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

1. Introduction

Mobility and transport are a key enabler of our economic and social life, whether it involves daily commuting to work; visiting family and friends; tourism; or the proper functioning of global supply chains for the goods in our shops or for our industrial production and e-commerce. Free movement of people and goods across the European Union's internal borders is a fundamental freedom of the EU and its single market. As the second-largest area of expenditure for EU households, **the transport sector accounts for 5% of EU GDP** and directly employs around **10 million workers** [1].

As noted in the Commission's **Sustainable and Smart Mobility Strategy (SSMS)** [2], the EU needs to quickly advance towards a sustainable, smart and inclusive mobility and transport sector. Decarbonisation and digitalisation are the key drivers of this transition, establishing a truly **efficient and interconnected multimodal transport system** for both passengers and freight, thereby meeting the need to fully contribute to the transition to a climate-neutral economy as part of the **European Green Deal** [3] and **A Europe fit for the digital age** [4] goals.

With the **European strategy for data** [5] and the **Commission Staff Working Document on Common European Data Spaces** [6], the Commission has proposed the creation of EU-wide common, interoperable data spaces in strategic sectors, including mobility and transport. **Data-driven innovation** can make an enormous contribution to mobility services in the EU that can lead to better use of transport systems and much more efficient multimodal mobility, thus serving the further development of an interconnected, climate-neutral and competitive EU transport sector[7]. However, while a lot of relevant data is generated (often driven by requirements under the EU transport *acquis*) the transport and mobility data landscape is fragmented into different ecosystems and accessibility is often difficult. This **fragmentation needs to be urgently addressed** so that the EU can successfully harness the benefits of **digitalisation** in the mobility and transport sector.

In this context, the strategy includes a **common European mobility data space (EMDS)** that should facilitate the access, pooling and sharing of data from existing and future transport and mobility data sources. The goal is to overcome technical and legal barriers and to ensure trusted and secure data-sharing by combining **data-governance frameworks** and **technical infrastructures** while using common design principles wherever possible. By strengthening trust and security in data transactions and adhering to the highest available cybersecurity standards, the EMDS should contribute to ensuring a high level of **cybersecurity** and **cyber-resilience** in the mobility and transport sector**.**

The EMDS will help market actors and public authorities to find, access and use relevant data more easily. It will support the shift to sustainable and smart mobility, enabling more efficient

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[1] COM(2020) 789 final
[2] COM(2020) 789 final
[3] COM(2019) 640 final
[4] A Europe fit for the digital age (europa.eu)
[5] COM(2020) 66 final
[6] SWD(2022) 45 final, Commission Staff Working Document on Common European Data Spaces
[7] leading also to reduction of transport-related air and noise emissions

transport and mobility services and thus reducing emissions and directly contributing to the **European Green Deal** goals.

Improving our approach to sharing relevant mobility and transport data can **significantly benefit Member States and all relevant public authorities**, including by **enhancing transport policy-making** through data-based decision-making and targeted implementation. It can help boost **cross-border connectivity**, thus fostering better cooperation between Member States, facilitating seamless travel and trade within the EU and thereby contributing to **increased economic growth**. Simplified access to comprehensive mobility and transport data can help Member States make better-informed decisions about infrastructure development and transportation planning, thus leading to more **efficient and optimised systems**.

Similarly, **market actors** can **benefit from new business and innovation opportunities** to develop innovative transportation services and technologies. Collaboration through simplified data access and sharing facilitates the formation of partnerships and the integration of services into broader mobility ecosystems. Increased data-sharing also **improves coordination between private and public actors**. Small and medium-sized enterprises (SMEs) could particularly benefit from this. Additionally, advances in data-sharing can allow private actors to optimise their operations and resource allocation with real-time information, resulting in **more efficient and cost-effective operations**.

Research will also benefit because the EMDS will improve understanding of the complex interactions of transport systems and promote innovation in cross-sectoral data handling. The EMDS will also encourage the use of **artificial intelligence** to enhance mobility and transport services, particularly as data volumes and potential synergies increase exponentially. A well-functioning common EMDS could also become a means to enhance **data exchange with non-EU countries** and thus help the integration of traffic coming from outside the EU into the EU transport system and fostering trade across our external borders.

It is ultimately the **passengers, commuters and travellers** who will benefit, through an **improved travel experience** with more efficient transportation systems and reduced travel times. Access to real-time data enables them to stay informed of the public transportation situation, infrastructure accessibility, traffic conditions and potential delays, and thus allows them to **plan their journeys better**. Many service providers and public authorities already offer real-time updates, but more comprehensive data-sharing would raise the **quality of services** and facilitate more **system integration**, **multimodality**, **road safety** and **sustainability**.

This communication 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. It invites all relevant actors to take note of the measures set out in this communication.

2. Relevance and demand for a common European mobility data space

2.1. Context, role and objectives

Currently, data sources and the ways in which data are exchanged are **deeply fragmented** in the different transport modes and the related businesses. There is also fragmentation between different Member States and within Member States at different levels (national, regional and local) for both the public and private sectors. This fragmentation hinders the free flow of data (and, more broadly, of people, goods and services) within the EU's single market. It also makes it difficult for users (individuals and service providers) to understand where and how to access and share data, which conditions for reuse apply and whom they should contact if they have questions or issues with data. These barriers hinder the reaping of the benefits of digitalisation in transport, and also the creation of a level playing field for the provision of digital mobility and transport services in the EU.

In this context the objectives of the EMDS are to:

1) **identify crucial data** and **increase their availability** to support essential and value-added services covering themes from sustainability to multimodality;
2) **help users discover available data sources**, by providing tools so that the user can also understand the quality of data and related access and reuse conditions, notably in connection with the protection of personal data;
3) **facilitate data access, sharing and reuse**, where possible, through modal and cross-modal harmonisation of sharing conditions in a fair, transparent, proportionate and non-discriminatory manner;
4) **enable technical, organisational, semantic and legal interoperability** for data access, reuse and data-sharing between actors (both public and private);
5) **optimise data-collection and reduce administrative burden** by identifying gaps and overlaps in existing data-collection arrangements and recommending appropriate adjustments in sectoral legislation;
6) **ensure interoperability with other common European data spaces** and allow data-access, sharing and reuse among them, in line with new and emerging EU data-related legislation.

The intention is not to create one vast centralised database or a single **hardware infrastructure** that will host all of the EU's mobility and transport data through this initiative. The EMDS will instead offer a **framework for interlinking and federating** [8] many different transport-data ecosystems that are heterogeneous and often difficult to discover or access. The EMDS will be based on a decentralised approach, whereby data will continue to be maintained with data space participants or in the domains and databases that are already governed by public or private stakeholders at EU, national, regional and local level. The EMDS will be guided by the design principles listed in the Commission Staff Working Document on Common European

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[8] 'Federation of data spaces: The organisation of two or more data spaces that have agreed upon standards for harmonised operation, under a common governance framework to realise mutual synergies to realise mutual synergies. Although operating autonomously and with possible different internal architectures, the goal is to jointly operate as a single and harmonised ecosystem towards participants.'; *Preparatory Actions for the Data Space for Mobility, Deliverable D3.1 (Glossary), 2023 p, 13*.

Data Spaces and it will be fully compliant with the EU transport *acquis*, its spirit and purpose, and it will be built on it.

The **EMDS framework will have technical and governance dimensions** that will include building blocks [9], standards, an interlinking layer and a governance structure. Further details of the EMDS framework are explained in Section 4.

The **participants in the EMDS will be data-providers and data-users (including data-intermediaries [10] and data-altruism organisations**[11]), as well as relevant **marketplaces** and **service providers** that want to create value by offering, discovering, accessing and using mobility and transport data across this vast range of ecosystems.

2.2. Value-added use cases and their benefits

The EMDS should enable improved, faster and more streamlined cross-border and cross-sectoral data access and sharing, thereby supporting the provision of EU-wide added value services. The territorial aspects of mobility should also be considered taking into account the rural community as well as the interconnection between urban and rural mobility. **Better data descriptions** (e.g. with improved metadata) and **increased interoperability** between different ecosystems (e.g. for data discovery and sharing) should make it easier and quicker for every EMDS participant to aggregate data from different sources; to use this data for their operations; and to deliver high-quality services to businesses, consumers and citizens. It could provide opportunities for developing new statistical indicators with higher level of disaggregation and with enhanced timelines, without increasing reporting burden. The use of EMDS for statistics is the intermediate step for using the available microdata in evidence-based analysis for policy making at national and EU level, alongside existing statistics. The EMDS will also facilitate data-sharing in a peer-to-peer (e.g. business-to-business, business-to-government, etc.) relationship. This should gradually enable more innovative mobility services and complex transactions in the transport sector.

The following are examples of such value-added use cases and their benefits:

How EMDS could contribute to:	Benefits and beneficiaries

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[9] 'Data space building block: A basic unit or component that can be implemented or a capability that can be deployed and combined with other building blocks to achieve the functionality of a data space. Data space building blocks can be divided into organisational and business building blocks and technical building blocks.'; https://dssc.eu/space/Glossary/176554169/10.+DSSC-specific+terms

[10] 'It is important also to recognise the trust-bringing role of third parties such as data intermediaries, such as those as regulated by the DGA, which can act as neutral facilitators and enablers of data reuse in a common European data space. These actors mediate between the suppliers of data, the data subjects, the data storage providers, and the data utilisers. Depending on specific needs, they can serve as matchmakers between supply and demand for data, offer services and relevant technologies to help share data more easily, and provide a guarantee that data will be handled in a trustworthy and legally compliant manner.';
European Commission, Joint Research Centre, Farrell, E., Minghini, M., Kotsev, A. et al., *European data spaces – Scientific insights into data sharing and utilisation at scale*, Publications Office of the European Union, 2023; https://data.europa.eu/doi/10.2760/400188

[11] European Commission, Joint Research Centre, Micheli, M., Farrell, E., Carballa-Smichowski, B. et al., Mapping the landscape of data intermediaries – Emerging models for more inclusive data governance, Publications Office of the European Union, 2023; https://data.europa.eu/doi/10.2760/261724

Urban and rural mobility Enabling the discovery and combination of data from different data spaces (e.g. mobility, energy and tourism) and transport modes.	• Enabling **local authorities** (both urban and rural) to identify well-targeted measures within their **sustainable (urban) mobility plans** and to use the data to monitor the progress made towards the set objectives. • Better management of traffic and tourist flows (e.g. through multimodal and coordinated **mobility services for citizens**), integrating shared and micro-mobility into the public transport offer. • Up-to-date data on cycling infrastructure (e.g. parking garages, charging stations and bike-sharing) to promote cycling and inform **cyclists**.
Supporting the discovery, access and combination of mobility, infrastructure, administrative and geospatial data.	• Supporting **local authorities** in the implementation of **urban vehicle access regulations (UVARs)** [12] in order to reduce emissions and traffic congestion. • Informing **travellers** when they are approaching an UVAR (e.g. through navigation apps) or granting ad hoc exemptions (e.g. for the transport of persons with disabilities and reduced mobility). • Informing **persons with disabilities and reduced mobility** on the accessibility of infrastructure and transportation services [13].
Multimodal mobility and transport Supporting the integration of information from operators of various transport modes.	• Improving access to interoperable tickets across all transport modes (e.g. providing comparable data on prices, carbon footprints and journey times) and delivering real-time and dynamic information to **passengers** (e.g. on accessibility, schedule changes and disruptions). • Integration and combination of different transport modes in multimodal supply chains for more efficient and resilient **logistics** and **freight transport**.
Road safety Facilitating the integration of transport data from non-transport sectors.	• Better monitoring of the severity and nature of road traffic casualties by linking hospital and police data. • Easier access to safety and traffic data can help **road transport operators** prioritise funding for the most urgent physical infrastructure adaptations.
Connected, automated and autonomous mobility Facilitating the discovery, access and sharing of infrastructure and real-time traffic data.	• Helping to build an ever-richer digital twin of the driving environment. • Supporting the development and operation of safe, **increasingly** connected, **automated and ultimately autonomous mobility**, allowing for faster development and test programmes as well as faster expansion of the roads on which automated vehicles can safely operate.

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[12] https://uvarbox.eu/
[13] Data should be provided in an accessible manner in line with the requirements set forth in Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services, OJ L 151, 7.6.2019, p. 70–115 (European Accessibility Act), which applies to the delivery of transport service information, including real-time travel information.

	• Enable the development of data-driven services benefiting **passengers** and **transport operators**, taking advantage of investments in connectivity infrastructure along transport paths, and supporting new business models.
Sustainable alternative fuels Enabling the discovery and merging of energy, vehicle, traffic, infrastructure and geospatial data.	• Supporting location **planning for the roll-out of alternative fuels infrastructure** by merging data on vehicle traffic flows with geospatial data on grid availability and renewable acceleration areas. • Leveraging the common European energy data space. Electromobility and energy data can be combined to simulate energy demand models, thus enabling **smart and bidirectional recharging of electric vehicles (EVs)** that contribute to data flows in real time to allow flexible electricity consumption (e.g. by reducing demand at peak times). • Facilitating data-sharing is crucial so that **service providers** can develop high-quality services to inform **EV drivers** about recharging locations, prices, availability and the overall characteristics of infrastructure and the availability of renewable energy.
Logistics Making it easier to discover and combine data from different (modal) sources, infrastructure and capacity availability.	• More accurate estimated times of arrival (ETAs) and estimated times of interchange (ETIs), and enhanced resource and asset management for **businesses**. • Dynamic rerouting of freight across modes, taking environmental efficiency into account. • Facilitating the discovery of optimal safe and secure parking for **heavy goods vehicle drivers**. • On-time delivery of goods for **consumers**, along with lower costs, climate and environmental impact.
Urban logistics Enabling access to freight data and urban infrastructure data.	Smarter urban logistics would benefit both **transport operators** and **local authorities**: • **City planners** could analyse freight data (e.g. freight volumes, vehicle and routes used, and loading/unloading operations) to steer their freight-related planning, policies and investment in infrastructure – especially for the first and last mile. • Urban infrastructure data (e.g. kerbside use, vehicle accessibility, parking space, real-time traffic monitoring and charging infrastructure) would help **freight service providers** and **transport operators** to increase the efficiency of delivery operations, and could encourage collaborative solutions.
Waterborne Enabling interoperability, access and exchange of data between different modes and stakeholders (e.g. inland ports, vessels and logistics actors).	• Helping **port authorities** to manage inland port infrastructure (reserving mooring places, locks, etc.) • Helping **fleet owners** and **skippers** to better plan voyages in order to maximise usage of their fleet (including during droughts). • Better integration of inland water transport (IWT) in supply chains.

	• Supporting the concept of IWT smart shipping [14].
	• Sharing data on environmental conditions for maritime vessels and supporting port call optimisation [15].
Aviation Enabling the integration of energy related data (e.g. electricity - source and cost, aviation fuel blend - origin, cost and availability)	• Helping **airport-managing bodies and aircraft operators** to better communicate their emission footprints as well as their contributions to the decarbonisation of the aviation sector by reference to benchmarks. This would bring clarity on the type of electricity and fuels used on the airport premises and to be able to report on it. • Promoting competition (e.g. between **fuel suppliers**), helping to boost innovation and reducing prices for **passengers**. This is particularly relevant in the context of trading sustainable aviation fuels [16].

Overall, as more data becomes available, the potential to optimise the transport and mobility systems also increases. However, the challenge to harness this potential (whether off-line or in day-to-day operations) is also great, and both public and private actors need to manage an increasingly detailed and complex transport system. **Artificial intelligence** (AI) can play a major role here. AI and the EMDS mutually reinforce each other. The EMDS fosters the accessibility and reuse of data, while AI makes it easier to use that data for new information and services (provided it is trained with representative, non-biased datasets). AI can make it easier to handle the sheer volume and complexity of data, finding synergies and patterns that might otherwise remain unnoticed and untapped. This is particularly the case when optimising large systems with many variables, for which there may not necessarily be one optimal solution. The EMDS is therefore also contributing to EU competences and competitiveness in AI for transport and mobility.

3. Cross-sectoral legislation and initiatives

3.1. The EU's cross-sectoral data legislation and relevant common European data spaces

The EMDS will be built on the EU's cross-sectoral legislation on data, such as the **Data Governance Act** [17], which increases trust in voluntary data-sharing, strengthens mechanisms to increase data availability and overcomes technical obstacles to the use of data. The Act is a key building block for the creation of common European data spaces because it regulates neutral data intermediaries that will play a central role in facilitating data exchanges. Furthermore, the Act mandates the Commission to establish the **European Data Innovation Board (EDIB)**, which is made up of relevant representatives from industry and from common European data spaces. The EDIB will play a fundamental role in developing and issuing

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[14] PIANC Report N° 21 – Smart Shipping on Inland Waterways, March 2022, p.52.

[15] https://www.emsa.europa.eu/sustainable-ports/port-call-optimisation.html

[16] By 1 July 2024, the Commission shall present a report assessing possible improvements or additional measures to the existing sustainable aviation fuels (SAF) flexibility mechanism referred to in Article 15 of Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation), OJ L, 2023/2405, 31.10.2023.

[17] Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), OJ L 152, 3.6.2022, p. 1.

guidelines on how to facilitate the development of these data spaces, and in identifying the relevant standards and interoperability requirements for cross-sectoral data-sharing.

The Commission proposed a **Data Act** [18] that aims to ensure fairness in the digital environment, stimulate a competitive data market, open opportunities for data-driven innovation and make data more accessible for all. By empowering users to access and share with third parties the data generated by their connected devices, such as connected vehicles, it will lead to more competitive and innovative services like aftermarket services. The development and recommendation by the Commission of non-binding model contractual terms for business-to-business data access, sharing and use will help EMDS participants to draft contracts with fair, reasonable and non-discriminatory rights and obligations. Finally, the Data Act defines essential requirements for data spaces and empowers the Commission to further specify these requirements by way of delegated acts and to adopt implementing acts with common specifications to ensure the interoperability of common European data spaces and of smart contracts.

The **Implementing Regulation on High-Value Datasets** [19] defines a list of 'high-value' datasets that the public sector has to make reusable as open data and free of charge. Datasets of particular relevance to transport include the INSPIRE data theme on Transport networks [20] . The **Open Data Directive** [21] lays down the general principle that publicly accessible data funded by the public sector should be reusable for commercial or non-commercial purposes. The **Interoperable Europe Act** [22] proposed by the Commission should strengthen cross-border interoperability and cooperation in the public sector across the EU.

Any implementation of action under the umbrella of the EMDS will ensure compliance with EU data protection rules, including data protection 'by design and by default', according to the **General Data Protection Regulation** [23] (the GDPR), which regulates the processing by an individual, company or organisation of personal data relating to individuals in the EU.

Cybersecurity should be at the forefront across all segments of the mobility ecosystem in line with the **NIS2 Directive** [24], which sets out strengthened cybersecurity requirements. Already the 2016 NIS Directive recognised transport—with its subsectors air, rail, water and road—as one of the most critical sectors. Due to their growing criticality for the EU economy and society, the operators of recharging points for motor vehicles (in the subsector electricity), as well as

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[18] COM(2022) 68 final, proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act).

[19] Commission Implementing Regulation (EU) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use, OJ L 19, 20.1.2023, p. 43.

[20] https://inspire.ec.europa.eu/Themes/115/2892

[21] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast), OJ L 172, 26.6.2019, p. 56.

[22] COM(2022) 720 final, proposal for a Regulation of the European Parliament and of the Council laying down measures for a high level of public sector interoperability across the Union (Interoperable Europe Act)

[23] Regulation (EU) 2016/679 of the European Parliament and the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016, p. 1.

[24] Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive), OJ L 333, 27.12.2022, p. 80.

manufacturers of motor vehicles were added to the scope of the NIS2 directive. For what concerns supply chain security, the **Cyber Resilience Act** proposal [25], which is currently in co-decision process, will also play a key role. It will mandate cybersecurity by design and by default for hardware and software accessing the European market. It also adds cybersecurity obligations throughout the lifecycle of a product, such as security updates and vulnerability handling. The Commission also proposed the review of the **Resilience of Critical Entities Directive** [26], which expands the scope and depth of the 2008 Directive to cover eleven sectors, including transport. Another important development related to cybersecurity is the Commission proposal for a **European Digital Identity Regulation** [27], which revises Regulation 910/2014 on electronic identification and trust services for electronic transactions in the internal market (the eIDAS) regulation [28]. The forthcoming developments in the area of digital identity, in particular the **European Digital Identity Wallets** and the introduction of new trust services (e.g. electronic attestations of attributes and electronic ledgers), are of particular interest for data spaces due to their contribution in terms of privacy, data protection and security, hence likely to play a key role in enabling them.

The creation of common European data spaces is a pioneering venture. The variety of sectors and domains involved, each of them with their own characteristics and specific data (e.g. mobility data, energy data and industrial manufacturing data) including different reuse modalities, make it a great challenge. Even within a specific sector, there is a high level of complexity due to diverse use cases and the diverging interests of relevant actors as regards data use and specific data needs that might be hard to reconcile.

> A one-size-fits-all approach, encompassing both the necessary **technical data infrastructure** and the **governance framework**, has limited ability to meet the specific needs of each vertical sector or domain. It will nevertheless be key to identify **cross-sector commonalities** and to develop, where possible, common **principles** and **building blocks** that can be used in different sectors and domains without compromising solutions that already exist or are emerging in sector-specific domains. Relying on harmonised approaches and mechanisms will save resources and make highly beneficial use cases possible.

The following are examples of data spaces **closely relevant to the EMDS** due to shared needs, datasets, key stakeholders and ecosystems.

1) The common European **Green Deal** data space will be developed as the thematic data ecosystem to achieve certain European Green Deal objectives set by the zero-pollution action plan [29], the circular economy action plan [30], the biodiversity strategy [31] and climate-change mitigation/adaptation strategies. It will make accessible currently fragmented and dispersed data from various data ecosystems, both for and from the private and public

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[25] COM/2022/454 final, Proposal for a Regulation of the European Parliament and of the Council on horizontal cybersecurity requirements for products with digital elements and amending Regulation (EU) 2019/1020.

[26] Directive (EU) 2022/2557 of the European Parliament and of the Council of 14 December 2022 on the resilience of critical entities and repealing Council Directive 2008/114/EC.

[27] COM(2021) 281 final, Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity.

[28] Regulation (EU) No 910/2014 of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (OJ L 257, 28.8.2014, p. 73).

[29] COM/2021/400 final

[30] COM(2020) 98 final

[31] COM/2020/380 final

sectors. It will also include the data space for **smart and sustainable cities and communities** which will support the green transition in local contexts and help provide services that can improve the quality of life of citizens. The EMDS covering the transport sector will contribute to and benefit from this data space that covers several thematic areas.

2) The common European **industrial (manufacturing)** data space, where data-sharing in industry has the potential to power strong growth, helps companies optimise existing processes, develop new products and create new businesses. The update of the 2020 New Industrial Strategy accordingly explains that an industrial (manufacturing) data space will lead to more flexible and resilient supply chains [32] that are closely related to the logistics and freight part of the transport sector and consequently of the EMDS.

3) The common European **energy** data space will benefit the green and digital transitions currently underway in the EU. It will help to further integrate renewables in the energy system, increase the energy system flexibility and overall energy efficiency, facilitate the smart and bidirectional charging of electric vehicles, benefit consumers and producers, and ensure a smooth and competitive transition towards the electrification of sectors such as heating and transport. As set out in the EU action plan on digitalising the energy system [33], alignment between mobility and energy data spaces is important to identify synergies, support system integration and roll-out cross-sectoral services.

4) The common European **tourism** data space [34] will support businesses, local authorities responsible for tourism strategy and management and other relevant actors. By supporting data access and flows across different data sets within the sector and across other data spaces, it will provide a service to various data users such as business intermediaries, destination managers, tourism service providers and data analysts. This will be of particular benefit for smaller destinations as well as for SMEs, who account for the vast majority of private sector stakeholders in tourism in the EU. Combining data from the mobility and tourism sectors will unlock value-added use cases for destinations and tourists as described in the relevant section above.

As the relevant data spaces will be gradually deployed, joint use cases will be sought.

The **Data Spaces Support Centre (DSSC)** [35], which is funded under the Digital Europe Programme (DIGITAL) and was launched in October 2022, supports and coordinates all relevant actions on the common European data spaces. It is mandated to provide common blueprint architecture and data-infrastructure requirements for data spaces and ensure a coherent and harmonised approach. The preparatory and deployment actions of the EMDS, have and will be carried out in close partnership with the DSSC to guarantee alignment with the common European data spaces technical framework.

In parallel, the Commission is procuring an **open-source smart cloud-to-edge middleware platform (Simpl)**, funded under DIGITAL, that will address the needs of the different data spaces and enable the realisation of the European Cloud Federation. The platform will provide

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[32] European Commission 2021 press release, 'Updating the 2020 Industrial Strategy: towards a stronger Single Market for Europe's recovery'.
[33] EU action plan on digitalising the energy system COM(2022) 552 final and SWD/2022/341 final
[34] C(2023)4787
[35] https://dssc.eu/

secure and modular basic building blocks that will serve as an enabling layer and a basis for the deployment and interconnection of sectoral data spaces, including the EMDS [36].

The **Digital Decade Policy Programme 2030** [37] introduced a new legal framework to implement multi-country projects: the **European Digital Infrastructure Consortium (EDIC)**. Created by a minimum of three Member States, an EDIC can become a legal entity with the capacity to pool European, national and private contributions. Germany, the Netherlands and Finland have pre-notified the Commission of their intention to create a mobility and logistics data EDIC that contributes to the objectives of the EMDS [38]. Such an EDIC would aim to ensure the sustainability of common data infrastructure, reinforce coordination among its members and drive adoption through cross-border use cases. Additional Member States and organisations have expressed their interest to join. The Commission welcomes the pre-notification of this EDIC and will closely follow its possible set-up.

3.2. Other relevant initiatives and building blocks

In addition to the above-mentioned initiatives, various data ecosystems, platforms and marketplaces, which are driven by public or private actors, seek to facilitate data-sharing where their building blocks, reference architectures and data-governance mechanisms could be used to complement the common EMDS. Indicative examples include the **EC DIGIT building blocks** [39] (e.g. eDelivery), the reference architecture of the **International Data Space Association (IDSA)** [40] and the open-source software platform components of **FIWARE** [41]. Of similar interest is the work being done under the lighthouse projects of **Gaia-X** [42] (e.g. **Eona-X** [43], which focuses on mobility, transport and tourism use cases; and the **German Mobility Data Space** [44]). Examples from the logistics sector include **iSHARE** [45] and **FEDeRATED** [46], a project co-funded by the Connecting Europe Facility (CEF)**.**

EU's support (under Horizon Europe and DIGITAL) in the development of cloud-to-edge infrastructure, services and value chains in the EU will provide a favourable ecosystem for the development of the EMDS. It will allow strong synergies with initiatives related to AI such as the AI testing and experimentation facility for smart cities and communities [47]. Finally, investments in digital communication infrastructure, such as 5G infrastructure at cross-borders and in market failure areas along major transport paths [48], are essential enablers for mobility and freight data sharing.

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[36] https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-made-simple
[37] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030, OJ L 323, 19.12.2022, p. 4.
[38] https://digital-strategy.ec.europa.eu/en/news/digital-assembly-2023-digital-open-and-secure-europe
[39] https://ec.europa.eu/digital-building-blocks/
[40] https://internationaldataspaces.org/
[41] https://www.fiware.org/
[42] https://gaia-x.eu/
[43] https://eona-x.eu/
[44] https://mobility-dataspace.eu/
[45] https://ishare.eu/
[46] http://www.federatedplatforms.eu/
[47] www.citcom.ai
[48] https://digital-strategy.ec.europa.eu/en/policies/cross-border-corridors

4. Towards a coherent and harmonised common European mobility data space

4.1. Existing and future initiatives in the field of mobility and transport data

The mobility and transport sector is characterised by a well-established and still-evolving EU set of legislation and complementary initiatives, which organise data-sharing for both passengers and freight in the business-to-consumer (B2C), business-to-business (B2B), business-to-government (B2G), government-to-business (G2B) and government-to-government (G2G) domains. The current landscape is very heterogeneous and fragmented, however, with various data-sharing frameworks and data ecosystems. The aim of the EMDS is to facilitate the interconnection of these ecosystems and where relevant introduce further progressive harmonization, including as concerns data access conditions.

Most of these frameworks have their own governance, architecture and platforms. They often include important achievements as regards the harmonisation of data-sharing conditions and are **considered important elements and building blocks of the EMDS** (as stated in the European strategy for data). They will be duly taken into account in establishing the EMDS. A non-exhaustive set of these EU mobility and transport data-relevant pieces of legislation and initiatives is described below by transport sector: waterborne and logistics; rail; intelligent transport systems; transport networks and infrastructure; automotive; aviation; and road transport and safety.

Waterborne and logistics

The **Digital Transport and Logistics Forum (DTLF)** [49], a Commission expert group, works on full-scale digital interoperability in order to facilitate data-sharing between relevant stakeholders from all transport modes in a **secure and trusted freight transport and logistics data space**. For this purpose, the DTLF defines design principles as well as technical and governance building blocks for a common federated data-exchange framework that connects existing transport and logistics platforms and ecosystems easily and in a collaborative and trusted environment. The DTLF played an important role in the preparation of the **EU Regulation on electronic freight transport information (eFTI)** [50] and continues to be essential in the related implementation work. The eFTI Regulation establishes a legal framework that will allow economic operators to provide freight transport information to prove compliance with EU and national rules for intra-EU transport in an electronic format.

The **European Maritime Single Window environment (EMSWe) Regulation** [51] establishes harmonised rules for the provision of the information that is required for port calls. In particular, it ensures that the same data-sets can be reported in each Member State in the same way and that once provided, data can be reused by the relevant stakeholders.

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[49] https://transport.ec.europa.eu/transport-themes/digital-transport-and-logistics-forum-dtlf_en
[50] Regulation (EU) 2020/1056 of the European Parliament and of the Council of 15 July 2020 on electronic freight transport information, OJ L 249, 31.7.2020, p. 33.
[51] Regulation (EU) 2019/1239 of the European Parliament and of the Council of 20 June 2019 establishing a European Maritime Single Window environment and repealing Directive 2010/65/EU, OJ L 198, 25.7.2019, p. 64.

The revision of the **River Information Services (RIS) Directive** [52] should provide an effective framework for the deployment and use of harmonised RIS in the EU and improve the interoperability of information services and data-sharing in inland waterway transport.

Rail

In the **railway sector**, infrastructure data are the basis for building up mobility data. The revised common specifications for the **register of railway infrastructure (RINF)** [53] establish the RINF as the common source of rail infrastructure data. It is based on the **ERA ontology** [54] which defines machine-readable and structured data elements of the rail system and is the **building block of the EMDS for rail**.

The review of the regulatory framework for interoperable data-sharing in rail transport [55] through the review of **technical specifications for interoperability (TSIs) relating to the telematics applications subsystem** will streamline information exchanges related to capacity management and traffic management of both passenger and freight services. The review will also set up a harmonised framework of technical specifications for **ticketing** of rail passenger services.

The recast **Regulation on rail passenger rights** [56] establishes an obligation for infrastructure managers and railway undertakings to **provide real-time dynamic traffic and travel information**, not only to railway undertakings but also to ticket vendors and tour operators, in order to make them available to rail users. Allowing ticket-selling entities to access information on real-time delays, reservations and availability requests will boost the rail-ticketing market and support efforts to offer more innovative tickets by enabling different rail carriers and ticket vendors/tour operators to sell bundled tickets from different carriers and for a variety of connections.

Intelligent transport systems

EU specifications adopted under the **ITS Directive** [57] aim at harmonising the provision of ITS services and access to data on the basis of common standards. They require the accessibility of multimodal traffic, travel and infrastructure data via a network of national access points (NAPs) established by the Member States. The CEF-funded **NAPCORE** [58] project, which involves all Member States as well as associated partners, allows EU-wide cooperation towards the creation of common solutions to better facilitate the reuse of ITS data and for a common vision for ITS data availability and accessibility in the EU.

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[52] Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community, OJ L 255 30.9.2005, p. 152.
[53] Commission Implementing Regulation (EU) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU, OJ L 139I, 27.5.2019, p. 312; and associated guidance documentation (https://www.era.europa.eu/domains/registers/rinf_en) to access RINF (https://rinf.era.europa.eu/rinf/).
[54] https://data-interop.era.europa.eu/era-vocabulary/
[55] COM(2020) 66 final
[56] Regulation (EU) 2021/782 of the European Parliament and of the Council of 29 April 2021 on rail passengers' rights and obligations (recast), OJ L 172, 17.5.2021, p. 1.
[57] Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport, OJ L 207, 6.8.2010, p. 1.
[58] https://napcore.eu/

This framework is constantly evolving, with the aim of increasing the availability and accessibility of ITS data via the NAPs. The **revision of the ITS Directive** [59] aims at making crucial data available across the EU, in order to foster the deployment of ITS services and ensure that the benefits of digitalisation can be reaped. Furthermore, in the revision of the Delegated Regulation (EU) 2017/1926 on **multimodal travel information services**, the Commission requires data holders to make real-time travel information data accessible via NAPs, which should enhance the quality of multimodal travel information services and facilitate planning for passengers.

Transport networks and infrastructure

The Regulation on the **Trans-European Transport Network (TEN-T)** [60], currently under revision [61], addresses the implementation and development of an EU-wide network of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railroad terminals as well as the deployment of information and communication technology (ICT) systems for all these transport modes. **TENtec** is the Commission's information and monitoring system for coordinating and supporting the TEN-T policy. The TENtec public portal [62] provides timely information to the public (citizens and professionals) through interactive maps and a map library. In order to ensure such timely and up-to-date data, 'automated data-exchange' solutions are currently being analysed together with the Member States and other relevant EU bodies. The guiding concept is the 'once-only' principle so as to reduce the administrative burden on Member States by asking the same information only once. In this context, the Commission is supporting the development of 'automated data exchange' solutions through CEF technical assistance [63].

The **Alternative Fuels Infrastructure Regulation (AFIR)** [64] requires recharging and refuelling point operators to make relevant data available through the NAPs to other data-users at no cost and requires Member States to ensure the accessibility of these data. Furthermore, the **European Alternative Fuels Observatory (EAFO)** [65] will underpin its role as the key public information tool on alternative fuels infrastructure. EAFO´s future development will support the creation of new information services and enable effective policy-monitoring of market developments. In this context, the common EMDS could help support wider access to and discoverability of alternative fuels infrastructure data.

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[59] COM/2021/813 final, Proposal for a Directive of the European Parliament and the Council, amending Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport

[60] Regulation (EU) 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU, OJ L 348, 20.12.2013, p. 1.

[61] COM(2021) 812 final, Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013.

[62] https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html

[63] https://cinea.ec.europa.eu/funding-opportunities/calls-proposals/cef-transport-technical-assistance-member-states-general-envelope_en

[64] Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU, OJ L 234, 22.9.2023, p. 1.

[65] https://alternative-fuels-observatory.ec.europa.eu/

The revised **Renewable Energy Directive (RED)** [66] puts an obligation on transmission and distribution system operators to make available information close to real time on the share of renewable energy and the greenhouse gas emissions content of the electricity they supply to the electric vehicle users, aggregators and e-mobility service providers and electricity market participants.

<u>Automotive</u>

In the **automotive sector**, type-approval legislation sets conditions of access for third-party service providers to repair and maintenance information. This legislation is currently under review [67] in an initiative that aims at setting the conditions for accessing and using **in-vehicle generated data**, as well as vehicle resources and functions. It aims to enable clear and competition-friendly EU rules for a faster development of services that are based on access to vehicle data, functions and resources (e.g. remote diagnostic, predictive maintenance, mobility as a service, connected and automated mobility, fleet management, smart charging of electric vehicles, car sharing, repurposing of batteries in electric vehicles to extend end of life, and insurance). Making it easier for public authorities to access in-vehicle data can also significantly increase adoption of modern (data-driven) policy-making methods in the fields of road safety, transport, mobility and the environment. For the sake of road safety, it will be crucial that authorised vehicle inspectors (public and private) have easy and free access to the vehicle-specific data they need in order to perform roadworthiness tests on modern vehicles. Assessing the cybersecurity aspects of connected and automated vehicles – including Electric Vehicles – is a matter of priority, as they may present implications for cyber-espionage, foreign interference or data security. In accordance with article 22 of the NIS2 Directive, the Commission, after consulting the NIS Cooperation Group and ENISA [68], will consider identifying relevant supply chains related to connected and automated vehicles in order to carry out a Union level coordinated risk assessment, taking into account technical, and where relevant, non-technical risk factors.

<u>Aviation</u>

The Commission amended in 2020 its proposal for a **regulation on the implementation of the Single European Sky** [69], partly in order to include (i) new provisions on data availability and in particular to make operational data (such as the estimated time of arrival for scheduled flights) available on a cross-border basis and across the EU; and (ii) pricing principles that are to be further defined in order to ensure a level playing field in market access for data service providers in the field of air traffic management.

Data4Safety (D4S) [70] is a voluntary partnership between EU Member States and industry to better identify systemic aviation safety risks at EU level as well as their mitigation. This is done through the collection of aviation data and the building-up of analytical capacity to make good use of this data, which are collected from across the aviation system (e.g. safety reports, flight

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[66] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, OJ L, 2023/2413, 31.10.2023.
[67] Access to vehicle data, functions and resources (europa.eu)
[68] https://www.enisa.europa.eu/
[69] COM(2020) 579 final, amended proposal for a regulation of the European Parliament and of the Council on the implementation of the Single European Sky (recast).
[70] https://www.easa.europa.eu/en/domains/safety-management/data4safety

data from airlines, and traffic data from the ATM system or weather data). The data are used by the experts from EU Member States and industry who collaborate with D4S data scientists.

ICARE (Informational Core for Aviation Related Extractions) is a tool used by the European Commission for data analysis and reporting in the field of aviation. It helps policymakers to make better-informed decisions. It makes it possible to analyse the global traffic supply and demand of air transport in aviation markets as reported by carriers of their flight schedules (supply) and Eurostat (demand).

The **Atlas of the Sky** [71] is a geographical tool that uses ICARE-based data to convert data-driven information into map-based charts (e.g. information on TEN-T, ASAs, PSOs, airports and air traffic). The Atlas of the Sky enables users to directly open reports in ICARE or traffic-related data.

Under the **ReFuelEU Aviation Regulation** [72], the Commission proposed that EASA should (from 2025 and every year thereafter) publish a technical report based on the annual reports published by the fuel suppliers, aircraft operators and airport-managing bodies within the scope of the Regulation. This report will contain key indicators on the development of sustainable aviation in the EU, such as the aggregated amount of sustainable aviation fuel (SAF) supplied and used across the EU, the state of the SAF market (including prices and trends in SAF production) and the compliance status of stakeholders affected by Regulation.

Road transport and safety

In the **road transport sector**, a number of databases and data-exchange systems make it easier for road transport operators and national authorities to comply with and control compliance with the EU's road transport rules. The key systems allowing G2G, B2G and G2B data exchanges are the **European Register on Road Undertakings (ERRU)** [73], **TACHOnet** [74] and the **Internal Market Information system (IMI)** [75].

In **road safety**, the EU CARE [76] database includes annual data on all road crashes leading to death or injury in the EU and EFTA [77] countries. It is based largely on police data. Linking police and hospital records would significantly improve the quality of data on the severity of injuries. Key road-safety performance indicators are also being collected through the EU-funded Trendline project [78].

> These initiatives and their ecosystems are an **important part of the development of the EMDS**. The added value of the EMDS will be the interlinking of those ecosystems and,

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[71] https://ec.europa.eu/transport/modes/air/aos/aos_public.html

[72] Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation), OJ L, 2023/2405, 31.10.2023.

[73] ERRU is an electronic system for the exchange of information between Member States' authorities on road transport undertakings and on their compliance with the EU road transport rules; European Register of Road Transport Undertakings (ERRU) (europa.eu)

[74] TACHOnet is a system for the electronic exchange of information between Member States on driver tachograph cards; https://transport.ec.europa.eu/transport-modes/road/tachograph/tachonet_en.

[75] IMI is a secure, multilingual online tool managed by the Commission that facilitates the exchange of information between Member States' authorities involved in the practical implementation of the EU law. IMI helps authorities to fulfil their cross-border administrative cooperation obligations in multiple single-market policy areas; IMI-Net - The EU Single Market (europa.eu)

[76] https://road-safety.transport.ec.europa.eu/statistics-and-analysis/methodology-and-research/care-database_en

[77] https://www.efta.int/

[78] https://www.baseline.vias.be/

where gaps are identified, the provision of recommendations or, where relevant, proposals, for further harmonisation to facilitate data access, reuse and sharing.

4.2. Designing a common umbrella framework and main components

In order to address the objectives mentioned in Section 2, the Commission will support the development of an EMDS framework.

> The EMDS framework will have **technical** (e.g. infrastructure elements) and **governance dimensions** (e.g. a set of rules, procedures, roles and responsibilities which will need to be developed and adapted on a case-by-case basis, in accordance with relevant EU legislation). It will **facilitate data access, reuse and sharing** in a federated, trusted and secure environment between mobility and transport data ecosystems and their stakeholders and with other sectoral data spaces.

The EMDS needs a clearly defined **governance structure,** compatible with relevant EU legislation, with roles and responsibilities for its effective establishment and operation. The Commission, drawing on dedicated projects and stakeholder consultations, will analyse existing governance frameworks in the mobility and transport sector and assess the options for the set-up of an organisational governance structure of the EMDS. This may include an operational role, encompassing for instance the recommendations of building blocks and standards, the certification of compliance with the EMDS framework and the operation of an interlinking layer. It may entail different levels of governance. It should ensure the active participation of different stakeholders and respect principles of fairness and transparency.

This EMDS framework will consist of the following main components.

1) **Building blocks**:
   Drawing on stakeholder input and dedicated projects, the Commission will first analyse the building blocks used in existing mobility and transport data ecosystems, and in other industry sectors that can be reused under the EMDS. On this basis, a **set of common building blocks** for **interoperability, data sovereignty** [79]**, trust and value creation**, as well as **governance, business and legal dimensions** will be outlined. These building blocks should be described as part of a coherent reference architecture. The goal is to reuse as many existing building blocks as possible (in particular generic data space building blocks), but also to facilitate the creation of new building blocks (if needed).

2) **Standards**:
   There are today a significant number of standards mandated under the EU's transport *acquis* – in addition to other industry standards that are also in use. The Commission will analyse the **existing standards landscape (**particularly those relevant to **data quality, comparability, level of service and accessibility**)**,** and will consider the

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[79] 'Data sovereignty involves enhancing control by organisations and individuals over data that they contribute to generating. It implies participation in data governance and allows individuals and organisations to self-determine how, when and at what price others may use their data across the value chain. It means that data holders can safeguard user data and ensure that it is used only in accordance with strictly defined rules.';
European Commission, Joint Research Centre, Farrell, E., Minghini, M., Kotsev, A. et al., *European data spaces – Scientific insights into data sharing and utilisation at scale*, Publications Office of the European Union, 2023; https://data.europa.eu/doi/10.2760/400188.
Rules on data sovereignty should always be objective, non-discriminatory and transparent.

opportunity of adopting suitable follow-up measures, including issuing non-binding recommendations to foster standardisation convergence and enable the interoperability of data sources and ecosystems that facilitate the exchange of data based on a federated framework. It is important to note that developing new standards is not within the scope of the EMDS. The aim is to recommend existing standards for data-sharing that could be used by existing and future mobility and transport ecosystems and to clearly set out those standards that would be most relevant when linking to the EMDS.

3) **Interlinking layer**:

Drawing on discussions with relevant stakeholders and dedicated projects, the Commission will aim at first **defining the specifications** and then support the **deploying of an interlinking layer** that will enable the interconnectivity of existing and emerging mobility and transport data spaces and domains. It will notably facilitate the **discoverability** and **accessibility** of data from those data spaces and domains. In this way, this layer is expected to become the core of EMDS.

All the EMDS components will be aligned with guidelines and essential requirements defined under cross-sectoral data legislation and with the generic framework for common European data spaces, in particular recommendations from the EDIB, the DSSC and relevant building blocks, e.g. provided by Simpl (see section 3.1).

The envisioned concept of the EMDS is illustrated in Figure 1. This concept will necessarily evolve as implementation progresses and requires a certain flexibility so that the overall framework can be adapted. The framework will follow guidelines and essential requirements defined in the EU's cross- sectoral data legislation, align with horizontal initiatives and other sectoral data spaces (see Section 3.1), public or private mobility data ecosystems and initiatives (see Section 3.2) and be built on existing and future EU-mobility data domains, legislation and initiatives (see Section 4.1). At the same time, the framework will feed these initiatives, ecosystems and data spaces with other data and relevant recommendations. The end-users of the EMDS will be able to discover, access and exchange data with this vast range of ecosystems, so that they can create innovative mobility services and enable value-added use cases in the transport sector (see Section 2.2).
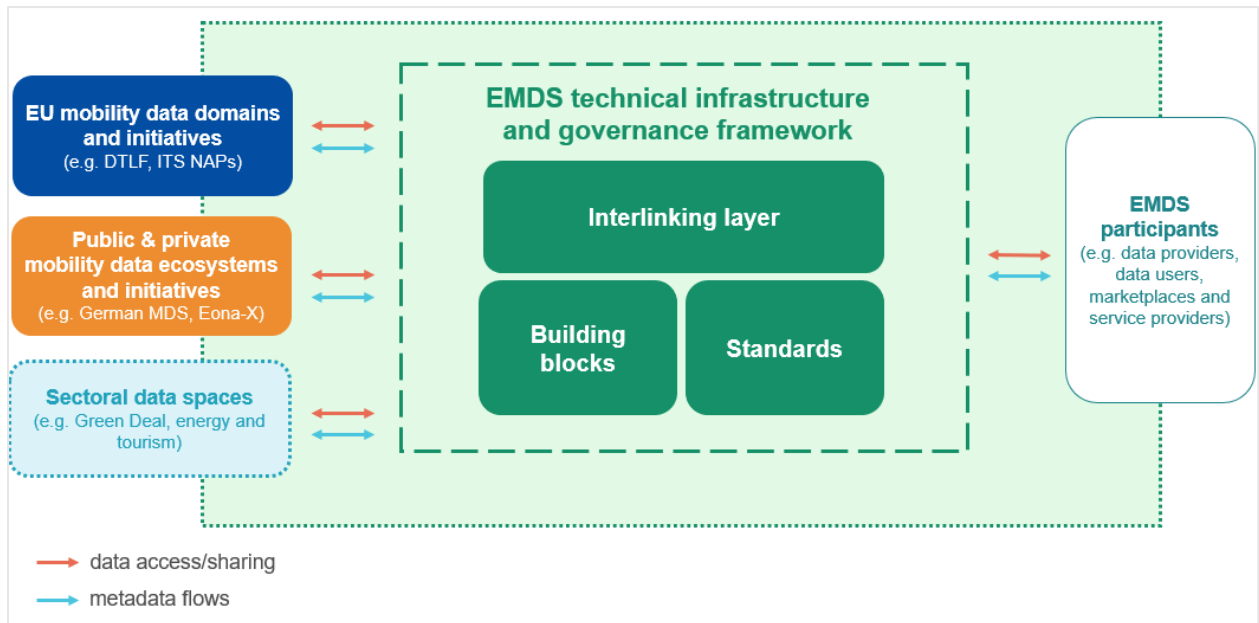
Figure 1: envisioned concept of the EMDS

4.3. EMDS development phases and funding instruments

In line with the commitment taken in the European data strategy, the development of the components of the common EMDS will be carried out in phases, following an incremental and iterative approach. The Commission is supporting this development by funding a number of projects under **DIGITAL** [80] and **CEF** [81] with a total current funding of EUR 11.4 million. Other initiatives will also have important spill-overs for the EMDS development (e.g. the planned next phase of the NAPCORE project (EUR 9.5 million)).

All ongoing and planned actions will include the requisite stakeholder consultation with Member States, public authorities, private actors and the general public. The public consultations have already begun with the call for evidence [82] (November-December 2022) and have continued with public and expert workshops [83] that involved a total of more than 1 000 participants in 2023.

Phase 1 (as from September 2022)

In the first phase, work is ongoing to identify and map relevant existing and emerging initiatives in the field of mobility and transport. It will also lead to a first set of guidelines that actors of existing and future domains and ecosystems can voluntarily implement to further

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[80] Digital Europe Programme, Work Programme for 2021-2022, Annex, p 47. Data space for mobility

[81] Regulation (EU) 2021/1153 of the European Parliament and of the Council of 7 July 2021 establishing the Connecting Europe Facility and repealing Regulations (EU) No 1316/2013 and (EU) No 283/2014, OJ L 249, 14.7.2021, p. 38.

[82] Transport data – creating a common European mobility data space (communication) (europa.eu)

[83] Three examples are the 10th Florence Intermodal Forum: Creating a Common European Mobility Data Space - Florence School of Regulation (eui.eu) (November 25, 2022); PrepDSpace4Mobility expert and public stakeholder workshops (mobilitydataspace-csa.eu); and an online stakeholder workshop by DG MOVE 'Public workshop on creating a common European mobility data space (EMDS)' (February 16, 2023)

develop and harmonise (in accordance with the recommendations of the DSSC when available).

More specifically, under DIGITAL, a 12-month coordination and support action (CSA) – '**PrepDSpace4Mobility**' [84] (EUR 1 million) – started in October 2022 with two main objectives. The first main objective was to draw up **an inventory of existing mobility and transport data initiatives, ecosystems and platforms** and their main characteristics. The second was to provide recommendations on possible common design principles and **building blocks** and to explore options for a common framework for data-sharing in the mobility and transport sector. It also brought stakeholders together and encouraged convergence in the diverse mobility and transport ecosystem.

Under the CEF, the Commission is planning to launch a 12-month **technical assistance study** (EUR 500 000) in Q1 2024. This will help define the governance aspects of the EMDS framework as well as develop the specifications for the **interlinking layer** that will facilitate the discoverability and accessibility of data by defining common metadata from existing and emerging mobility and transport data domains. It will also develop non-binding recommendations to enable **interoperability** of existing data sources and ecosystems that facilitate the exchange of data based on a federated framework. The study will complement the results of the PrepDSpace4Mobility initiative.

Phase 2 (as from November 2023)

The second phase will focus on the implementation of the EMDS framework. Support and collaboration will be needed for the progressive implementation of this framework by existing transport and mobility data initiatives to facilitate mobility data access, pooling and sharing within the mobility sector and across sectors.

To support the second phase, a project [85] under DIGITAL was kicked-off in November 2023 (EUR 8 million) and it will run for 36 months. It will deploy an **operational data space** so that participants can make data available and share data in a controlled, simple and secure way. It will focus on data-sharing use cases related to **travel, traffic and urban mobility indicators**.

Additionally, under the CEF, a **deployment initiative** is planned for Q1 2025 (EUR 1.9 million). This will build on the outcome of the DIGITAL projects, the CEF technical assistance study and existing national and EU initiatives that will further **develop, test and validate the overall framework for the EMDS**. The focus will be on:

- the **interlinking layer**;
- the further identification of the required **building blocks** around data **interoperability and semantics, sovereignty, trust and value creation**;
- recommendations for **standards for data quality, level of service and accessibility**.

Further complementary EU-funded deployment actions could be envisaged.

Long-term perspective

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[84] PrepDSpace4Mobility; https://mobilitydataspace-csa.eu/
[85] DIGITAL-2022-CLOUD-AI-03-DS-MOBILITY

The long-term perspective is an established data space that will enable data-sharing between all the different stakeholders. It will continuously evolve as it covers more and more use cases, participants and users. In addition, further initiatives (including legislative measures), both at the level of the EMDS and/or at the level of its components, may be required in the coming years. Such initiatives could include fostering agreements among key ecosystems and stakeholders, and identifying use cases and new business models – thus demonstrating the value of the EMDS and supporting the progressive integration of legacy and new initiatives. The Commission will ensure the long-term operation and sustainability of the EMDS by supporting the set-up of an appropriate governance structure and analysing solutions for its economic viability.

Summary

To design and implement the umbrella framework of the common EMDS, the Commission is planning to launch or has already launched the following actions with a total funding of **EUR 11.4 million**:

Phase 1
- **DIGITAL CSA** (12 months – from Oct 2022 to Sept 2023): **EUR 1 million**
  Milestones:
    - mapping of existing mobility and transport data ecosystems
    - the first identification of recommended common building blocks and standards
- **CEF technical assistance study** (12 months – from Q1 2024 to Q1 2025): **EUR 500 000**
  Milestones:
    - definition of the governance aspects of the EMDS framework
    - definition of the interlinking layer

Phase 2
- **DIGITAL deployment action** (36 months – from Nov 2023 to Nov 2026): **EUR 8 million**
  Milestones:
    - data-space pilots focused on traffic and urban mobility indicators
- **CEF deployment** (36 months – from Q1 2025 to Q1 2028): **EUR 1.9 million**
  Milestones:
    - deployment of the interlinking layer
    - further identification of recommended common building blocks and standards

5. Conclusion and next steps

The feedback in response to the call for evidence and the various stakeholder consultations confirms not only the needs and the large potential benefits, but also the challenges of establishing a common EMDS. The development of the EMDS therefore needs to follow a sequenced pathway that first identifies the overarching challenges outlined in this communication and then prepares appropriate measures to implement it. The heterogeneity and diversity of data types and stakeholders, and the fragmentation of existing databases and data-

sharing standards currently make any interoperability exercise very difficult. The existing ecosystems are also very different in that some of them create data while others only exchange data; and that some are open to all while most are available only for specific actors and some concern confidential data and access is restricted. Digitisation efforts in some sectors are still ongoing and not all relevant data have been digitised.

Building the EMDS will be a dynamic process. Its elements will be identified, fine-tuned and further developed consistently aligned with other sectoral data spaces and supporting initiatives (e.g. the DSSC). A certain level of flexibility to add new initiatives and refine others will be needed. The **feedback and support of all stakeholders in the EU mobility and transport sector will be fundamental to achieving the goals of the EMDS**. The EMDS should be built primarily for and by the mobility and transport stakeholders, responding to their needs and leveraging the existing and emerging initiatives across the EU.

The common EMDS will help to **accelerate the digital and green transformation** of the EU's mobility and transport sector, strengthening its performance and efficiency and contributing to safety, climate neutrality, sustainability, resilience and agility. It will reduce the current fragmentation in the sector and will improve access to mobility and transport data by public and private actors in a seamless, non-discriminatory, trusted and harmonised way. It will also provide cross-sectoral benefits via its synergies with other sectoral data spaces.

A functioning EMDS will bring significant advantages for Member States, all relevant public authorities, market actors and the general public. Enabling access to and sharing of relevant mobility and transport data can support the making of transport policy and increase cross-border connectivity, thus contributing to economic growth. Simplified access to comprehensive data facilitates informed decisions on infrastructure and transportation planning, thus resulting in more efficient systems. Market actors can seize new business opportunities through data-sharing, forming partnerships and integrating services for improved coordination. Real-time information optimises private and public actors' operations, thus ensuring compliance with regulations. Ultimately, passengers, commuters and travellers benefit from an improved and more inclusive travel experience with efficient transportation systems, real-time updates, enhanced safety, sustainability and accessibility through system integration and multimodality.