FLORENCE SCHOOL OF REGULATION

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POLICY BRIEF

EUROPEAN TRANSPORT REGULATION OBSERVER

Creating a common European mobility data space

Highlights

Transforming Europe into a climate neutral economy by 2050 in line with the European Green Deal places a particular responsibility on the transport sector, which accounts for a quarter of the Union's total greenhouse gas (GHG) emissions. Specifically, transport will have to collectively reduce its GHG emissions by 90% by mid-century compared to 1990 levels.

This will require advancing digitalisation and the use of data in all modes of transport, including passenger and freight segments. Notwithstanding, data availability, access and exchange in the transport sector today continue to be hampered due to unclear regulatory conditions, the lack of an EU market for data provision, the absence of an obligation to collect and share data, incompatible tools and systems for data collection and sharing, different standards, or data sovereignty concerns, among others.

The European strategy for data aims to establish a single market for data, where data can be accessed and used efficiently. This will include the creation of a common European mobility data space to facilitate access, pooling, and sharing of transport and mobility data. Against this backdrop, the 10th Florence Intermodal Forum brought together relevant stakeholders to discuss opportunities and challenges for building such a mobility data space.

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Building the Common European Mobility Data Space

A comment by Juan Montero and Matthias Finger, Florence School of Regulation – Transport Area

As part of the European strategy for data, the Commission is proposing a common European mobility data space as one of the EU-wide strategic data spaces. Relevant to the mobility data space are certainly also the energy and the tourism data spaces. The aim of such sectoral data spaces is to facilitate data flows among stakeholders, so as to improve mobility in the European Union and further the single transport area, always of course respecting European values.

Being basically in support of the European Single Transport Area, we think that the mobility data space should reflect a similar architecture: just as the EU is building a new European-wide more integrated transport network on top of the national transport networks by interconnecting them, making them interoperable, defining common rules for PSOs and financing, as well as identifying priority-lanes (e.g., corridors), a similar approach could and should be adopted at the transport or mobility data layer: the aim should not be to build an entirely new data layer from scratch, but rather to interconnect already existing initiatives at the local, national or sectoral levels (e.g., logistics) by facilitating and promoting the interoperability of existing data pools and data spaces, and, if need be, to develop and invest in missing links and specific priority areas. In this sense, the EU-wide mobility data spaces should be the equivalent, on a digital level, of the physical transport infrastructure. Just like EU-wide physical transport services become possible thanks to an ever more interconnected and ever more interoperable infrastructure, digital mobility services would, and doubtlessly will become possible thanks to ever more interconnected and interoperable data ecosystems.

In other words, just like the EU does not own physical transport infrastructures, but defines rules as to their standards, their utilisation, their access, their pricing and their public service functions, the same will be true for the mobility data infrastructures: again, the EU will not own them, but set certain standards, as well as certain rules as to their utilisation, their access, and perhaps even one say their pricing along with, who knows, their public service functions in the future.

To recall, the EU has already promoted and/or regulated data initiatives in specific transport modes and for specific purposes. It will and should continue to do so in areas where specific public policy objectives make such data initiatives necessary. But such data initiatives, as well as private data space initiatives, which may more appropriately be labelled data clubs, do not make up for an EU-wide mobility data space. They are merely potential components of such an EU-wide mobility data space, i.e., they are areas where data are exchanged under specific rules in a more advanced manner, sometimes even in real time, among selected actors all pursuing shared purposes.

We think that a common European mobility data space could indeed make a difference if it succeeds in mapping all the existing and still emerging data initiatives and (local as well as national) data spaces, reinforcing interoperability among them, and enhancing data discoverability in this data universe (space?).

Mapping appears to us to be the point of departure, owing to the difficulties to keep track of all the national, regional and local initiatives to pool and exchange transport data. It is even more difficult to identify the myriad of private initiatives often with a narrower scope (e.g., data clubs), be it geographical or purpose-oriented. Again, the common European mobility data space should not be built against all these initiatives, but rather on top of and thanks to them, ultimately reinforcing them.

Interoperability will be the key tool. The Commission could certainly make a difference by enhancing the interoperability of the existing and future data pools, spaces and clubs. The more data can be exchanged the more network effects can be generated, the more efficient the European mobility system will be and the better it will meet the users' needs.

In doing so one should distinguish between technical and semantic interoperability: Technical interoperability is required, as data generating infrastructures, software application protocol interfaces, and others more have to be standardised so as to make data exchange feasible. Some interoperability standards are emerging as winners in certain transport modes and in certain geographic areas. While building a new EU standard to be imposed across all transport modes and all Member States will be overly ambitious, the Commission may simply step in by supporting the most popular standards as well as by filling in the gaps (see the Interoperable Europe Act, adopted by the Commission in November 2022).

Semantic interoperability, in turn, is required, so that data has a format and a meaning that can be identified and shared by the stakeholders. It is useless to share data that cannot be read and managed by the recipient party. Again, standardisation is key, and the Commission has an important role to play.

Discoverability is also an important as a means to fully exploit available data. Discoverability is the ability to easily locate the data available, know about its quality, understand its structure and origin and be guided as to how to access it. Promoting the availability of tools like data catalogues, metadata, etc. would allow to build information and knowledge out from available data. The most useful data are the ones that are generated and exchanged at the right moment in time, including real time, though complex interactions among different players such as data providers, data consumers, data brokers, data intermediaries, identity services providers, digital platforms and many others. The mobility data space could support and accelerate the emergence of such a sophisticated ecosystem covering all transport modes across Europe.

And all this should of course be framed within the broader principles of data spaces as currently being defined at the EU level for all data spaces and even beyond, notably in the Data Governance Act as well as in the Data Act.

Main Takeaways from the Discussions

By Francisco de Abreu Duarte, European University Institute, Law Department

The present Forum was part of the stakeholders' consultation that the EC is conducting to receive feedback on the Communication on the creation of a common European mobility data space (EMDS). This initiative took place in parallel with the Call for Evidence that was published between November 9th and December 7th 2022, entitled 'Transport data – creating a common European mobility data space'.

1. Introduction

In 2020, the European Commission (EC) launched its European data strategy, aiming at transforming the European Union (EU) into a global leader in a data-driven society. Among the different objectives of such strategy, the EC committed to proposing actions to build common European data spaces, facilitating access, pooling and sharing of data. These proposed data spaces are divided into key areas: health, agriculture, manufacturing, energy, mobility, Green Deal, finance, public administration, skills, tourism, media, and cultural heritage. According to the EC's staff working document, these data spaces will include:

- the deployment of data-sharing tools and services for the pooling, processing, and sharing of data by an open number of organisations, as well as the federation of energy-efficient and trustworthy cloud capacities and related services;
- the creation of data governance structures compatible with relevant EU legislation, which determine, in a transparent and fair way, the rights of access to and processing of the data;
- the improvement of data availability, quality, and interoperability – both in domain-specific settings and across sectors.

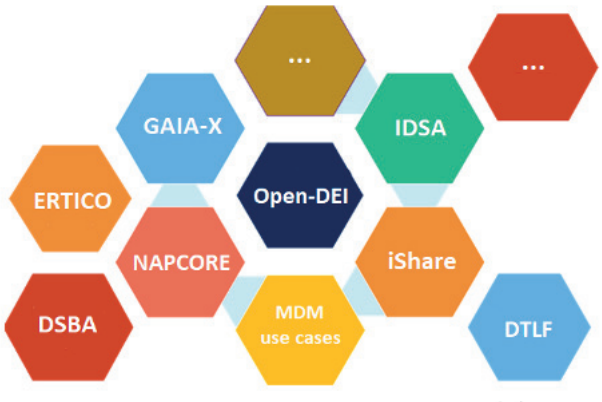
These data spaces could, in principle, improve different industries to grow and have better and more efficient supply chains. Regardless of the sector in question, these spaces must comply with the foundational principles of data access and use in a **fair, transparent, proportionate, and non-discriminatory manner**, with clear and trustworthy governance structures.

One such proposed data space concerns mobility. According to the EC's Mobility Strategy and Action Plan, a vital part of the future of European mobility is boosting innovation in data and Artificial Intelligence, which includes promoting such a common European mobility data space.

Among the several existing sectors subject to data spaces, mobility plays a particularly prominent role, given its long tradition of data exchanges. With existing mobility data-sharing practices and frameworks at local, national (e.g., German Mobility Data Space) and private levels (e.g., EONA-X), many of them already subject to regulation at national or EU level, a common European mobility data space has much to offer.

As the Commission identified in its staff working document, this pre-existing *acquis* on mobility data eco-systems means that the focus should be placed on *'existing EU and Member States' legislation and infrastructures related to transport data. It should promote interoperability by contributing tools to support convergence on governance and infrastructure.*'

Fig. 1 – Some ongoing initiatives and actors across Europe contributing to developing of data spaces



These goals have been translated into numerous legislative efforts at the European level, including horizontal pieces such as the Data Act and the Data Governance Act, but also sector-specific legislation for transport and mobility, such as the ITS Directive and the eFTI Regulation and many other modal legislation. Furthermore, in its Sustainable and Smart Mobility Strategy, the Commission announced further actions, such as the revision of the Delegated Regulation EU) 2017/1926 on multimodal travel information services, the revision of the Directive 2005/44/EC on harmonised river information services and of Directive 2010/40/EU on intelligent transport systems.

The Commission has also announced several other actions for the digitalisation of the aviation, rail, maritime and freight sectors.

In this context, multiple stakeholders met at the 10th Florence Intermodal Forum, which gathered representatives from the mobility industry, the European Commission, and relevant associations to discuss the idea of a common European mobility data space. This Report analyses the main takeaways from the one-day discussion from four distinct points:

i. the EC's strategy on a common European mobility data space;

ii. the meaning and mapping of a data space;

iii. how to learn from other data spaces;

iv. interoperability as a solution for Data Spaces; and

v. some final conclusions.

2. The EC vision on the common European mobility data space

The idea of a common European mobility data space (EMDS) stems from the two aforementioned strategies, namely the Data Strategy and the Sustainable and Smart Mobility Strategy. In both efforts, the core concept of data sharing for the common good is put forth using such data in a mobility context toward a more sustainable internal market.

Indeed, the EMDS could contribute to fulfilling the strategy's three main objectives:

Sustainability: including a 90% reduction in GHG emissions from transport by 2050 compared to 1990 levels;

Digitalisation: rendering mobility smarter, more efficient and greener; and

Resilience: making the transport sector more resilient to conjectural impacts, such as pandemics.

The key element of 'smart' mobility requires ensuring a framework for data exchanges that can help foster mobility innovation for the future. However, any attempt to establish such common ground is hindered by different challenges, including unclear regulatory landscapes, incompatibility between systems, and the lack of an actual EU market for data. On top of this, pre-existing data-sharing structures, motivated by private and national initiatives, make interoperable solutions challenging to agree on. More than finding a common technical solution, the challenge has been to reach a joint agreement on which solution to adopt.

These challenges led the discussion to its first key question of the day:

Key Question #1

How do we establish links between these initiatives? how do we break the silos?

A critical legislative initiative to answer this question relates to the proposed amendment to the ITS Directive 2010/40/EU, governing the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport. According to the EC's objectives, this amendment should reflect the importance of data-sharing by mandating: i) the availability of crucial data (e.g., real-time traffic information) and ii) the deployment of essential services (e.g,. road safety).

All data spaces must **also share some common characteristics** that the EC highlighted during

the discussions. These would necessarily comprise:

- A secure and privacy-preserving infrastructure to pool, access, share, process and use data;
- A data governance mechanism, including rules governing how data is shared in a trustful, transparent and law-abiding manner;
- Placing data holders in control, namely on who accesses their data and for which purposes;
- Deploying vast amounts of data on a voluntary basis, which can then be reused in different ways, subject to the data holders' decisions;
- Gathering an open and participatory number of organisations and individuals.

Such a notion of a data space would build on existing initiatives rather than being designed from scratch. The EC clarified this point throughout the discussion, given that it raised concerns among stakeholders from early on.

The European Commission's position was then made clear in the following statement:

> 'A "data space" is not a database or a piece of hardware infrastructure. The common European mobility data space should be a framework for interlinking and federating many different transport data eco-systems that are rather heterogeneous and often difficult to discover or access.

The discussion made clear that establishing such a common European mobility data space is no easy task. There are overarching challenges that must be discussed before advancing. For example, the industry's reluctance to share data due to industry secrecy or competitive advantages. Likewise, the heterogeneity and diversity of data types and stakeholders and the fragmentation of existing databases and data sharing standards renders any interoperability exercise very difficult, despite many sectoral harmonisation efforts.

The complexity of introducing a common mobility data space becomes obvious when taking into account the numerous existing data-sharing infrastructures in the multimodal spectrum.

In summary, according to the European Commission, the EMDS should have as objectives to:

- Identify essential data and increase their availability to support services considered crucial across the EU's territory;
- Help users in the discovery of available data sources, providing tools for the user to understand the data quality and related access conditions;
- Facilitate data access and reuse through the modal and cross-modal harmonisation of sharing conditions
- Enable technical, organisational and legal interoperability for data access, reuse and data sharing between public and private actors;
- Optimise data collection and reduce administrative burdens;
- Facilitate interoperability with other common European data spaces and allow data sharing and reuse.

This introduction by the Directorate-General for Mobility & Transport and by the Directorate-General for Communications Network, Content and Technology opened the discussion and framed the rest of the exercise, namely the conceptual mapping and solutions brainstorming.

3. Mapping the concept of data space

In this mapping exercise, industry representatives and associations took the floor to question the EC and discuss the concept of data spaces. Two important remarks were broadly shared by the audience regarding the concept of a data space.

First, many representatives highlighted that the expression of "data space" might induce

confusion. It could namely transmit the wrong idea of a single pool of data – akin to a data lake (or data swamp, as a representative remarked). This calls for raising awareness on the notion of data spaces, as defined, for example, by the Data Spaces Support Centre, as decentralised structures to enable trustworthy data sharing between data space participants based on common standards and governance, while ensuring compliance with relevant laws and fair treatment of all involved. The Commission also remarked that while many organisations could develop data spaces, there could only be one common EU mobility data space interlinking all these data spaces

Second, some representatives noted that the geographical scope of any data space could ultimately result in a data silo itself. For example, if this data space is not properly connected to other regional data initiatives, the industry will have difficulties adapting and promoting full interoperability.

Another important point raised during this discussion was the multi-level challenges engrained in the notion of data spaces. The point was made regarding micro-mobility providers, who work closely with local authorities and national access points. In many of these data-sharing experiences, some stakeholders argued there is uncertainty and inefficiency in using the data provided. The EMDS should also pay close attention to minimising technical integration efforts (e.g., not demand the adoption of new standards) and try to work with existing technology. Moreover, it would be essential for commercial information to be protected. This once again appealed to the idea of Data Sovereignty, meaning the capability of an individual or organisation for self-determination with regard to the data it generated or acquired in the first place, without prejudice to existing legislation.

This session highlighted some core points which should be clarified in defining a common data space for the future:

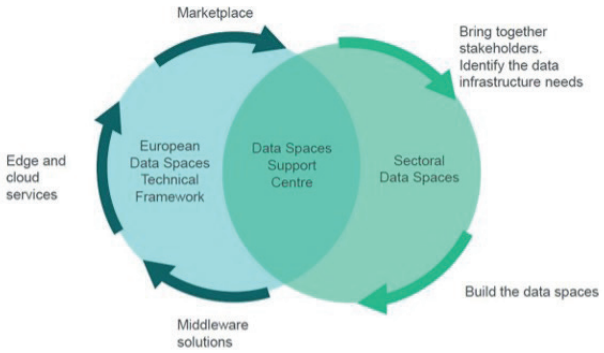
1. **Who are the different actors interacting and ready to participate in this data space?** These range from private entities to local governments, national authorities and regional bodies;
2. **Under what conditions are actors willing to make their data accessible and share it in this data space, if no mandatory sharing obligations exist**? Here the interaction between data altruism and data sovereignty became clear, with industry representatives having different positions on it;
3. **What are the required elements to build a data space?** Data spaces should combine a 'soft' technical infrastructure and a governance structure. This implies a number of decisions, for example, on the architecture (e.g., is there a need for central components?), the governance framework (e.g., is there a need for a neutral trustee?) and the economic model (e.g., should it be publicly funded? Commercially viable?). More importantly, the data space should help participants discover and make visible existing data assets and the conditions attached to their use, helping to share data in a trusted and sovereign way. The data space should be able to progressively grow, enabling more and more use cases.

Members of the industry highlighted that data is a strategic asset and that making it available is costly. It was made clear that the idea of data space is not to share every bit of data. Quite the contrary, the objective is to be selective, identify which use cases could benefit from this, and adopt cross-sector interoperability to reduce the effort to implement technical standards. Discoverability is also essential to know what data is available and under which conditions in order to be able to identify new use cases.

Some participants have also contributed to the active development of such an EMDS from a technical perspective by creating a proposed eco-system taxonomy. The PrepDSpace4Mobility project will prepare the deployment of the common European mobility data space. The

project will develop an **inventory of existing data eco-systems and initiatives** in the mobility and transport domains and **analyse existing gaps** among mobility data. The ultimate objective is to identify common building blocks that could serve as the basis for P2P interaction and deploying the EMDS. Such an open eco-system could have exceptional benefits for the industry, namely securing data sovereignty by enabling trustworthy and controlled data sharing between all participants.

Fig. 3 – Approach to support the deployment of common European data spaces. Source: European Commission



Once again, commenting on this type of initiative, the participants highlighted the need for coordination and consensus building. This will only be possible if rules are fair and balanced according to all stakeholders and if technical solutions are scalable.

At this moment, another key question arose:

Key Question #2

What are the pre-conditions to securing consensus among stakeholders in these ecosystems?

4. Learning from other Data Spaces: the specific case of Tourism

The discussion then shifted towards learning from existing experiences outside of the mobility area. The focus was placed on learning **from tourism data exchanges** and contrasting such an experience with the mobility landscape.

A key aspect of data sharing in tourism is the need for strong semantics. Tourism needs a common language that can be understood by different market players and which allows cross-border exchanges to occur without problems. For example, a hotel in Italy or Portugal should have common identifiers that allow for standardisation and data exchange. Unlike other areas, tourism is horizontal, with less need to define what data gets in and out of the space. The market is ever-evolving, and new uses for data make such a top-down exercise inefficient.

Tourism also has some particularities that contrast it with the mobility landscape.

First, it is a market dominated by small and medium enterprises, with typically low levels of data access or sharing culture. This is mostly because data is collected by large platforms, which may have little incentive to share it with other players.

Second, in tourism, there is not a tradition of data sharing as in mobility. One of the main conclusions of this comparison/contrasting exercise was to note how advanced the mobility sector is in terms of data-sharing initiatives. Due to its historical connection to public investment, transport has had a long history of state intervention, which might be more welcoming to regulation. On the other hand, tourism has been traditionally private-led, with a potential rejection of the state's mandatory data-sharing obligations.

The discussion clarified that the Commission's Data Strategy was a radically new way to look at digitalisation. It represented a new European data economy model based on the collaboration between different stakeholders, which highly contrasted with the privatised view of the Silicon Valley model. Tourism provided a good

example of a sector that might benefit from such an approach, and the comparison exercise was very productive. While other sectors like health are quite developed in data-sharing practices, they sometimes look at very specific data types (e.g., patient data). Each data space's characteristics are then crucial in shaping how data sharing should occur in that market. A one-size fits all approach will not work.

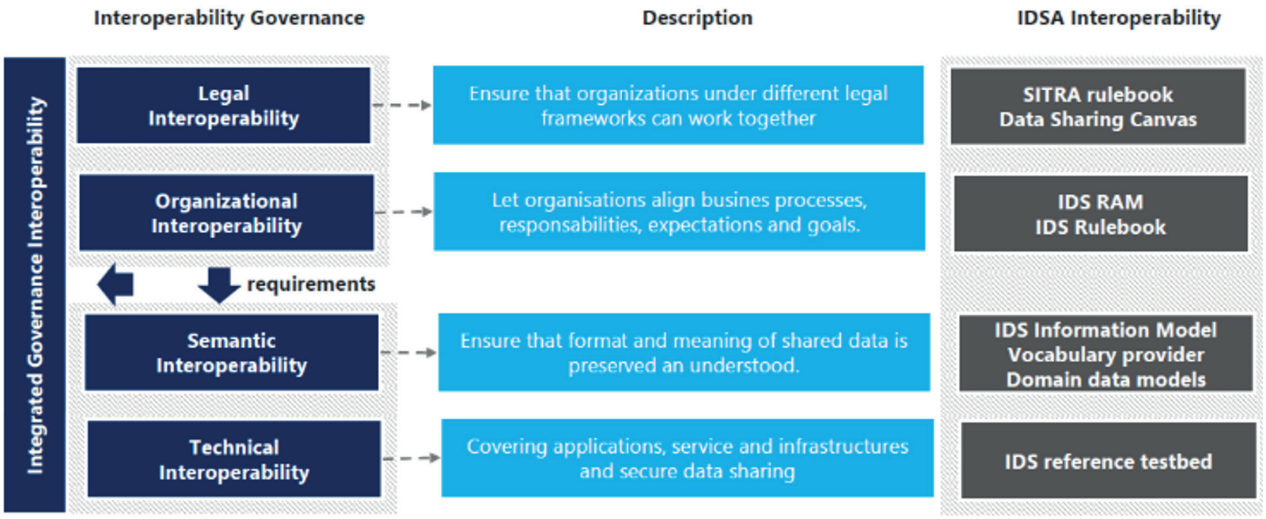
This realisation led to the third key question of the day:

ability in the interplay among those data spaces. Interoperability might mean:

Legal interoperability, meaning ensuring that organisations under different legal frameworks can work together;

Organisational interoperability, meaning aligning business processes, responsibilities, expectations, and goals;

Semantic interoperability, meaning ensuring that the format and meaning of shared data is preserved and understood; and



Source: European Interoperability Framework & IDSA

Key Question #3

Should data spaces obey different rules according to the specificities of each sector?

5. Interoperability: a path forward?

The discussion then advanced towards solutions, explicitly looking at interoperability as a potential pathway forward. Here the participants discussed the different levels at which such interoperability should occur, including with which standards and actors.

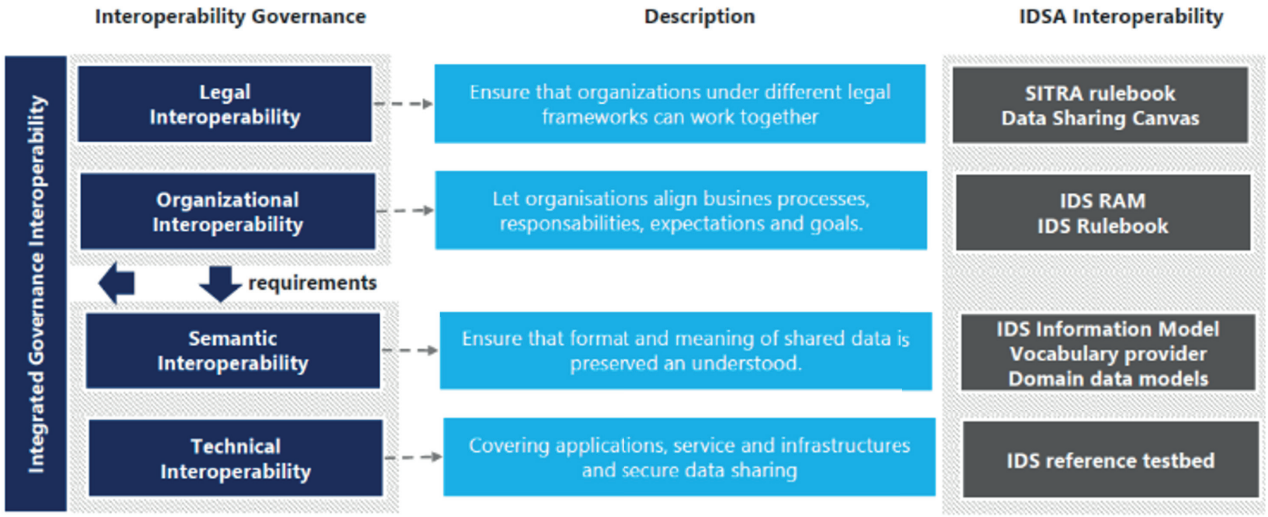
One of the speakers provided an important distinction between different meanings of interoper-

Technical interoperability, meaning that covering applications, services and infrastructures must allow secure and efficient data-sharing. Connecting these different ideas of interoperability can be ultimately beneficial to private actors in a platform economy. For example, original equipment manufacturers (OEMs) gain more efficient and transparent processes using interoperable pilots. Likewise, small and medium enterprises can reach new customers and collaborators with brand-new access to resources.

The participants soon agreed that such interoperability is the best idea, but many questions remain unanswered about its details. These could be summarised in four different points regarding interoperability:

- What are the necessary pre-conditions to establishing and implementing the common building blocks in the different data-sharing eco-systems?
- How can data sharing be accelerated?
- How can we ensure that the building blocks and recommendations remain relevant and future-proof? How to gain stakeholders' trust?

is adopting a legislative framework for data (Data Act, Data Governance Act), defining common rules notably for the governance of data spaces and on data access and use. It is also investing in a cross-sectoral framework for data spaces, in particular with the Data Spaces Support Centre, which will coordinate, advice and support European data spaces, and Simpl, which in turn will provide open-source smart middleware helping to build data spaces.



Source: European Interoperability Framework & IDSA

Also, if raw data does not leave a data room but only aggregated refined data via publicly accessible services, this can lead to an increased willingness to share data.

One of the participants summarised the connection between data spaces and interoperability by attempting a key definition:

Proposed Key Definition

A data space is a virtual place where actors pursue public interest goals through data sharing and refinement.

This resonated with some participants that called for adopting the idea of data spaces as networks of networks, a meta layer connecting existing private and public spaces.

In this notion, the EU could have an essential role as a facilitator of the data economy by developing a cross-sectoral framework for data. It

However, questions remain regarding the participation of actors beyond the European Union. The attempts made by the International Data Space Association (IDSA) aim to internationalise the process and allow exchanges worldwide. Such global interoperability for data spaces requires common principles. Together with a large group of organisations and initiatives, IDSA has worked on some, namely *i) data sovereignty; ii) level playing field for data sharing and exchange; iii) a distributed soft infrastructure and iv) public-private governance.* These could constitute the 'design principles' for data spaces and a basis for common blocks for interoperability.

6. Conclusions

The Forum concluded with essential remarks on the concept of a data space.

It became clear that this is still an early stage of the process and more debate needs to be had. Key questions remain unanswered at this point. While many technical solutions already exist, some still need to be found and, more importantly, agreement must be reached on widely accepted technical standards. Nonetheless, the discussion proved the importance of the concept and its potential, with all participants agreeing on the need to build more interoperable solutions.

Throughout the discussion, the exchanges showed that at least three notions of data spaces exist, namely:

- **A Space for Data**: a virtual 'one-stop-shop' for mobility data, akin to a catalogue or a library, helping to easily identify and access available data;
- **Data Clubs**: spaces created and shared by private operators in their own private interest. Data is exchanged and companies work together for a common goal. The challenge with this notion resides in certification and market exclusion, namely, on who certifies these spaces and ensures that fair, reasonable and non-discriminatory (FRAND) principles are respected;
- **Data Spaces**: based on technical infrastructure and governance mechanisms developed per sector, like tourism or mobility, driven by public policy objectives, and in which private and public entities are encouraged to participate. This is the avenue pursued by the EC's Data Strategy.

In all three notions, participants concluded that it is essential for data spaces **to set clear objectives for the use of data.** These can range from public interest goals, such as reducing emissions, enhancing safety, and boosting efficiency, or citizens' welfare, to private interests, such as innovation or revenue generation. In any event, for data sharing to be effective, such purpose must be clearly defined when building the data space.

Likewise, participants agreed that data spaces should not be mistaken for data pools or data swamps. Inspiration could be drawn from other places, such as digital advertising, in which such interoperable interactions exist and are very efficient.

The ultimate value of the initiative seems to lie in the coordination among different players and actors in reducing transaction costs through a common approach guided by the European Commission. This means investing in interoperable solutions at all levels – technical, semantic, legal and organisational – and creating common structures for the common good.

Mobility data as a commons – towards a common mobility data infrastructure

A comment by Lucie Kirstein, Senior Manager Strategic Projects at acatech – National Academy of Science and Engineering, and coordinator of the EU-funded preparatory action to establish a common European data space for mobility

There are several domains in which Europe is falling behind other large economies. One is the ability to harness the potential of data. Giant tech firms in the U.S. increasingly act as knowledge and information gatekeepers engaged in extensive *technology enclosure*[1] – made possible thanks to the harvesting and processing of large amounts of data stored on their customers' clouds.[2] This has led to the emergence of unprecedented power asymmetries with severe effects on European businesses and individuals, the "rule by data", as Katharina Pistor frames it.[3]

Today, the most important digital innovations, especially in the field of artificial intelligence, can only develop their full potential when large amounts of data are made available and processed to derive knowledge from it. In the mobility domain, strengthening public and shared transportation as a backbone for sustainable mobility in Europe depends on the availability and linkage of large datasets. For example, mobility data can provide valuable insights regarding movement patterns that can help address questions in the public interest, including sustainable urban planning and the provision of public services. In rail, the availability of large amounts of data is the basis for more capacity, punctuality, and efficiency in railway traffic, and hence massive savings and increased attractiveness.

Limited data availability for innovation

Despite efforts, many mobility-related data remain confined in silos, unused by big tech and not shared among peers or made open to the public. The lack of widespread data sharing in Europe can be seen as a market failure, as it fails to reach its full potential for the benefit of society. In the sense of the famous game-theoretical prisoner's dilemma, there are economic disincentives for actors to share data with each other.[4] If only one actor shares data, all others benefit. In forming their expectations, all actors anticipate that other actors will shy away from sharing their data. This leads to low data availability overall. If actors nevertheless decide to share data, there is a danger of free riding: the benefits from improved data availability accrue to actors who do not have to provide anything in return. The concept of *data altruism*[5], as used in the Data Governance Act, illustrates this notion of data sharing without return.

However, it is unlikely that data altruism will become widespread and a mandate for open data in all sectors is met with scepticism. To reap benefits from data sharing while bypassing emerging power asymmetries, a possible solution is the sovereign, decentralised sharing of data organised by a central trustee. At acatech, we believe that improving data availability for the benefit of society can be achieved by creating a shared data infrastructure and services that provide fair regulations, contractual agreements, and incentives. In other words, the evident market failure points to the necessity of a public European project, treating mobility data as a public good or as part of the commons.

As opposed to monopolising informational content and governance power, the idea is to

1 Hinting to the enclosure movement, the term refers to the extraction of value from data as "commons" (intangible or informational resources under collective ownership or without prior coded value or property). The last decade gave rise to a commodification of data in ways similar to what Polanyi described as *fictitious commodities*. See e.g., Vatanparast (2021), "The Code of Data Capital: A Distributional Analysis of Law in the Global Data Economy", Juridikum 1/2021, 98-110, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3832471.

2 Rikap (2022), "Big Tech: Not Only Market But Also Knowledge and Information Gatekeepers", https://www.ineteconomics.org/perspectives/blog/big-tech-not-only-market-but-also-knowledge-and-information-gatekeepers.

3 Pistor (2020), "Rule by Data – The end of markets?", 83(2) Law & Contemp. Probs. 101, https://scholarship.law.columbia.edu/faculty_scholarship/2852.

4 Overdiek & Schwab (2023), "Ein Datenclub als Booster für die digitale Transformation", https://makronom.de/ein-datenclub-als-booster-fuer-die-digitale-transformation-43354.

5 Data altruism refers to individuals and companies giving their consent or permission to make available data that they generate – voluntarily and without reward – to be used in the public interest.

build a democratic and transparent organisational structure that allows increased collective benefit from mobility data. Information asymmetries will be limited by improved discoverability of data (e.g., through an open central catalogue) and transparency of logged transactions. Free data production and loss of control can be mitigated by digital tools to enforce usage policies and monetise data to allow for fair shares in value-creation. Transaction and search costs ("economies of speed") can be lowered by creating a one-stop-shop for mobility data in Europe. Interoperability avoids fragmentation of the data economy and lowers integration costs. Finally, such ecosystems allow multi-sided transactions and business models without typical power concentration seen in big multi-sided platforms.[6]

How could a common European data space for mobility look like?

A practical application of principles such as fairness, trust and data sovereignty can be realised in a **common European data space for mobility**[7]. There is a myriad of options when it comes to building the business, legal, operational, functional, and technical dimensions of a data space.

Data spaces can be set up in a centralised or decentralised manner. This means that a neutral trustee provides central services to all data space participants or that an orchestrator manages a set of federated services provided by different parties in the ecosystem. In terms of organisational models, two main approaches are emerging: (a) a mobility data space as a voluntary, private marketplace[8] proposing added-value services facilitating discoverability and lowering participants' transaction costs in accessing data, and (b) a public *digital* infrastructure (managed e.g. by a public utility company[9]) erected on top of the *physical* infrastructure to facilitate data flows via harmonised, open components, built around National Access Points and shaped by strong policies and regulations.

Both approaches can be conciliated by making sure adequate funding is available for an agency or neutral organisation to manage and operate the common technical infrastructure and allowing the on-boarding of numerous public and private stakeholders to achieve the desired *network effects*[10]. Ultimately, to limit monopolistic behaviour and sector fragmentation, massive investments are needed to achieve a decentralised, sustainable, and commons-based data economy.

6 See e.g., OECD (2018), "Rethinking Antitrust Tools for Multi-Sided Platforms",www.oecd.org/competition/rethinking-antitrust-tools-for-multi-sided-platforms.htm.

7 See https://transport.ec.europa.eu/news/share-your-views-common-european-mobility-data-space-2022-11-14_en.

8 The Mobility Data Space in Germany was set up as a private non-profit company, receiving government subsidies during its start-up phase. See https://mobility-dataspace.eu/.

9 See e.g. the Flemish Data Utility Company, https://www.vlaanderen.be/digitaal-vlaanderen/het-vlaams-datanutsbedrijf/the-flemish-data-utility-company.

10 Network effects imply that once digital platforms have reached a certain size, they are likely to tip. This comes close to the idea of natural monopolies where technological developments result in various forms of economies of scale related to the access to data, the use of algorithms and prediction. See e.g., Ducci (2020), "Natural Monopolies in Digital Platform Markets", Cambridge University Press, https://www.cambridge.org/core/books/natural-monopolies-in-digital-platform-markets/1EA207B0EB21EAFDC0197DA511C5E0BA.

What are the key building blocks of different data-sharing ecosystems?

A comment by Katri Valkokari, Research Manager, VTT Foresight and Data Economy

The rise of the data economy has led to a variety of concepts, that enable data flows, such as data marketplaces, data platforms and data spaces. Digitalisation is transforming products and services into networked systems. This transformation is impacting all companies, their value chains and other stakeholders. As products and services are increasingly integrated into interconnected, data-intensive systems, data is increasingly at the core of the competitive advantage of companies across industries. At the same time, the hype around data is tempting actors to protect their data rather than share it, thereby hindering the growth of data-intensive businesses. In any case, data-intensive environments are in constant change. Creating value in such environments requires complementary perspectives and dynamic strategies. Thus, there are some key building blocks that can enable the emergence of data-sharing ecosystems.

First, the value of data must be understood from the perspective of a variety of actors. The business logics inside different application areas - from global logistics to local mobility chains - are different, which has led to fragmentation and different standards within application areas. Although standardisation of the technical building blocks could drive the development, the data sharing and governance rules need to be aligned with the actors' current and future business models. In addition, although companies acknowledge the potential value of data and even consider it as a treasure, they are not often in a position to exploit this potential. Identifying mechanisms for creating value, implementing changes and extracting value is complex. Addressing this complexity requires multiple lenses, i.e., technology, people, business and society. This is the key to navigating the complexity and ambiguity of the internal and external business environments.

Second, when we dive deeper into one application area and the current value chain at the core, we should understand that the roles in the core value chain and the data (sharing) value chain are likely to be different. There are a variety of end users within the data-sharing ecosystem and typically, all actors in the value chain are both users and owners of data, leading to changes in the relationships between actors. To figure out the future roles of actors and the development paths within data-sharing ecosystems, this should be understood. When it comes to developing new businesses, often cross-sectoral collaboration is required, and in this area, the support of public actors is needed to enable interoperability. The primary question is, then, who makes the rules of the game. The rules of game are set at multiple levels from policies to business ecosystems and technology standards. Coordination - or even transparency - between these levels is crucial. In this context, it is important to note, that business actors of current value chains often emphasise the need to federate existing models rather than to create new ones. Therefore, integrating existing pieces is as important as building new ones.

Third, the discussions at the 10th Florence Intermodal Forum in November 2022 have shown that there are different conceptualisations of data space and a variety - over 30 - of ongoing initiatives. They often include their own solutions for data governance, architecture, harmonisation, and divergent definitions. As a result, it is difficult to obtain a clear picture of the various developments. This even applies to the experts, who are familiar with the different initiatives. It is important to understand that it is difficult for actors whose main focus is on day-to-day business operations to follow the discussion and quickly take advantage of these opportunities. SMEs, in particular, have limited resources to keep up with the developments and further implement novel roles. Therefore, it is important for intermediators to share success stories as well as lessons learnt. For this reason, stakeholder networking, such as the event organised by FSR Transport, is an important enabler.

This is because networks foster dialogue between the different stakeholders and create links between the different initiatives related to mobility data spaces.

In summary, it is important to emphasise, that data spaces are not only about technical aspects but also about collaboration between different actors who have different expectations, interests and capabilities. Future solutions need to be 1) end user-proofed and provide a working connection to personal data spaces and fair use of personal data; 2) business-proofed and enable a well-functioning data-sharing ecosystems with unique and transparent objectives, as well as 3) policy-proofed and allow cross-sectoral local, regional and European policies with social goals and missions. The common European mobility data space is not an ocean of data; it is about creating a network of networks enabling relevant, although not always open, access to various already existing data sources.

A common European data space for tourism

A comment by Misa Labarile, European Commission, DG GROW, Unit G1

Let's imagine the case of a family travelling to another country for their summer holidays. After landing, they likely need a transfer from the airport to their hotel, be it a shuttle, a private ride, or a rental car, and hope to reach their hotel as quickly as possible. Knowing when to leave the air-conditioned waiting room for the pick-up and how long the transfer will take, which in turn can inform the hotel about arrival time so they can speed up check-in procedures, can make the difference between a pleasant and a stressful experience. If, in addition, the destination employs a smart mobility plan, managing flows of tourists, vehicle access restrictions, and navigation apps, the whole experience greatly improves beyond the moment of arrival and departure and for residents as well as visitors. A good holiday destination will build loyalty and more likely be booked again.

B2B data-sharing agreements allow these services to function better together. However, they depend on the business model and strategy of each party involved. If data were accessible by all stakeholders sharing their information in the data space, then partnerships would be more likely to start up, with a beneficial impact on the end user.

This example shows the opportunities a common EU data space for tourism would offer to the sector at large: it also shows how intertwined sectoral data is, with transport and tourism sharing particularly close ties. The Transition Pathway for Tourism, published in February 2022 and formally supported by the Council of the European Union on December 1, 2022, as the European Agenda for Tourism 2030, announced the intention of the European Commission to set up a data space for tourism. However, it clearly mentioned the need for it to work with other sectoral data spaces to ensure that information is not sealed in silos.

This is acutely evident when it comes to tourism and transport information. Indeed, in June 2022, the Communication of the European Commission on the *Conference on the Future of the EU* mentioned the mobility and tourism data spaces together as "new areas of action to consider".

The tourism data space wants to build trust between stakeholders, providing strategic support for data-sharing partnerships in the tourism industry. This would open or allow access to a pool of data sets larger than what is reachable on an individual/national basis, which in turn would help tourism businesses improve and expand their services and authorities/destinations manage tourism flows better. This is a key goal because tourism is a sector almost completely composed of micro, small or medium enterprises that have little or no capacity for data management.

While the objectives set at policy level make for generally desirable outcomes, the challenges that come with actually making data sharing a reality raise thorny issues related to access, control, trust, data use and re-use, interoperability, and the need to avoid administrative burdens. Neither the tourism nor the mobility data space can take shape without an agreement between all parties involved on each and every one of these aspects.

Work has already begun on addressing these issues, and it involves the public and private sectors in cooperation with the European institutions and Member States. The tourism data space will be developed based on the outcomes of two preparatory projects, which kicked off in November 2022 and are expected to deliver answers regarding current initiatives, governance and technical requirements of the data space by the end of 2023.

While this is ongoing, the idea of a pilot project is in the pipeline in relation to the recent proposal of the European Commission for a Regulation on Short-Term Rentals,[1] which includes a key requirement on establishing unique identifiers for tourism accommodations, data collection and

1 Tourist services – short-term rental initiative (europa.eu)

transmission by private actors to public authorities. Scheduled in 2023, the project would gather public authorities and platforms willing to pilot, on a voluntary basis, the implementation of the proposal with a view to tackling its key enablers. This would allow all parties involved to anticipate the actual hurdles and requirements for data sharing in the tourism sector.

In parallel, the tourism industry is working on a Code of Conduct for public-private data partnerships in tourism. The Code of Conduct aims to support trust between relevant stakeholders as well as provide general guidance on how to build mutually beneficial data-sharing relationships in tourism, with or without a data space. As a tool for building trust, it will be published with the support of the European Commission in the first quarter of 2023.

2022 has been the year of great focus on data sharing and interoperability, with sectoral data spaces taking a firm footing on the policy agenda at the EU level. Stakeholders, EU institutions and national and local authorities across sectors have come together to discuss key aspects of future frameworks for interoperability and effectively set up an ambitious agenda for the years to come. More work is needed to transform similarities into synergies, and this is where the European Commission can play an important steering and coordination role.

FSR Transport

The Florence School of Regulation (FSR) is a project within the European University Institute (EUI) focusing on regulatory topics. It works closely with the European Commission, and is a growing point of reference for regulatory theory and practice. It covers four areas: Communications and Media, Energy (Electricity and Gas), Transport, and Water.
The FSR-Transport Area's main activities are the European Transport Regulation Forums, which address policy and regulatory topics in different transport sectors. They bring relevant stakeholders together to analyse and reflect upon the latest developments and important regulatory issues in the European transport sector. These Forums inspire the comments gathered in this European Transport Regulation Observer. Complete information on our activities can be found online at: fsr.eui.eu

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