



**DATA SPACE FOR
SMART AND SUSTAINABLE
CITIES AND COMMUNITIES**

Deliverable D2.2

Multi-Stakeholder Governance Scheme

WP 2– Governance

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Delivery date: 26/09/2023

Dissemination level: Public

Type: Report



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Revision History

Author Name, Partner short name	Description	Date
Justine Gangneux (Eurocities)	Version 1	31/08/2023
Sophie Meszaros (OASC)	Review 1	06/09/2023
Charline Feurtey (Eurocities)	Review 2	08/09/2023
Federica Bordelot (Eurocities)	Review 3	20/09/2023
Clara Pezuela (Fiware)	Review 4	24/09/2023
Sophie Meszaros (OASC)	Final review	24/09/2023
Martin Brynskov (OASC)	Final review	24/09/2023
Justine Gangneux (Eurocities)	Final version	26/09/2023

Abbreviations

APIs	Application programming Interfaces
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
CDO	Chief Data Officer
CTO	Chief Technology Officer
DaaS	Data-As-A-Service
DPIA	Data Protection Impact Assessment
DPO	Data protection Officer
DS	Data Space
DS4SSCC	Data Space for Smart and Sustainable Cities and Communities
DSSC	Data Spaces Support Centre
DGA	Data Governance Act
EDIB	European Data Innovation Board
EDPB	European Data Protection Board
EDPS	European Data Protection Supervisor
eIDAS	electronic IDentification, Authentication and Trust Services
EIF	European Interoperability Framework
FAIR	Findable, Accessible, Interoperable and Reusable
GDPR	General Data Protection Regulation
IDEA	Intelligent Data Exchange Alliance
IDSA	International Data Spaces Association
IPRs	Intellectual Property Rights
LDES	Linked Data Event Streams
LDT	Local Digital Twin
MIMs	Minimal Interoperability Mechanisms
NAP Core	National Access Point Coordination Organisation for Europe
NDA	Non-Disclosure Agreement
OSLO	Open Standards for Linked Organisations
PETs	Privacy-Enhancing Technologies
PPP	Public Private Partnerships
SLA	Service Level Agreement
SaaS	Software-As-A-Service



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Acknowledgements

This work would not have been possible without the dedication and input of the representatives of local authorities who took part and contributed to the WP2 Governance Group. I would like to thank city representatives in Amsterdam, Lisbon, Barcelona, and Rubi who presented insightful use-cases for WP2 as well as representatives in Eindhoven, Helsinki, Porto, Région Centre-Val de Loire, Riga, and Zaragoza who provided further input and examples to nourish the scheme. I am also grateful to all stakeholders who took part in the project's events and provided input and feedback on the scheme. Finally, I would also like to thank Ron van der Lans and Jasper Soetendal from Braxwell.com (as external experts' strategic data partnerships of the City of Amsterdam's Directorate Digitalization & Innovation) for their valuable work on the Data Cooperation Canvas.



Executive Summary

This document sets out the **multi-stakeholder governance scheme** for the Data Space for Smart and Sustainable Cities and Communities (DS4SSCC) developed in collaboration with local authority representatives and broader stakeholders (i.e. private sector, academia, civil society organisations) as part of work package 2 led by Eurocities.

The multi-stakeholder governance scheme aims to provide a **baseline modality** for data access and exchange in the deployment phase of DS4SSCC and facilitate the development of trustworthy local data ecosystems which align with European values. It is also a basis to support the future progressive harmonisation of local data ecosystems into a federated European data space for smart communities.

This document is aimed at **local data ecosystem stakeholders** in the public (cities, municipalities, regions) and private (SMEs, Start-ups, IT industry) sectors as well as stakeholders in the scientific community and civil society organisations who would like to set up and/or take part in multi-stakeholder data cooperation in line with the Data Space for Smart and Sustainable Cities and Communities.

This document is structured in three main sections. The first part iterates the first version of the **DS4SSCC Code of Conduct** which includes the principles and vision of the data space for smart communities, details the roles and responsibilities of participants, proposes governance structures, and reviews the legal and contractual frameworks relevant to DS4SSCC data sharing. The second section of the deliverable follows the framework of **the Data Cooperation Canvas** (Figure 11) and provides a **step-by step guide** to developing and sustaining multi-stakeholder collaborations that align with DS4SSCC. The canvas was co-developed during the preparatory action and cuts across all the work packages. The last part puts forward **recommendations** at the local, national, and European levels to foster trustworthy multi-stakeholder data cooperation.

The multi-stakeholder governance scheme is accompanied by appendices providing a **toolbox** with a range of relevant resources for data sharing, a **detailed overview of each WP2 use-cases** and a **summary of the methodology underlying the development of the multi-stakeholder governance scheme**.

The scheme is one component of the **blueprint for DS4SSCC** which also offers guidance on technical specifications and data standards (D3.1), sets up a reference architecture (D.3.2) as well as identifies priority datasets (D4.1) and provides a roadmap for the implementation of the data space at European level (D4.2). The blueprint will be further developed and validated during the **deployment phase** of DS4SSCC in the context of local pilots.



1.Introduction

DS4SSCC is a Coordination and Support Action under the umbrella of the [Living-in.EU](#) movement and aligns with its principles and values: citizen-centricity, a city-led approach at EU level, the city as a citizen-driven and open innovation ecosystem, ethical and socially responsible access, use, sharing and management of data, technologies as key enablers and the deployment of interoperable ecosystems based on open standards and technical specifications, Application Programming Interfaces (APIs) and shared data models.

DS4SSCC is envisioned as a **cross-sectoral horizontal data space** which will enable the [European Green Deal](#). It is grounded in local communities and authorities which are in a unique position to tackle climate change. Driven by the ambitious [EU Mission: Climate-Neutral and Smart Cities](#), European municipalities are taking the lead to reach climate neutrality by 2050 and pioneer innovative approaches with citizens and stakeholders¹. Initiatives range from energy efficient buildings and retrofitting^{2 3}, low carbon public transport⁴ and encouraging active and sustainable mobility⁵, to green urban spaces to reduce CO2 emissions, increase air quality and fight against heat islands⁶ while community led actions and citizen engagement (e.g., Citizen Assemblies, green participatory budgeting, citizen science) have also been growing⁷⁸. In terms of data, local authorities and communities can both be providers and users of data and related services while bringing their local knowledge and experience. In the past years, numerous local data initiatives aimed at tackling climate change have emerged across domains such as [urban planning](#), [mobility](#), [climate change adaptation](#) or [energy flows management](#) (see also ODI, 2021, 2022).

The preparatory work for DS4SSCC delivers a **comprehensive blueprint** of a European data space for smart communities in line with European values and policies. Based on the Data Space Support Centre (DSSC), we understand Data Space (DS) as “*a distributed system defined by a governance framework that enables secure and trustworthy data transactions between participants while supporting trust and data sovereignty. A data space is implemented by one or more infrastructures and enables one or more use cases*”⁹. The aim is to create a single and secure market for data, to boost the digital economy and foster “*an ecosystem (of companies, civil society and individuals) creating new products and services based on more accessible data*”¹⁰.

A common European Data Space (DS) needs to provide a **secure and privacy-preserving infrastructure** as well as **clear and practical governance mechanisms**. The DS should be interoperable and follow European rules, (e.g. personal data

¹ <https://eurocities.eu/latest/the-100-climate-neutral-and-smart-cities-by-2030/>

² <https://eurocities.eu/stories/mapping-the-solar-transformation-in-budapest/>

³ <https://eurocities.eu/stories/housing-built-with-empathy-and-respect-for-people/>

⁴ <https://eurocities.eu/stories/carbon-free/>

⁵ <https://eurocities.eu/latest/a-guideline-to-boost-sustainable-transport-in-cities/>

⁶ <https://eurocities.eu/stories/beating-the-heat-in-vienna/>

⁷ <https://www.newlocal.org.uk/wp-content/uploads/2021/10/Communities-Vs-Climate-Change1.pdf>

⁸ https://climate.ec.europa.eu/citizens/citizen-support-climate-action_en

⁹ DSSC Glossary <https://docs.google.com/document/d/15x6WHHGSOG4ZuXQw8u3AinpJrgbydril/edit>

¹⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0066>



protection, consumer protection legislation, competition law, etc.) and principles (e.g. technological sovereignty, public interest) as set in the [European Strategy for Data](#). The Staff Working Document (SWD) on common European data spaces¹¹ further specifies the required functions of a DS:

- I. *'deploy data-sharing tools and services for the pooling, processing and sharing of data by an open number of organisations, as well as federate energy-efficient and trustworthy cloud capacities and related services;*
- II. *include data governance structures, compatible with relevant EU legislation, which determine, in a transparent and fair way, the rights concerning access to and processing of the data;*
- III. *improve the availability, quality and interoperability of data – both in domain-specific settings and across sectors.'*

The European strategy for data initially put forward 9 domain-specific data spaces in strategic economic sectors and domains of public interest including industrial and manufacturing, mobility, health, energy, agriculture, public administration, financial, skills, and Green Deal. Both the Green Deal DS and DS4SSCC are **cross domain** and are foreseen to enable the EU [Green Deal Objectives](#) and UN [Sustainable Development Goals](#). In this way, DS4SSCC is envisioned to intersect with other sectoral DS, in particular the Mobility DS, Energy DS, Skills DS and Health DS.

DS4SSCC prioritises the sharing and (re)use of **data for the common good** to make cities inclusive and sustainable and empower people to address global challenges such as a green and just transition to climate neutrality by 2050. Thus, the creation of value from data sharing is understood in broader terms than monetisation. Identified areas relevant to DS4SSCC include:

- Predictive traffic management/sustainable mobility planning
- Management/efficiency of energy flows
- Zero pollution actions (e.g., air, water, soil pollution or waste)
- Data-services related to weather, climate, and extreme weather events (e.g. disaster resilience)
- Any other domain falling under the New European Bauhaus initiative (urban design, building management, public services, nature-based solutions, amongst others)

For more detail about the strategy of DS4SSCC, please refer to the project Deliverable [D1.1: Strategy Report](#).

In the context of this deliverable, it is important to highlight that DS4SSCC brings together a **large range of local, national, and European stakeholders** (Table 1) with interests that do not always converge. The emphasis is on creating **win-win situations and incentives** for stakeholders to collaborate in a trustworthy environment.

¹¹<https://digital-strategy.ec.europa.eu/en/library/staff-working-document-data-spaces#:~:text=This%20document%2C%20prepared%20in%20response,programmes%20and%20data%20infrastructure%20initiatives.>



Stakeholders		Type
Public administrations & institutions	Local authorities	Cities, metropolises, regions, local government
	Other public bodies	Public city service/ utility operators (e.g., EMEL, CARRIS, STIB) National public bodies (e.g., IPMA, national transport authorities, national statistical offices, etc) National data access points (e.g. NDW)
	National governments	
	EU institutions & organisations	EU Commission, European Data Innovation Board, European Data Protection Board, etc
Private sector	Semi public or private city service operators	Utilities incl. energy, water, waste, transport infrastructures (e.g., Suez, Veolia, Enedis, Acciona, Mobico Group)
	SMEs	Technology & smart city solutions (e.g., ImpactE, Urban Software Institute GmbH, Lattitudo 40 etc.) Other local businesses
	Large corporations	Technology & smart city solutions (e.g., Google, BeMobile, TomTon, Microsoft, Cisco, IBM, Atos, IES Communications, Huawei, etc) Telecommunications (e.g., Vodafone, Orange, etc) Finances & banks (e.g., Mastercard) Global management consulting (e.g., Deloitte, McKinsey & Company, etc) Shared mobility operators (e.g., Uber, Lyft, Bolt, Lime, Cambio CarSharing, NextBike, etc.)
Academia & research institutions		Higher education institutions (e.g., University of Barcelona, Lisbon's Nova Management Information School, Université de Rennes, etc) Independent research organisations (e.g., RISE, computer vision centre, Open Data Institute, etc)
Civil society organisations & Citizens		Citizens Community organisations (e.g., citizens science organisations, neighbourhood organisations, etc) Non-governmental & non-for-profit organisations (e.g., World Data League, FING, etc.)

Table 1: DS4SSCC stakeholders

This deliverable presents the multi-stakeholder governance scheme for DS4SSCC which was developed in collaboration with cities and local authorities' representatives and broader stakeholders (i.e., private sector, academia, civil society organisations) as part of work package 2 led by Eurocities. The scheme will be further developed and validated during the deployment phase of DS4SSCC in the context of local pilots.

1.1. Multi-stakeholder governance scheme

The multi-stakeholder governance scheme provides a **baseline modality** for DS4SSCC data access and exchange in the deployment phase and will facilitate the development of local data ecosystems that foster trust. It is also a basis to support the future progressive harmonisation of local data ecosystems into a federated European data space for smart communities.

In the context of this work, governance is understood in a broad sense, following Micheli et al (2020:3)'s definition as '*the power relations between all the actors affected by, or having an effect on, the way data is accessed, controlled, shared and used, the various socio technical arrangements set in place to generate value from data, and how such value is redistributed between actors*'. Indeed, the work is not focusing only on technical and legal questions related to data governance but also takes into



account the variety of DS4SSCC stakeholders and the power dynamics that characterise their current relationships to create a **level playing field**.

1.1.1. Scope of the scheme

The multi-stakeholder scheme's objectives were to:

- Consider the roles and responsibilities of different stakeholders in the data space for smart and sustainable cities and communities
- Identify standardised access rights and business models for the management of the ecosystem
- Determine conditions for access, sharing, processing, and using data within (local) data ecosystems
- Explore mechanisms for identity management and trust
- Establish data quality assurance guidelines and standards
- Take into consideration existing European policies, legislations, and regulations.

The scheme needs to be implemented alongside the other components of the DS4SSCC blueprint which also drew on existing best practices and standards to define guidelines and mechanisms required for the upcoming deployment of the DS around four pillars (see Figure 1):

1. A Multi-Stakeholder Governance Scheme (WP2)
2. A Technical blueprint including a [Catalogue of Specifications](#) (D3.1), a Reference Architecture Model and Cookbook (D3.2) to deploy the technical infrastructure for the data space. (WP3)
3. A Roadmap and action plan (D4.2) towards a mature, connected pan-EU DS4SSCC. (WP4)
4. A Stakeholder Forum (WP1 & WP5), including capacity building activities. The deliverables of the preparatory action are built on the regular interaction with the stakeholder forum which brings together individuals from both the supply and demand side.

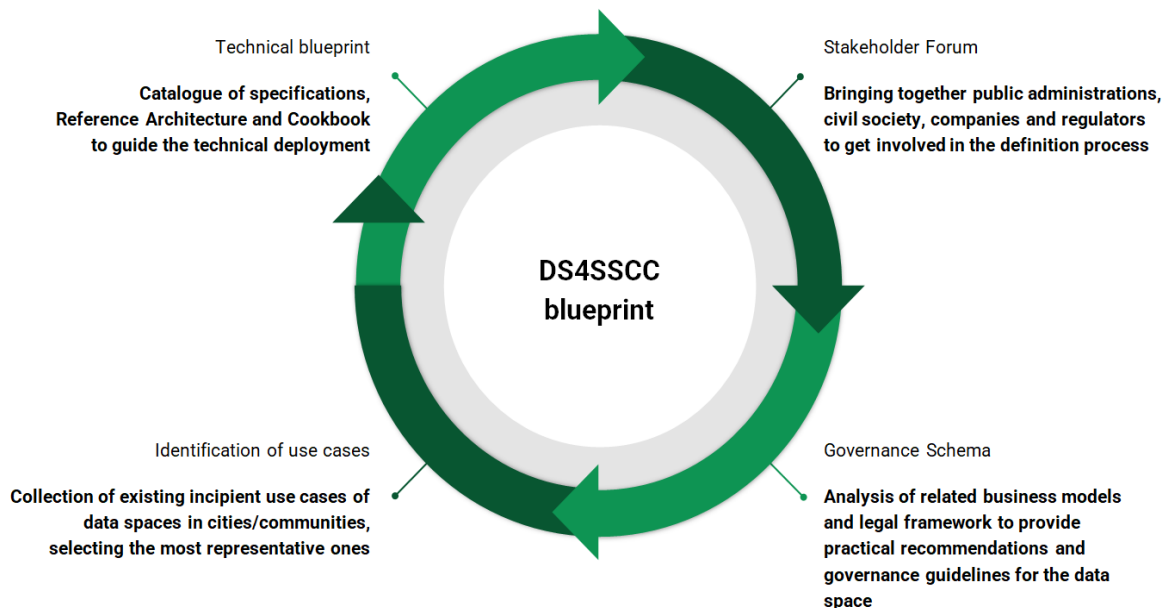


Figure 1: DS4SSCC Blueprint

The multi-stakeholder governance scheme was co-developed during the activities of **WP2 led by Eurocities**. It was presented and validated during the **DS4SSCC Stakeholder Forums** which convened monthly and had a representation of broader stakeholders covering the 'quadruple helix' (public sector, private sector, academia and civil society).

The work was developed by the **Governance Group** which brought together representatives of local authorities during a series of workshops. The Governance Group workshops were designed to capture existing knowledge and experience on local data sharing with different configurations of stakeholders (e.g., municipalities, metropolitan areas, regions, private sector, academia, civil society, etc.). See Appendix 4 for more information about the Governance Group.

The work and exchanges conducted during the workshops informed the first iteration of guidance and principles for the governance of the data space for smart communities. The workshops drew on **concrete use-cases** to discuss data sharing in different local data ecosystems and identify lessons learnt and best practices. For each use-case we mapped:

- The stakeholders involved using the quadruple helix
- The datasets shared and used as well as the data flows between organisations
- The other types of exchanges between stakeholders which facilitate data flows (e.g., knowledge exchange, legal support, supply of data skills, provide data services, citizens involvement)
- The mechanisms underlying data exchanges (i.e., Cooperation/ decision making mechanisms, Value creation, Value Distribution, Financing, Contractual agreements)



The development of the scheme was further enriched by frequent inputs from the broader community via expert interviews, surveys, and exchanges with the DSSC. For more information about the work conducted by WP2 throughout the preparatory action, please refer to our [work plan](#) (see also Appendix 4 for a detailed overview of the methodology).

1.1.2. Selection of use-cases

Given their areas of competencies and practical knowledge, local authorities play a central role in exploring new modalities and frameworks to responsibly govern data in ways that safeguard it from harm while delivering public value. It has been recognised that 'city governments stand out as key stakeholders, who might act as promoters of innovative approaches for data sharing and use for the public interest (Liva et al 2023, p.12).

WP2, thus, identified use-cases which reflected **different configurations of stakeholder collaborations** and provided **different approaches on the role of local authorities in data ecosystems**.

The criteria for the selection of use-cases were:

- Be grounded in cities and communities and cutting across domains
- Involve different types of stakeholders (e.g. private sector, governments & public administrations, research & academia, civil society)
- Align with [Green Deal Objectives](#), the [EU Mission on Climate Neutral and Smart Cities](#) and/or the [New European Bauhaus](#) initiative.
- Align with the [Living-in.EU principles and values](#)

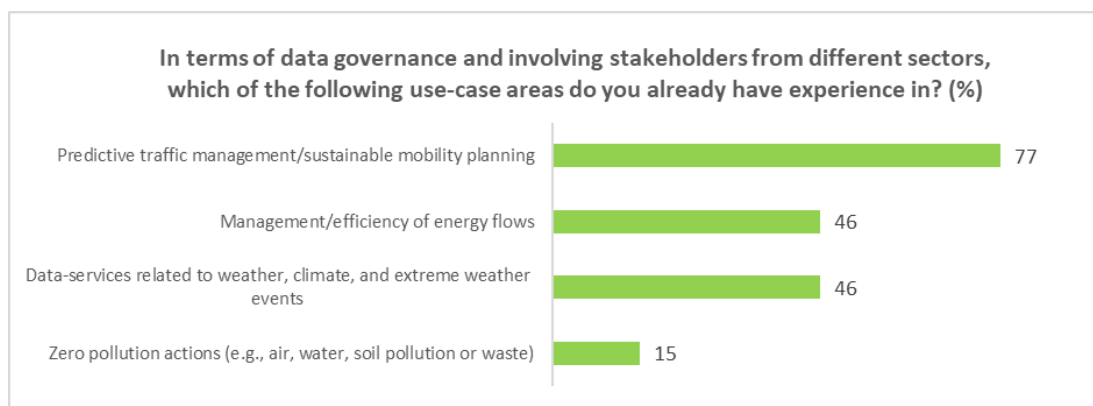


Figure 2: Existing experience in Governance Group

After a scoping exercise of relevant areas and associated experiences of data sharing in the Governance Group (see Figure 2 & Table 2), we identified four relevant initial use-cases.



Selection criteria	Name & Coordinator of local initiative			
	IDEA City of Amsterdam	LxDataLab Lisbon City Council	DataCity Lab Barcelona City Council	Rubi Brilla Rubí City Council
Aligned with Green Deal Objectives				
Accelerating the shift to smart & sustainable mobility	✓	✓		
Zero-pollution ambition for a toxic-free environment	✓	✓		
Supplying clean, affordable, and secure energy			✓	✓
Leave no-one behind (Just Transition)			✓	✓
Multi-stakeholder initiatives				
Public sector	✓	✓	✓	✓
Private sector	✓		✓	✓
Academia & research institutions		✓	✓	
Civil society		✓		✓

Table 2: Selection criteria for WP2 use-cases

Participants also had the opportunity to enrich the work and the exchanges by bringing up other relevant multi stakeholder use cases which demonstrated other aspects of collaborations and data sharing. These included four more use-cases: the Rennes Urban Data Interface (RUDI), the Climate Data Hub in Région Centre-Val de Loire, the Amsterdam Smart Port Platform and MyData Operator in Helsinki (see Table 3 & Appendix 4 for a detailed overview of the methodology).

1.1.3. Overview of use-cases

Name & Coordinator	Overview	Characteristics	Cooperation model	Maturity
WP2 Use-Cases				
IDEA City of Amsterdam	The Intelligent Data Exchange Alliance (IDEA) brings local, regional, and national public bodies in the Netherlands together to create high-quality traffic data and cooperate more closely with the private sector. This initiative is led by Amsterdam City Council and, to begin with, focused on improving data on road works. By providing high-quality, real-time data on road works, Navigation Service providers are able to provide better information to road users and road authorities have insight into their roadworks' actual impact. More broadly, it enables better traffic management and air pollution reduction.	Collaboration between public bodies at different levels (city, regional and national) and private sector Use of third-party intermediary (National Data Access Point) and use of data services providers (data quality partner)	Trusted third party (intermediary)	Operational
LxDataLab Lisbon City Council	Lisbon city council provides, acquires, and uses mobility-related data to develop real time applications and foster better policy and decision making. The Lx Data Lab brings the municipality, universities, and higher education institutions together in a cooperation protocol. The Lx Data Lab aims to reuse and generate data collected and/or acquired by the municipality through analytical and forecast challenges including in the domain of mobility.	Collaboration with academia (public and private institutions) as well as with civil society organisations (World Data League)	Pragmatic data sharing As a Service model (Data as a service, Software as a Service) Open Data	Operational
DataCity Lab Barcelona City Council	The project aimed to assess the impacts of Energy Communities in three Social Superblocks of the city within three neighbourhoods of Barcelona: Poblenou, La Marina and Vila de Gràcia. The challenge consisted in using data to identify the potential of photovoltaic panels on public spaces in these three neighbourhoods. The tool developed allows the municipality to assess the maximum surplus of solar energy - generated from municipal buildings and public spaces – in relation to the maximum impact on the spending of households in a situation of energy poverty.	Collaboration with private sector (SMEs and large private entity) and academia	As a Service model (Data as a service, Software as a Service) Open Data Data Donation (private sector)	Implementation
Rubi Brilla Rubi City Council	Rubi Brilla aims to reduce city energy consumption, accelerate the transition to renewable energy and empower citizens and companies to make meaningful changes. The city collaborated with a SME to develop a geoportal tool which allows better decision making and informs local policy on energy and planning. The city developed a consent mechanism to obtain individual smart meter data which enables them to provide personalised energy advice to individuals.	Direct involvement of citizens Collaboration with other local authorities	As a Service model (Data as a service, Software as a Service) Open Data Data Donation (private sector) Personal Data Intermediary (citizen data)	Operational



Other relevant local multi-stakeholder use-cases				
Rennes Urban Data Interface Rennes Métropole	RUDI is a local data sharing platform enabling stakeholders (e.g., service operators, researchers, public and private bodies) to share their data while retaining control over it. RUDI effectively provides a one-stop shop enabling the safe and ethical sharing of a wide range of regional data that can be used to develop and improve services.	Multi-stakeholder initiative led by metropole	Trusted third party (intermediary)	Operational
Climate Data Hub Région Centre-Val de Loire	The Climate Data Hub aims to foster the sharing and reuse of climate-related data between public and private stakeholders and thus support climate change adaptation. One of the first use-case focuses on urban heat islands to 1) identify locations of heat islands in cities and the severity of their impact to prioritise projects, 2) assess the impact of forthcoming urban developments on urban heat concentration.	Multi-stakeholder initiative led by region	Trusted third party (intermediary)	Preparatory
Smart Port Platform Amsterdam City of Amsterdam	The objective of the platform is to establish an infrastructure for smart data exchange, where all parties agree in advance on which data can be shared under specific circumstances. This ensures that when the situation demands it, such as during an incident in the port, relevant data can be quickly exchanged among all involved parties.	Collaboration between public and private sectors, and data sharing between private companies which are competitors under set conditions	Pragmatic data sharing Trusted third party (intermediary)	Preparatory
MyData Operator City of Helsinki	The city of Helsinki has deployed a MyData operator system using consent management mechanisms which enables individuals to consent to share data in the context of a specific service and for a stated purpose.	Control and decision of personal data use by citizens	Personal data intermediary	Implementation

Table 3: Overview of WP2 use-cases

1.2 Contextual background

Given the interrelated and complex challenges related to climate change, the **role of cross-sectoral data sharing and use in tackling the climate crisis** has increasingly been recognised (ODI, 2021, 2022, Susha et al 2023, Verhulst 2021). Municipalities and local governments generate large amounts of data across various domains, ranging from transport, waste management and urban planning to social services and health. Thus, secure, and trustworthy access to and strategic use of public sector data is critical to address long-standing inequalities, ensure better provision and access to public services, and support the transition to climate neutrality by 2050 (OECD, 2021, van Ooijen et al 2019, WEF 2022). Private sector data, such as from private utilities (energy, water), telecommunications companies or MaaS providers, would also offer communities and local governments valuable insights in their efforts to address both short term and long-term societal challenges and deliver better services (Micheli, 2022, Verhulst, 2021). More broadly, research has shown the crucial role of (near real-time) data to inform the design, evaluation and forecasting of policy and more broadly support climate adaptation (Bibri, 2021, Maffei et al 2020, Mauree et al 2019).

Cities and local authorities can play a **crucial role in local data ecosystems** as creator, user and provider of public, proprietary and/or personal data, and the digital infrastructures in which data is integrated (Chignard & Glatron 2023, Granel et al 2022). They are also key stakeholders who can facilitate and be the gatekeepers of innovative approaches for data sharing and use for the public interest (Liva et al 2023, p.12). Furthermore, research shows that when **citizens and communities are involved in the stewardship and (re)use of data**, it can bolster societal and economic equity, foster greater accountability, and contribute towards increased public confidence in the use of data (Ada, 2021:10).

In this context, the creation and deployment of horizontal European data spaces - DS4SSCC and the Green Deal Data Space - are key in fostering cross-sector and **multi stakeholder data collaborations** understood as a 'form of cross-sector partnership to exchange and integrate data and use it to generate public value' (Klievink et al, 2018:379).

1.2.1. Local data ecosystems and sharing

Local authorities have long collected and used multiple data including statistical data, on social services, urban infrastructures, and more, to generate insights on policy priorities and inform decision-making. In the past two decades, this trend has accelerated through the deployment of smart city initiatives across Europe (Correia et al, 2022) and the steady increase of public sector open data portals and urban platforms (Barn, 2018; Pereira, 2017). Local authorities collect, store, use, visualise and share data in a **complex city data ecosystem integrated in a technological and institutional environment** (Gupta et al, 2020; Liva et al, 2023, Meijer, 2018, see Figure 3). Data generated by the private sector (including via PPP or in public spaces) and by citizens (i.e., passively through applications and platforms or actively through crowdsourcing and citizen science), further adds to these fragmented local data ecosystems.

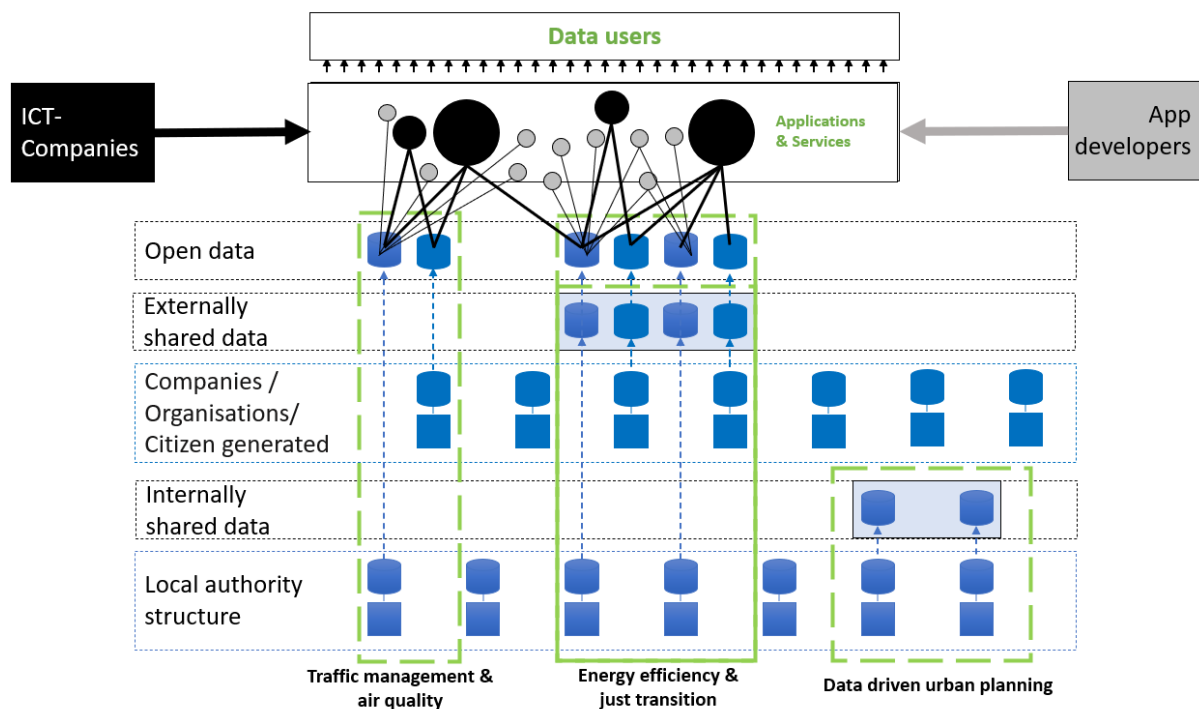


Figure 3: City data ecosystems

In their report *Innovation and Data Use in Cities*, the OECD (2021) found that 80% of European cities surveyed had **existing collaborations with academia, think tanks and research institutions** to collect and analyse data, evidencing a thriving collaborative space between non-for-profit organisations (including academia) and the public sector. Local partnerships can foster data sharing through multi-stakeholder approaches including Urban Observatories (Acuto et al 2021) or Living Labs (Ruijet & Meijer, 2020). Data sharing also takes place via **local and global citizen and community initiatives** ranging from the crowdsourcing of data on air quality¹², biodiversity and water quality to the use of ArcGIS software to collect and aggregate data on the built environment (e.g., ODI, 2022; Willians, 2020). It is important to note, however, that citizen and civil society participation in the data practices of local administrations remain limited (Cardullo & Kitchin, 2019; Przeybilovicz et al 2022)

The OECD report shows that **existing collaborations and partnerships with the private sector are also limited** with only 60% of cities reporting it (ibid:122). Recent work, conducted on B2G data sharing has identified the **four more recurring models** used by local authorities to access private sector/proprietary data. These include data donorship, public procurement of data, data partnerships and pools, and data sharing obligations (Micheli, 2022):

- Public procurement of data is when local authorities pay companies to obtain data
- Data donorship [also called 'data altruism' or 'data philanthropy'] is when companies voluntarily give data to public bodies or other organisations

¹² <https://eurocities.eu/latest/how-data-visualisation-contribute-to-cleaner-air-in-our-cities/>



- Data partnerships identify win-win situations and shared interests to encourage public and private stakeholders to share data
- Data sharing obligation clauses can be used as a legal means when inserted in tender contracts to obtain data.

While **public procurement of data** is widely used by municipalities, it is often described as restrictive due to transaction costs and lack of data standards and interoperability (Micheli, 2022, Liva et al 2023). Data partnerships based on mutual interests are less common, however, they have a higher likelihood of being successful while not straining the budget of local governments (Liva et al 2023:12) (see below on opportunities).

Data donorship by corporations such as telecommunication companies (e.g. Vodafone), banks (e.g. Mastercard), navigation service providers (e.g. Waze) or digital platforms (e.g. Google Community Mobility reports, Meta's Data for Good) have also increased in the past years with various successful examples (e.g. Benjamin et al, 2022, Verhulst et al 2019) Data donations, often framed within the narrative of social good, are not without criticism. They can be a mean for companies to build new data-driven services to be sold to other cities in the future, ultimately reproducing the asymmetrical power relations between large corporations and other actors and legitimating extractive, profit-oriented data practices by companies (Espinoza & Aronczyn, 2021, Micheli, 2022). Furthermore, recent research shows that resistance from businesses to share data is more important for public interest purposes, such as statistics, inclusion, and education than in the case of emergencies (Susha et al 2022, p.12).

In recent years, there has also been a growing interest in **data intermediaries** and the role that they could play in creating a fairer data economy (Micheli et al 2020; 2023). Data intermediaries are understood as '*mediators between those who wish to make their data available, and those who seek to leverage that data. The intermediary works to govern the data in specific ways and provides some degree of confidence regarding how the data will be used.*' (Janssen & Singh, 2022: 1). Another definition provided by the OECD states that '*data intermediaries enable data holders to share their data, so it can be re-used by potential data users. They may also provide additional added-value services such as data processing services, payment and clearing services and legal services, including the provision of standard-licence schemes*' (2019, np). Intermediaries cover a **range of organisational forms of data exchanges** including data cooperatives, data commons, data unions, personal information management systems (e.g., MyData) and trusted third parties and tend to focus on creating societal value and supporting individuals in managing their data (CDEI, 2021, Micheli et al, 2020, 2023). Local authorities are innovating in the field of data intermediaries, with for example Digital Flanders experimenting with Solid¹³, a decentralised way of storing data in personal pods¹⁴ or Helsinki deploying a MyData

¹³ <https://solidproject.org/>

¹⁴ <https://www.healthskouts.com/2022/04/12/citizen-centric-data-platform-will-put-flanders-on-the-map-as-digital-health-frontrunner/>



operator¹⁵ system using consent management mechanisms which enable individuals to share data in the context of a specific service and for a stated purpose.

The results of the survey we conducted in January 2023 (see Appendix 4) confirmed the existing research on local data sharing practices highlighted above. All public sector organisations surveyed had open data initiatives in place and the majority of them acquired data via bilateral data sharing agreement, public procurement or Service Level Agreements (SLA). Government and public administrations also reported cross-sector data collaborations with other public sector organisations (92%), industry & SMEs (67%), research institutes and academia (84%) and civil society (49%). Interestingly, approximately half (18 out of 39) of public sector organisations defined themselves either as data intermediary or urban platform provider, demonstrating the lead taken by the public sector in terms of local data sharing.

1.2.2. Challenges & opportunities

The challenges of data sharing for public sector organisations have been well documented. These include uneven **data quality, lack of interoperability and common standards, the siloing of data between services, a shortage of skills, concerns about GDPR and legal compliance, perceived security, ethics and reputational risks, budgetary constraints and fragmented IT infrastructure and capabilities** (CDEI, 2021, OECD, 2021; van Ooijen et al 2019). In addition, these barriers can be further entrenched by a **lack of strategic leadership** on digital transformation and long-term investment regarding data quality and digital infrastructure (Pittaway & Montazemi, 2020, Tangi et al 2021). Importantly, there is a high degree of variation whereby capabilities, investment, and negotiation power depend on the size, data maturity and/or strategic agenda of local authorities.

Private sector organisations also face barriers for sharing data, such as **the costs of preparing data, a perceived lack of incentives and risks regarding competition and commercial confidentiality, privacy, and security** (Helderop et al., 2019; Mercille, 2021; Micheli, 2022). Private companies might not be aware of the needs of local government or familiar with all relevant legal frameworks. Lastly the working methods (in terms of agility), the interests and positions of private sector companies, often centred on economic and market-drive incentives can create important cultural and organisational barriers (Klievink et al. 2018, Susha et al 2023). For example, some tensions in local data sharing, and B2G in particular, can revolve around how stakeholders understand and prioritise **value creation from data**. Is data understood mostly as a commodified asset and source of revenues (e.g., the models of the data marketplace and data brokers fit this understanding) or is it seen as a public good?

However, it is important to note that **shared interests** between the public and private sector can be identified¹⁶. The granular data produced by local authorities can represent rich sources of information for private companies to improve their products and services and innovate by enriching their datasets and creating additional value.

¹⁵ <https://oldwww.mydata.org/mydata-operators/>

¹⁶ See B2G data sharing workshop series: <https://digital-strategy.ec.europa.eu/en/events/b2g-data-sharing-cities-series-5-workshops>



For example, electricity network operators would benefit from accessing data on urban development projects, forecasting data on housing and population growth, energy performance of housing, development of transportation networks and, mobility policies which are often produced by local authorities (Chignard and Glatron, 2023). In turn, energy data produced by network operators is a crucial resource for local authorities to inform their policies on energy transition or mobility. Furthermore, making data available can present business and societal opportunities such as the development of new products and the delivery of better services (OECD, 2019 WEF 2021). Finally, data collaborations allow organisations to draw on external skills and resources that they do not have in house, resulting in knowledge spill-over (OECD, 2019). Identifying mutual interests to create **win-win situations and have a strategic alignment between partners** are key in ensuring the success of data sharing across sectors (Chignard & Glatron, 2023, Liva et al, 2023; Sussha et al,2022).

2. DS4SSCC Code of Conduct

The DS4SSCC Code of Conduct below provides the foundational **principles, roles, responsibilities, governance structures and legal frameworks** for participants of the data space. The Code of Conduct will be tested and further developed during the three-years of deployment of the data space for smart communities¹⁷.

2.1. Vision & Principles

The vision and principles are at the foundation of DS4SSCC and will inform the governance processes of the DS and of the different use-cases that will be part of it. Indeed, governance processes build *'on the basis established through core principles to enshrine systematic mechanisms for making and implementing decisions. These processes include defining and communicating the roles and responsibilities of different actors and stakeholders; establishing oversight, transparency, and accountability policies and mechanisms; clarifying decision flows across stakeholders; and creating procedures for dispute resolution'* (Fritzenkötter et al 2022, p.8). It is thus crucial to co-define with a broad range of stakeholders a **shared vision and common principles** and ensure a strong buy-in.

To develop the DS4SSCC vision, we conducted a range of activities with stakeholders and experts including workshops, interviews, and surveys. The work was presented, refined and validated on an ongoing basis to stakeholders as part of the Stakeholder Forum workshops (see Appendix 4 for an overview of the methodology).

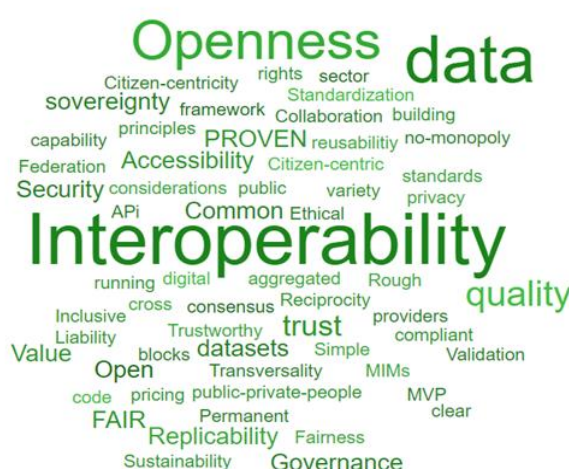


Figure 4: DS4SSCC Principles
(Stakeholder Forum March 2023)

We asked stakeholders to provide feedback on the principles during the stakeholder forum workshops on the 3rd of May and 6th of September. We distinguished between principles related to organisational processes and to data governance.

The DS4SSCC **organisational principles** include:

- The sharing and re(use) of data via DS4SSCC should create **tangible societal value and public benefits** on top of economic value.

¹⁷<https://digital-strategy.ec.europa.eu/en/events/info-day-deployment-data-space-smart-communities>



Local authorities, communities, and citizens should be the main beneficiaries of data sharing and reuse in the context of DS4SSCC.

- The purpose of data sharing and reuse should align with the **European Green Deal objectives** and with the **European data strategy**, including on data and technological sovereignty. (PUBLIC GOOD, SOVEREIGNTY)
- The data space should **level the playing field** in terms of data sharing and reuse between different types of stakeholders. (FAIRNESS/ INCLUSIVITY/ SOVEREIGNTY)
- The **added value should be retained in the data ecosystem** and surplus either reinvested or returned to the ecosystem in other forms. (RECIPROCITY/ FAIRNESS)
- The **purpose of data sharing and reuse should be clearly explained** for each use-case and demonstrate this societal value/public benefit.
- The governance and infrastructure of DS4SSCC should abide by the **principles of technological and data sovereignty**¹⁸ with particular attention to vendor lock-ins (SOVEREIGNTY, SECURITY)
- Data space participants should **be represented in Governance Bodies** and be able to contribute to the decision-making processes. This includes participation of the main beneficiaries: local governments, communities and citizens (REPRESENTATIVITY/ PARTICIPATION)

In terms of **Data Governance**, stakeholders agreed on principles which align with the European Strategy for Data and the **FAIR principles** (Wilkinson et al. 2016:4, see Figure 5).

Organisational Processes & Decision Making	Data Governance
Citizen-centricity / public interest	Protection of human & digital rights
Transparency & Trust	Ethical & responsible use of data
Representativity	Data & Technology Sovereignty
Consensus process & Reciprocity	FAIR ¹⁹
Participation	Data quality
Inclusion of broad range of stakeholders	Security & Data Protection
Oversight & Monitoring	Privacy by design
Accountability	Decentralised solutions
Enforcement of governance rules	Data minimisation
Fairness	Common standards
Assessment of carbon footprint of digital infrastructure	Work with linked data (e.g. OSLO ²⁰ , LDES ²¹)
	Open-Source software ²²

Table 4: Principles for DS4SSCC

¹⁸ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651992/EPRS_BRI\(2020\)651992_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/651992/EPRS_BRI(2020)651992_EN.pdf)

¹⁹ See FAIR principles: <https://www.go-fair.org/fair-principles/>

²⁰ <https://joinup.ec.europa.eu/collection/oslo-open-standards-linked-organisations-0/about>

²¹ <https://joinup.ec.europa.eu/collection/semic-support-centre/linked-data-event-streams-ldes>

²² <https://joinup.ec.europa.eu/collection/free-and-open-source-software>



Box 2 | The FAIR Guiding Principles

To be Findable:

- F1. (meta)data are assigned a globally unique and persistent identifier
- F2. data are described with rich metadata (defined by R1 below)
- F3. metadata clearly and explicitly include the identifier of the data it describes
- F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:

- A1. (meta)data are retrievable by their identifier using a standardized communications protocol
 - A1.1 the protocol is open, free, and universally implementable
 - A1.2 the protocol allows for an authentication and authorization procedure, where necessary
- A2. metadata are accessible, even when the data are no longer available

To be Interoperable:

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles
- I3. (meta)data include qualified references to other (meta)data

To be Reusable:

- R1. meta(data) are richly described with a plurality of accurate and relevant attributes
 - R1.1. (meta)data are released with a clear and accessible data usage license
 - R1.2. (meta)data are associated with detailed provenance
 - R1.3. (meta)data meet domain-relevant community standards

Figure 5: FAIR Principles

2.2. Roles

Based on the DSSC glossary (version for public consultation²³), we define:

- **Data Subject:** an identified or identifiable natural person (GDPR, article 4²⁴)
- **Data space participant:** a party that has committed to the governance framework of a particular data space and may have one or more roles in it.
- **Data space role:** a distinct and logically consistent set of responsibilities within a data space, that encompass associated rights and duties required to perform specific tasks, and that are designed to be fulfilled by one or more participants.

We define three categories of roles (see Table 5) in the context of DS4SSCC:

- **Participatory:** roles involving data transactions;
- **Intermediary:** roles facilitating data exchanges and/or enabling the functioning of the DS;
- **Governing:** roles related to the development, implementation, enforcement and facilitation of rules of engagement and the governance framework of the DS.

DS participants can have more than one role in accordance with the relevant legal frameworks (see section 2.5) and the agreed governance rules (see section 2.4)

²³ https://confluence.external-share.com/content/80889/dssc_blueprintv05_public_consultation/142606408

²⁴ <https://gdpr-info.eu/art-4-gdpr/>



Roles	Description
Participatory	Data holder: ‘A legal person, including public sector bodies and international organisations, or a natural person who is not a data subject with respect to the specific data in question, which, in accordance with applicable Union or national law, has the right to grant access to or to share certain personal data or non-personal data’ (DGA, article 2)
	Data provider: A DS participant that, in the context of a specific data transaction, technically provides data to the data users that have a right or duty (granted by the data rights holder) to access and/or receive that data. (DSSC Glossary)
	Data user: A natural or legal person who has lawful access to certain personal or non-personal data and has the right, including under Regulation (EU) 2016/679 in the case of personal data, to use that data for commercial or non-commercial purposes (DGA, article 2)
	Use-case participants: A DS participant that is involved in one or several use-cases. While the use-case participants can take part in data transactions, it is not always the case.
Intermediary	Data intermediaries/ enabling services: A DS participant that provides a (technical or non-technical) service enabling or facilitating trustworthy data transactions for data space participants. Examples of data space services include identity management, vocabulary providers, authorisation management, consent management, clearing house. Data intermediaries can be registered and DGA-compliant as per Article 10 of the Data Governance Act . In this case they have to be neutral third parties and have a structural separation between the intermediation services they provide and other data services (see section 2.5.1).
	Personal data intermediaries: A DS participant which facilitates the management of personal data, often providing direct mechanisms for citizens to give permission to use their data to organisations.
Governing	Governance bodies (e.g., Governance Authority, Advisory boards): The party(/ies) that is (/are) accountable for the governance of a particular governance framework. In any scenario, they do not replace the role of public enforcement authorities . (DSSC Glossary)
	Orchestrator/ coordinating entity: Organisation which coordinates/ orchestrates the data space ecosystem and ensures its functioning and that participants abide by the agreed common rules and principles.
	Community support bodies (e.g. Training & capacity building, legal & technological support) animates/supports the DS4SSCC community of practice.

Table 5: DS4SSCC Roles



2.3. Responsibilities

To be able to join and participate in DS4SSCC, all participants **must**:

- Commit to DS4SSCC vision & core principles
- Sign and comply with DS4SSCC constitutive agreements or membership agreements
- Monitor compliance with relevant regulatory frameworks
- Commit to adequate security and data protection mechanisms as per data governance principles
- Comply with the data space's technical & data standards (see architecture model/ Catalogue of Specifications)
- Have a DS4SSCC reference person in place (e.g., Data Protection Officer, Data Chief Officer, Project Manager)
- Be transparent, and provide data and reporting for audits

In addition, they should when feasible and applicable:

- Conduct data maturity assessments²⁵
- Complete a data ethics assessment for data (re)use and associated use-cases
- Share methods used to get insights from data
- Share use-cases in common repository

The DS governance authority (see Figure 7) will be in charge of monitoring practices and enforcing compliance. Participants who are found in breach of their responsibilities should receive first a warning with a timeline to address their shortcomings. If repeatedly found in breach, the matter should be discussed by the DS4SSCC participants representative committee and the relevant advisory boards while the Governance Authority should take the final decision.

Table 6 provides an initial sketch of the specific responsibilities associated with each of DS4SSCC role (non-exhaustive) as well as recommended provisions and mechanisms to foster accountability and support participants to meet these responsibilities. These will be further elaborated on, drawing on the pilots during the deployment of DS4SSCC. Finally, Figure 6 maps the DS4SSCC ecosystem of stakeholders in relation to DS4SSCC roles.

²⁵ See Bahim et al 2020

Roles	Specific Responsibilities	Recommended provisions
Participatory roles		
Data holder	<p>Give and retract consent</p> <p>Are informed and agreed about the purposes for which and the means by which data is processed</p>	<p>Multiple levels mechanisms of giving consents (e.g. Personal Data Management Systems)</p>
Data provider	<p>Define reference datasets</p> <p>Define Dataset terms and conditions of use (including clear data licences (open, restricted, private, etc.)</p> <p>Anonymisation of data</p> <p>Maintain/ check availability of datasets</p> <p>Ensure data quality</p> <p>Inform when data is no longer available/ up to date</p> <p>Provide sampling of data for better understanding of value of data and possibility of reuse</p> <p>Make methods of processing data open & transparent</p> <p>Make available and keep updated metadata & relevant documentation for data reuse</p> <p>Publish clear and transparent data catalogue and quality standards</p>	<p>Data quality insurance mechanisms with clear control/ KPIs</p> <p>Mechanisms for responding to questions or feedback about data provided</p> <p>When possible, embed process to know data usage (API Key) for monitoring purposes</p> <p>Rewards but also penalties when failure to deliver what has been agreed</p> <p>Transparency and feedback mechanisms to data holders</p>
Data user	<p>Be transparent about data usage</p> <p>Be aware of the quality/limitations of data used</p> <p>Share insights/ documentation on the added value of the used data</p> <p>Provide feedback for all (data providers, right holders)</p>	<p>Tools for extracting and analysing data</p> <p>Training to understand how to use data</p> <p>Channels for providing feedback or requesting specific data to data providers</p> <p>Safe experimenting environments (e.g., sandbox)</p>
Use case participants	<p>Share insights/ documentation on the added value of use-cases</p> <p>Demonstration public value of use-case</p>	<p>Repository of DS4SSCC use-cases</p>
Intermediary roles		
Data intermediaries/ enabling services	<p>Maintain technical infrastructure/ services they provide</p> <p>Provide technical assistance/ support to data space participants</p> <p>Enable connections with other data spaces</p> <p>Disclose content plugging/processes</p> <p>Monitor services and inform users if deterioration/discontinuity</p> <p>Publishing clear documentation on data product possibilities</p>	<p>Should have relevant expertise and technical capabilities</p> <p>Recognised by EU in case of DGA compliant intermediaries (certification processes)</p>



Governance Roles		
Governance bodies	<ul style="list-style-type: none"> Monitor compliance to DS4SSCC processes (constitutive/ contractual processes) Request providers to correct/add relevant metadata Ensure & monitor responsible and fair use of data Make decisions in a transparent manner Advise on technology and data standards for data space & Ensure convergence of solutions Define strategic direction of DS Resolve conflicts Manage change and continuity of data space (e.g., decide new rules/ edit rules) Checks and certifies data agreements according to DS4SSCC principles 	<ul style="list-style-type: none"> The governance bodies should be representative of the data space's stakeholders & participatory/ enabling roles Decision making mechanisms Mechanisms to remove datasets if needed When possible, automatization of governance processes Legal and technical expertise
Orchestrator/ coordinating entity	<ul style="list-style-type: none"> Take care of onboarding new participants Inform all actors about the guidelines/rules/negotiations Find new stakeholders & connect participants working on similar use-cases Maintain a common catalogue Manage communication channels Organise working group meetings, events, etc to increase awareness in the ecosystem and interactions frequency. Manage change and continuity of data space 	<ul style="list-style-type: none"> Mechanism to check if participants, in particular data providers, are still active Provide a regular overview of developed data products with used data When possible, embedding process to know data usage (API Key) for monitoring purposes Mechanism to ensure that knowledge and best practices flow and that technical solutions converge, part of onboarding is to identify relevant existing use-cases, solutions and partners Match-making system Feedback loops
Community support bodies	<ul style="list-style-type: none"> Provide support to users to onboard and comply with DS technical and governance standards Provide training & capacity building Organise Knowledge exchange activities Help stakeholders work together on projects or initiatives Provide technical and governance support Support negotiation collaborations/ contracts 	<ul style="list-style-type: none"> Repository of best practices/ examples use-cases/ guides Data steward forum for common coordination and alignment Technical support to set-up exchange mechanisms according to agreements

Table 6: DS4SSCC roles and associated responsibilities

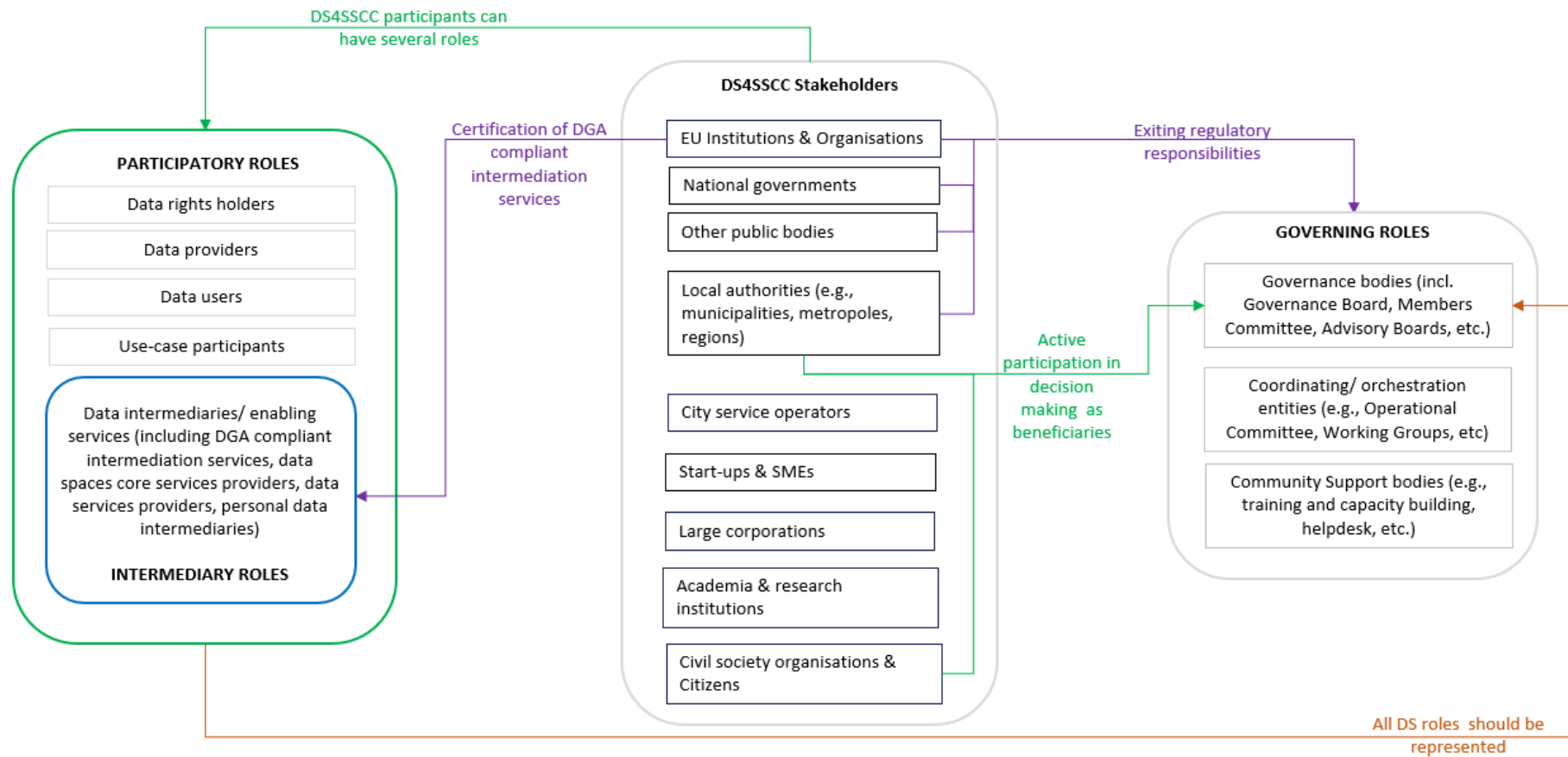


Figure 6: DS4SSCC Stakeholders and associated roles

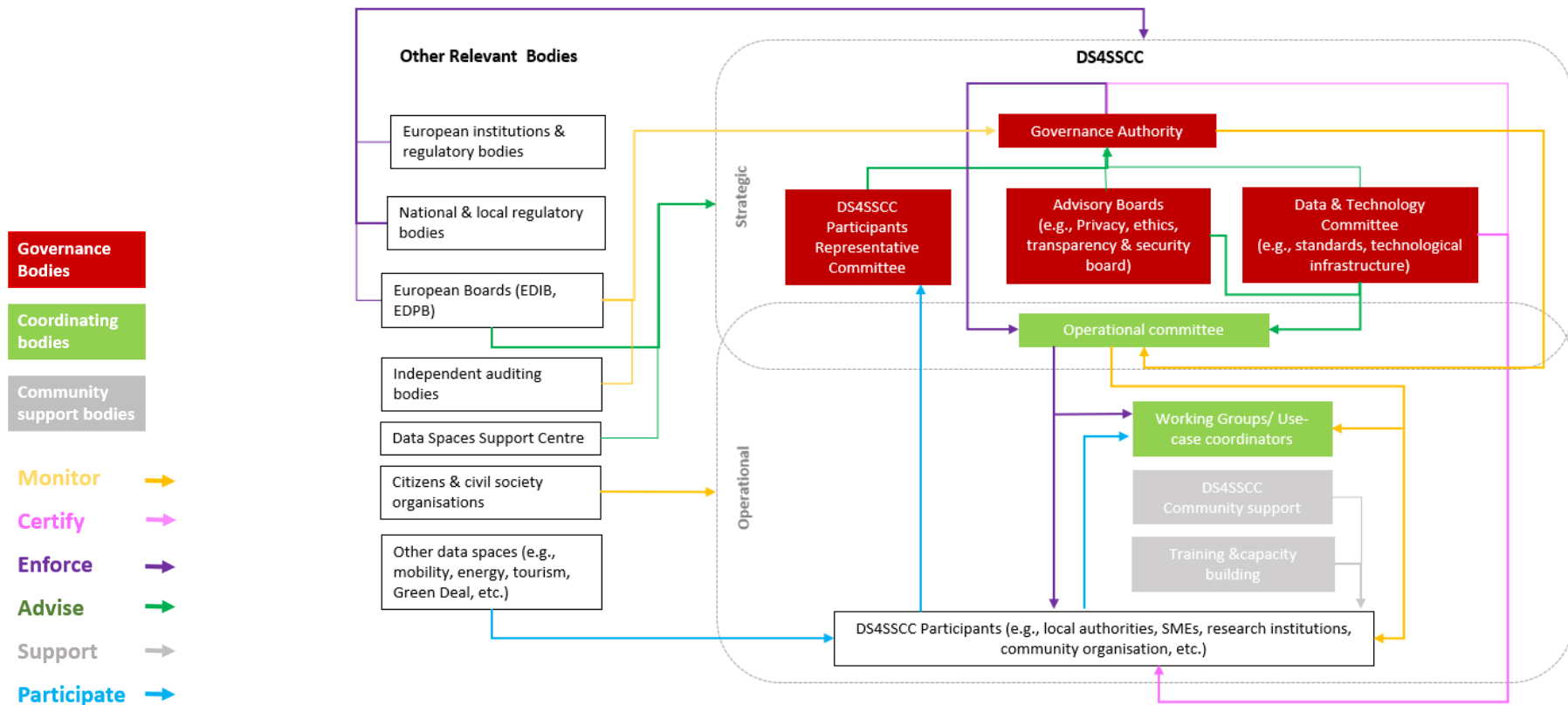


Figure 7: Possible structure for DS4SSCC governance

2.4. Governance framework

The governance framework is understood by the DSSC as the ‘*set of principles, standards, policies (rules/regulations) and practices that apply to the governance, management, and operations within a particular scope as well as to the enforcement thereof, and the resolution of any conflicts*’²⁶.

In the context of the preparatory action for DS4SSCC, we explored governance frameworks at the two levels:

1. DS4SSCC including roles, responsibilities, governance structures and mechanisms.
2. DS4SSCC use-cases including how to set up multi-stakeholder cooperation which align with the DS’s vision, principles, and governance rules (see section 3).

In this section, we lay out the governance structures and rules at the level of DS. In their work on [Governing the Environment Related Data Space](#), Fritzenkötter et al (2022,p.58) provided valuable insights by distinguishing **different types of governance** in terms of broad, mixed and narrow (see Figure 8). The broad governance calls for all DS4SSCC stakeholders whereas narrower governance structures with selected stakeholders can be used to take technical and operational decisions delivered through smaller-group processes.

Suited for broad governance	Suited for narrow governance
Agreeing on core values and principles	Decisions on technical and quality standards
Deliberating options for strategic development, in particular to determine fundamental approaches to data rights and ownership	Resource management and executive functions of a holding body/agency
Fundamental approaches to data rights and ownership	Decisions on guidance on appropriate forms of data management (e.g. collective management of data rights/ data trusts)
Suited for mixed governance	
Review of processes	
Oversight of executive or agency functions	
Quality and process assurance	
Enforcement decisions	

Figure 8: Different levels of governance

Differentiating between types of governance helps define who needs to be involved, to what degree and via which governing bodies in relation to identified actions. Drawing on the work conducted as part of the DS4SSCC preparatory action, we have identified the different governance bodies (see Table 7) that need to be in place for the functioning of the DS. We have laid out the initial responsibilities of these bodies as well as their possible structure.

²⁶ DSSC Glossary:

<https://dssc.eu/space/Glossary/55443460/DSSC+Glossary+%7C+Version+1.0+%7C+March+2023>



Entities	Composition	Responsibilities
Governance Authority	Representation of all types of roles and stakeholders	Make decisions Approve/ certify new participants Enforce rules Monitor DS4SSCC operations (Operational Committee, WG, participants))
DS4SSCC participants representative committee	Representation of DS participants	Advise Governance Authority
Advisory boards	Different types of Advisory Boards incorporating relevant expertise (e.g., Privacy, ethics, security)	Advise Governance Authority
Data & technology committee	Committee of experts and DS4SSCC representatives	Advise Governance Authority on technology, standards, etc Recommend/certify technologies/standards
Operational Committee	Representatives of WG, community support bodies, DS4SSCC participants representative committee	Monitor/ oversight of operational processes and respect of DS4SSCC rules by participants/WG Report to Governance Authority Enforce operational rules Coordinate support bodies with DS participants Communication with DS participants
WG/ use-case coordinators	Different types of working groups incorporating DS participants working on similar use-cases/ with similar technology	Coordinate use-cases
DS4SSCC Community support	Organisations with relevant technical / legal expertise	Communication Operational Support of DS participants
Training & Capacity Building	Organisations with relevant training expertise	Upskilling, training, and capacity building of DS participants

Table 7: Governance bodies

Drawing on Fritzenkötter et al 2022 and the differentiated levels of governance, Table 8 mapped identified actions (e.g., ‘Agreeing on core values and principles’) and assigned each action to relevant data space participants and bodies according to the type of governance. For example, the action ‘Agreeing on core values and principles’ is understood as a broad governance matter and has been assigned to all with the supervision of the Governance Authority and the DS4SSCC participants representative committee.

Actions	Governance	Relevant bodies
Agreeing on core values and principles	Broad	All (led by Governance Authority & DS4SSCC participants representative committee)
Determine conditions for access, sharing, processing, and using data	Broad	All (led by Governance Authority & DS4SSCC participants representative committee)
Strategic Development & change management	Broad	Governance Authority, Advisory Boards, DS4SSCC participants representative committee, Data & Technology committee
Review of processes (Audits & monitoring)	Mixed	Governance board, Operational Committee, DS4SSCC participants representative committee
Enforcement	Mixed	EDIB, Governance Authority, Operational Committee
Certification	Mixed	EDIB, DSSC, Governance Authority, Data & Technology committee
Onboarding	Narrow	Operational Committee



Data/ technical quality and standards	Narrow	Data & Technology committee, DS4SSCC participants representative board. Advisory boards
Resource management	Narrow	Governance Board
Support & capacity building	Narrow	Operational Committee, Community support, Training & Capacity building
Provenance & traceability	Narrow	Governance Authority, Operational committee
Identity management	Narrow	Governance Authority, Data & Technology committee

Table 8: Types of actions and governance and relevant bodies

Following this work, we have sketched a first structure for the governance of DS4SSCC (see Figure 7).

2.5 Legal frameworks

Digital sovereignty and fair and trustworthy data sharing were identified as policy priorities of the European Commission under the agenda of ‘A Europe fit for the digital age²⁷’ and with the publication of the *European Data Strategy* (2020). In practice, the creation and deployment of common European data spaces fit within an existing and emerging cross-sectoral regulatory ecosystem (see Figure 9).



Figure 9: Overview of European Strategy for Data

2.5.1. Regulatory ecosystem

DS4SSCC must comply with the existing and upcoming **cross-sectorial legislations related to non-personal and personal data** including the Data Governance Act; the Data Act; the Open Data Directive and the Implementing Act on High Value Datasets, the Regulation on the Free Flow of Non-Personal Data, the General Data Protection Regulation, and ePrivacy Directive (see Table 9).

Legislation/ regulation	Status	
Data Act	Proposal for a Regulation Of The European Parliament And Of The Council on harmonised rules on fair access to and use of data	Ongoing
Data Governance Act	Proposal for a Regulation of the European Parliament and of the Council on European data governance	Completed, in force in Sept 2023
ePrivacy Directive	Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector	In force
ePrivacy Regulation	Proposal for a Regulation Of The European Parliament And Of The Council concerning the respect for private life and the protection of personal data in electronic communications and repealing Directive 2002/58/EC (Regulation on Privacy and Electronic Communications)	Ongoing
General Data Protection Regulation	General Regulation on data protection 2016/679 of the European Parliament and of 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	In force

²⁷ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_273



Implementing Act on High-Value Datasets	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	In force
Open Data Directive	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	In force
Regulation on the Free Flow of Non-Personal Data	Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union	In force

Table 9: EU cross-sectorial legislation related to non-personal and personal data

The DGA and DA are particularly relevant in the context of DS4SSCC. The DGA aims to (1) promote the fair reuse of certain categories of protected data held by public sector bodies; (2) foster the creation of data intermediation services, and (3) facilitate data altruism understood as a voluntary donation of data by entities, individuals, or organisations that make data available for the common good. Finally, it also supports the creation and development of common European data spaces.

The DA aims at maximising the value of data by ensuring that a wider range of stakeholders (including citizens) gains control over their data in B2B, B2G and B2C contexts and that more data is used to generate innovation and boost the digital economy. The text gives public sector bodies the right to access and use private sector data in situations of public emergency, for implementing a legal mandate and for reducing the administrative burden in cities as well as introduces the possibility of sharing data with third parties and new rules for allowing cloud switching between cloud providers. These provisions would allow local authorities to gain access to data that could be used to develop data-driven innovative services in the city, such as for mobility, climate transition and urban planning purposes.

DS4SSCC stakeholders have identified several **areas of uncertainties** in the different cross-sectorial legislations related to data provision:

- Interpretation of 'data intermediation services' in DGA

Data intermediation services are defined in Article 2 and 10 of the DGA while article 10 further elaborates the possible forms of data intermediation services²⁸. The key area of uncertainty centres on the concept of neutral third parties. In their report *Mapping the Landscape of Data Intermediaries*²⁹, Micheli et al (2023, pp.21-25, Figure 10) provides a clear overview of this conception of data intermediation services:

²⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R0868>

²⁹ <https://publications.jrc.ec.europa.eu/repository/handle/JRC133988>



Box 3. The concept of neutrality in the Data Governance Act

The Data Governance Act only concerns 'neutral' data intermediation services providers. The term 'neutral' refers to two cumulative criteria data intermediaries have to meet in order to have to register according to the DGA:

- **Structural separation.** A legal entity considered to be a data intermediary can only provide data intermediation services. Hence, if it provides data-driven services beyond intermediation such as data analytics, it should do so through a separate legal entity.
- **Non-exclusivity.** The data intermediation service provided by a data intermediary should be open to any third party that respects the terms and conditions of the intermediary and the legal framework.

If these criteria do not apply, the entity will not have to register and thus will not be recognised as a neutral data intermediation services provider in the EU and able to register under the DGA.

Figure 10: Concept of neutrality, DGA

Furthermore, Micheli et al (2023, p.27, Table 10) provide an overview of the criteria for data intermediaries and data altruist organisations to comply with DGA. While this helps clarifying some of the legal aspects of data intermediaries and data altruism organisations, practical questions remain including:

1. How many intermediaries do we want at national and European levels?
2. What level should they function at (national, sectorial, etc)?
3. How can you make sure that it is not the private interest that is overruling these intermediaries?
4. How do we involve citizens and communities in intermediaries (representation / participation)?



	Providers	Data suppliers	Purposes for data sharing
DISPs <i>Data intermediation services providers recognised in the Union</i>	<ul style="list-style-type: none"> Providers of a service which aims to establish commercial relationships for the purposes of data sharing between data subjects/holders and data users through technical or legal means. Neutral third parties (structural separation between data intermediation services and any other data-driven services). <p>DISPs do not include:</p> <ul style="list-style-type: none"> services that aggregate, enrich or transform data for adding value; services that focus on the intermediation of copyright-protected content; services that are exclusively accessed by one data holder; data-sharing services offered by public sector bodies that do not aim to establish commercial relationships; data altruism organisations. 	Data holders	<ul style="list-style-type: none"> Bilateral or multilateral exchanges of data; creation of platforms or databases enabling the exchange or joint use of data; establishment of other infrastructure for the interconnection of data holders with data users.
		Data subjects and individuals	Make personal or non-personal data available for potential data users.
		Groups of data holders or data subjects ¹⁹ (Members of data cooperatives)	<p>Support members in the exercise of their rights over their data, with regard to:</p> <ul style="list-style-type: none"> making informed choices before they consent to data processing; exchanging views on data processing purposes and conditions that best represent the interests of its members; negotiating terms and conditions for data processing on behalf of its members.
RDAOs <i>Data altruism organisations recognised in the Union</i>	<ul style="list-style-type: none"> Entities operating on a not-for-profit basis enabling the voluntary sharing of data for objectives of general interest (e.g., healthcare, fighting climate change, official statistics, improving mobility and public services, enhancing public policy making and research). Complying with Rulebook, meeting transparency requirements, and offering specific safeguards. 	Data holders and data subjects	Consent or permission to collect, store, process or share data with third parties for objectives of general interest.

Source: JRC own elaboration with contribution of Viivi Lähteenoja

Table 10: DGA provision for data intermediaries and altruism organisations

- Lack of clarity on DA Art 15 on data sharing in public emergencies and exceptional situations to access private sector data

According to the text ‘This primarily concerns public emergencies, but also other exceptional situations where compulsory business-to-government data sharing is justified, in order to support evidence-based, effective, efficient, and performance-driven public policies and services’³⁰.

³⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A68%3AFIN>



Remaining questions include:

- how would it work in practice (timeliness, who enforces it)?
- How broad is the scope of data of public interest?

The questions highlighted here have informed some of the recommendations put forward in Section 4.

Other relevant **cross-sectorial regulations** to consider when it comes to data sharing and re(use) include Artificial Intelligence, Digital Identity, Cybersecurity, Intellectual Property Rights, Interoperability and Platforms and Digital Services (see Table 11). These regulations intersect with different components of data exchanges.

Legislation/ regulation	Status	
<u>Artificial Intelligence Act</u>	Proposal For A Regulation Of The European Parliament And Of The Council Laying Down Harmonised Rules On Artificial Intelligence (Artificial Intelligence Act) And Amending Certain Union Legislative Acts	Ongoing
<u>AI Liability Directive</u>	Proposal for a Directive Of The European Parliament And Of The Council on adapting non-contractual civil liability rules to artificial intelligence	Ongoing
<u>Copyright in the Digital Single Market Directive</u>	Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC	In force
<u>Cybersecurity Act</u>	Regulation (EU) 2019/881 of the European Parliament and of the Council of 17 April 2019 on ENISA (the European Union Agency for Cybersecurity) and on information and communications technology cybersecurity certification and repealing Regulation (EU) No 526/2013 (Cybersecurity Act) (Text with EEA relevance)	In force
<u>Digital Markets Act</u>	Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828	In force
<u>Digital Services Act</u>	Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC	In force
<u>eIDAS</u>	Regulation 910/2014 on electronic identification and trust services for electronic transactions in the internal market	In force
<u>Interoperable Europe Act</u>	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	Ongoing
<u>NIS2 Directive</u>	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	In force
<u>Platform-to-Business Regulation</u>	Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services	In force

Table 11: Other relevant EU cross-sectorial regulations

DS4SSCC must also comply with EU Competition policies and regulations to promote fair commercial and competition practices (e.g., Antitrust legislation³¹, Consumer

³¹ https://competition-policy.ec.europa.eu/antitrust/legislation_en



protection law³², Consumer contract law³³, Public procurement rules and legislations³⁴).

National and local specific frameworks need also to be taken into account. For example, the French Law for a Digital Republic (*Projet de loi pour une République numérique*³⁵) adopted in 2016 mandates companies operating under public service delegation (e.g., utilities, transportation) to publish their data. France also adopted a law on Energy Transition and Green Growth (2015), which compels energy distributors to publish local energy consumption data (see Chignard & Glatron, 2023). Furthermore, it is important to note that national and European regulations are fragmented and thus can create legal tensions. For example, Cologne is building a cross-partner data infrastructure with common governance principles called KUDOS (Kölner Urbanes Daten OkoSystem) and is using public procurement to secure the technical infrastructure. However, they had to reconcile the needs to comply with German cyber security certification which is a level higher up than the EU standard (ISO27001).

Finally, the legal framework of DS4SSCC will be informed by relevant **sector policies and regulations according to specific use-cases**. For example, National Data Access Points have been established to facilitate access, easy exchange and reuse of data in the transport sector³⁶.

These examples show that it is crucial to map the sector and national/local legal contexts to leverage the regulatory and policy instruments which already exist.

³² https://commission.europa.eu/law/law-topic/consumer-protection-law_en

³³ https://commission.europa.eu/law/law-topic/consumer-protection-law/consumer-contract-law_en

³⁴ https://single-market-economy.ec.europa.eu/single-market/public-procurement/legal-rules-and-implementation_en

³⁵ <https://www.wipo.int/wipolex/en/legislation/details/18412>

³⁶ https://transport.ec.europa.eu/transport-themes/intelligent-transport-systems/road/action-plan-and-directive/national-access-points_en



2.5.2. Contractual agreements

Following the legal frameworks highlighted in the previous section, DS4SSCC could consist of several types of contractual agreements as stated in Table 12.

Contractual relationships ³⁷	Data Holder	Data Provider	Data User	Use-Case Participant	Data Intermediaries	Governance Bodies	Orchestrator/ Coordinating Entity	Community Support Bodies
General agreement or constitutive agreement						✓	✓	✓
Status of Governance body and legal entity						✓		
Membership agreements (incl. T&C)	✓	✓	✓	✓	✓			
Service-level agreements for services offered within the data space		✓			✓			
Contractual terms concerning switching between providers of data processing services					✓			
Specific data sharing agreements in DS4SSCC use-cases	✓	✓	✓	✓		✓		

Table 12: Possible contractual relationships in DS4SSCC

³⁷ From DSSC public consultation on the contractual building block:
<https://dataspacesupportcentre.atlassian.net/wiki/spaces/ELFFDS/pages/142901354/PUBLIC+CONSULTATION+-+31+08+2023+-+Contractual+framework+building+block+-+Description+v0.5>



3. Developing Multi-Stakeholder Data Cooperations

3.1. The Data Cooperation Canvas

The Data Cooperation Canvas (Figure 11) was co-developed during the preparatory action for DS4SSCC. It was built drawing on the exchanges in WP2 which provided a range of use-cases with different configurations of stakeholders/partners, data sharing and business models and with different governance practices that were put in place to ensure fair and trustworthy data exchanges.

The cooperation canvas **focuses on specific use-cases**. This is key as it allows partners and stakeholders to clearly identify the needs for data sharing, define its purpose as well as lay out the different components (technical, governance, business models, implementation) that are required to ensure the success of the cooperation. The canvas is divided into **three main parts** providing

- The context of the cooperation ('Why')
- The governance and business models underlining the cooperation ('Organisational')
- The technical aspects of the cooperation ('Data & Technical')

Each part contains subsections to describe the characteristics of the cooperation alongside guiding questions (see Table 13). You can find some detailed examples of the technical part of the data cooperation canvas in D3.2 Architecture Model.

The canvas is a tool which can be used in several ways:

1. to explore and define multi-stakeholder cooperation focusing on a specific use-case;
2. to describe existing multi-stakeholder cooperation and reflect on the enablers and obstacles of data exchange;
3. to understand at one glance the added value of cooperation between different types of stakeholders;
4. to foster trust between stakeholders by clearly setting up the cooperation
5. to capture a body of knowledge on multi-stakeholder cooperations and create a DS4SSCC use-case repository.

Finally, Governance Group participants flagged that it could be used as part of the contracting processes for data sharing. This could be further explored during the deployment phase of DS4SSCC.



Guiding questions		Sections
Why	What is the purpose of the data exchange?	3.2.1
	What are the outcomes envisioned for the data exchange?	3.2.2
	What is the scope of the data exchange? What is out of scope?	
	What is the context that creates the opportunity/necessity for data exchange?	
	Why will this data exchange succeed? What is the added value for participants?	
	What is the motivation for the key partners to join the data exchange?	
Who	Who will be the partners in the initiative? How (much) would they contribute?	3.2.2
	Who will be interested in / able to participate? How many participants will the exchange have? What are the “dream participants”?	
	Are there other organisations that also want to share the same kind of data?	
	What key roles are needed to sustain the cooperation? What rights and responsibilities are associated with these roles?	
	What will be the data intermediary organisation (if any)?	
What	What types of data will the data exchange involve?	3.2.3
	What organisation will share what data when?	3.2.4
	What is the provenance/source of the datasets?	3.2.5
	What is the data quality (e.g., format, standards, etc)?	
	What organisational resources are required for this data cooperation? What resources are available already? What needs to be done to get all required resources?	See also Catalogue of Specifications & D3.2.
	What steps are performed as a shared process in the data exchange? What steps are done individually?	Architecture Model
	How can the data be uniformed/standardised/combined?	
	What shared concepts, languages, formats, or methods can be used? What data standards & formats are used or need to be used?	
	What technical concepts or models need to be in place for the data exchange. What MIMs are implemented and how are they implemented?	
	What technical infrastructure is needed for the data exchange?	
How	What will the long-term business model of the exchange look like?	3.2.5
	How should the value created be distributed?	3.2.6
	What are the costs of the data exchange? Who is paying? What are the revenues?	3.2.7
	Who is profiting? What compensation, fees or other financials are needed?	3.2.8
	How are decisions made?	
	What operational processes/ mechanisms should be in place? (e.g., monitoring, accountability, certification, clearance, conflict resolution, termination, etc.)	
	What are the most appropriate contractual agreements?	
	What are the relevant local/national/European frameworks to consider?	
How will the data exchange be implemented and sustained over time?		

Table 13: Data Cooperation Canvas- Guiding Questions

All the components of the canvas will form the **business model for the data cooperation** (including the value proposition (why), the partners and targeted customers (who), the types of data exchanged, and technical infrastructure used (what) and the resources and mechanisms required to deliver and sustain value (how).

The canvas was first iterated by *Braxwell.com* in the role of external experts’ strategic data partnerships of the City of Amsterdam’s Directorate Digitalization & Innovation and members of the Governance Group. It was further developed during bilateral exchanges as well as discussions with WP3 and WP4 to ensure alignment with the technical and implementation work which was developed by them. The canvas was revised repeatedly to incorporate feedback. It was then presented, further



developed with, and validated by the Governance Group during an interactive workshop in June and by the broader stakeholders during the Stakeholder Forum meetings in June and July. (see Appendix 4 for a detailed overview of the methodology).

3.2. Filling the canvas

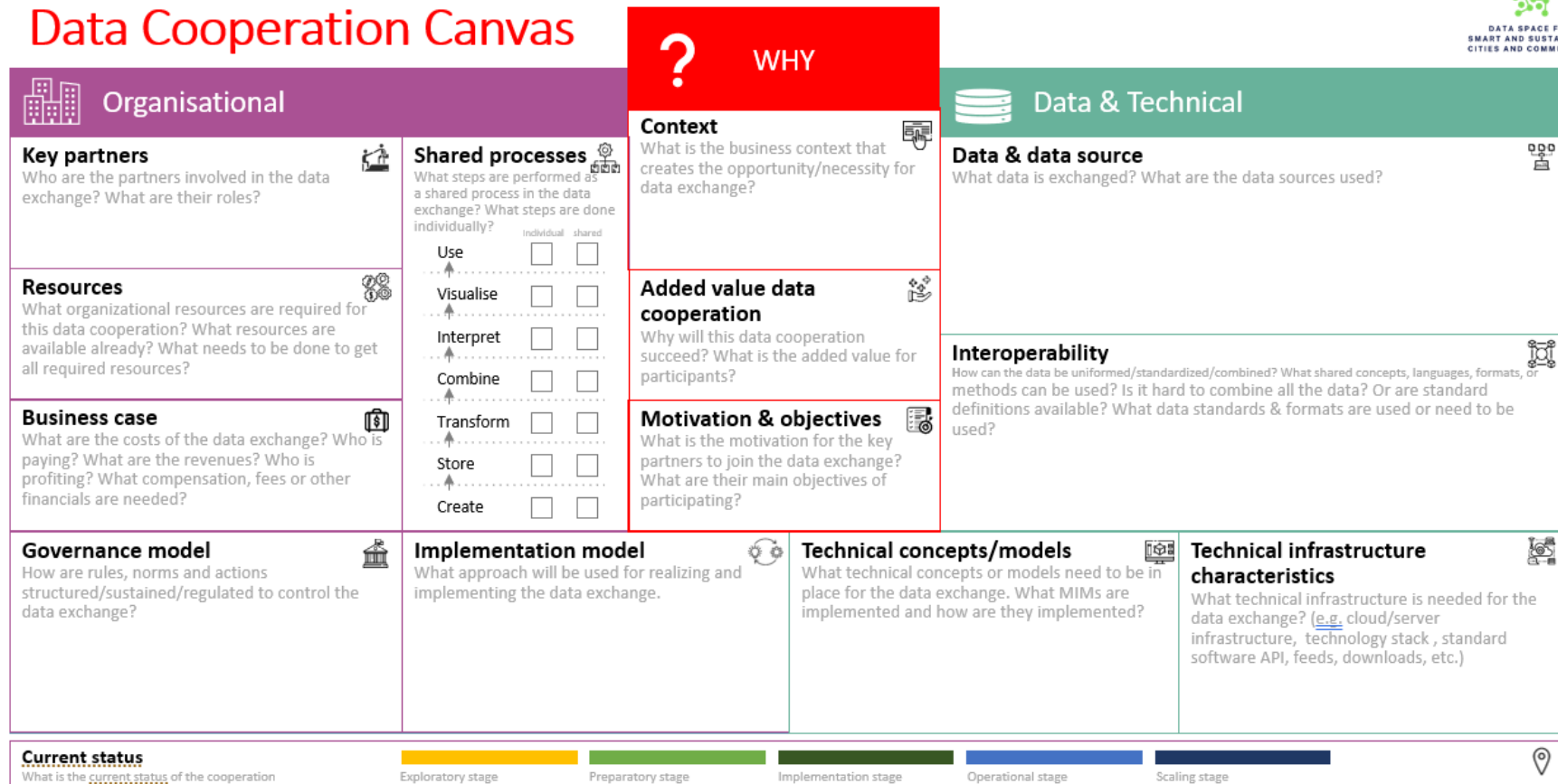
3.2.1. Define objectives & identify value proposition

Before starting a cooperation on data sharing between stakeholders, it is crucial to understand the **local context** which creates a **specific need** for data exchange; and clearly define and agree on the **objectives and the scope** of the cooperation (see Table 14 for examples from WP2 use-cases). The 'Why' part of the canvas focuses on the context, added value and motivations and objectives of the cooperation. This part should be filled up first.

To do so, it is important to keep the following elements in mind:

- Identify specific challenge/ question (local/ policy need) to solve rather than with data
- Define specific and measurable objectives in relation to the challenge. If the cooperation meets these objectives, it will act as a **proof of concept**. The objectives should be **concrete, relevant for all stakeholders and driven by local needs** (and not only by the desire to share and/or get data). This will ensure buy-in by relevant stakeholders.
- Establish the **value proposition** of the cooperation (e.g. reduction transaction costs, increase of data quality, provision of new data services).
- Devise the cooperation to be a **win-win situation** for all involved. This may require reaching a compromise; however, it is key for the cooperation to be successful that every partner obtains an added value from it.
- Market-driven incentives (e.g., monetarisation, service provision) are important incentives for cooperation. However, it is also crucial to explicitly articulate other types of incentives (i.e., organisational, and societal) (see Table 15). **Societal incentives** are at the heart of the DS4SSCC's shared vision and as such need to inform the data cooperation.
- While the initial scope and objectives of the cooperation should be narrow, it is important to work on a **long-term concept that can be scaled up**.

Data Cooperation Canvas



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City of Amsterdam / Braxwell.com
 This work has been conceived as part of the preparatory actions for the Data Space for Smart and Sustainable Cities and Communities (DS4SSCC). The canvas was developed by Ron van der Lans and Jasper Soetendal of Braxwell.com in the role of external experts' strategic data partnerships of the Directorate Digitalization & Innovation of the City of Amsterdam and has been further developed with and validated by other participants of DS4SSCC working groups.

Figure 11: Data Cooperation Canvas



Name & Coordinator	Context	Motivations & objectives	Value proposition
IDEA City of Amsterdam	Road authorities (local and national) have open data on road works. This data about the planned road works may differ from the actual road works due to, for example, subcontractors.	Service providers and road authorities want to have data on actual road works. By validating the planned road works, using live data (from floating car data (FCD)), IDEA generates a high quality, real-time data feed for road works.	<ul style="list-style-type: none"> • Providing high-quality, real-time data on road works. • Service providers can provide better information to road users. • Road authorities have insight into their roadworks' actual impact. For example, to check on subcontractors.
LxDataLab Mobility Lisbon City Council	Lisbon city council aims to broaden the use of mobility data from different sources to better understand the mobility patterns in the city and create solutions to enhance planning, safety, operations, and emergency management connected to mobility (e.g., event management, road traffic, etc).	The Lx Data Lab cooperation aims to reuse the data that Lisbon City Council collects, produces and purchases (e.g., Vodafone), and to develop tools for internal uses and research (e.g., prediction model of uses of shared bikes).	<ul style="list-style-type: none"> • Tailored and need-based projects which provide input for day-to-day operations and decision-making of the city council. • Use of data for research purposes. • Citizen participation.
DataCity Lab Barcelona City Council	Barcelona has developed an energy strategy (SEAP) which aims to use 100% renewable energy, with zero emissions and reduce energy poverty.	The cooperation aimed to use data to evaluate the potential of photovoltaic panels on public buildings in three neighbourhoods of Barcelona (i.e., Poblenou, La Marina and Vila de Gràcia) and in turn inform the creation of Energy Communities.	<ul style="list-style-type: none"> • Development of a visual tool for city use which can support decision making in terms of energy transition and the development of energy communities. • Acciona and ImpactE also benefit from the creation of such a tool and can share it with other local authorities.
Rubi Brilla Rubí City Council	Rubi City council has committed to sustainable energy management as a long-term strategy. In this context, the city has developed Rubi Brilla which aims to reduce city energy consumption, accelerate the transition to renewable energy and empower citizens and companies to make meaningful and informed changes in terms of energy consumption.	The aim of the project is to combine energy data from different sources to reduce energy poverty, optimise energy consumption in the city and inform citizens about energy.	<ul style="list-style-type: none"> • Inform Local Policy design and evaluation. • Provide personalised services to individuals and collectives (energy communities). • Opening (integrated data outputs) to citizens and stakeholders (market creation) and to society (creation of knowledge of general interest, generalisation of knowledge).

Table 14: Context, Objectives and Value Propositions of WP2 Use-Cases

	Cities & Local authorities	Private sector	Academia	Civil Society
Monetary/ Market-driven	<p>Costs sharing (e.g., reduce data storage compliance costs, lower costs of development & implementation, saving time and money by sharing burden).</p> <p>Resources sharing (e.g., capacities, capabilities, skills, infrastructures, etc).</p> <p>Development of new products & services (Combining data sources to improve services/ optimise services/ develop new ones).</p> <p>Enabling joint innovation.</p> <p>Scaling up</p>	<p>Provider of technical and digital solutions for smart cities (platforms, SaaS, data as a service, visualisations, analytical tools, etc.).</p> <p>Enabling markets for both data products and solutions based on data.</p> <p>Increased visibility and distribution of services.</p> <p>Finding new partners/ clients, expanding the EU market.</p> <p>Test & deploy new services/ infrastructures.</p> <p>Test deployment possibilities with cities.</p> <p>Development of new products & services (Combining data sources to improve services/ optimise services/ develop new ones).</p> <p>Enabling joint innovation.</p>	<p>Enabling joint innovation</p> <p>Development of new products & services (Combining data sources to improve services/ optimise services/ develop new ones).</p>	<p>Enabling joint innovation</p> <p>Development of new products & services (Combining data sources to improve services/ optimise services/ develop new ones).</p>
Organisational	<p>Access to new sources of high-quality data</p> <p>Internal data discoverability (Vision about available datasets, Providing data and finding consumers for data improves your internal processes).</p> <p>Early access to specifications and state of the art technology.</p> <p>Data standardisation (incl. data quality improvement).</p> <p>Access to funding (e.g. DS4SSCC Deployment call).</p> <p>Sharing methods/processes to ensure legal compliance (e.g. reduce costs of making processes and data GDPR compliant and reduce risks of GDPR breaches).</p> <p>Reputational (i.e., using data for common good).</p> <p>Align with EU standardisation & digital infrastructure and be part of the EU digital single market.</p> <p>Exchange experience about specific use-cases (i.e. Learning from other stakeholders in the ecosystem, especially frontrunners sharing knowledge/experience/practices with less mature players).</p> <p>Benefit from technical or legal expertise.</p>	<p>Access to new sources of high-quality data.</p> <p>Help define and establish Data Sharing Agreements and Standards.</p> <p>Reputational (i.e., using data for common good).</p> <p>Align with EU standardisation & digital infrastructure and be part of the EU digital single market.</p> <p>Identification of gaps (data services) and creation of opportunities.</p> <p>Data exploration/ discovery.</p>	<p>Access to new sources of high-quality data for research purposes.</p> <p>Access to funding.</p> <p>Part of broader ecosystem/contact with future partners.</p>	<p>Control of personal data</p> <p>Access to new sources of high-quality data.</p> <p>Better services</p> <p>Participation in data stewardship and local data initiatives to ensure relevance/ public benefit.</p>



Societal

Improvement of services provision for citizens.
Making more use of data that is collected using public resources for value to flow back to society (businesses, citizens).
Use data for research.
Data-driven decisions and policy making (e.g., planning, operations & emergency management, safety, mobility).
Align with Green Deal objectives.
Empowering citizens & communities.

Table 15: Incentives per type of stakeholders

3.2.2. Identify key partners & roles

Once the objectives and added value proposition have been defined, the next step is to undertake a **comprehensive mapping of the relevant stakeholders** in the context of the use-case and cooperation envisioned above. A number of tools can enable you to conduct this exploratory exercise including the ODI Data Ecosystem Mapping Tool³⁸ or Adaptation Scotland's Stakeholder and Power Mapping Tool³⁹

During this stage, it is important to keep the following elements in mind:

- Distinguish between **initial partners** of the cooperation and **broader stakeholders** (see Table 16).
- Select carefully initial partners for the first phases of the cooperation, they need to be willing to **put time/resources for the initial push of the cooperation**.
- When it comes to development and service partners; be particularly **careful with vendor lock ins and ownership of products developed**
- Network with a **minimum number of partners** while ensuring that all required roles for the objectives to be met are fulfilled. Every partner should play a very distinctive role in the initial partnership (see roles Table 5 and template Table 17)
- Start with limited collaboration and small steps. New members can be added to the team once the proof of concept is validated.
- Use **independent third-party intermediaries** to instil trust in the exchange (e.g., universities, personal data stores) and secure the skills needed (e.g. data quality partners, universities)
- Explore within a municipality where a data intermediary could fulfil a role
- Ideally, there should be big and medium/small local authorities. When relevant it is important to incorporate different levels of governance (e.g. metropolitan, regional, etc.). This will ensure scalability and future adoption.
- Ideally, **involve end-users and citizens** from the outset and throughout the process⁴⁰. To do so, build on existing community networks and develop partnerships with organisations that are already conducting work with communities and can act as trusted gatekeepers.

³⁸ <https://www.theodi.org/article/data-ecosystem-mapping-tool/#1675181030992-dc81419a-f150>

³⁹ <https://www.adaptationscotland.org.uk/how-adapt/tools-and-resources/stakeholder-and-power-mapping-template-workshop-outline>

⁴⁰ See Ada Lovelace Institute, Participatory data stewardship. A framework for involving people in the use of data, 2021. <https://www.adalovelaceinstitute.org/report/participatory-data-stewardship/>



Name	Partners & Stakeholders			
	Public administrations & institutions	Private sector	Academia & Research Institutions	Civil Society
IDEA	The City of Amsterdam Municipality of The Hague Province of North Holland National Road Authority (Rijkswaterstaat) National Data Access Point (NDW)	Three technology SMEs BeMobile Other navigation service providers (TomTom, Google, etc)		Citizens
LxDataLab Mobility	Lisbon City Council CARRIS (City bus operator) EMEL (City parking & mobility company) IPMA (Instituto Português do Mar e da Atmosfera) AMA (Agency for Administrative Modernization)	Waze Vodafone	Private & Public Higher Educational Institutions (e.g. Instituto Universitário de Lisboa (ISCTE IUL), Universidade Nova de Lisboa (UNL FCT, NSBE), Instituto Superior Técnico (IST), Nova Management Information School (NOVA IMS)) University of Barcelona	World Data League Citizens
DataCity Lab	Barcelona City Council Other local authorities (e.g. Rubí City Council, EL Prat de Llobregat)	Data City Lab Acciona ImpactE Endesa	University of Barcelona	Citizens
Rubi Brilla	Rubí City Council Other local authorities (e.g., Barcelona City Council, El Prat de Llobregat, Granollers, Mataró Viladecans) CNMC (National Markets and Competition Commission)	PSIG Pylon Data eDistribucion		Citizens

Table 16: WP2 Use-cases partners & stakeholders
(Bold font: main partners/ Light font: broader stakeholders)

Roles	Partner 1	Partner 2	Partner 3	Etc.
Participatory	Data Holder			
	Data Provider			
	Data User			
	Use case Participant			
Intermediary	Intermediation services			
	Personal data intermediaries			
Governing	Decision-making (Governance bodies)			
	Orchestrator/coordinating entity			
	Support & Capacity building			

Table 17: Template mapping initial partners & roles

See appendix 4 (Tables 1, 3, 4 & 5) for the mapping of partners and roles in WP2 use-cases.



3.2.3. Identify data types & sources

While setting up a data cooperation, it is critical to identify the **specific datasets** that will be used (see Table 19 for example from WP2 use-cases) and draw a clear **data profile for each** (see Table 18). In doing so, it is key to remember that the distinction between personal and non-personal data is blurry. Here the taxonomy developed by the OECD (2019, np.) provides a useful framework (see Figure 12). They define three broad domains – personal, private, and public – and show how the domains overlap as well as how they are typically subject to different legal and governance frameworks such as privacy, data protection regulation, competition and property rights.

*‘the **personal domain**, which covers all personal data “relating to an identified or identifiable individual” for which data subjects have privacy interests,*

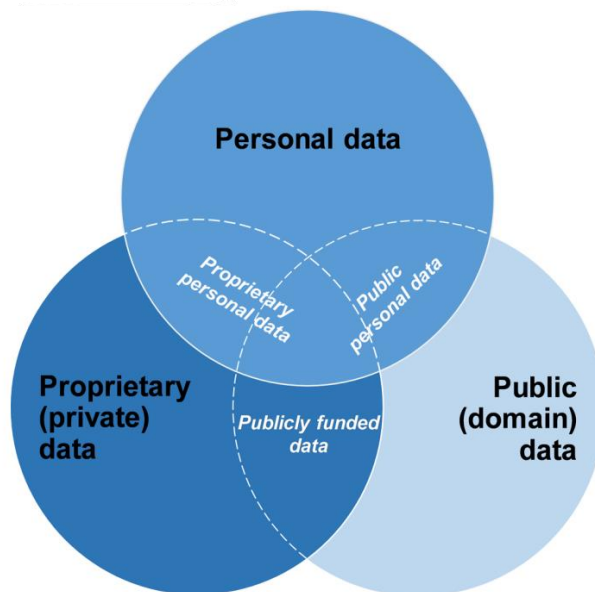


Figure 12: The personal, private and public domains of data

*the **private domain**, which covers all proprietary data that are typically protected by IPRs (including copyright and trade secrets) or by other access and control rights (provided by e.g. contract and cyber-criminal law), and for which there is typically an economic interest to exclude others,*

*the **public domain**, which covers all data that are not protected by IPRs or any other rights with similar effects, and therefore lie in the “public domain” (understood more broadly than to be free from copyright protection), thus free to access and re-use’. (OECD: 2019, np, figure 2.2 in the report).*

Creating clear dataset profiles allows partners to **understand the opportunities and assess the risks** in data sharing as well as the steps needed to share the data as specified (e.g., data cleaning/formatting, set-up of API, etc), see next section.



Dataset profile	Description
Types/Domains	Personal/Public/Private domains
Source/ provenance	Public sector, private sector, citizen-generated, sensors, research
Format	Data & Technical standards (including meta-data documentation, level and methods of aggregation and anonymisation)
Access rights ⁴¹	Restricted, Shared, Open
Specifications	Granularity required (see example mobile phone data specifications Appendix 3)
Quality	Accuracy, completeness, consistency, timeliness, uniqueness, and validity.
Risk assessments	DPIA, Data ethics assessment, Data maturity assessment ⁴²

Table 18: Dataset profile

In addition, it is essential to follow the principle of **data minimisation** enshrined in GDPR's article 5(1)(c) which states that personal data shall be: "adequate, relevant and **limited to what is necessary in relation to the purposes for which they are processed**". While it is key to follow this principle for legal compliance, it is also *pragmatic* to do so. Indeed, in some cases, stakeholders might be focusing on getting access to as much data as possible (foreseen future opportunities) rather than identifying the exact categories of data that are required to address the challenge. This can lead to lengthy and unnecessary discussions with data owners and thus delays in accessing the relevant data.

Name	Provenance	Domain(s)	Datasets
IDEA	One national service provider (BeMobile)	Proprietary personal data (purchased)	Floating Car Data
	Local, regional, and national road authorities	Public domain data (open)	Planned dates and details for road closures and construction works
LxDataLab	Lisbon city council	Public domain data (open)	Road network data: https://dados.cm-lisboa.pt/dataset/rede-viaria-escala-1-20000
	Vodafone	Proprietary personal data (purchased)	Mobile phone data: organised per grid of 156X156 metres (minimum 10 devices, every 15 min) total of devices, Total of different devices, Permanence and crossing grid, Exit and entering the city (11 entry points), Top 10 of roaming.
	Waze	Proprietary personal data	Floating car data Traffic Jams, Reason of traffic jams, trusted Waze messages

⁴¹ See ODI, Data Spectrum: <https://www.theodi.org/about-the-odi/the-data-spectrum/>

⁴² Useful resources include Bahim et al 2020, ODI, Assessing risks when sharing data: <https://www.theodi.org/article/assessing-risk-when-sharing-data-a-guide/>, ODI Data ethics maturity model: <https://www.theodi.org/article/data-ethics-maturity-model-benchmarking-your-approach-to-data-ethics/>



	CARRIS	Public domain data (open)	Bus routes, stops, frequencies: https://transitfeeds.com/p/carris/1000
	EMEL	Public domain data (open)	Parking occupation, Bike Stations, Availability of bikes, Space in stations: https://emel.city-platform.com/opendata/
	IPMA	Public domain data (open)	Weather data: temperature, precipitations, humidity per weather station
DataCity Lab	Barcelona city council	Public domain data (open) Proprietary personal data	Social services data, CRM data, Population statistics, Public building/public spaces characteristics, geospatial data
	Municipalities (El Prat & Rubi)	Proprietary personal data	Anonymized energy consumption data/patterns of individuals/families to develop the algorithm
	Datadis	Public domain data (open) Proprietary personal data	Energy consumption per postcode
	Endesa	Proprietary personal data (donated)	Monthly consumption per building
Rubi Brilla	Rubi city council	Public domain data (open) Proprietary personal data	Geospatial data (land register) Population register, Fiscal Registers (Real Estate Tax, Mechanical Traction Vehicle Tax). Electronic administrative files: Rehabilitation licences, photovoltaic installations. Individual smart meter data (Informed Consent for Access to Personal Data through Rubí Brilla website)
	Datadis	Public domain data (open) Proprietary personal data	Energy consumption per postcode. Power data: One record for each CUPS (Universal Supply Point Code) and month. Maximum power per month, day and hour of the maximum, demanded power. Consumption data: A record per CUPS per day & hour. Day, hour, kWh
	Citizen	Proprietary personal data	Smart meter data

Table 19: WP2 Use-cases datasets



3.2.4. Define shared data flows

As well as identifying the data types and sources that will be required in the cooperation, it is crucial to determine the **steps needed in the transformation of data throughout the lifecycle of data in the cooperation** (e.g., data creation, storage, processing, analysis, visualisation, and use). It will then support partners to decide which of these processes will be shared or done individually and allocate them.

In Figure 13, we provided an overview of **typical data flow processes** that often need to be undertaken to exchange and generate value from data safely and ethically. This overview can support partners to map and establish the activities needed to process and reuse the different datasets identified in the previous step. It also enables to clearly identify the type of outputs shared (raw data, aggregated data, information, service).

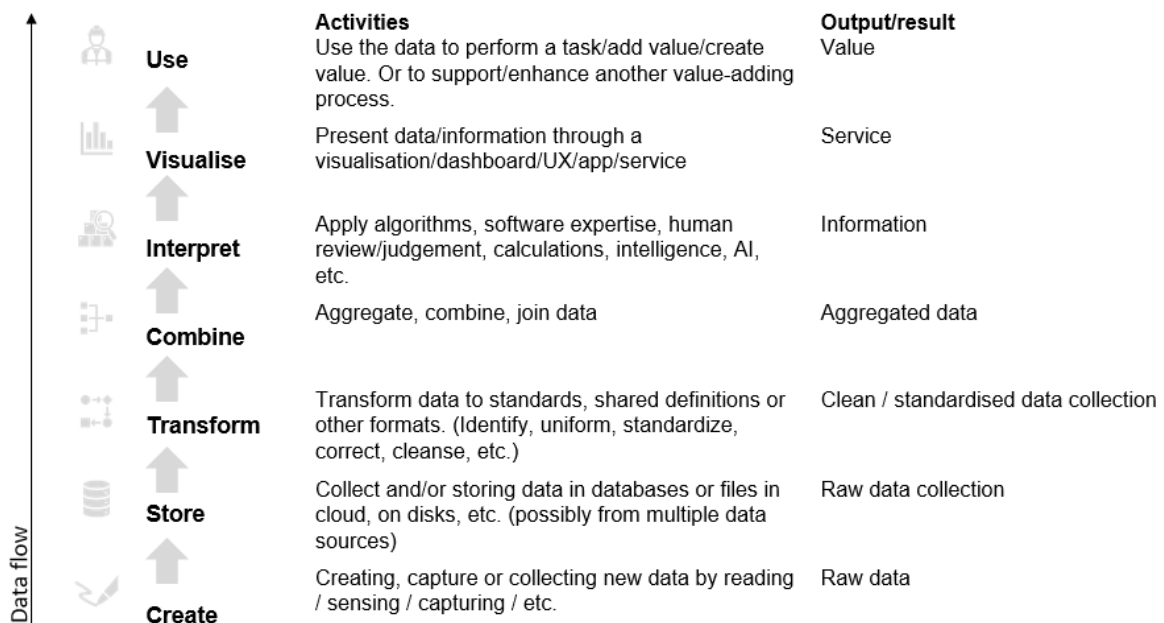


Figure 13: Typical data flows processes

Once the specific data-related activities required in the cooperation have been mapped, partners should decide which of these activities should be conducted jointly or individually. This will allow partners to identify shared processes ranging from exchanging data to shared application (see Figure 14).

Shared data processes must be supported by recommended technical infrastructures and mechanisms to ensure trust including authorisation mechanisms, digital identity standards, verified credentials, standardised API models such as NGSI-LD API, etc. The [catalogue of technical specifications](#) as well as architecture model published by WP3 provide an overview of recommended technologies and standards for DS4SSCC.

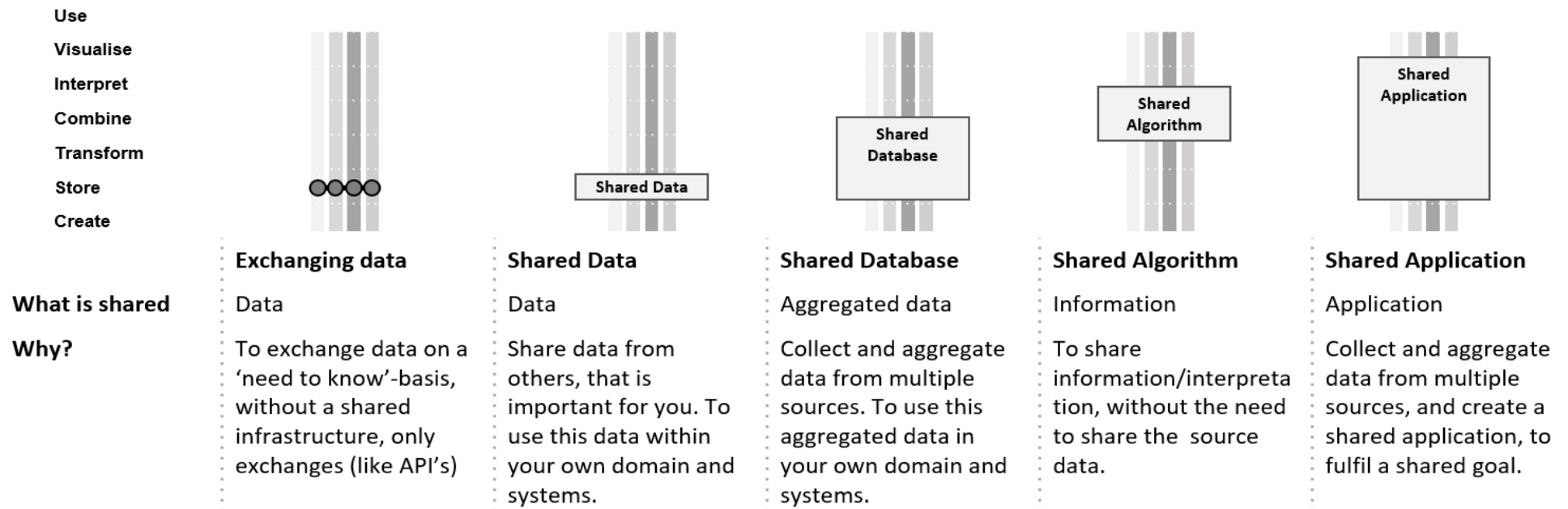


Figure 14: Shared processes in cooperation

3.2.5. Identify resources required

The template below (Table 20) helps to **identify resources required and associated organisational roles** for the cooperation to be successful. It might be useful to consider the following questions:

- What expertise/ skills/ assets required to meet the cooperation objectives can each partner bring?
- What are the gaps in the resources and capabilities required? Could you leverage partners' wider networks?

Resources include:

- Cash flow/direct funding
- Staff time
- Datasets
- Infrastructure
- Products & services
- Access to expertise
- Access to networks

Resources required for each phase ⁴³ of data cooperation	Examples of associated organisational roles	Preparatory phase	Implementation phase	Operational phase	Scaling up phase
Datasets	Data steward, DPO, Data Scientists				
Data services	CTO, CDO, Data Scientists				
Infrastructures (e.g., hardware, storage, etc.)	CTO, IT Specialists/ technicians, specialist core technology				
Technical support & skills	CTO, technicians, Specialist technical standards				
Legal support & skills	DPO, lawyers				
Strategic staff resources	Partnership Manager, Senior manager				
Operational staff resources	Administrative staff, project manager				
Communication	Communication manager, Marketing manager				
Finances/ funding	Financial manager				

Table 20: Template identifying resources

⁴³ A detailed roadmap to set up a multi-stakeholder data cooperation can be found in D4.2 Roadmap for implementing a European data space for smart and sustainable cities and communities



3.2.6. Choose an appropriate model for the cooperation

In the context of DS4SSCC, data cooperation must align with the shared vision and principles set in section 2. The choice of cooperation models depends on the incentives identified for the cooperation as well as the preferred types of exchange(s) between partners. One or more cooperation models can be part of the use-case business model (see Tables 21, 22 & 23, see Table 24 for examples from WP2 use-cases). Table 21 provides an **overview of the characteristics of each of the cooperation models** identified during the preparatory action, focusing on the **type of exchanges** (unilateral, bilateral, and multilateral) and the **approach adopted** (business oriented, altruistic, cooperation, individual control). Table 22 sets out each of the cooperation models and scenarios when to implement them. Finally, Table 23 assesses the advantages and risks of each of these models.

Type	Type exchanges	Type of approach
Commercial Data	Bilateral	Business oriented
Data Marketplace	Multilateral	Business oriented
As-a-service model	Bilateral/multilateral	Business oriented
Open Data / Data Donation	Unilateral	Altruistic
Pragmatic/Ad-hoc Data sharing	Bilateral/multilateral	Cooperation
Trusted Third Party Intermediary	Multilateral	Cooperation
Personal Data Intermediary	Multilateral	Altruistic/ Individual control
Data Common/ Cooperative	Multilateral	Cooperation

Table 21: Overview of data cooperation models

Types	When to use it	How it works	Control on input	Control on use
Commercial data	When data is needed that is not available for free and/or requires a lot of effort to collect, uniform, combine and aggregate.	One or more commercial data providers collect, transform, combine and/or aggregate data and provide the information to users in exchange for a fee (per month, per data set, per GB, etc.).	High. The data provider decides on what data is used for input and how it is processed	Medium. Once delivered to the purchaser, the data can be used for any application. In some cases, the terms and conditions exclude a certain type of use
Data Marketplace	When data is available but is spread all over the internet.	A marketplace provides a platform for data providers to offer their data to potential users. It enables the monetization or brokerage of data for both discovery and transactions between buyers and providers.	Low: if marketplace is open High: if marketplace is curated	Low. Re-use and innovation for unforeseen applications are welcomed
As-A-Service model	When a data owner has an interest in adding an extra service layer on top of the available data	Businesses provide services that are valuable to public bodies and private companies. This includes SaaS (LDT), DaaS (e.g., data quality, aggregation, standardisation, etc) and Algorithm/analytics as a service.	Low. The input of data depends on the information that is provided by data owners and users.	Low. When data analytics and methods of analytics are not provided High. When data analytics and methods of processing are provided
Open Data / Data Donation	When one or more entities (government, non-profit or business) want to provide their data to enable re-use and innovation.	The data is published on a website or portal, or alternatively shared with specific organisations. The data is well-documented with metadata and has a licence that allows for a broad use of the data. The data can be published using a repository that provides data users an efficient way to search for data as well metadata and a link to the actual data.	High. The initiator decides for itself what data will be published.	Low. Re-use and innovation for unforeseen applications are welcomed
Pragmatic / Ad-hoc data sharing	When participants have a shared interest or objective, and don't mind sharing their (source) data.	In a shared data cooperation, participants define what data they can offer, and what data they would like from other participants. If a satisfying set of data can be agreed upon, this data is shared on a shared disk, cloud platform or any other way to exchange this data.	Medium. All participants agree on what data is input, so there is a strict control. However, only data that participants have and are allowed and willing to share, will be shared.	Medium. Participants agree on what data can be used for what use. However, once the data is out, it is difficult to control the use.
Trusted Third Party Intermediary	When participants don't want to share their (source) data but can think of very specific situations (like incidents/disasters or bankruptcy) where they have a shared interest or objective to share data.	A trusted third party is used to collect, interpret, and combine the data. The third party applies an agreed-upon algorithm or process to provide the required output information. This output information is the minimum amount of (aggregated) data that a) can be shared and b) is needed to fulfil the shared objective	High. All participants agree in advance what data will be provided.	High. Provided information is tailored to and can only be used for specific objectives, as agreed with third party intermediary.



D2.2 Multi-Stakeholder Governance Scheme

Personal Data Intermediary	When persons should have maximum control over access to their data.	Providing personal data vaults or personal information management systems to citizens, to store their personal data and to empower maximum user control over data access, permissions and data decision making. To facilitate secure, personal control over your data.	High. Each person has maximum control over its personal data vault	High. Each person has maximum control over its personal data vault
Data Common / Cooperative	When members of a community want to protect valuable data, so that it can only be used in a way that contributes to the community.	Data commons refer to organisational arrangements 'with members voluntarily 'pooling' their data for the benefit of a specific community or for the public interest' while data cooperatives refer to 'to a data intermediary owned and democratically controlled by its members who delegate control over data about them' (Janssen & Singh 2022:6)	High. The community has maximum control over data	High. The community has maximum control over data

Table 22: Detailed overview of cooperation models



Types	Associated contractual forms	Advantages	Risks
Commercial Data	Data purchasing agreements	Certainty: contractual agreements with specifications Clear legal terms/obligations to stick to by the provider Clear business opportunity for private sector	Risk of discontinuity when contract expires (cannot be renewed) Not always applicable (if you are targeting a specific dataset from one supplier) due to fair competence rules on tenders Can be expensive
Data Marketplace	Data purchasing agreements	Monetisation Data discoverability Easy process / standardisation of processes	Data is hard to find as it is spread across the internet. Demand and supply of data are inefficiently matched. Can be expensive
As-A—Service model	Service Level Agreements Data Sharing Agreements	Certainty: contractual agreements with specifications Clear legal terms/obligations to stick to by the provider Adapted to specific needs in ecosystem (e.g., SaaS, DaaS (data quality as a service, aggregated data as a service, algorithm/analytics as a service)) Clear business opportunity for private sector	Risk of vendor/ provider lock-in
Open Data / Data Donation	Open data Data altruism	Can foster citizen participation (citizen science, hackathons, etc) Easy process / standardisation of processes	Data can be hard to find as it is spread across different portals/websites. Demand and supply of data are inefficiently matched. Data is not useable and needs a lot of processing (lack of control in specifications)
Pragmatic / Ad-hoc data sharing	Bilateral data sharing agreements Service Level Agreements	Mutual incentives/ win-win situations Possibility of feedback Trustworthy environment	Often bilateral negotiations/agreements which can be time consuming Sustainability over time
Trusted Third Party Intermediary	Cooperation agreements Consortium agreements 'Groupement d'intérêt public' (France) Governance document	Mutual incentives/ win-win situations Possibility of feedback External expert knowledge Trustworthy environment	Difficulty of finding sustainable financing Difficulty of first push
Personal Data Intermediary	Certification of data intermediaries (DGA)	Support individuals in managing their data, including help in managing consent Preference for distributed PDI for data security and privacy	Complexity of use/set-up Data security/ recovery in case of loss/theft Different suppliers (needs for one consent model)



D2.2 Multi-Stakeholder Governance Scheme

Data Common / Cooperative

Collective ownership &
decision making

Mutual incentives exist from the start
Possibility of feedback
Trustworthy environment
Ensure public/community benefit
Levelling playing field by enabling collective bargaining
power

Difficulty of finding sustainable financing
How to encourage bottom-up data stewardship and citizen
participation
Limited existing use-cases

Table 23: Advantages & Risks of different cooperation models



Name	Business case	Governance structure	Characteristics cooperation	Cooperation models
IDEA	The road authorities invest in IDEA to create high quality data. This data will improve the information to road users (through the service providers) and may be used to efficiently control subcontractors.	IDEA is open to all road authorities in The Netherlands. The resulting data feed is available for free for all service providers. NDW is technical lead, and through its member structure, a steering committee, represented by all key partners, makes decisions about IDEA. A user group is being set up to govern the functional parts.	Multilateral exchanges Cooperation Business-oriented	Trusted-third party (intermediary)
LxDataLab Mobility	LxData Lab is funded internally through the city council. Co-design and collaboration on challenges which allows to develop tools for internal uses (e.g., tool for fire department, prediction model of uses of shared bikes).	Lisbon city council leads and funds the LxData Lab. Each challenge brings the municipality and academic partners together in a cooperation protocol. Each project must identify a specific challenge at city level and must be approved by the municipality's executive board.	Multilateral exchanges Cooperation Altruistic	Pragmatic data sharing As a Service model Open Data
DataCity Lab	Acciona funded the project under the condition that the final product produced should present a new business opportunity both for Acciona and ImpactE.	Barcelona city council led and coordinated the project. DataCity Lab acted as project manager, looked for funding for the challenge, organised workshops to define specific challenges and provided administration and legal support.	Multilateral exchanges Cooperation Altruistic	Pragmatic data sharing As a Service model Open Data/ Data Donation
Rubi Brilla	Internal investment by the council. Rubi Brilla began more than 10 years ago as a strategic project of the council. Technical work financed by EUCF (2022-23) for the development of an innovative Investment Concept based on energy savings. "REFER" model. eDistribucion shares data following an altruistic model	Led and coordinated by the Rubi Brilla unit at council. Citizen participation: give consent to sharing their personal data and give feedback on data driven services.	Multilateral exchanges Cooperation Altruistic	As a Service model Open Data/ Data Donation

Table 24: WP2 Use-cases cooperation models

3.2.7. Choose appropriate contractual agreements

The DSSC is currently working on a building block dedicated to contractual agreement. The aim is to provide a catalogue of contractual templates and modules to support data transactions within data spaces, whether they are bilateral or multi-party agreements and thus ensuring consistency across DS. These will include reference licence agreements and contractual modules with standardised clauses.

Here it is important to:

- Ensure technological sovereignty by using specific licensing requirements including **clauses to release products built on data in public domains** or to ensure outcomes of data comes for free to community users that pooled their data with a restricted licence for commercial use.
- Include **data sharing clauses in tender/procurement processes and SLA**. Data sharing clauses can cover data but also aggregation/analytical methods that are deployed so the data is not locked in specific products or platforms and legacy and continuity is ensured over time.
- Customise contracts with **detailed data specifications** (e.g., format, granularity, etc.) (see Appendix 3 for an example of mobile phone data specifications)
- Use open source/ standard protocols
- Use SLA provides a legal set of requirements for the service offering and ensures quality and accountability.
- Consider using initial NDA before final sharing agreement to be able to see if data is useful or not

Example: Data clause for the use of personal data stored in Zaragoza Citizen Card for altruist purposes

'In compliance with the provisions of the current Personal Data Protection Act and Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, you are hereby informed that the data contained in your application for issuance of the Citizen Card will be included in a file for which the City Council of Zaragoza is responsible and whose purpose is the management of the Citizen Card service.

The legitimacy is based on the consent of the interested party, who grants authorization to the City Council for the processing of the personal data provided.

Personal data will be processed with appropriate security measures, and only for the above-mentioned purpose. It is only contemplated its transfer to third parties for purposes of public interest such as archiving, scientific, historical or statistical research. In any case such transfer will be made after anonymization of such data.'

Source : <https://www.zaragoza.es/sede/servicio/normativa/1502>

Figure 15: Data sharing clauses – Zaragoza



3.2.8. Sustaining the cooperation over time

To ensure the success of the cooperation and sustain it over time, it is key to plan its scaling up from the start. The aim is for the cooperation to be sustainable i.e. to ensure *'sufficient revenue not only to cover day-to-day operational costs, but also to cover the costs of future investment in the infrastructure and costs to handle iterative change to their business model.'* (ODI, 2020, p.20). Here, partners need to plan for the **incurring costs** (e.g., upfront costs of building infrastructure and setting-up cooperation, operational costs) and the types of **revenue streams** envisioned once the cooperation is operational.

The financing of the cooperation is the most important factor in ensuring its success. Starting a new data cooperation is cost intensive (legal, operational, infrastructure costs, etc), time and resource consuming, and there is a risk it might fail. This is why it is important to plan finances at each phase of the cooperation and anticipate when the main budget will be needed. Ideally, the initial budget should be kept minimal for the success of the pilot. Once the proof of concept is demonstrated, real investments will take place especially in terms of technology and infrastructure as well as scaling up the network. Once the cooperation is operational, the revenues will be diversified and the budget for development minimal.

To keep in mind when planning the budget for the cooperation:

- In the first phases of the project, be aware of the fact that you are developing for a first implementation group, partners can bring **other resources that cash flow**
- Recognise the difference between the **financing** needed to design and set-up a data cooperation and the **ongoing sources of revenue** once it is operational.
- Consider creating a **not-for-profit organisation** that will run the operation of the data cooperation (from Phase 3)
- Consider the use of scaling membership fees, freemium models, and tiered pricing to enable a broader set of users (e.g., reduced fee/free access for non-for-profit, pay fees to access data analytics, membership fee for companies, etc).
- Consider private foundations and investors whose goals and values align with DS4SSCC

ODI (2020) identified a number of appropriate resources of revenues for sustainable data institutions including value-added services, consulting, API, Service Level Agreements, or membership fees (see Table 25) ⁴⁴

⁴⁴ Adapted from ODI (2020) Designing sustainable data institutions, pp 22-25:
<https://www.theodi.org/article/designing-sustainable-data-institutions-paper/>



Type	Possible forms
Usage fees	Fees for depositing, submitting or updating data, via a standard API or submission form. Includes registration of organisations, content and identifiers for parts, products and services into an official register/ repository Fees for accessing and using data via a standard API or else.
Subscription fees	Membership fees for access to services, data and other direct benefits provided as part of the cooperation (e.g., training, helpdesk) Subscription fees for use of the infrastructure. Subscription fees for access to a specific product or service that uses the data Subscription fees for access to a higher-level service level agreement or support arrangement for using the infrastructure
Selling of services	Provision of services (including by DS enablers/ intermediaries) It overlaps with the subscriptions and usage fees models
Public funding/ grants	Grants awarded for a specific agreed purpose, for example, to carry out a project or invest in infrastructure (local, regional, national, EU)
Private investment	Money invested by private sector organisations under conditions (return on investment)
Private sponsorship	One-off or regular cash donations and sponsorship
In-kind donations	Provision of staff time to provide support during setup and operations Provision of technical infrastructure to support operations Provision of staff time to develop and maintain software Volunteer time to support collection and curation of data, community engagement, software development, etc Data donations

Table 25: Types of revenue streams



4. Recommendations

4.1 At the local ecosystem level

Local authorities

- Involve relevant stakeholders in local authorities including CDO, CTO, DPO, ICT representative, partnership/strategic representative, legal representative, ethics/equality officer, senior management representative, relevant domain representatives
- Clarify roles and responsibilities within the organisation in terms of data sharing including a referent person for DS4SSCC
- Nominate Executive Champion Advocate in senior management who actively supports initiative
- Create a strategy for partnership development overseen by a strategic partnership manager
- Develop a culture of innovative procurement, including the adoption of common standards in procurement actions
- Develop monitoring and impact assessment tools to better understand and evidence the impacts of data driven local decision and policy making (e.g., Eindhoven's Integrated Impact Assessment Framework)⁴⁵
- Engage in peer learning with other cities and share knowledge/experience
- Consider using 'data sharing obligations' as part of tender/procurement processes and SLA. Local authorities can request service providers to supply data in specific format (e.g., using open data standard) for reuse.
- Explore the domains in a municipality where a data intermediary could fulfil a role (e.g., B2G)
- Build the collective bargaining power of cities: collective negotiation with private sector, in terms of sharing knowledge/experience, data lobbying, data academy
- Big cities should take the lead and set-up networks for data sharing at national level as well as support/upskill smaller cities

Private sector

- Identify win-win situations. Example of Waze for Cities/ Google partnership where they get planning data from cities (i.e., data for data).
- Identify national gatekeepers
- Follow recommended standards to foster interoperability.
- Identify gaps of key services in ecosystem
- Create a catalogue of datasets and how they can be used in specific use-cases

Academia

- Provide capacity-building and training to city workers and civil society (e.g., data literacy, data science skills)
- Provide courses to professionalise data stewardship (GovLab 2020)
- Conduct applied research on ethical and data protection aspects (open access)
- Help to setup common good principles
- Provide skills (e.g., technical, data) and knowledge (e.g., legal, research)

⁴⁵ <https://research.tue.nl/en/publications/guidelines-on-integrated-impact-assessment-framework-for-urban-di>



- Develop tools with robust methodologies
- Provide testing environment (e.g., sandboxes)
- Advise and support cities and communities

Civil society

- Participate in defining and contributing to the data ownership and governance models of DS4SSCC
- Help safeguarding public interest
- Bring up needs from communities and help frame local challenges

4.2 At the national level

- Create a national coordinating body for DS4SSCC with associated community of practice to share knowledge
- Create and fund independent auditing bodies
- Provide incentives/'impulse' to initiatives via calls for projects/funding. Calls can be competitive, which makes them much more difficult to access for smaller or less data mature cities and communities.
- Provide fund to upscale successful local initiatives to national level
- Provide national leadership on data sharing (e.g., data strategy)
- Provide national level guidance / recommended standards and include local authorities in the process of developing/agreeing on standards.
- Identify gaps in the sectoral laws where B2G is considered necessary
- Support the implementation of standard data models and the management migration from legacy systems to compliant innovative solutions that supports interoperability
- Create and sustain national infrastructures and facilities (e.g., National Data Access Points).
- Provide safe testing environments (e.g., sandboxes, see Galasso et al 2022)
- Support culture of innovative procurement
- Play a role in collectivising data-related purchases: intermediation and lowering of costs

4.3 At the European level

- Create European coordinating bodies (e.g., NAP Core⁴⁶)
- Provide register of certified Data Altruism Organisations and Data Intermediaries (DGA)
- Share good guidance on how to work with existing EU legislation in relation to DS
- Provide interpretations/examples for Art 15 of DA on exceptional needs
- Clarify the role of data intermediaries in DGA, in particular in relation to municipalities/local authorities as facilitator/gatekeeper of local data sharing
- Involve local authorities as key entities in the European Data Innovation Board⁴⁷

⁴⁶ <https://napcore.eu/>

⁴⁷ <https://digital-strategy.ec.europa.eu/en/policies/data-governance-act-explained#ecl-inpage-l4ihmjx4>



- Build community of practice with shared and open resources (e.g. repository of software & solutions used, catalogue of good example use-cases, data agreement templates)
- Recognise the key role played by local administration in enabling and fostering a thriving local data ecosystem and how they could play a role of intermediary at local level
- Provide recurring funding for the deployment and sustaining of European data spaces (e.g., infrastructures, coordination efforts)
- Provide safe testing environments (e.g., TEFs)
- Harmonise tech specifications/ data standards for EU procurement including by providing a repository of tenders, standards, changes, procurement clauses to be shared and accessible by cities
- Build a shared platform of principles for better purchasing practices (platform, software) for cities. This can support harmonisation and more sustainable procurement
- Ensure that cities and communities and their specific interests (outside B2B) are represented at all stages of DS4SCC / EU policy design



5. Conclusions and next steps

The multi-stakeholder governance scheme layout in this deliverable provides the **foundational principles and governance structure** of the DS4SSCC. It is one component of the blueprint for this data space which also includes a catalogue of specifications (D3.1), an architecture model with a cookbook (D3.2), and a roadmap for the deployment of the data space at the European level (D4.2). Importantly it also provides a practical framework, the **data cooperation canvas**, to set up and sustain multi-stakeholder data collaborations that align with DS4SSCC.

This blueprint will be used, further developed, and validated during the **upcoming DS4SSCC deployment call**. This second phase will start on the 1st of October 2023 and will call upon and support local authorities, communities, and broader stakeholders across Europe to apply to become sites for a pilot.

The DS4SSCC has the ambition not only to become an enabler of the European Green Deal but also to foster trust through multi-stakeholder collaborations and community building. It is embedded in the [Living-in EU](#) movement which brings together public administration representatives at local, regional, national, or European level with representatives of the private sector, non-for profit and academic organisations to boost sustainable digital transformation in cities and communities in the EU. As such, **Living-in.EU**, through its different **working groups** (i.e., legal, technical, financial, capacity building and monitoring), provides a key space to build upon the work of the preparatory action for DS4SSCC.

In the next few months, it will be key to **continue and broaden engagement with stakeholders**, and in particular with **local authorities, communities and citizens**, to ensure the success of the deployment of DS4SSCC. Finally, the coordination and alignment with **other sectoral data spaces** (e.g., Mobility, Tourism, Green Deal, Energy, etc) will also be essential to establish the vision of common European Data Spaces set out in the European Strategy for data.



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About Data Space for Smart and Sustainable Cities and Communities (DS4SSCC)

Data is a central aspect of the twin green and digital transformation, and European cities, regions, towns, and rural areas play a vital role in safely leveraging its potential. This preparatory action for a Data Space for Sustainable and Smart Cities and Communities (DS4SSCC) provides a coordinated starting point for public, private, and individual stakeholders to contribute and use data, aligned with European values and policies. This preparatory action emphasises the sustainability aspect – green, social, and economic – and the diversity of communities, and aims to:

- Develop a multi-stakeholder data governance scheme by bringing together European cities and their local stakeholders (‘quadruple helix’) to collaborate on use cases relevant to Green Deal objectives through an operational local data governance core group”.
- Create a blueprint for the European DS4SSCC by co-creating with stakeholders a methodology for setting it up, from the vision of a full-fledged pan-EU DS4SSCC, not only from a technical perspective but also giving operational guidance e.g., for procurement.
- Bring an agreed set of priority datasets into conformity with the new blueprint by delivering a catalogue of domains, use cases and related data sets for DS4SSCC.
- Develop a roadmap and action plan towards a mature, connected pan-EU DS4SSCC.
- Shape and implement the data space on the local, regional, national and EU levels, taking into account their different levels of maturity, will be an exercise in co-creation with the stakeholder forum.

Documentation will include recommended actions for standardisation, business models and strategies for running data spaces, and a vision for the federation of platforms. Building on core European networks of cities and communities that have championed the Living-in.EU movement, DS4SSCC is a timely, ambitious, and essential contribution towards the sustainability goals of European citizens.

Our consortium:

 OPEN & AGILE SMART CITIES	 EURO CITIES	 European Network of Living Labs
 FIWARE	 AUSTRIAN INSTITUTE OF TECHNOLOGY	 Gospodarska zbornica Slovenije Chamber of Commerce and Industry of Slovenia