Open Science in Road Safety Data

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Background

- Open Science is a new approach to the scientific process, aiming to provide **accessibility to all levels of research community** and society, increase integrity and reproducibility of research.

- The rapid growth of **digital technologies** and new collaborative tools enable the vision of Open Science.

- In the EU, the **European Open Science Cloud** (EOSC) has initiated as a single point of access to all European research data, data services, tools and standards.

- Within this context, there is a need for promoting Open Science within the **road safety research community**.
What is Open Science?

- Open Science represents an approach to research that is **collaborative, transparent, and accessible**.
- Research data, research processes and results are freely available, under terms that **enable reuse, redistribution and reproduction** of the research and its underlying data and methods.
- Includes **open**: publications, research data / FAIR data, software / lab books, methodologies / protocols, educational resources, processes (open peer review), annotations.
- Promotes open research beyond academia, combining **innovation and citizen science**.
The BE OPEN Project
Duration: 30 months
Start Date: 01-01-2019

Call: H2020-MG-2018-SingleStage-INEA
Type of Action: Coordination and Support Action
GA Number: 824323

Estimated Project Cost: € 1,997,283.75
Requested EU Contribution: € 1,997,283.75
Consortium & Third Parties

- 17 partners
- 8 third parties
- 8 Work Packages
- 32 Deliverables
Objectives

- 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

- **Road safety** has a prominent role among all transport sectors and topics.
Open Science in Road Safety Research
Opportunities for Road Safety Research

- Open and easily accessible data will facilitate **road safety research across communities and countries**.

- **Open data platforms** should make it easier for the researcher to find and use data in research and this should be done at minimal cost.

- The availability of road safety data to all researchers and policy makers could support a **data-driven approach** in road safety policy making.
Road Safety Research Data

- **Original 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.)
Sources of Road Safety Research Data

- EC funded research projects
- Non-governmental and government projects and initiatives
- Industry and research projects
- Libraries of research activities (e.g. CORDIS, TRIMIS, universities, publishing houses or research institutes etc.)

European Open Science Cloud
- European Union Open Data Portal (EU ODP)
- Registry of Research Data Repositories

Eurostat, national statistical agencies, national governmental bodies

Published research articles in scientific journals or at conferences, workshops etc. (e.g. DOAJ)
Examples of Open Science in Road Safety (1/2)

Road Safety Observatories

- ERSO, European Road Safety Observatory
- OISEVI, Ibero-American Observatory
- African Road Safety Observatory
- Dacota, EC Project – Knowledge Centre
- NRSO – NTUA Road Safety Observatory
Examples of Open Science in Road Safety (2/2)

Road Safety Decision Support Systems

- SafeFITS, UNECE-Global Road Safety Model
- SafetyCube, EU Road Safety DSS
- iRAP, Road Safety ToolKit
- PRACT, CEDR
- PIARC, WRA Road Safety Manual
- US NHTSA/FHWA CMF Clearinghouse
- AustRoads Road Safety Engineering Toolkit
Barriers in Data Sharing

- Fragmentation of data ownership and a lack of interoperability between datasets and platforms.
- Different interests of the various road safety stakeholders in data, creating differing requirements for data access.
- Data ownership varies by who generates and collects the data and they may be not willing to share data due to privacy, legal liability, IP, competition, or cost related issues.
- Road safety data are often ethically or commercially sensitive.
- The diversity of data sources affecting data quality.
- Variations in hardware and software used for collecting the data.
- Lack of expertise in machine learning, data mining, and data management.
Requirements for Open Research 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.
- **DMPs** should be developed in all research projects, based on online tools conforming to common methodologies.
Road safety data are often ethically or commercially sensitive, requiring tight controls for their access.

Issues, such as personal or privacy sensitivity, intellectual property rights (IPR), should be taken into consideration.

Other issues concern fair competition, cybersecurity, and liability.

The use of strong de-identification techniques, data aggregation and encryption techniques are critical.

The existence of a clear legislation and a legal framework supporting data security, data protection and privacy is imperative.
Concluding Remarks
Scientific and Social Impact

- During the last years, several Open Road Safety Information Systems have been developed, adding significant value to the quest for safer roads worldwide.

- The more developed Information Systems are associated with countries and regions with higher road safety performance and are a direct sign of advanced road safety culture.

- Road Safety Information Systems are key management tools for developing road safety capacity and engaging stakeholders (not only for providing scientific evidence but also for monitoring efforts).

- Making road safety research results more accessible contributes to better and more efficient science and provides greater evaluation by the scientific community.
Future Challenges

- Open Science could increase the current great potential of Road Safety Systems with:
  - more data and knowledge
  - broader geographical coverage

- Global impact could be optimized through:
  - a network of open science road safety systems
  - standardisation of data, processes and systems
  - evidence-based & customized best practice guidelines

- Data sharing will allow the verification of the scientific results, could foster collaborations among researchers and promote more public-private partnership.
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