



# INTERLINK – A EUROPEAN ROAD OTL

LDAC – 5<sup>th</sup> Linked Data in Architecture and Construction Workshop 13-15 November 2017  
Dijon, France



# FIRST OF ALL...



- › <http://www.cedr.eu/strategic-plan-tasks/research/cedr-call-2015/call-2015-asset-information-using-bim/interlink/>
- › [www.roadotl.eu](http://www.roadotl.eu)
- › **“The INTERLINK project will provide an open, scalable and future-proof European Road Object-Type Library (OTL) that meets the business needs of CEDR members and their supply chain”**
- › **Consortium members:**
  - › TNO, Netherlands (<https://www.tno.nl/en/>)
  - › ROD, Ireland (<http://www.rod.ie/>)
  - › RHDHV, Netherlands (<https://www.royalhaskoningdhv.com/>)
  - › AEC3, Germany (<http://www.aec3.com/>)
  - › Trimble, Norway (<https://construction.trimble.com/where-to-buy/trimble-solutions-Norway>)
    - › Triona, Sweden (<http://www.triona.eu/>) and Eurostep, Sweden (<http://www.eurostep.com/>)
  - › Semmtech, Netherlands (<http://www.semmtech.com/nl/>)
  - › ii, Germany (<https://www.interactive-instruments.de/en/>)
  - › Pb4.0, Germany (<http://planen-bauen40.de/>)

# INTERLINK PROJECT WORK PACKAGES



- ✓ WPA - Information management requirements
- ✓ WPB - Information management solutions
  - ✓ WPA + B integrated report available
- ✓ WPC - Principles European Road OTL
  - ✓ WPC Report available
- › WPD1 - Basic European Road OTL
  - › Basic European Road OTL & BIM connections
- › WPD2 - Proof of concept information management tools
  - › PoC tools
- › WPD3 - Information management test cases
  - › Report on testing
- › WPE – Project coordination
- › WPF – Dissemination and implementation

WP	Work Package title
A	IM Requirements
B	IM Solutions
C	Principles European Road OTL
E1	Project Management
F1	Dissemination and Implementation
D1	Basic European Road OTL
D2	PoC IM Tools
D3	IM Test Cases
E2	Project Management
F2	Dissemination and Implementation



# WHY? TO GET THE BEST ROAD OTL FOR EACH NRA!

- › To get the best Road OTL for each NRA, i.e.
  - › Reuse experience of others
  - › Quick start
  - › Modular & flexible
  - › National + international
  - › Influence on software vendors
  - › Influence on standardisation



Why OTL?

Why OTL Framework?

Why Road OTL (framework)?

Why European Road OTL (framework)?

Why Linked data / semantic web?

Why Linking and modelling guide?

# WHY OTL? WHAT IS IT?



= Main data structure for a specific domain,  
e.g. road network or inspection or road geometry; defining the terms to be used

- › Defined using a human and computer interpretable language



- › Agreed upon between and shared with partners in the main process dealing with that data (internally and externally)



- › Used for communicating (exchanging and sharing) data in projects and in asset management



- › Hub to other OTLs used in the domain; e.g. for modelling road networks, link to IFC, CityGML, InfraGML, INSPIRE...



# WHY OTL? BENEFITS



- + in practice: **data becomes sharable** between computer applications
- + in practice: **data not depending on apps** only anymore
- + development: **use same data structure**; not reinvent the wheel over and over
- + development: if two applications use the same OTL, they can communicate with **less (or sometimes even no) conversion needed** to be programmed

# WHY OTL FRAMEWORK? WHAT IS IT?

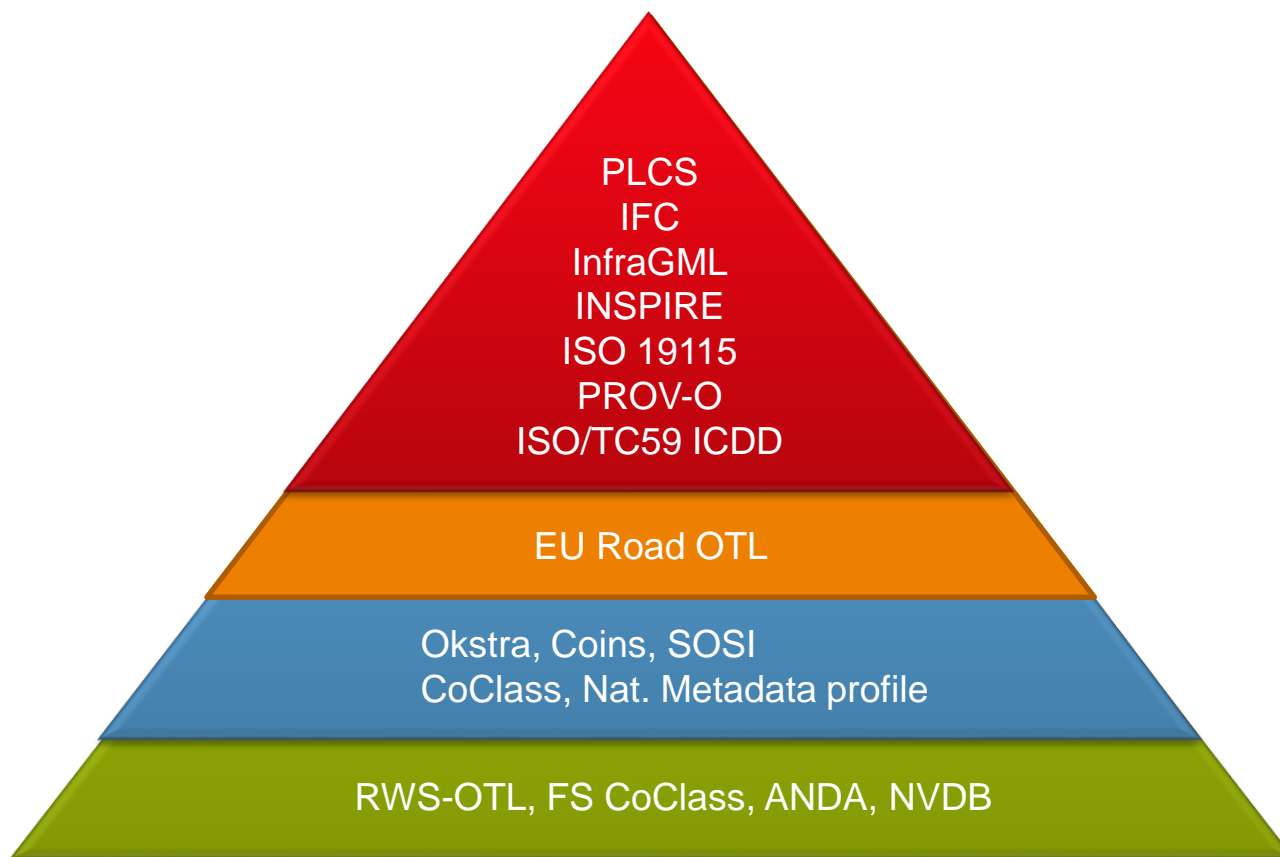


= modular combination of OTLs,  
together covering the whole domain of collaboration

- › Each OTL is a piece in the OTL framework puzzle
- › Layered structure of OTLs: top-down, bottom-up; world / European - national - company – project
- › Each group of collaborating partners selects the OTLs in their OTL framework they want to use for handling data
- › Typically, in asset management the asset owner takes the lead in this OTL selection, in our case the NRA







# WHY OTL FRAMEWORK? BENEFITS



- + **restricted scope per OTL**: easier to communicate about; manageable and maintainable
- + **modular approach**: pieces can be added or replaced, based on wishes from partners (what's needed?) and opportunities (what's available?)
  - › Without having to change all other pieces in the OTL puzzle
- + **blue print**: step-by-step start of a NRA's implementation, starting with most needed modular OTLs and with the OTLs that are successful in other situations
- + **best-practice sharing**: reuse modular OTLs that have proven their value in other situations
- + **combine international** standards with **national** classification systems

# WHY ROAD OTL? WHAT IS IT?

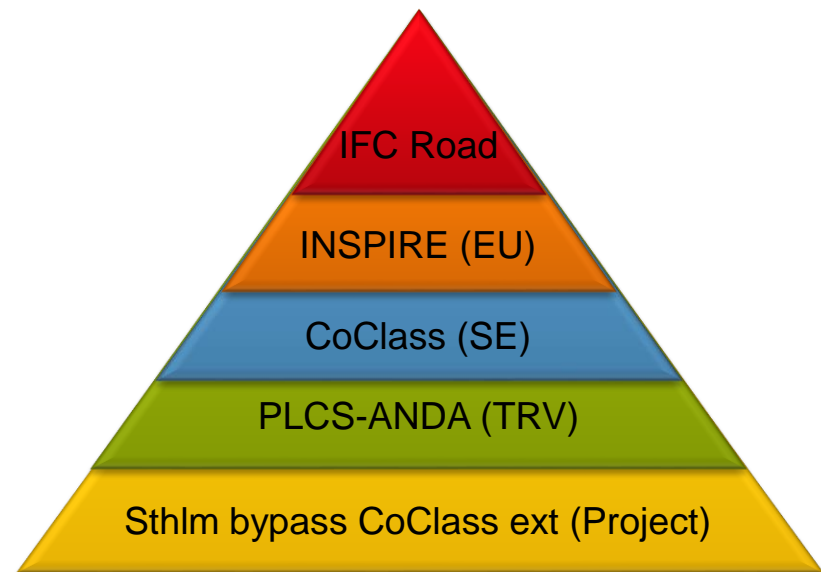


= OTL framework with selected set of preferred OTLs, all dealing with and supporting road asset management

Can be on any level: international, national, company, or project

E.g.

- IFC Road (Schema - International)
- INSPIRE (Schema - European)
- CoClass (Classification - Swedish)
- ANDA (Schema - Trafikverket)
- Sthlm bypass CoClass extension  
(Classification - Project)



# WHY ROAD OTL? BENEFITS

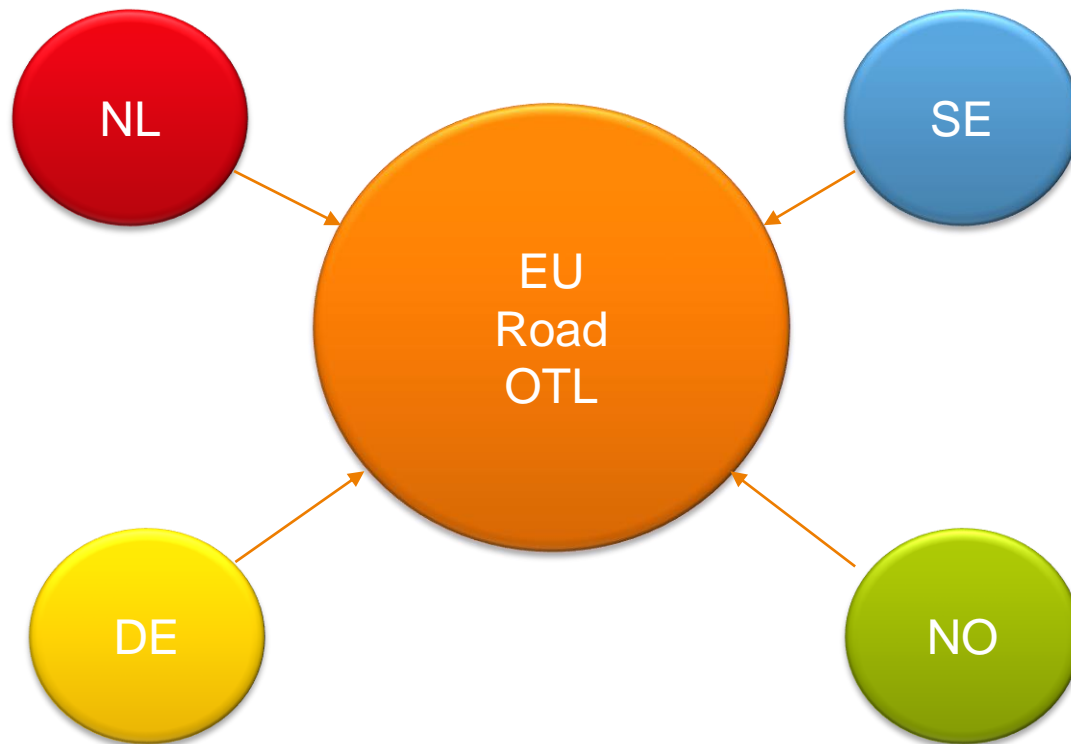


- + **focal point for sharing best-practice** in the sector
- + an **organisation** can be selected to **maintain** this focal point
  - Bringing domain and modelling experts together
  - Here decisions are taken about adopting preferred OTLs; bottom-up
  - Here decisions are taken about improving preferred OTLs
    - e.g. using ISO specifications for units, time and geo coordinates
  - This organisation influences other OTLs to improve their specifications; top-down

# WHY EUROPEAN ROAD OTL? WHAT IS IT?



= Road OTL framework, containing those elements that national OTLs have in common and that the European NRAs want to reuse from each other



# WHY EUROPEAN ROAD OTL? BENEFITS



- + development of national OTLs: **reuse best practice of other countries**; learn from each other; **blue print** for starting NRA
- + development of national OTLs: **implement once in applications**, use in multiple countries; critical mass towards IT vendors
- + development of national OTLs: **implement connections with international standards once**, use in multiple countries
- + in practice: **cross national projects**: easier communication; TERN and INSPIRE data delivery
- + in practice: **level playing field for international contractors** working in other countries; European market



# WHY LINKED DATA / SEMANTIC WEB? BENEFITS



- › **(Open) Data:** business expresses need to share asset data; asset data is common denominator in life-cycle and over supply-chain; data **liberated from applications** (and also specific standards!) so it can be reused in other contexts over the life-cycle
- › **Linked:** data from multiple sources connected; data stays at source, where owner (or main stakeholder) maintains the data; multiple sources inherent for infrastructure assets
- › **Web:** W3C technology is founded in logic and widely accepted; generic tools available, open source and proprietary; all data accessible using web addresses; access control and data protection uses standard web technology
- › **Semantic:** add meaning, links, constraints etc to data so data is computer interpretable, communicable, verifiable vs requirements, ...



**LD / SW is the only (?) technology that can provide these benefits**

# WHY MODELLING AND LINKING GUIDE? WHAT IS IT?



- › Guides supporting modellers how to best model and link OTLs, which are pieces in an OTL framework



# WHY MODELLING AND LINKING GUIDE? BENEFITS



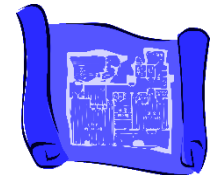
+ ease of linking OTLs in an OTL framework: when OTLs follow the same modelling guide, **linking becomes easier**



+ reuse of modelling best-practice; **sharing experience in LD/SW modelling**



+ **blue print** for organisations that start using OTLs (and LD/SW)



+ in practice: in **data rooms**, applying OTLs with similar modelling and linking guides is **easier**

# SUMMARY



› INTERLINK proposes the NRAs to build their national OTLs:



› Using linked data / semantic web technology

› According to the linking and modelling guide, whenever possible



› Inspired by the European Road OTL framework

› Jointly define the domains of interests for data management

› Step-by-step fill in these domains with OTLs used in national projects or from international standards

› Per NRA make your own modular Road OTL framework

› Select from existing OTLs, European or nationally

› Create OTLs to fill in the gaps, again step-by-step

› Propose to include successful national OTLs in the European framework

# THANK YOU!



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