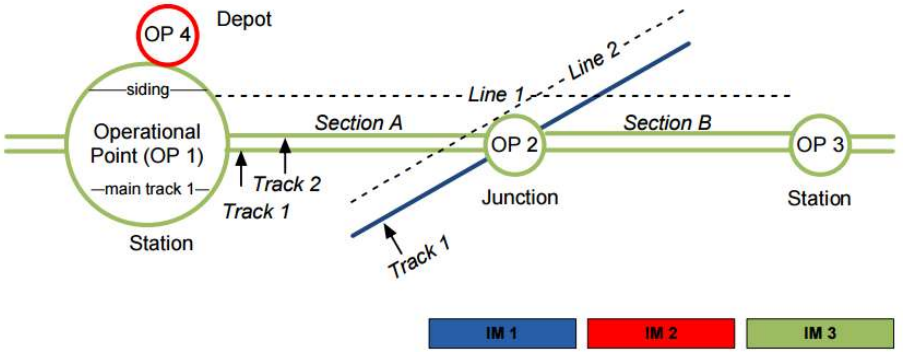


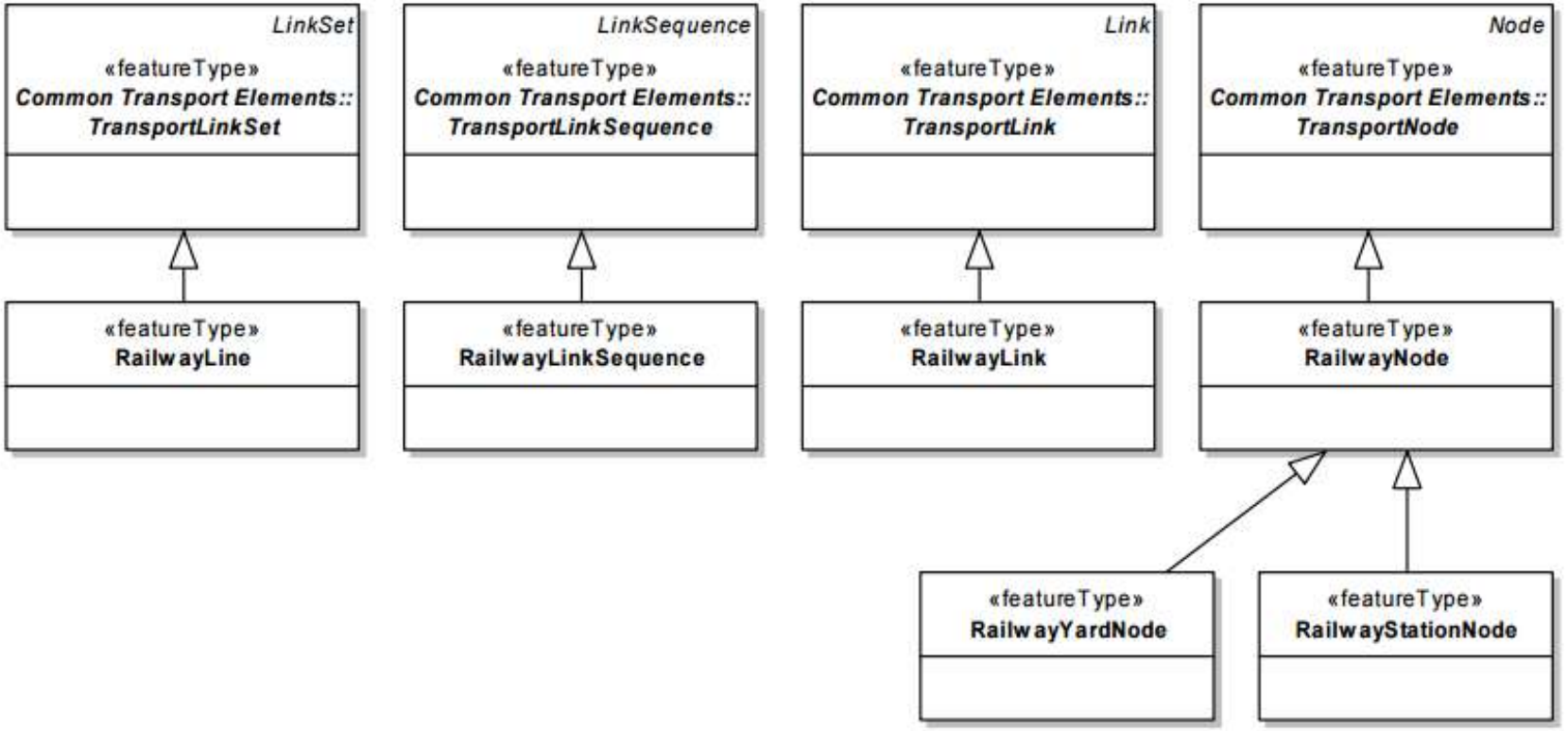


INSPIRE & RINF - Agregation

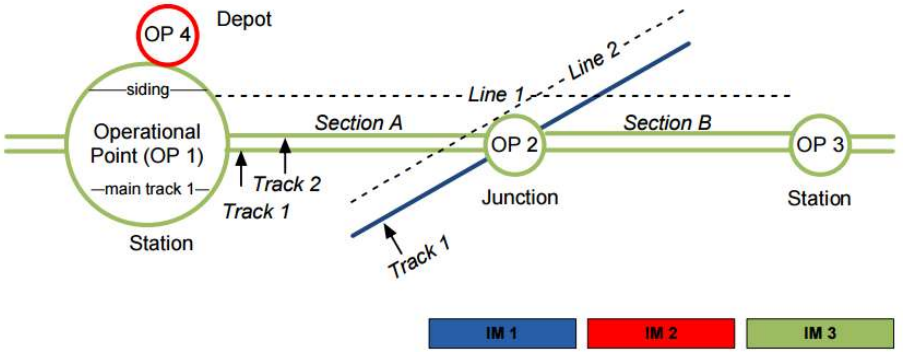


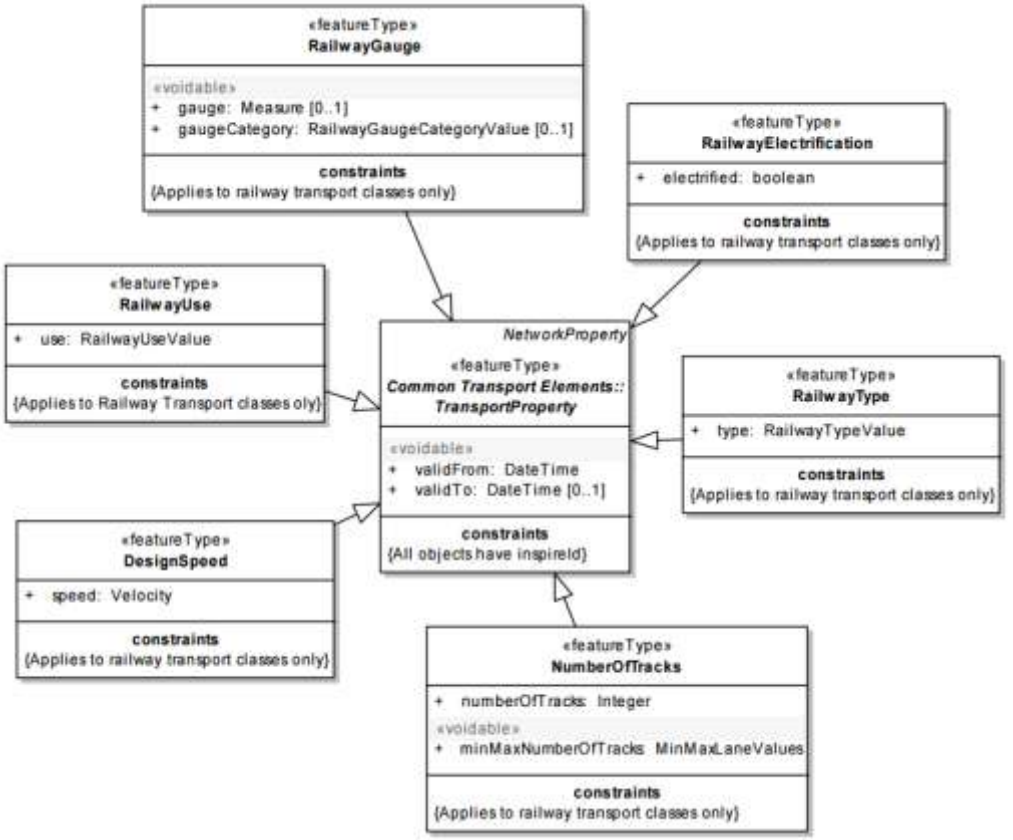
INSPIRE & RINF





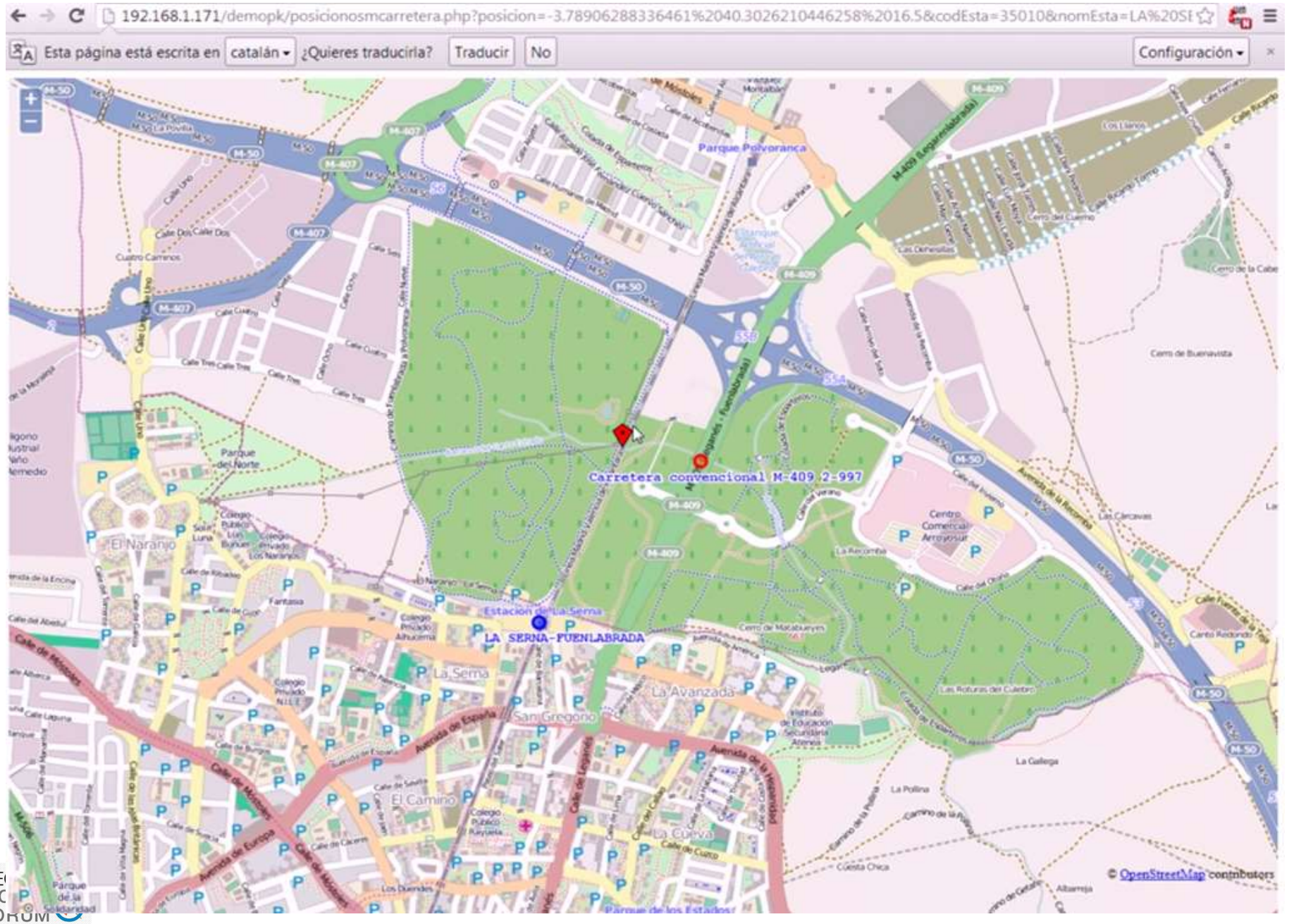
INSPIRE & RINF





Operational Examples – Incidence assistance

Use WPS services to exchange information https://www.youtube.com/watch?v=O6L9kdAYDA8

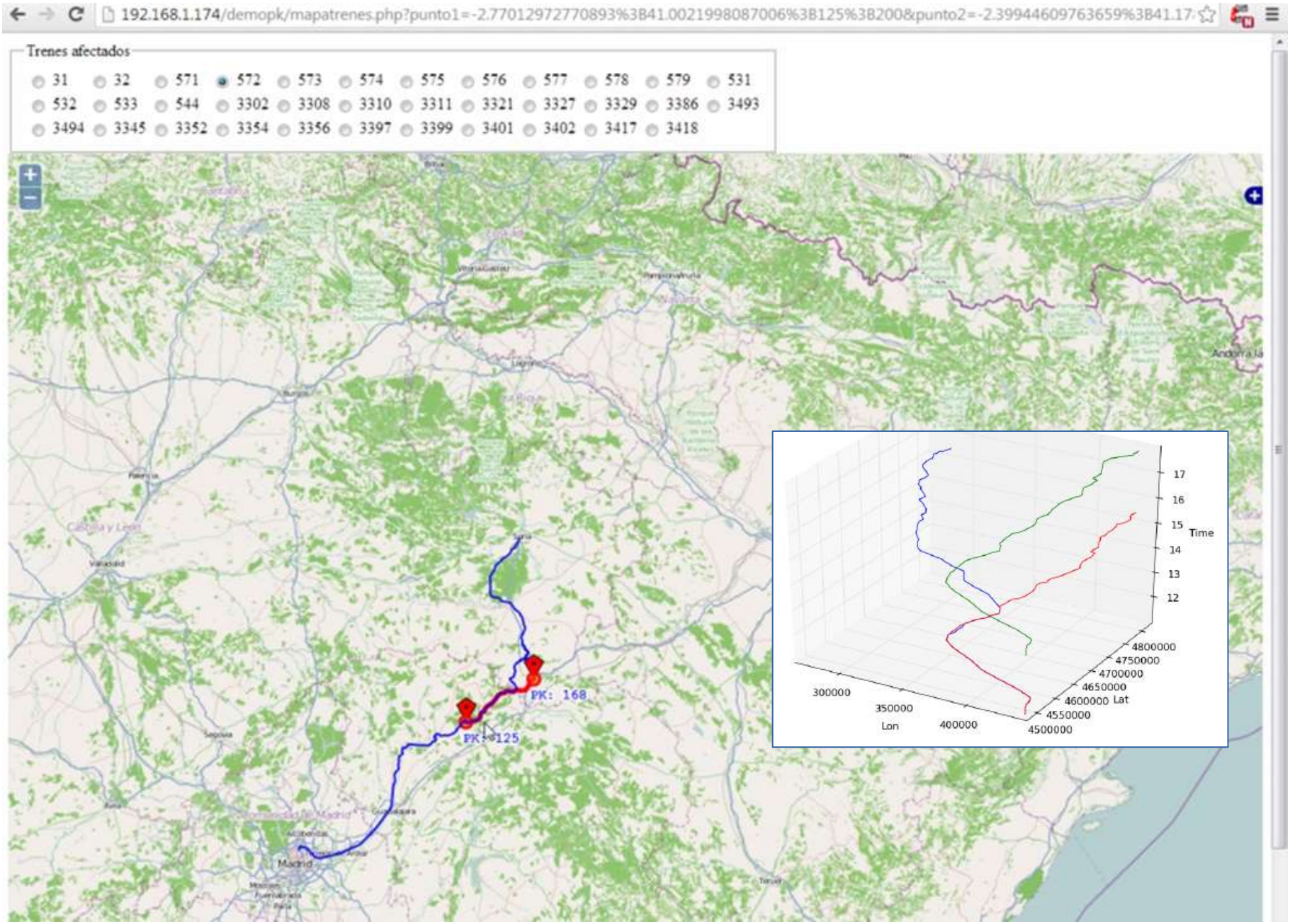


Operational Examples – Railway capacity impac

https://www.youtube.com/watch?v=63qbSx4hoxU

More than 3500 train paths will be taken into account

Operational Examples – Railway capacity impac



Operational Examples – on board system

Conclusion

INSPIRE railway schemas and RINF specifications may be used to represent railwa elements from micro to macro level

They are standards that can be used to improve interoperability among organizatio

It is necessary an attribute to link between both schemas. In this work, possition has been choose

Allows Independence from any company

Allows a cost reduction in time integration and money

Future work

Make a conversion process between INSPIRE and RailTopomodel schemas

Add spatial analysis to more operational activities

Improve relations with other INSPIRE Themes as Road, Weather, etc

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Thanks for your attention

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