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ENDORSE 16-19 MARCH 2021

THE EUROPEAN DATA CONFERENCE ON REFERENCE DATA AND SEMANTICS

Connecting research and public sector data through FAIR principles
Round Table
March 19, 2021

FAIR Challenges in Transport Open Science

BE OPEN

George Yannis, Katerina Folla
NTUA, Greece

Department of Transportation Planning and Engineering,
National Technical University of Athens

Background

- Transport research data is highly diverse in content, structure, use, and degree of openness
- All Transport Modes (Road, Rail, Maritime, Air, Combined transport), All Transport Types (persons and goods, urban and interurban, national, European and international, operations and services)
- Transport domains differ significantly in the data they collect, how they refer to the data, the analyses they perform, and in their views on open data

BE OPEN project

https://www.topos-observatory.eu/

- Capitalize upon existing initiatives enabling Open Science
  - Key actors will coordinate and support actions for promoting Open Science policies, services and infrastructures
  - Involve key actors in planning and implementation
  - Enable key actors to learn from direct experience, previous knowledge and other relevant stakeholders

- Facilitate a common understanding among actors
  - Promoting Open Science
  - Prioritizing existing initiatives and actions at regional, European and International level

- Monitor progress in order to facilitate continuous improvements in Open Science exploitation
  - Proper indicators will be developed for supporting Open Science purposes
  - A monitoring process will be used to address information management, internal coordination, external coordination, risk management and other relevant dimensions

Duration: 30 months

Start Date: 01-01-2019

Call: H2020-MG-2018-SingleStage-INEA

Type of Action: Coordination and Support Action

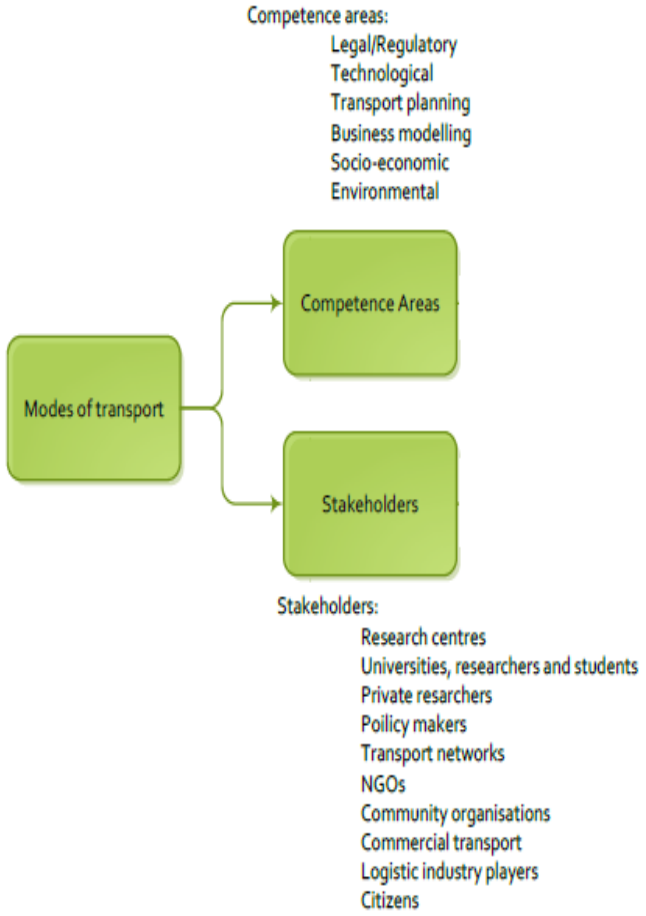
GA Number: 824323

Transport Research Data

- Original transport research data (e.g., data from Field Operational Tests, Naturalistic Driving Studies, research results and research models)
- Operational data directly related to research (as accident data, transport volumes data, etc.)
- Data from published research (as presented in scientific journals, delivered at conferences, workshops, etc.)

Transport Key Stakeholders

Type of data	Competence Areas					
	Legal/Regulatory	Technological	Transport planning	Business modelling	Socio-economic	Environmental
Original Research Data	• Policy makers • Public authorities • Transport networks • Commercial transport and logistics industry players	• Research centres and Universities • Commercial transport and logistics industry players	• Research centres and Universities • Private researchers • Policy makers • Public authorities • Transport networks	• Policy makers • Public authorities • Transport networks • Commercial transport and logistics industry players • Citizens	• Research centres and Universities • Public authorities • Commercial transport and logistics industry players • NGOs and community organisations	• Research centres and Universities • Policy makers • Public authorities • Transport networks • Commercial transport and logistics industry players
Operational data	• Public authorities • Policy makers (international level)	• Public authorities	• Public authorities	• Public authorities	• Public authorities • Transport networks • Commercial transport and logistics industry players	• Public authorities
Data from published transport research	• Policy makers (regional and national level) • Public authorities	• Policy makers • Public authorities • Transport networks • Commercial transport and logistics industry players	• Policy makers • Public authorities • Transport networks • Commercial transport and logistics industry players	• Policy makers (international level) • Public authorities • Transport networks • Commercial transport and logistics industry players	• Policy makers (regional level) • Public authorities • Commercial transport and logistics industry players • NGOs and community organisations	• Policy makers (regional and national level) • Public authorities • Commercial transport and logistics industry players



Source: BE OPEN Project Deliverable D1.1: Taxonomy of actors, terminology and experimental tools, 2019.

Benefits of Data Sharing

- Open and easily accessible data will facilitate research across communities and countries
- Promote more transport public-private partnerships, with commercial companies being encouraged to make their data available
- Reduction of funding and effort requirements for development and operation of transport systems
- Strengthen capabilities and capacities/gather intelligence
- Foster transparency and innovation in the new digital transport era

Challenges in Transport Data Sharing

- **Socio-cultural**
  - diverse approaches within the transport community
  - absence of incentives and rewarding systems
- **Technological**
  - lack of awareness on communication technologies and European research e-infrastructures
- **Political**
  - different interests and needs of the various stakeholders
  - lower priority of Open Science in governmental agendas and resources allocation
- **Organizational**
  - lack of open research tools, workflows, units and services
  - lack of available human resources
- **Economic**
  - high initial investment costs on infrastructure and scientific personnel
  - long-term efficiency of research activities and resource allocation
- **Legal**
  - diversified legislation frameworks at global level
  - unclear legal environment on data privacy, ownership and security issues

Challenges, Opportunities and Barriers in Transport Research

	Challenges	Opportunities	Barriers
Researchers	<u>Technical challenges:</u> • Expertise in data security and privacy • Expertise in data management • Expertise in open licence practices • Expertise in database design and computer programming <u>Data management:</u> • Data quality • Data protection and security • Complex nature of transport data and information	<u>Openly sharing their data:</u> • More co-operations/contacts • Gain recognition • Co-authorship to other researchers' publications using their data <u>Use of open data:</u> • Accessibility to more data • More cross-disciplinary co-operations • New, original research results and products	<u>Openly sharing their data:</u> • Significant effort to produce dataset • Data protection and ethical restrictions • Concern to opening up to competitors <u>Use of open data:</u> • Insufficient documentation of the data • Not easy accessibility • Poor data quality
Research Institutions	• Legal restrictions (GDPR, privacy issues, IPR, etc.) • Contractual restrictions from other partners • Lack of skilled personnel	• Advance of the science in the transport field • Increased collaborations across institutional, national and disciplinary boundaries • Increased collaboration between companies and research infrastructures	• Data ownership/IPR • Resources and organisational issues • Competition with other institutions
Public Transport Companies/ Organisations	• Data ownership conflicts • Data protection, privacy and ethical issues • Skilled personnel	• Improve transport operations and performance • Foster data-based decisions • Transparency	• Protection of commercial/ confidential data • Conflicts regarding ownership/IPR • Protection of personal data
Private Transport Companies/ Organisations	• Data ownership conflicts • Data protection, privacy and ethical issues • Commercial competition	• Reduce costs • Improve and align customer needs • Accessibility to more data	• Conflicts regarding ownership/IPR • Protection of commercial/ confidential data • Protection of personal data • Limited financial resources

Delphi Survey on Challenges, Opportunities and Barriers in Transport Research

- Legal and ethical issues (GDPR, privacy issues, IPR, etc.) were assessed as the main challenges for both research institutions and transport companies
- Lack of skilled personnel was also highlighted as a significant challenge for research institutions and public transport companies.
- Commercial competition was also identified for the private transport companies.

Source: BE OPEN Project Deliverable D5.1: Main challenges, opportunities, constraints and bottlenecks of Open Science in transport research, 2020.

Requirements for Open Transport Data

- FAIR data: Findable, Accessible, Interoperable and Reusable
- Ensure data quality, i.e. relevance, accuracy, credibility, timeliness, accessibility, interpretability, coherence
- Standards are needed for the data collection and data formats
- High quality metadata describing properly the data
- Appropriate formats of the metadata, so that search engines easily find and characterize data
- Appropriate infrastructure services so that both data providers and data users easily use open data platforms
- Data Management Plans should be developed in all projects, based on online tools conforming to common methodologies

Conclusions

- Open Science could increase the current great potential of Transport Systems (new infrastructure, services, governance) with:
  - more data and knowledge
  - broader geographical coverage
- Data sharing will allow the verification of the scientific results, foster collaborations among researchers and promote more public-private partnership
- Further work needs to be done in setting standards and understanding the needs of related stakeholders
- Key policy issues are needed to be tackled, concerning the conditions in which data are provided, curated, maintained and accessed with new and innovative business models

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