European forum and oBservatory for OPEN science in transport

ETC 2019

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« Open Science in transport: stakeholders involved and their areas of interest, main gaps and opportunities to overcome »

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Analysis of main actors involved

6 competence areas
- Business Modelling area
- Environmental area
- Legal/Regulatory area
- Socio-economic area
- Technological area
- Transport planning area

Research of scientific resources
- Original research data
- Operational data directly related to research
- Data from published transport research

Analysis of three main actors’ categories
- Industry
- Research
- Public authorities
Main findings

Business area

Most influencing actors
- Policy makers
- Public authorities
- Transport networks
- Commercial and logistics transport players

Research question trends
From:
- Increased traffic demand
- Transport efficiency
- Modal shift

Towards:
- Innovative commercial models also using digital technologies
- Fostering seamless and shared mobility
- Cross-cutting issues
- User needs
- People and goods services integration
Main findings (2)

Environmental area

- Most influencing actors
  - Research centres and universities
  - Public authorities
  - Commercial transport and logistics industry players
  - Policy makers

- Research question trends
  - From:
    - Tackle urban pollution
    - Improve quality of life
  - Towards:
    - Environmental protection and monitoring
    - Blue growth development
    - Alternative energies and propulsions (zero emissions targets)
    - Impact of land use
    - Increase re-use and recycling
### Main findings (3)

#### Transport legal and regulatory area

**Most influencing actors**
- Policy makers
- Public authorities
- Transport networks
- Commercial and logistics industry players

**Research question trends**

**From:**
- Management of barriers and legal issues
- Addressing incentives

**Towards:**
- Policy and regulatory needs
- Intermodal technical interoperability
- Regulatory frameworks (global level playing field for EU)
- Policies for information and data sharing and ownership
- PPPs and P2Ps
- Unified language for European transport operations
Main findings (4)

Socio-economic area

Most influencing actors
- Public authorities
- Transport networks
- Commercial and logistics industry players

Research question trends
From:
- Safety, social and economic constrains
- Public participation
- Improvement of collective transport for better accessibility and social inclusion

Towards:
- User awareness
- Market liberalisation
- Circular economy in transport
- Investments in EU innovations and transport capacity
- Supply chain cost reduction
- Travel behaviour
- Ageing society
- Pricing and externalities and service economics
Main findings (5)

Technological area

Most influencing actors

• Research centres and universities
• Commercial transport and logistics industry players

Research question trends

From:

• Quality of transport system and services
• Traffic congestion related issues
• Advancement of critical technologies

Towards:

• Smart and connected transport
• Services provision from hub to hub
• Digital awareness and resilience
• Automated vehicles,
• big data, IoT and blockchain
• New space-based applications
• Cooperative systems
• New materials
• Augmented reality systems
• Smart grids and sensors
Main findings

Transport planning area

Most influencing actors
- Public authorities
- Transport networks
- Policy makers

Research question trends
From:
- Traffic congestion
- Emissions reduction and safety increase

Towards:
- Accessibility
- Smart city planning
- Network efficiency
- Interoperability within modes
- Integrated and resilient transport systems
- Risk analysis and management
Open Science framework, terminology and instruments

Scope

- Connect transport modes, stakeholders and competence areas to extrapolate the main challenges to be addressed by the framework structure.
- List Open Science main challenges, analyses transport sector stakeholders experience and proposes a framework.
Approach

Modes of transport
Competence Areas
Stakeholders
Mapping of current situation
Survey
Terminology
Challenges
Common understanding
Potential for implementation
Open Science Sources
FRAMEWORK
## Areas of Interest & Stakeholders in Transport Research

<table>
<thead>
<tr>
<th>Areas of Interest:</th>
<th>Stakeholders:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal/Regulatory</td>
<td>Research centres</td>
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<tr>
<td>Technological</td>
<td>Universities</td>
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<tr>
<td>Transport planning</td>
<td>Private researchers</td>
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<tr>
<td>Business modelling</td>
<td>Policy makers</td>
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<tr>
<td>Socio-economic</td>
<td>Transport networks</td>
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<tr>
<td>Environmental</td>
<td>NGOs</td>
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<td></td>
<td>Community organisations</td>
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<td></td>
<td>Commercial transport</td>
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<td>Logistics industry</td>
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<td>Citizens</td>
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</tbody>
</table>
## Interrelation of Stakeholders

<table>
<thead>
<tr>
<th>Competence area</th>
<th>Primary stakeholder</th>
<th>Secondary stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal/ Regulatory</td>
<td>Policy makers, public authorities Transport networks, commercial transport &amp; logistics</td>
<td>Research centres, universities</td>
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<tr>
<td>Technological</td>
<td>Research centres, universities Commercial transport, logistics industry Transport network, policy makers</td>
<td>Transport network, policy makers</td>
</tr>
<tr>
<td>Transport planning</td>
<td>Public authorities, transport networks, policy makers</td>
<td>Commercial transport &amp; logistics Research centres &amp; universities.</td>
</tr>
<tr>
<td>Business modelling</td>
<td>Policy maker, public authority, transport networks, Commercial transport &amp; logistics</td>
<td>Research centres &amp; universities</td>
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<tr>
<td>Socio-economic</td>
<td>Public authorities, commercial transport, logistics &amp; transport network</td>
<td>Transport network</td>
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<tr>
<td>Environmental</td>
<td>Research centres &amp; universities Public authorities, commercial transport, logistics &amp; policy makers</td>
<td>NGOs &amp; community organizations Citizens</td>
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</table>
Survey – Stakeholder-centered Study

I see Open Data / Open Science as an opportunity in precompetitive research

I feel that there are no limitations to use Open Data or Open Science

My organization would benefit from using Open Data / Open Science

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree
Challenges

- Fragmented data, data quality, data security
- Technological framework (standards, etc.)
- Lack of skilled experts
- Large variety of stakeholders, privacy principles
- Legal framework

→ Establish **common understanding** among all stakeholders
→ Provide a common **technical framework**
→ develop appropriate **funding mechanisms**
## Challenges & Opportunities

<table>
<thead>
<tr>
<th>Identified Challenge</th>
<th>Framework Topics</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragmented data &amp; large variety of stakeholders:</td>
<td>Policy and Guidelines, Dissemination of Open Science in transport research data</td>
<td>Research Data Alliance (RDA)/ RDA Europe 4 Transport fOrum/ Observatory for Promoting Open Science - TOPOS Implementation Roadmap for the European Science Cloud – Communication European Cloud FREYA V-Advance</td>
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<tr>
<td>Data quality</td>
<td>Explicit guidelines</td>
<td>EU ODP EUROSTAT FAIR European Commission Open Research Publishing Platform TRIMIS</td>
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<tr>
<td>Enhancing data security &amp; privacy</td>
<td>Data protection and security</td>
<td>Cyber security framework EOSCPilot</td>
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# Challenges & Opportunities

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<tr>
<td><strong>Technological challenge</strong></td>
<td>Support and research services</td>
<td>Transport Research Cloud (TRC)</td>
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<td>eInfraCentral</td>
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<td>Next generation repository</td>
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<td>FREYA</td>
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<td>EOSC-Hub</td>
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<td>OpenAIRE-Advanced</td>
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<td>GO-BUILD – coordinating FAIR technology</td>
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<tr>
<td><strong>Lack of skilled experts</strong></td>
<td>Training requirements</td>
<td>GO-Train, European Skills and Qualifications Matrix for Open Science. FOSTER Plus</td>
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<td><strong>Legal challenges</strong></td>
<td>Policy</td>
<td>Policy development to create common understanding</td>
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<td>EOSCPilot</td>
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<td>Open Science Policy Platform</td>
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<td>V-Advance</td>
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<td>GO CHANGE</td>
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<tr>
<td><strong>Funding</strong></td>
<td>Financial schemes</td>
<td>EC initiative to support Open Science</td>
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Framework & Metrics

Framework structure:
- Policy
- Dissemination
- Financial models
- Support & services
- Training
- Data protection
- Guidelines
Framework & Metrics

adapted from: Björneborn & Ingwersen (2004, p. 1217)
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