WEBINAR

'Data spaces: experience from the common European mobility data space'
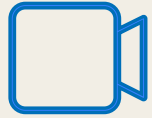
data.europa academy

19 July 2024

10.00 — 11.00 CEST

Rules of the game

The webinar will be recorded

For questions, please use the ClickMeeting chat.

Please reserve 3 min after the webinar to help us improve by filling in our feedback form

data. europa academy

Introduction

Inmaculada Farfan Velasco
Data.europa academy,
Publications Office of the
EU

Dimitrios Gkatzoflias
Policy Officer,
Directorate-General
Mobility and Transport

Marina Aguado
Project Officer,
European Union Agency
for Railways

Stefanie Federl
Strategic Project
Manager, acatech

Steven Logghe
Managing Director,
Movias

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academy

Agenda

10.00 – 10.05	Opening and introduction – *Inmaculada Farfan Velasco*
10.05 – 10.25	Deep-dive into the common European mobility data space – *Dimitrios Gkatzoflias*
10.25 – 10.35	Zooming into the railway sector and ERA ontologies – *Marina Aguado*
10.35 – 10.40	Overview of the deployEMDS project – *Stefanie Federl*
10.40 – 10.45	The Flanders case: traffic measurements data space – *Steven Logghe*
10.45 – 11.00	Q&A session and closing remarks

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Digitalisation of transport

- Digital technologies and networks are key enablers for an efficiently functioning, affordable, sustainable and safe mobility and transport

Road Transport
- Revised ITS Directive
- Smart tachograph
- Revised Directive on electronic tolling (EETS)

Waterborne
- European Maritime Single Window environment (EMSWe)
- Revision of the river information services (RIS) Directive
- Vessel Traffic Monitoring Directive

Rail
- European Railway Traffic Management System (ERTMS)
- Register of railway infrastructure (RINF)
- Technical specifications for interoperability (TSIs)

Aviation
- Data4Safety
- Single European Sky ATM Research (SESAR) project
- Drone Strategy 2.0

Multimodal mobility and logistics
- Alternative Fuels Infrastructure Regulation (AFIR)
- Revised Delegated Regulation on multi-modal travel information (MMTIS)
- Multimodal digital mobility services (MDMS)
- Electronic Freight Transport Information Regulation (eFTI)
- Digital Transport and Logistics Forum (DTLF)

European Commission

Challenges of mobility data sharing

Reluctance to share data: security, competition concerns, lack of trust
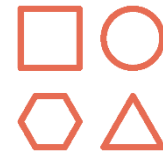
Heterogeneity and diversity of stakeholders, transport modes, data types, etc.

Fragmentation, lack of access and interoperability

European Commission

At the crossroads of two EU strategies

Data Strategy

Sustainable and Smart Mobility Strategy (SSMS)

Establish a single market for data. Enable data sharing and establish fair and clear rules on data use and access.

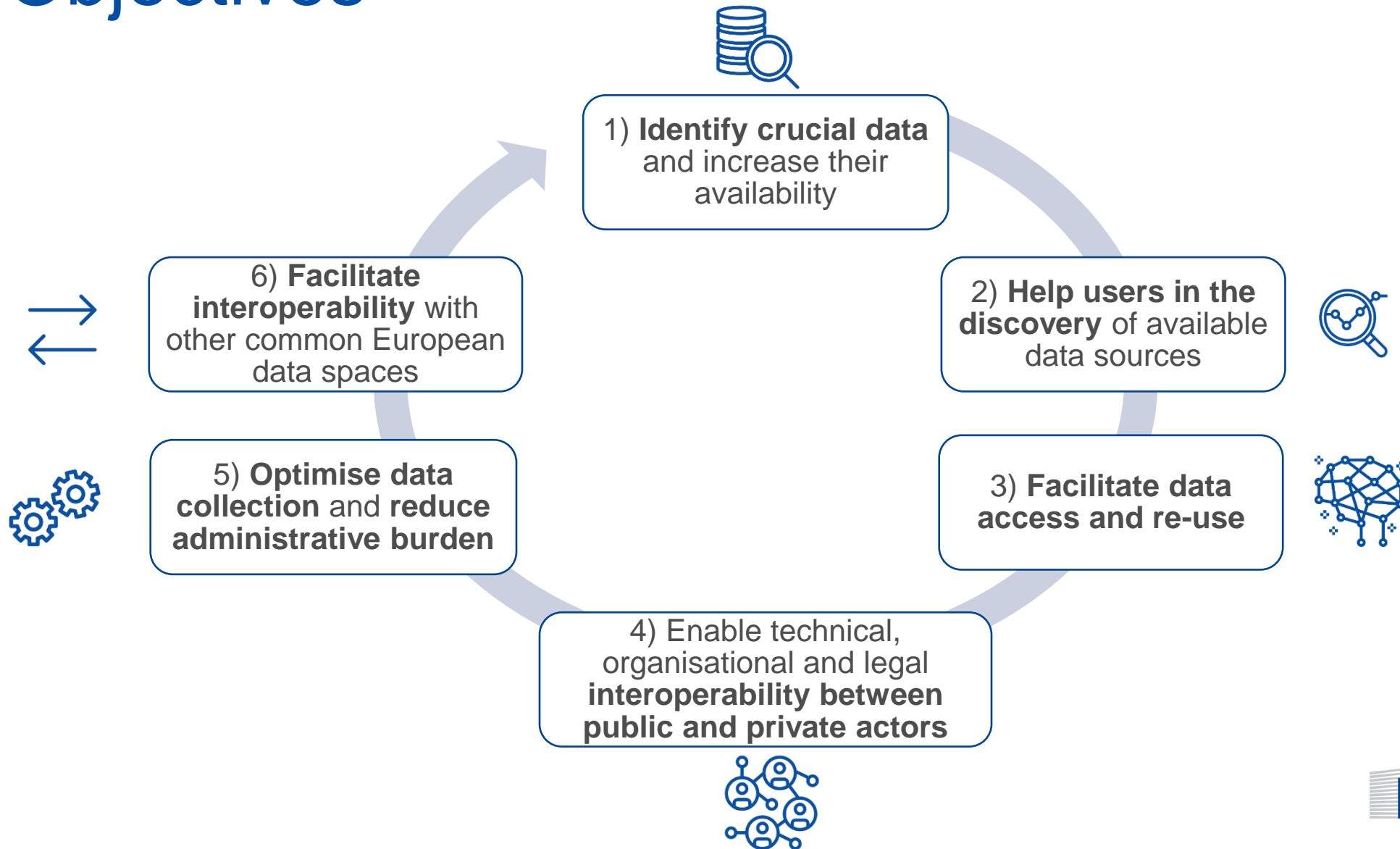Ensure that the EU transport sector is fit for a clean, digital and modern economy.

➔ A **common European mobility data space (EMDS)** facilitating access, pooling and sharing of data from existing and future transport and mobility data sources.

European Commission

Objectives

1) **Identify crucial data** and increase their availability

2) **Help users in the discovery** of available data sources

3) **Facilitate data access and re-use**

4) Enable technical, organisational and legal **interoperability between public and private actors**

5) **Optimise data collection** and **reduce administrative burden**

6) **Facilitate interoperability** with other common European data spaces

European Commission

Other relevant common European data spaces and initiatives

Green Deal

Tourism

Common European data spaces

Smart and sustainable cities and communities

Industrial (manufacturing)

Energy
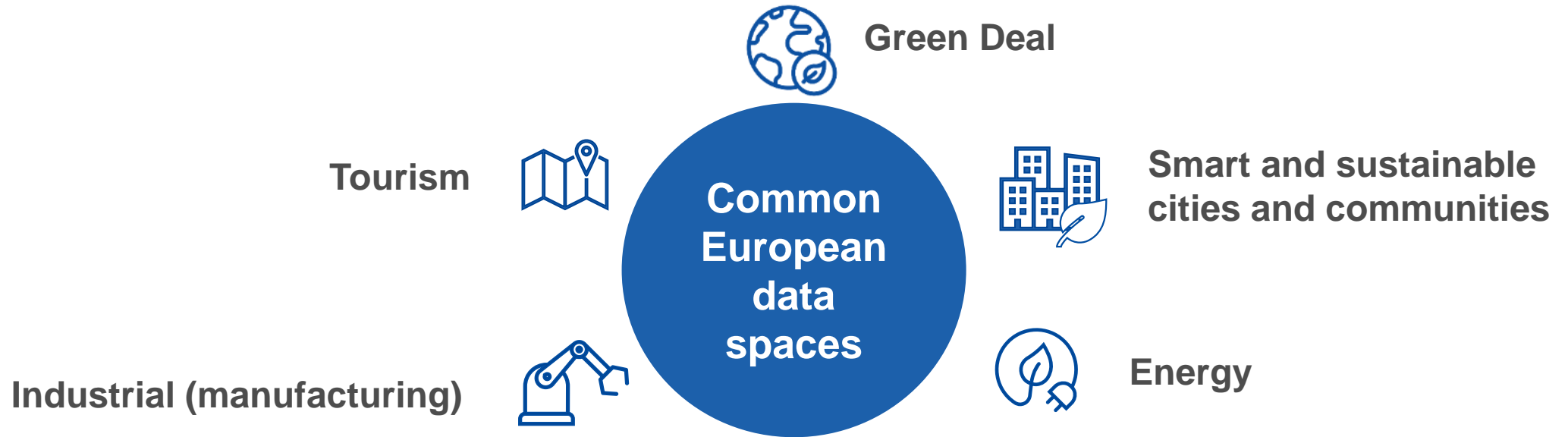
Data Spaces Support Centre
Coordination and governance

SIMPL
open-source cloud-to-edge middleware platform

European Commission

EMDS Communication ([COM(2023) 751](#) - [adopted Nov 29](#), 2023)

- It outlines the Commission's proposed way forward for the creation of a common EMDS, including its **objectives, main components, supporting measures** and **milestones**.

- The Commission is seeking to promote the exchange of information on this topic, as well as collaboration more generally.

Brussels, 29.11.2023
COM(2023) 751 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Creation of a common European mobility data space

Use cases and their added value for the mobility transition ahead

Increasing the efficiency of the **logistics sector**

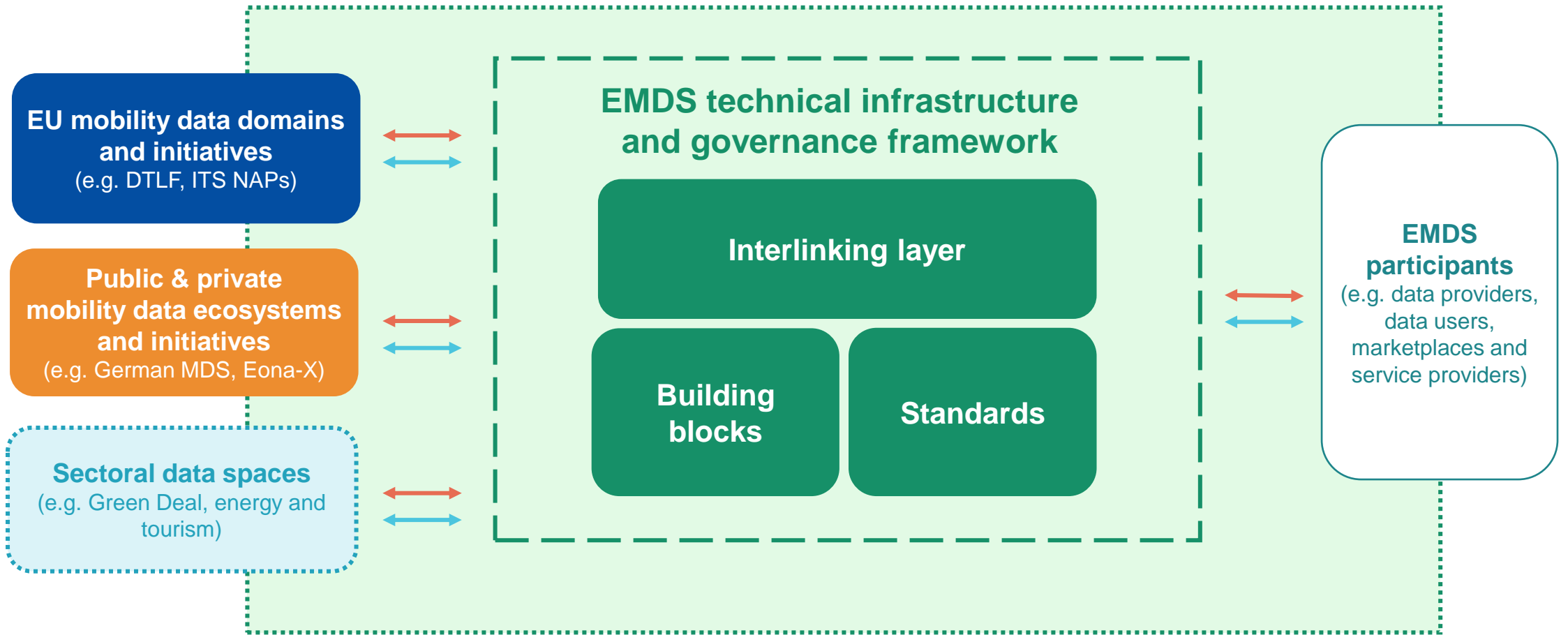Implementation of **urban vehicle access regulations (UVARs)**

Boosting cross-border passenger & freight **multimodality**

Facilitating access to **electromobility** data

European Commission

EMDS framework

EU mobility data domains and initiatives
(e.g. DTLF, ITS NAPs)

Public & private mobility data ecosystems and initiatives
(e.g. German MDS, Eona-X)

Sectoral data spaces
(e.g. Green Deal, energy and tourism)

EMDS technical infrastructure and governance framework

Interlinking layer

Building blocks

Standards

EMDS participants
(e.g. data providers, data users, marketplaces and service providers)

→ data access/sharing

→ metadata flows

European Commission

Actions supporting the common European mobility data space (1/2)

Preparatory action
Digital Europe Programme

12 months coordination & support action: PrepDSpace4mobility

Oct 2022-Sept 2023 ✅

→ Map existing mobility data ecosystems

→ Recommend first common building blocks

PrepDSpace4Mobility

Deployment action
Digital Europe Programme

36 months deployment action: deployEMDS

Kick-off Nov 2023 ✅

→ Deployment of mobility data sharing use cases related to **traffic and urban mobility** indicators

deploy EMDS

Technical assistance
Connecting Europe Facility

12 months study

Kick-off Jan 2024 ✅

Followed by a deployment action in 2025 (TBC)

→ Focus on the **governance**, **interlinking layer** and further definition of building blocks and **interoperability**

RICARDO VTT

- Building on the **Data Spaces Support Centre** and **SIMPL**

European Commission

Actions supporting the common European mobility data space (2/2)

Proof-of-Concept
Digital Europe Programme

6 months PoC

Jan - June 2024 ✅

→ Focus on how **personal data** are managed in the EMDS framework, through a **multimodal use-case**

→ Looking for **local authorities and transport operators** to test the PoC

Multi-country projects
Digital Europe Programme

First call will be:

- [published](#) Feb 13, 2024 ✅

- open Feb 29-May 29, 2024 ✅

→ Support the establishment of a **lasting collaboration structure**

→ Support the deployment of **cross-border use cases** in different areas
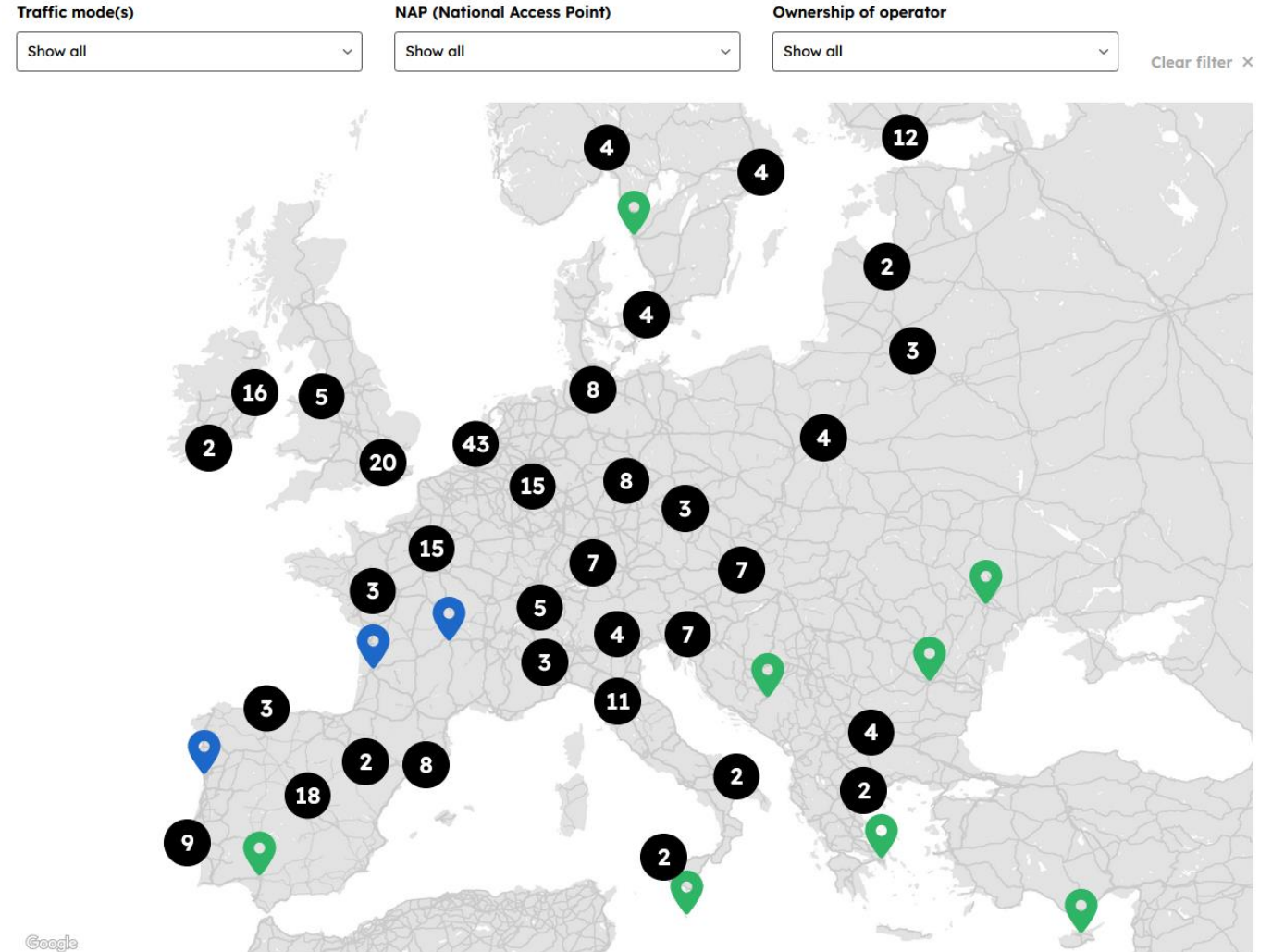
- Building on the **Data Spaces Support Centre** and **SIMPL**

PrepDSpace4mobility - Mapping of ecosystems

- Looked at **426** initiatives, ecosystems and platforms**.**

- **272** data ecosystems matched the relevance criteria and are included in the inventory of data ecosystems.
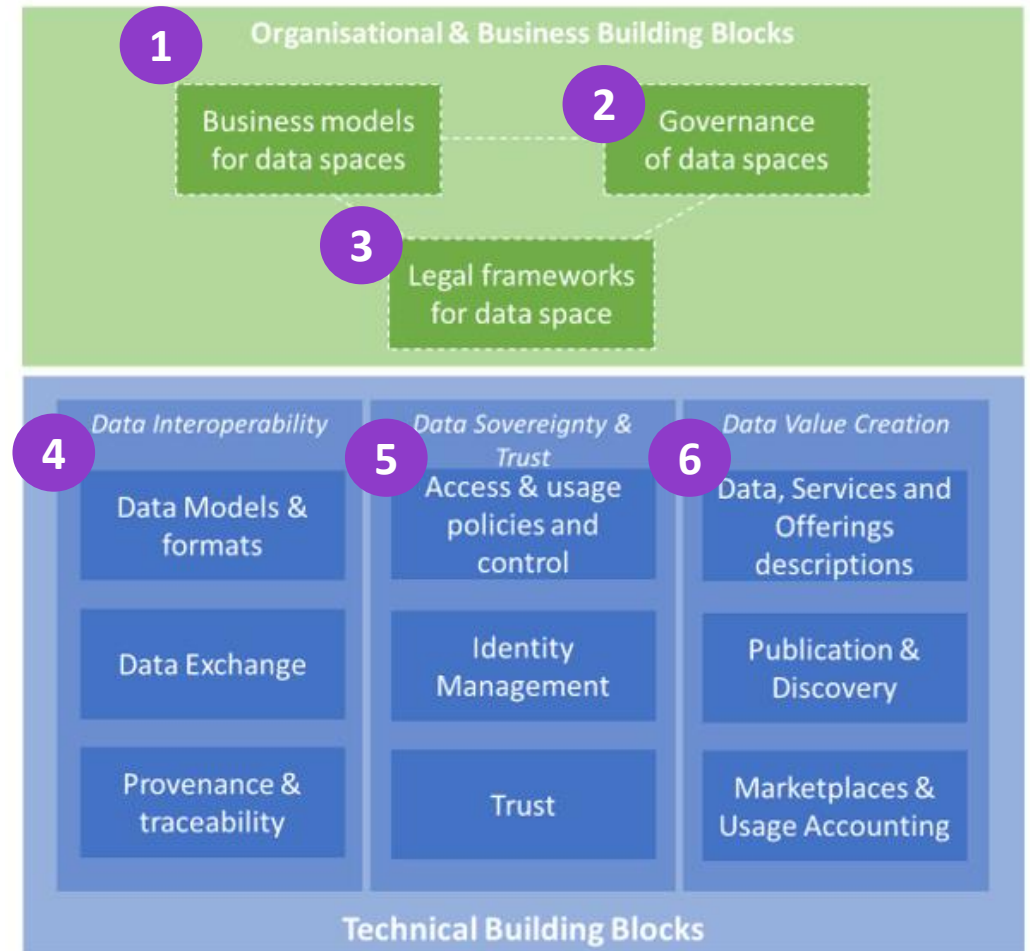
https://mobilitydataspace-csa.eu/inventory/

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PrepDSpace4mobility - Building blocks

① **Business and Funding Models**

② **Governance**

③ **Legal**

Technical Grounding & Ref. Architectures

④ Data Interoperability

⑤ Data Sovereignty and Trust

⑥ Data Value Creation

Based on the DSSC building block taxonomy:

① **Organisational & Business Building Blocks**

Business models for data spaces

② Governance of data spaces

③ Legal frameworks for data space

④ *Data Interoperability*
- Data Models & formats
- Data Exchange
- Provenance & traceability

⑤ *Data Sovereignty & Trust*
- Access & usage policies and control
- Identity Management
- Trust

⑥ *Data Value Creation*
- Data, Services and Offerings descriptions
- Publication & Discovery
- Marketplaces & Usage Accounting

Technical Building Blocks

EMDS technical assistance study

- **12 months** (Jan 2024 – Dec 2024)

- **EUR 500,000** (funded under the CEF)

- Consortium with **3 partners**

- Tasks:

  - 1 – analysis of the **technical and governance dimension** of the EMDS framework

  - 2 – analysis with specifications and recommendations for the creation of an **interlinking layer**

  - 3 – specifications and recommendations for potential **participants to interlink and exchange data through the EMDS framework**

Stakeholder interaction during study

Workshops:

1. **Feb 23, 2024**: Governance and technical dimension of the common EMDS

2. **Apr 16, 2024**: Preliminary results of the analysis of the options for the governance and technical dimension, and of the interlinking layer desk study

3. **May 29, 2024**: Initial specifications and preliminary recommendations regarding the interlinking layer and participation to the common EMDS ecosystem

4. **Sept 10, 2024**: Validation of the draft recommendations
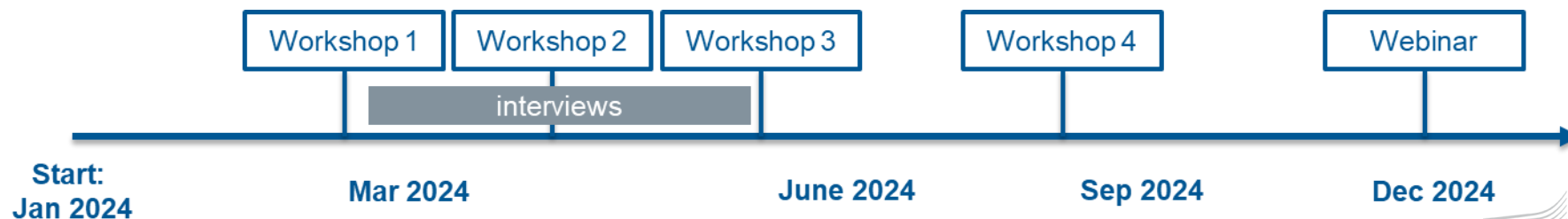
Mobility and Logistics Data EDIC

European Digital Infrastructure Consortium (EDIC): new **mechanism to implement Multi-Country Projects (MCP)** created by the Digital Decade Policy Programme 2030

Ongoing preparation of a possible **Mobility and Logistics Data EDIC** to ensure long term sustainability of common data infrastructure and promote large scale adoption. Proposed scope:

- Allowing the **coordination** and **alignment** on common standards among its members.

- support the **implementation of cross-border use cases** under a coherent approach

Preparation of an application by the **Netherlands** (host), **Germany, Finland, Spain, Austria**, **Slovakia**, **Italy** (new), **France** (observer), **Luxembourg** (observer - new) and closely followed by the EC. Other Member States, regions and organisations showed interest.

Application planned by the Members States for Q3 2024.

European Commission

Next steps

- Evaluation and award of the **DIGITAL WP 2024 proposals** (Q3-Q4 2024)

- Review **Mobility and Logistics Data EDIC** material and application (ongoing)

- Review of the EMDS **technical assistance study** deliverables (ongoing)

- Review of the **deployEMDS** preliminary deliverables (ongoing)

- Define terms of reference for the **deployment action of the interlinking layer** (Q4 2024-Q1 2025)

European Commission

Thank you

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European Commission

Useful links

European data strategy
https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en

Sustainable and smart mobility strategy
https://transport.ec.europa.eu/transport-themes/mobility-strategy_en

DIGITAL Work Programme 2024
Funding & tenders (europa.eu)

Deployment call - Funding and tenders portal
DIGITAL-2022-CLOUD-AI-03-DS-MOBILITY

PrepDSpace4Mobility (mobilitydataspace-csa.eu)

Staff working document on data spaces
https://digital-strategy.ec.europa.eu/en/library/staff-working-document-data-spaces

Consultation – Communication on common European mobility data space
Have your say - creating a common European mobility data space

Zooming into the railway sector and the ERA ontology

19 July 2024 | data.europa.eu academy

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23

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Railway ¨data¨ ecosystem

- Assets scattered all over the railway network and **in motion**
- Realtime traceability of rail data assets is crucial for effective maintenance and operations

Switch monitoring

Signal box

Traction sub-station

Catenary lines

Beacon

Junction

Rolling stock

ECM

Station platform

Rail network maintaining

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Railway ¨data¨ ecosystem
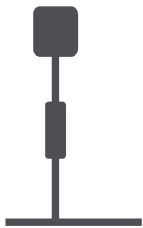
Capacity allocation

Operations centre

Maintenance works planning

Ticketing

Signal   000x

- Multiple use cases using the same data assets
- Heterogeneous data models
- Lack of common definitions
- Lack of common identifiers
- Low reusability
- Huge $$ on N2N data transformations

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FOR RAILWAYS

Context

common European Data Space

Sectorial Data Spaces (e.g. common European mobility data space)

→ data access/sharing

→ Meta data flows

→ SEMANTIC Interoperability Layer

Public and Private Initiatives

Railway Regulation generating **data stores**

Interoperability of the rail system		Safety Directive	Single European Railway Area SERA	Rail Freight Corridors (RFCs)	Trans European Network – Transport (TEN-T)
Directive (EU) 2016/797		(EU) 2016/798	Directive (EU) 2012/34/EU	Regulation (EU) No 913/2010	Regulation (EU) No 1315/2013
TSIs (CCS,Telematics, OPE..)	Registers (ERATV, RINF, ERADIS,SRD,OC)	Information Sharing System	Network statements & Capacity path allocations	Rail Facilities Portal	

Law as Code and...Code as Law
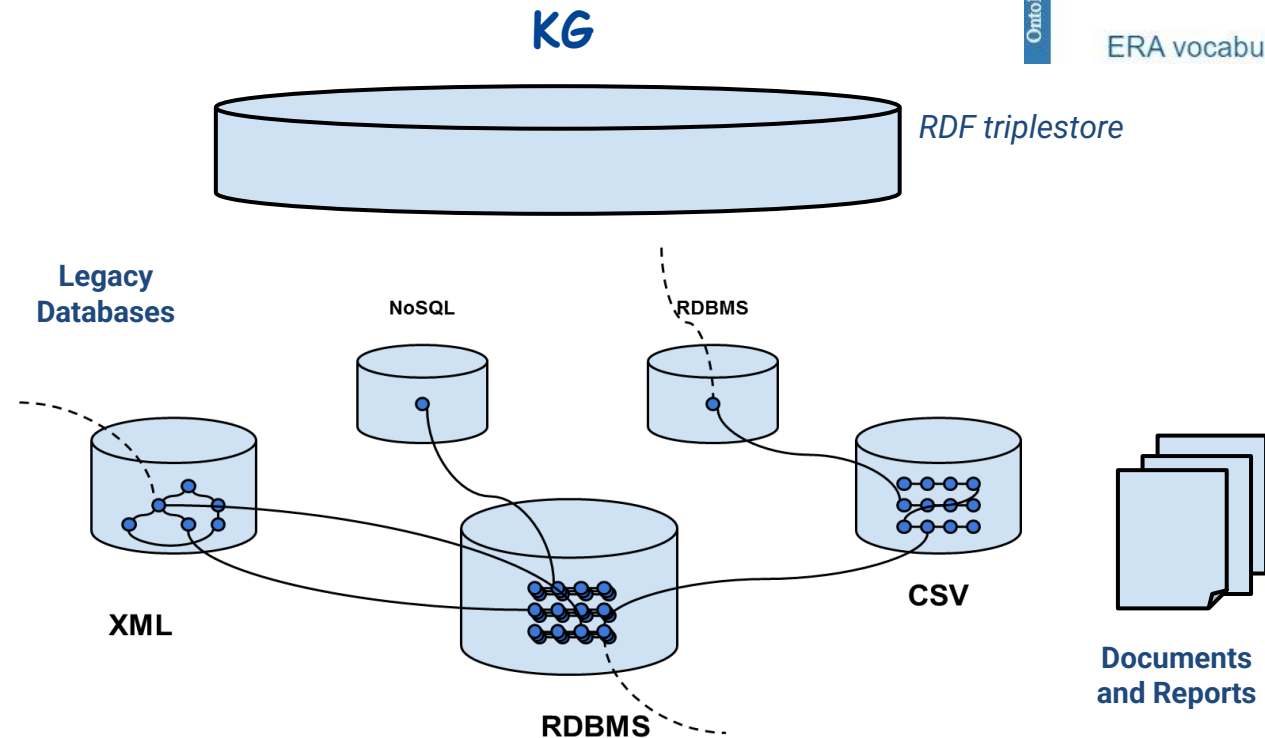
Make law machine readable

Interoperability of the rail system	Safety Directive	Single European Railway Area SERA	Rail Freight Corridors (RFCs)	Trans European Network – Transport (TEN-T)

Organization Interoperability

Legal Interoperability

Semantic Interoperability

Tecnical Interoperability

Linked data is not a technology is a mindset, an enabler towards data centricity towards ***knowledge management***

Ontology as an instrument to harmonize law glossary terms and taxonomies in the legal texts

Ontology Specification

EUROPEAN UNION AGENCY FOR RAILWAYS

ERA vocabulary. Version 3.0.0

KG

RDF triplestore

Legacy Databases

NoSQL

RDBMS

XML

RDBMS

CSV

Documents and Reports

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What about … ?

A standard ..

in use …

human and machine readable

and . . legally binding!!!

Brussels, 24.1.2024
SWD(2024) 21 final

COMMISSION STAFF WORKING DOCUMENT

on Common European Data Spaces

Article 7a

ERA vocabulary

"ERA Vocabulary" means a Technical Document issued by the Agency pursuant to Article 4(8) of Directive (EU) 2016/797, establishing human and machine readable data definitions and presentations and linked quality and accuracy requirements for each data element (ontology) of the rail system.

The Agency shall ensure the ERA vocabulary is maintained to reflect regulatory and technical developments affecting the rail system. The first update shall be made available by [*PO please enter 6 months after enter into force of this regulation*]";

(6)   the Annex is amended in accordance with Annex VII to this Regulation.

ERA ontology & ERA Knowledge Graph !

Some numbers …

- More than 36 million triples (statements)
- More than 31k lines of mappings
- More than 100 shacl shapes – business rules
- +270k track segments described
- +50k stations described
- +50k geo-referenced objects (lat/lon)
- +2k Vehicle Types described
- 27 countries covered

Ontology Specification
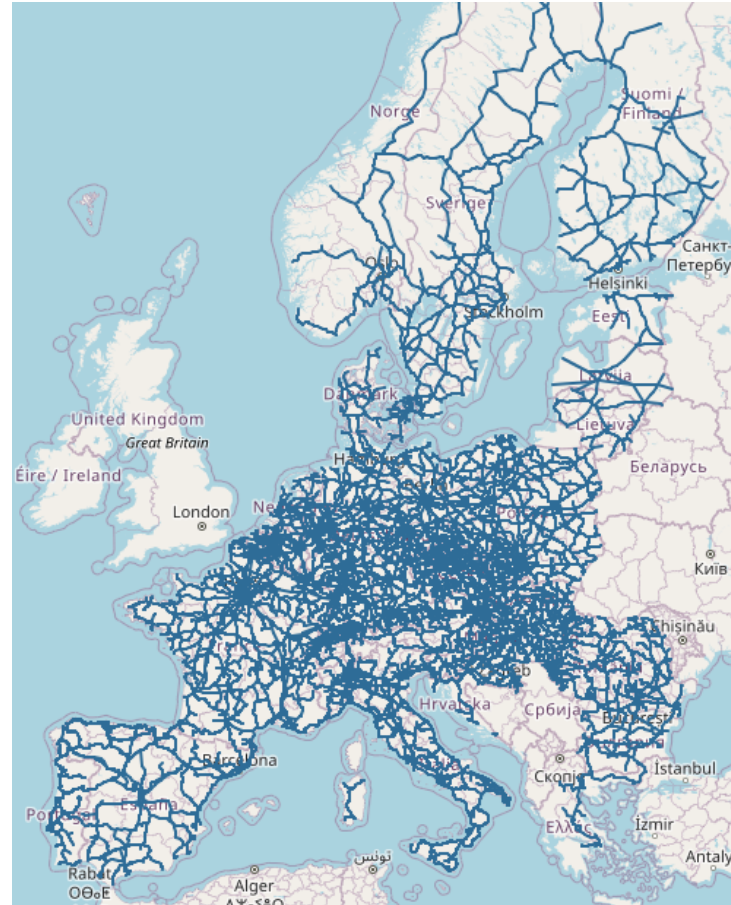
ERA vocabulary. Version 3.0.0

This version:
https://data-interop.era.europa.eu/era-vocabulary/
Previous version:
https://zenodo.org/record/7775344
Version:
v3.0.0 (released on 2023-03-29)
Publisher:
European Union Agency for Railways
Download serialization:
Format JSON LD   Format RDF/XML   Format N Triples   Format TTL
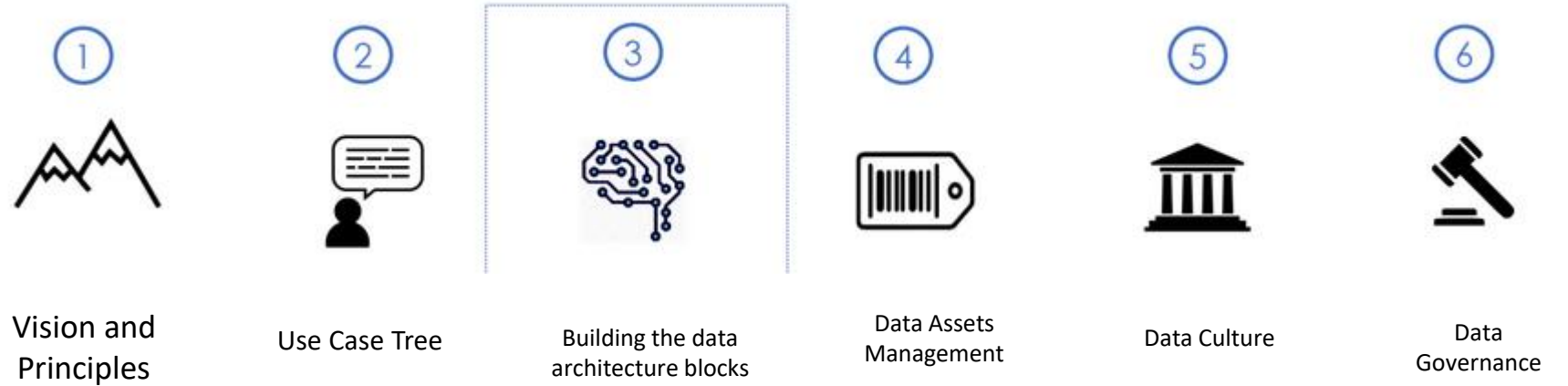**Browse SKOS thesauri:**
Format HTML
Download SHACL shapes:
Format TTL

Industrial Knowledge Graph

Zooming... IN @ Data Interoperability

Findable Accessible Interoperable Reusable

ONCE ONLY

FAIRification at scale @ERA

① Vision and Principles

② Use Case Tree

③ Building the data architecture blocks and artefacts, pipeline

④ Data Assets Management

⑤ Data Culture

⑥ Data Governance

Reusability and Interoperability

Data generated by one part of the system can be effectively utilized by other parts.

a) G2G

b) B2G

data provision to Register of Infrastructure
models semantically lifted

c) B2B i.e. harmonized Data Prep

70% of the cost of ERTMS deployment engineering hours is data transformation

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Rail Ontologies in bloom

2019

Alone in the dessert

2024

Rail Ontologies blooming as Mushrooms

Rail Ontologies in bloom

THANK YOU

Moving Europe towards a sustainable and safe railway system without frontiers.

Follow us: 🐦 in ▶

deployEMDS

Towards a common European mobility data space

Data spaces: experience from the common European mobility data space

19 July 2024

Dr. Stefanie Federl

From theory to implementation

PrepDSpace4Mobility

deploy EMDS

Oct 2022 – Sep 2023

17 European partners

Map existing data ecosystems

analyse and recommend
common building blocks for a future EMDS.
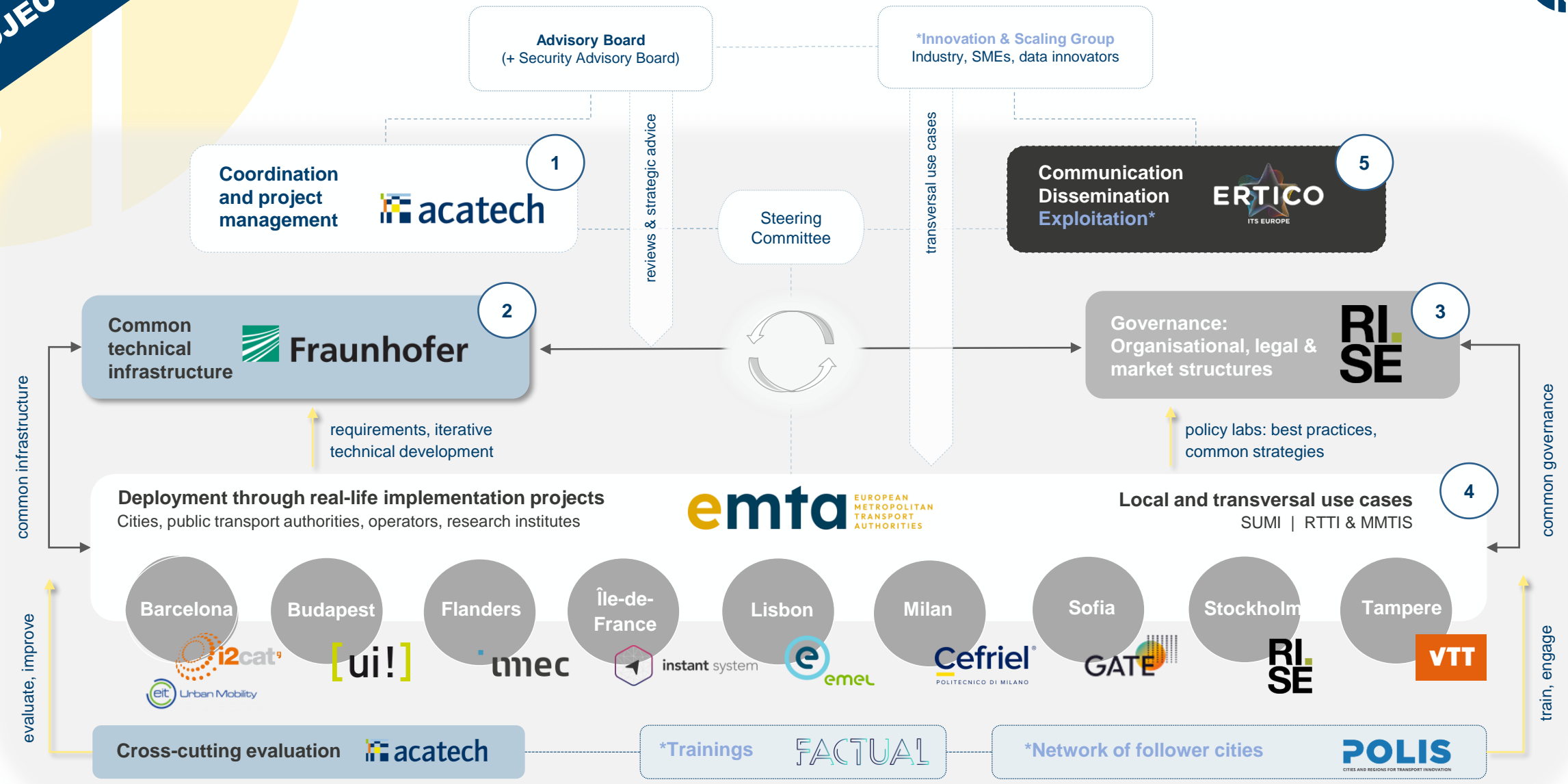
Nov 2023 – Oct 2026

45 European partners

build a decentralised technical infrastructure
and common governance mechanisms

for urban mobility use cases in 9 cities and
regions across Europe.

Advisory Board
(+ Security Advisory Board)

*Innovation & Scaling Group
Industry, SMEs, data innovators

1 **Coordination and project management** acatech

Steering Committee

reviews & strategic advice

transversal use cases

5 **Communication Dissemination Exploitation*** ERTICO ITS EUROPE

common infrastructure

2 **Common technical infrastructure** Fraunhofer

3 **Governance: Organisational, legal & market structures** RISE

common governance

requirements, iterative technical development

policy labs: best practices, common strategies

Deployment through real-life implementation projects
Cities, public transport authorities, operators, research institutes

emta EUROPEAN METROPOLITAN TRANSPORT AUTHORITIES

Local and transversal use cases
SUMI | RTTI & MMTIS

4

evaluate, improve

train, engage

Barcelona — i2cat, eit Urban Mobility

Budapest — [ui!]

Flanders — imec

Île-de-France — instant system

Lisbon — emel

Milan — Cefriel POLITECNICO DI MILANO

Sofia — GATE

Stockholm — RISE

Tampere — VTT

Cross-cutting evaluation acatech

*Trainings FACTUAL

*Network of follower cities POLIS CITIES AND REGIONS FOR TRANSPORT INNOVATION

37

16 use cases in 9 cities & regions

Mobilising Europe through interlinked data sharing ecosystems

Flanders

Sofia

Barcelona
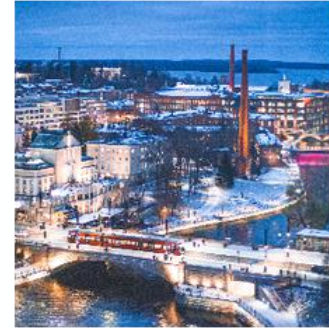
Tampere

Île-de-France region

Budapest

Milan

Lisbon

Stockholm

Focus:

- multi-modal travel information
- real-time traffic information
- Sustainable Urban Mobility Indicators

deployEMDS.eu/ deployment/

Local Use Cases in 4 Clusters, 2+ Transversial Use Cases

TRANSVERSAL 1:
Multimodality (Open PT Ticketing, Integration of Shared Mobility in PT Apps, Multimodal Mobility Management and Data Reporting to Authorities)

TRANSVERSAL 2:
Data Reporting for Sustainable Urban Mobility Indicators (SUMI)

Public Transport Operations	Data for Mobility Planning	Multimodality	Speciality Travel Information
BAR 01: Multi-Operator Fleet Data System	BAR 02: Forecasting system to optimize traffic	BUD 01: Multimodal Route Planning in BudapestGO	BUD 02: Mobility as a Right for people with reduced mobility
LIS 03: Increase reliability and commercial speed of buses	FLA 01: Optimizing the re-use of traffic measurement data	IDF 01: MaaS for Companies	LIS 01: Enhancing seamless route-planning for people with reduced mobility
	MIL 01: Decision support system for local public transport planning	LIS 02: Increasing the attractiveness of alternative mobility solutions	
	MIL 02: MaaS based mobility scenarios	SOF 01: Connected, Green and Shared Journeys	
	STO 01: Gradual introduction of zero emission zones and introduction of measures to reduce car traffic	SOF 02: Park and Walk	
	TAM 01: Collection of data mandated by ITS Directive	IDF 02: Optimization environment for journey planner providers	

Get involved

1	**Innovation & Scaling Group** Industry, SMEs, data innovators

Aims to foster **collaboration** between **deployEMDS** stakeholders and **external entities**, mainly from the **private sector**.

Its objective is to
- develop innovative use cases
- promote knowledge exchange
- ensure technical and governance developments meet private actors' needs.

2	**Network of follower cities**

Aims to engage with **external local** and **regional public entities** interested in shaping the future of the EMDS by supporting the development of the deployEMDS project.

Establish a space for local and regional public authorities to
- engage in peer-learning with deployEMDS cities
- Allow knowledge exchange on EMDS developments
- contribute to the development of future policies and standards within the EU
- collaborate with industry players and platforms represented in ISG

Contact

Project coordination
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federl@acatech.de
acatech – National Academy of Science & Engineering

/deployEMDS

www.deployEMDS.eu

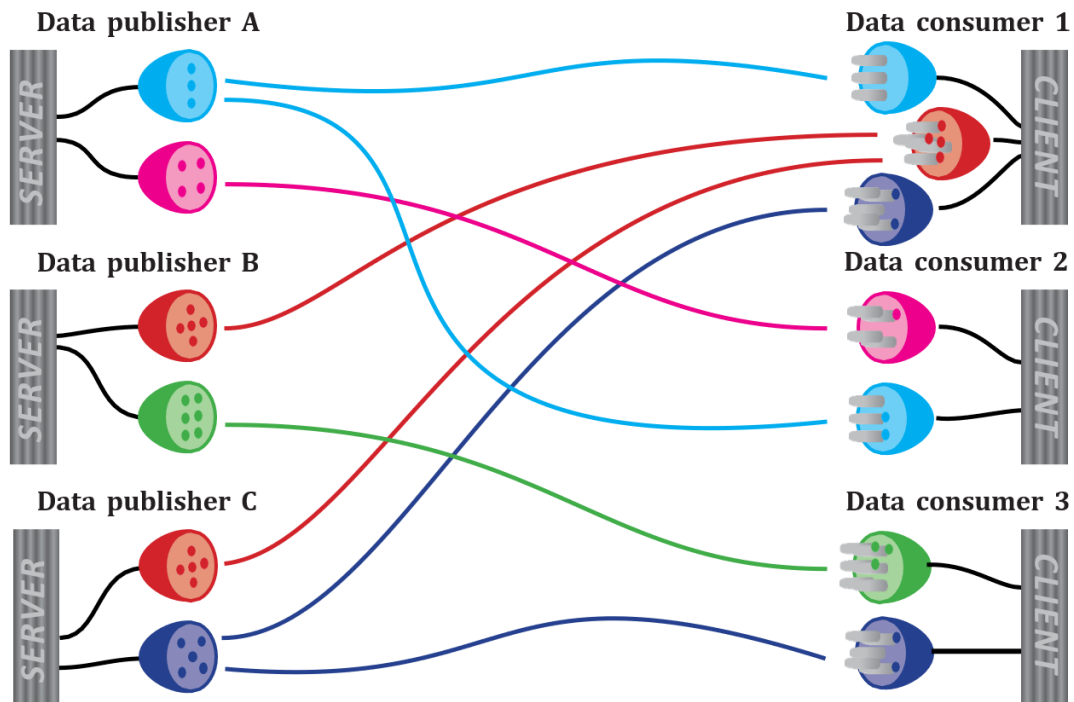Restricted Use

Data Space Concept

## AS—IS

Many different ways (and standards) to exchange data,
both on publisher side and consumer side

Data publisher A

Data publisher B

Data publisher C

Data consumer 1

Data consumer 2

Data consumer 3

TO—BE

Standardisation: publishers publish their data following the same standard
that make consumer able to use
one standard 'socket' to consume the data, regardless their origins

Data publisher A

Data publisher B

Data publisher C

Data consumer 1

Data consumer 2

Data consumer 3
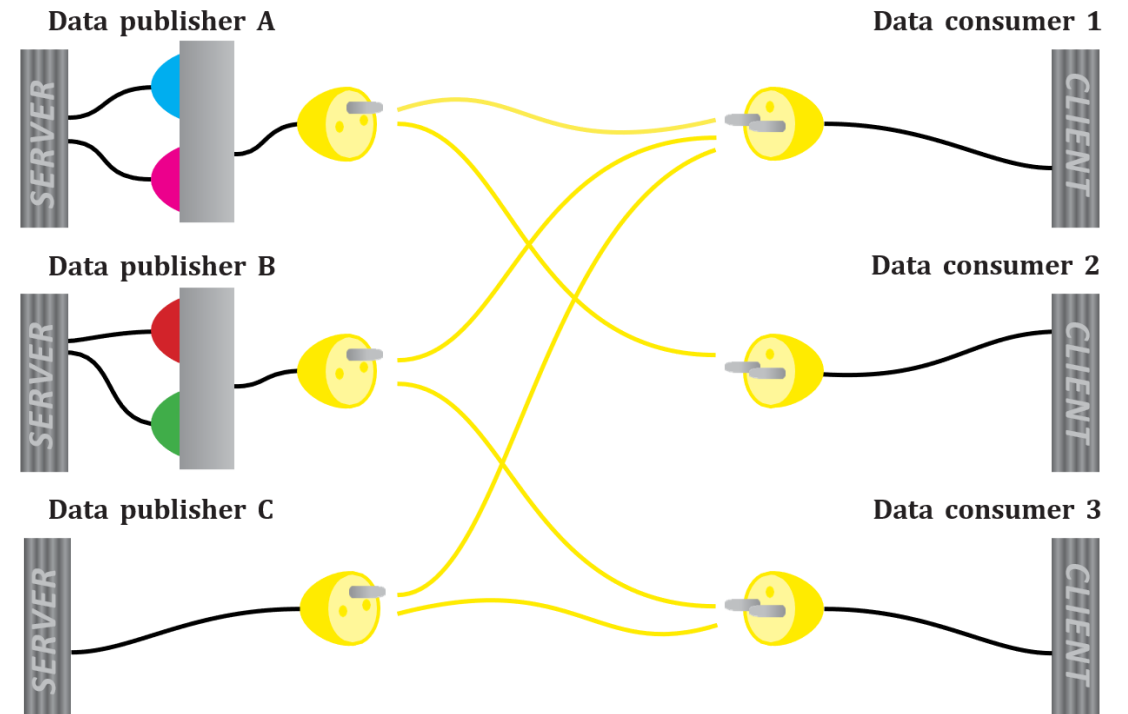
- Traffic Measurements -

Measuring the amount and speed of vehicles, bikes, walking on a specific location

A wide range of technics, each with own strong points
A lot of data protocols
Operated and used by + 500 stakeholders in Flanders region
Immature data culture
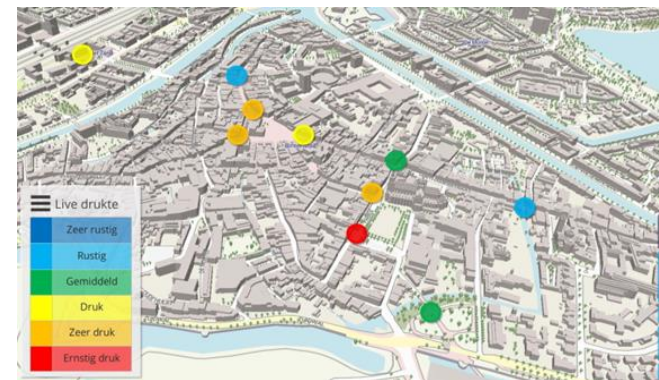
A wide range of use cases

Mobility domain:

- **Control** systems: eg traffic lights, lane signalisation, parking route guidance
- **Monitoring and evaluation**: statistics, policy KPI's, evolutions, impact of measures
- **Visualisation:** view on current traffic state, using dashboards and map applications
- **Simulations:** transportation modelling, digital twins and scenario analyses.

Outside mobility domain:

- **Environment:** emission modelling and calculations
- **Spatial planning**: impact assessment during permit processes
- **Retail and economic policy**: monitoring locations and modelling retail sales areas
- **Tourism**: monitoring and analyses
- **Advertisement:** measuring audience of out of home billboards

The value chain of traffic measurements

If you need traffic measurements, you need to buy them

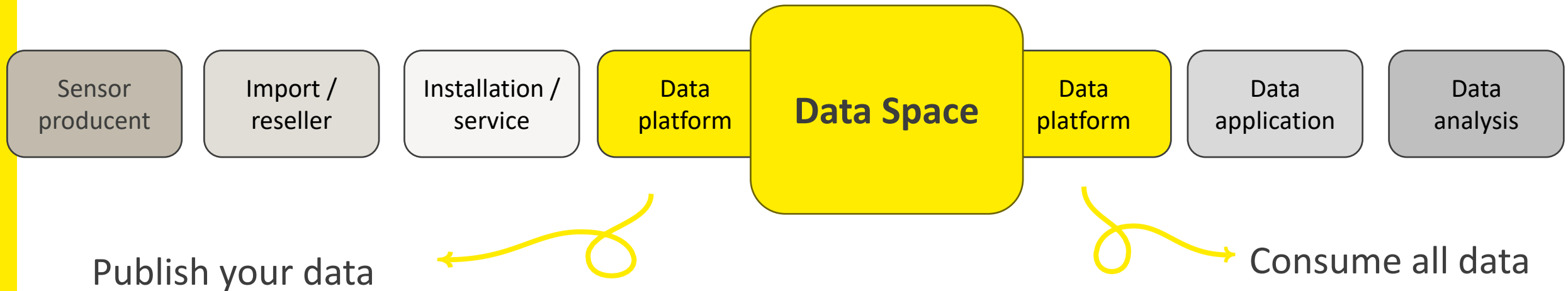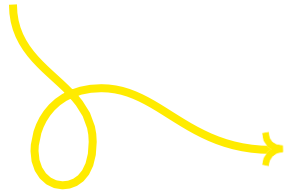| Sensor producent | Import / reseller | Installation / service | Data platform | Data application | Data analysis |

linear closed value chain

Can we change this and re-use traffic data?

Introducing a data space

Introduction of a data space leads to re-use of traffic measurement data

| Sensor producent | Import / reseller | Installation / service | Data platform | **Data Space** | Data platform | Data application | Data analysis |

Publish your data

Consume all data

- Our approach -

Understandable	=>	Standardization	**1**
Exchangeable	=>	Interface	**2**
Re-Usable	=>	Ecosystem	**3**
Future proof	=>	Governance	**4**

Traffic Measurements Data Space

data owner

data provider

BRUGGE

GEO MOBILITY IDASO

Telraam

AGENTSCHAP WEGEN & VERKEER

Vlaams Verkeerscentrum

A

sign co

TERNAT

KRYCER

Vocabularium
OSLO standard

App store
LDES building block

Meta data
'datavindplaats'

data owners → data providers → data flow → data consumers → data users
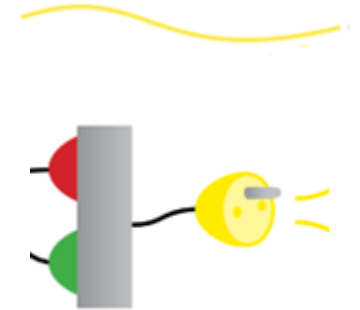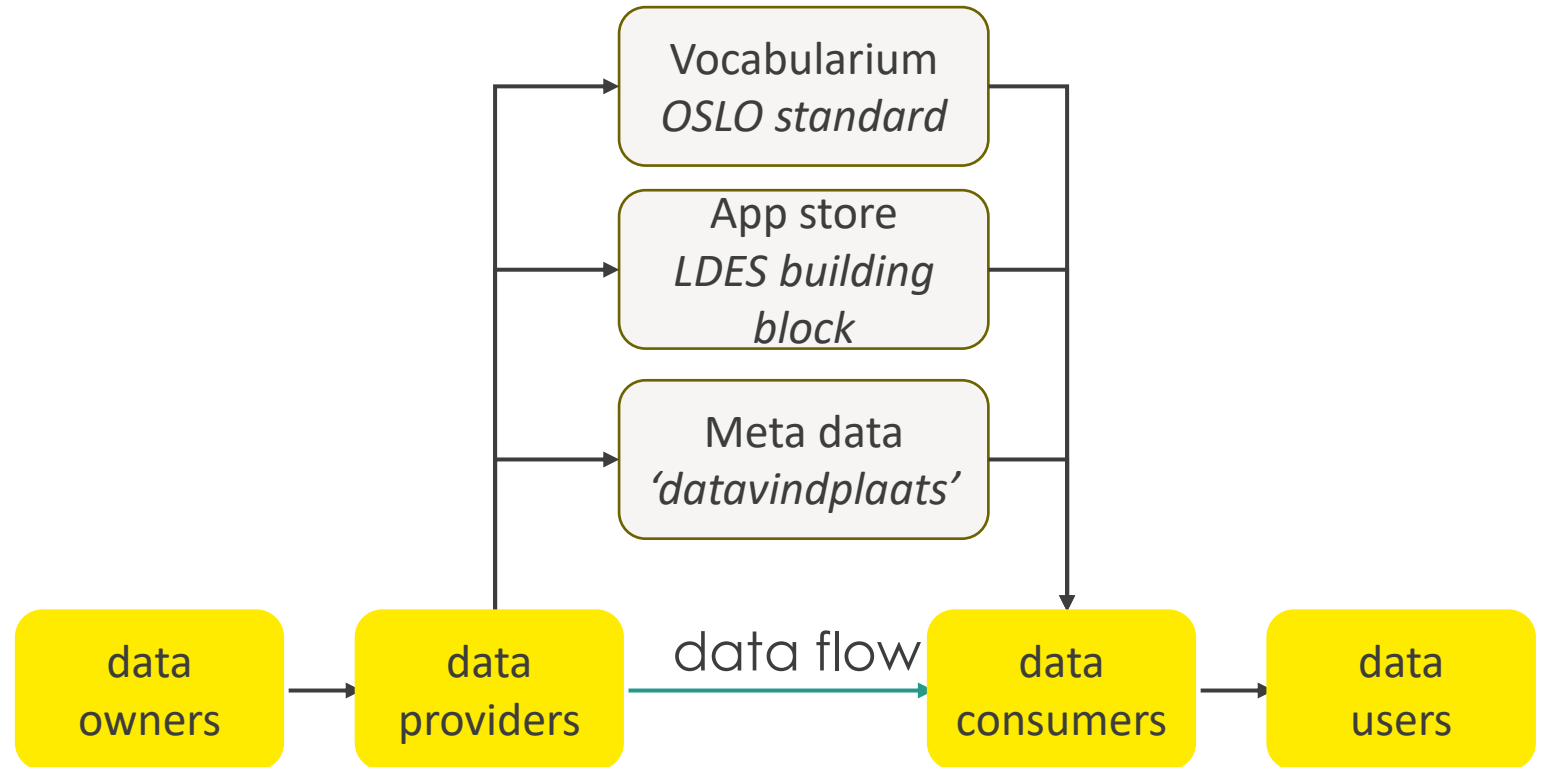
A minimal viable data space:

• Open data

• No control plane yet: no contracts

⇒ Ecosystem leads to additional onboardings, new consumers coming up!

⇒ Bottum up during a project => in search for the governance authority

Goal: further interlink with other regions within DeployEMDS

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Q&A

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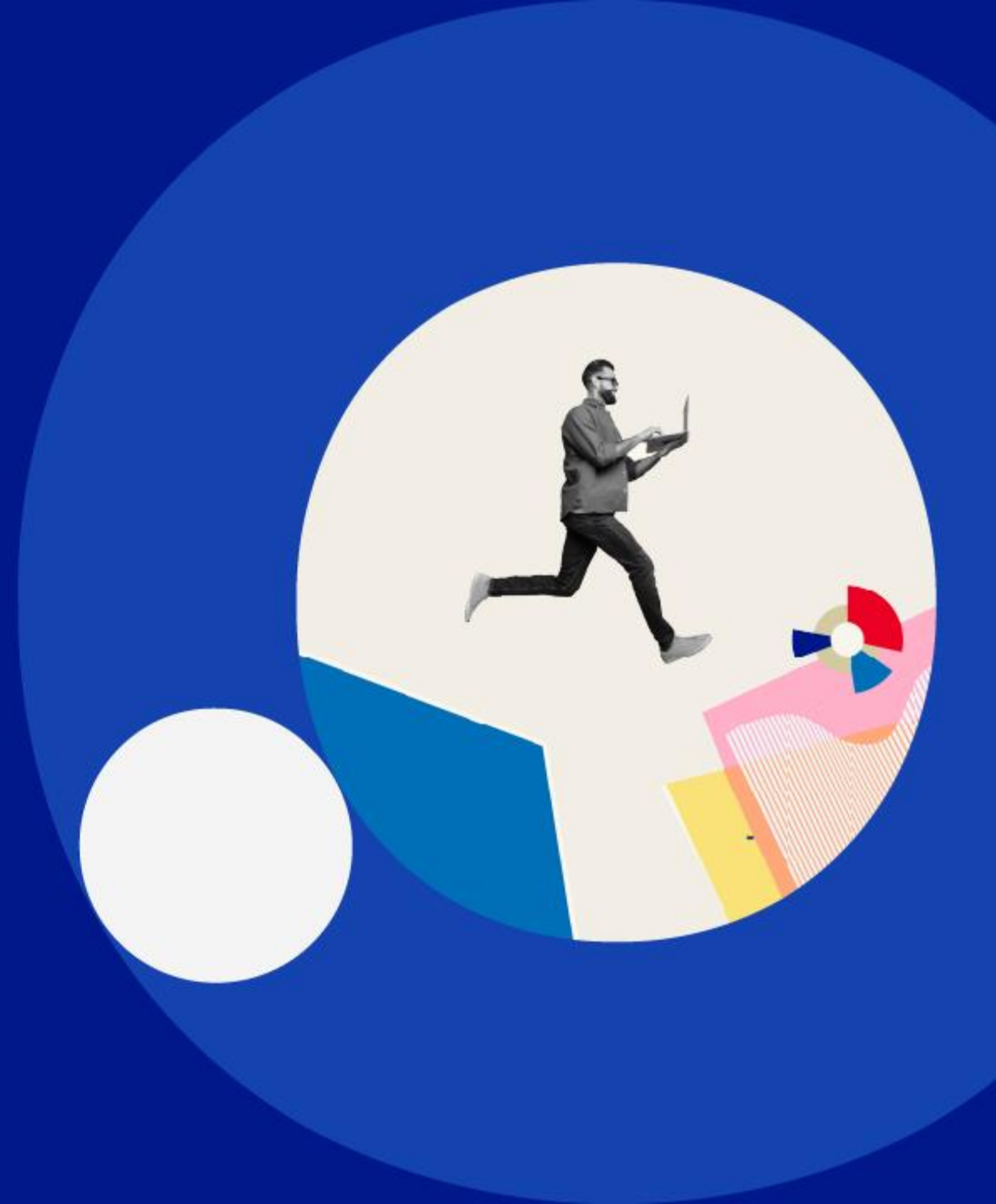Project Officer,
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Thank you

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